

AT&T SYSTEM 85

MAINTENANCE

AT&T System 85
Release 2 Version 4
Maintenance

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INTRODUCTION

PURPOSE

This service manual describes maintenance of the System 85 R2, Version 4 switch and switch related components. It is intended for use primarily by personnel trained in the maintenance of digital switching equipment. It may be used by others having a working knowledge of digital switching equipment while under the control and direction of a remote maintenance facility such as Remote Maintenance, Administration, and Traffic System (RMATS II).

The service manual is intended for use by maintenance personnel using the Maintenance and Administration Panel (MAAP). The manual as well as the switch maintenance process is keyed to the use of the MAAP connected to the switch.

When this document is reissued, the reason for reissue will be given in this paragraph.

HOW TO USE THIS MANUAL

It is recommended that you become familiar with the contents and organization of this manual. Read the sections entitled SWITCH MAINTENANCE OVERVIEW and HUMAN INTERFACES to become familiar with the maintenance processes, aids, and types of troubles you may encounter.

Read the section entitled TROUBLE CLEARING to become familiar with the trouble locating process and the methods for isolating a failure.

The detailed information on the maintenance procedure (PROC) flipcharts is arranged in numerical sequence with the procedure identified at the top of the page.

Observe the switch alarm panel to identify the lighted indicator. Some indicators on the alarm panel are marked to associate the fault indicator with a particular PROC. **Always** start with PROC 600 (alarm causes/error log) to determine the maintenance procedure used to isolate that failure, then go to the referenced procedure for detailed information.

The failure identification and clearing process is progressive. Unless you are certain of the failure cause, always start with Test 1 (when applicable) and progress through all tests of the referenced procedure given for that failure.

If you are providing on-site support for a remote maintenance facility, use the Index to locate the instruction for performing the action or replacing the component identified by the remote facility.

ORGANIZATION

This service manual is divided into the following sections:

1. **Switch Maintenance Overview** - provides an overview of the error logging software and stored maintenance programs. Faults, errors, and failures are defined in their relationship to the maintenance process.
2. **Human Interfaces** - describes the functions of the switch alarm panel and the MAAP. Use of switch microdiagnostic testing capabilities, LEDs on circuit packs, tools and test equipment, and preventive maintenance are also covered.
3. **Trouble Clearing** - describes the recommended method of handling alarmed, user reported, and no response from the switch trouble conditions.
4. **Maintenance Procedures** - contains the detailed instructions for using the maintenance procedures for failure analysis and trouble clearing.
5. **Switch Component Replacement** - provides description of the switch cabinets and carriers and contains instructions for checking option settings and replacing circuit packs and components.
6. **SMDR Component Replacement** - provides instructions for replacing circuit packs and components. Adjustments required as a result of circuit pack replacement are also provided.
7. **Auxiliary Cabinet Component Replacement** - provides a description of the auxiliary cabinet and contains instructions on replacing auxiliary cabinet components.
8. **Maintenance and Administration Panel (MAAP)** - provides a description of the MAAP and how to use it. Port contention between facilities utilizing the maintenance mode is also covered.

Common procedures (opening cabinet doors, removing rear covers, etc.) are assumed and not illustrated or covered in the component replacement procedures.

This issue of the maintenance service manual is compatible with MAAP flipcharts comcode 845552223, Issue 1 through Issue 5. The flipchart illustrations in this manual are not drawn to scale and should not be reproduced for use as replacements on your MAAP.

SWITCH MAINTENANCE OVERVIEW

GENERAL

Switch maintenance uses built-in maintenance capabilities, error logging software programs, and stored diagnostic maintenance procedures.

The self-diagnostic ability and the various fault handling capabilities programmed into switch software are used as the basis for the analysis and trouble clearing processes presented.

Maintenance objectives are the fault detection, isolation, and repair of defective equipment.

Major alarms are faults affecting more than (or equal to) 64 time slots and minor alarms are faults affecting less than 64 time slots.

Faults, errors, and failures are detected and identified when they occur.

- a. A fault is a physical defect of the switch hardware that causes improper circuit operation. Some faults are intermittent because they have no predictable or regular frequency of occurrence. Others are considered solid. Possible causes of intermittent faults are noise, deterioration, and critical timing.
- b. An error is a single occurrence of an incorrect event or response and can be either hardware or software in nature. An error is the result of a fault, noise, a software bug, or an irregularity.
- c. A failure is when the number of detected errors exceeds a predetermined threshold. The signal that this threshold is exceeded is an alarm(s). The level of alarm shows the effect of the failure on the quality of service.

Tests are used for both detection and diagnosis. A test is a sequence of stimuli applied to a circuit, a group of circuits, or a software function, with the expected output or results.

A detection test determines the existence of a fault or an abnormal software condition; i.e., it indicates whether or not the circuit(s) or function(s) appears to operate correctly.

A diagnostic test analyzes the nature of detected errors and isolates the source of each. There are two subsets of diagnostic tests: identification and analytical.

- a. Identification tests provide information for the error log when an error is detected: e.g., circuit identity and error code.
- b. Analytical tests perform higher level analysis of recorded errors: e.g., patterning, manually initiated testing, and repair analysis.

ERROR DETECTION

Error detection routines determine whether or not specific circuits or system functions are operating correctly. Detection of errors can occur during an integrity check, an operational check and/or a demand test.

- a. **Integrity Check:** A test which is scheduled to be executed on either a periodic or time-available basis in order to verify the integrity of the system.
- b. **Operational Check:** A check which is performed when the switch carries out one of its assigned operations. The check can be done by hardware (e.g., a parity check) or by software (e.g., verification of data consistency by the call processing routines).
- c. **Demand Test:** A test which is executed upon demand via a maintenance procedure. Demand tests include the set of tests that are used for integrity checks.

Once an error is detected, a diagnostic routine may be used to analyze the nature of the error and to determine its source. The error is then recorded in the error log, and if necessary appropriate recovery action is initiated.

Detection tests check the integrity of the switch's hardware components and some of the software functions on an on-going basis. These tests are scheduled either as periodic or time-available tasks and are designed to detect both hardware and software errors.

The integrity of selected portions of the switch can be verified by running corresponding demand tests. Integrity checks, as well as operation checks, record errors in the Periodic Maintenance Information Data Structure (PMIDS) while demand tests record errors in the Demand Maintenance Information Data Structure (DMIDS).

Operational checks are made to detect abnormal conditions and/or correct results that might arise during switch operation. Detection of these errors is provided by special hardware and software.

- a. For hardware detectable errors, circuitry on the circuit packs is used to find faults such as parity or data errors. Most of the errors cause a bit to be set in a special error register that is polled every second by the network (TMS and/or module) processor.
- b. A 1-second periodic task in the common control processor requests the error information from the network (TMS and/or module) processor and takes appropriate action. Other faults cause an interrupt to be sent to the module processor for immediate processing.

ERROR LOGGING

Overview

To allow for automatic detection of defective circuits, and to provide information that might be required in the analysis and repair of switch problems, especially intermittent ones, each occurrence of a detected circuit malfunction is recorded in the switch error log. This error log is maintained in a portion of the common control memory called PMIDS.

When a periodic test detects an error in the operation of a circuit or functional area, an entry describing the presence and nature of the detected malfunction is made in PMIDS to record that fact. Data stored in PMIDS is used by the alarm thresholding algorithms to flag switch failures.

Periodic Maintenance Information Data Structure (PMIDS)

PMIDS is composed of a set of eight tables, containing a particular type of information about an error entry. The eight tables collectively characterize the malfunction of a particular circuit or function. The eight tables for each function or circuit type are:

- a. Circuit identification.
- b. Error rate and duration.
- c. Time count.
- d. Fault signature and alarm information.
- e. Beginning time stamp.
- f. Alarm time stamp.
- g. Ending/resolved time stamp.
- h. Error count.

Entries in PMIDS are categorized as new, active, inactive, alarmed, or resolved.

- a. New entries are those where no entry for the circuit exists in PMIDS.
- b. Active entries are those where errors are recently detected.
- c. Inactive entries are those where the time since the most recent error exceeds 20 minutes.
- d. Alarmed entries are those where a circuit failure is detected and an alarm sent.
- e. Resolved entries are those that represent circuits that were alarmed but are repaired or the alarm manually turned off.

In a system with duplicated processors, there are two distinct PMIDS. This allows detection and identification of processor dependent problems. Most periodic tasks which update PMIDS do not run on the off-line processor. However, the addition of time stamps to PMIDS permanently establishes the time of errors, even in the off-line processor.

A facility is provided to allow the manual clearing of entries from the error log. It is possible to selectively clear the entire PMIDS, all entries for a particular circuit type, or an entry for a specific circuit. This capability is provided through two maintenance procedures.

PROC 600 (alarm causes/error log) allows individual entries or all entries for a particular unit type to be cleared (zeroed), and **PROC 612** (initialization causes) allows the clearing (zeroing) of all failure history (entries) in PMIDS.

The ability to manually clear (zero) entries in PMIDS is provided as a maintenance aid.

- a. This aid is not intended to be used in the normal course of performing switch maintenance as it destroys all failure history for the entries which are cleared (zeroed).
- b. The capability is provided when it is desirable to start with a clean failure history after correcting major problems that caused many alarms and at other times (i.e., installation).

The preferred method for clearing alarms is to **resolve** them using the appropriate maintenance procedure and its associated verification test after performing any necessary repairs.

Manual capabilities for clearing (zeroing) PMIDS entries are not provided in any of the other maintenance procedures.

Resolving of alarms can be accomplished in two ways.

- a. The preferred and normal method for clearing alarm causes is to resolve them by using the appropriate maintenance procedure, performing isolation of failures, making necessary repairs, and performing the associated verification test to ensure that the failure is corrected.
- b. A manual capability of turning off alarms and resolving the alarm causes is available by using the **CLEAR DATA; EXECUTE** sequence in most maintenance procedures.

Both of the above methods have the same result, they turn off the alarm indicator and update the alarmed entry in PMIDS as resolved. As can be determined by analyzing the above two methods, the alarm is resolved as far as the error log is concerned, but the cause of the alarm has not been determined nor repaired using the manual capability (i.e., **CLEAR DATA; EXECUTE** sequence). In addition, the alarm returns in a matter of minutes unless the cause of the alarm is eliminated.

Demand Maintenance Information Data Structure (DMIDS)

DMIDS is used when demand tests are active. DMIDS records detailed information (in a temporary buffer) concerning the nature of errors when associated maintenance procedures are performed.

Demand tests do not update or in any way alter the contents of PMIDS except for resolving alarmed entries for circuits that pass the demand test.

The information recorded by DMIDS for failing circuits may consist of a unit type, circuit identification, and specific fault code.

The specific fault code contains information that uniquely identifies the point in the decision algorithm at which the diagnosis was completed (diagnosis stopped because of a failure).

ALARM PLAN

The alarm plan is the strategy for notifying the user that a circuit or functional block of the switch is malfunctioning. When the information in PMIDS indicates that a malfunction occurred, this is considered a **failure** and an alarm is raised to serve notice of this condition.

An alarm may be indicated in several ways. It may be a lighted alarm or fault indicator on the alarm panel, a lighted alarm indicator on the attendant console, an immediate automatic call to a remote maintenance facility (if applicable), an affirmative response to a maintenance poll from the user or a remote maintenance facility, or any combination of these.

Alarms are generated for failures detected by operational error processing, periodic tests, time available tests, and/or call processing. Failures detected during maintenance procedure diagnostic testing are not alarmed.

There are two alarm thresholds which may be exceeded. The first, which is intended to flag hard failures, is one error detected in each of 3 consecutive minutes. The second, which is aimed at detecting intermittent failures, is achieved when the error rate (peg count) exceeds a set number (typically five errors in 2 hours).

The threshold value is defined in a table by the switch software for each circuit type or functional area. These values may be altered by issuing a patch to the switch tape. **PROC 275, Word 4** can alter the threshold values for unit type 30 (even port peripherals), unit type 41 (trunk, software), and unit type 45 (auxiliary trunk). No other unit types can be altered by translation or maintenance procedures. The ability to modify this table of threshold values allows flexibility to vary the sensitivity of certain types of circuits as experience warrants.

In those situations where duplicated circuitry exists, a malfunctioning circuit may need to be alarmed (for a switch of equipment) much more quickly than the normal thresholding algorithms allow. In such cases the normal alarming mechanism may be bypassed and an immediate failure declared.

The routing of alarm indicators is a function of the alarm level. The routing for each alarm level is:

- a. Major or minor alarm - Turns on indicator lights at the attendant's console and the alarm panel, and automatically makes a call to a remote maintenance facility (if applicable) to report the failure.
- b. Warning alarm - Turns on an indicator light on the alarm panel only and waits for the user or a remote maintenance facility (if applicable) to poll the switch before reporting the failure.

HUMAN INTERFACES

PRECAUTIONS

When performing maintenance or translation procedures on System 85 switch equipment, certain precautions must be observed by user personnel.

Cautions, warnings, and danger statements contained within the service manual **must** be observed to prevent loss of service, possible equipment damage, and possibility of personnel injury.

In addition, the following precautions regarding electromagnetic interference and static electricity **must** be observed.

- a. **Electromagnetic Interference:** This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise to be introduced into the customer's equipment. If the equipment is not installed and used in accordance with the instruction manual, interference to radio communications may be caused.

WARNING: To maintain the Electromagnetic Interference (EMI) integrity of the System 85 switch, maintenance personnel (after performing any translation or maintenance activities) must ensure that all cabinet panels, covers, etc. are firmly secured in place prior to leaving the customer's premises.

- b. **Static Electricity:** To prevent or reduce electrostatic discharge, maintenance personnel **must** always attach wrist grounding straps before working on switch components or handling circuit packs.

Caution: Electrostatic discharge can damage or destroy circuit packs containing integrated circuits (ICs).

The electromagnetic compatibility (EMC) wrist strap and cable assembly (cc900698226) is placed in the bottom of the module control cabinet in a poly bag (cc900492372) next to the AC distribution unit.

Note: This wrist strap is to be used whenever troubleshooting or performing maintenance or handling any circuit packs associated with the System 85 switch.

The EMC wrist strap assembly is used in the following manner:

- a. Attach the wrist strap to either wrist.
- b. Connect the alligator clip to the cabinet frame.

A good ground connection for the alligator clip is:

- a. In equipment coded cabinets which have removable sides, attach the alligator clip to any convenient screw head that fasten the hinges to the cabinet or to the screws that fasten the door latch to the frame.

- b. In equipment coded cabinets which have intergrated sides, the alligator clip may be attached to any of the front and rear cabinet formed faces (front door area or back area when viewed in an open position) which are coated with a conductive paint.
- c. In either case, an area close to the vertical center of the cabinet should be selected for the alligator clip allowing a more central position from which to operate.

MAINTENANCE AND ADMINISTRATION PANEL (MAAP)

The **MAAP**, (Figure 1), is the primary interface used by maintenance personnel at the customer's premises to perform maintenance tasks. The stored maintenance programs are represented on the **MAAP** by a series of flipcharts.

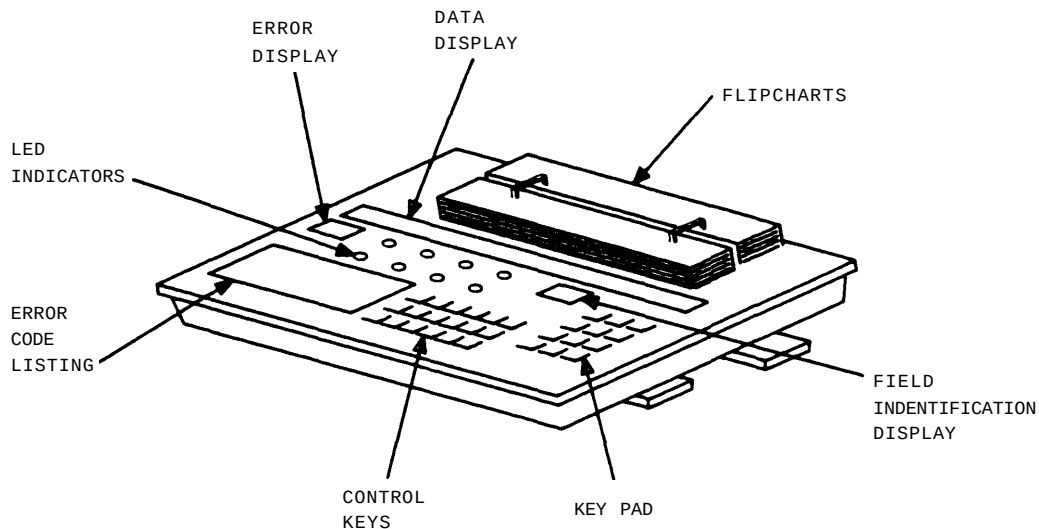


Figure 1. MAAP

The **MAAP** provides access to maintenance procedures to perform interrogation, testing, and fault isolation.

Blockage (port contention) on use of the **MAAP** may occur if another facility (user) has the maintenance mode bit set in the **MODE** status display procedure. The maintenance mode bit (and other modes as required) has to be set prior to using the **MAAP** in either the on-line or off-line side (as appropriate) to perform maintenance tasks.

When the switch is duplicated, it may be necessary to examine both the on-line and off-line side to determine the maintenance procedure to be performed. The problem that exists could have caused a switch to the healthier common control. When the problem is corrected, both the on-line and off-line sides should be examined to determine if potential problems exist.

For further information on a description of the **MAAP**, port contention (blockage), and how to use the **MAAP** read the section entitled MAINTENANCE AND ADMINISTRATION PANEL (MAAP).

ALARM PANEL

The alarm panel (Figures 2 and 3) is located at the top of the common control cabinet.

The alarm panel provides an indication of the seriousness of system problems by displaying the alarm level (major, minor, or warning) of any active alarm. A general indication of the hardware (processor/memory, environment, network, etc.) area that caused the alarm is also displayed.

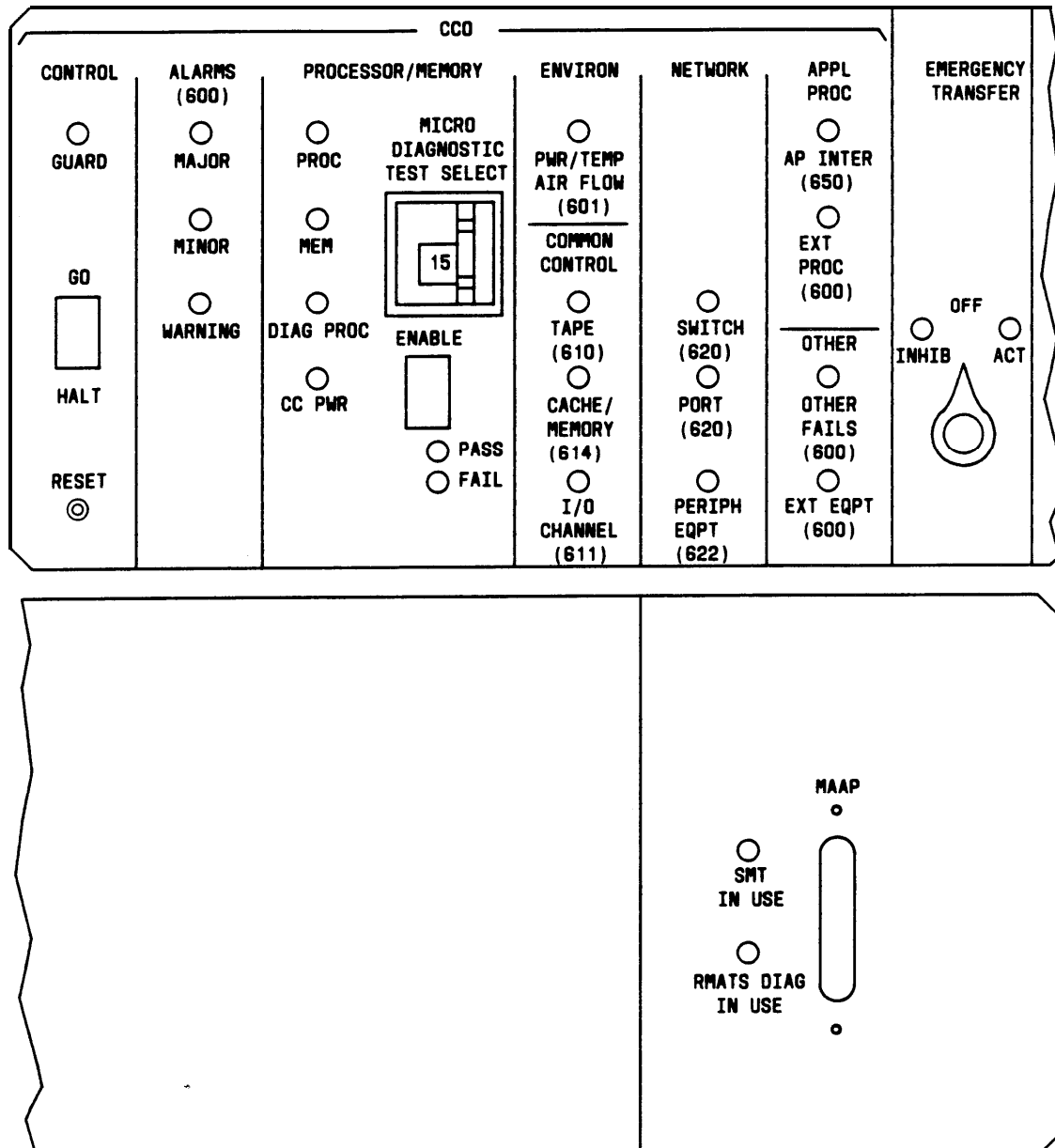


Figure 2. Unduplicated Common Control Alarm Panel

The system's state of health is provided through the use of alarm and equipment failure indicators. Equipment failure indicators are grouped functionally by their potential importance to system operation and call processing integrity.

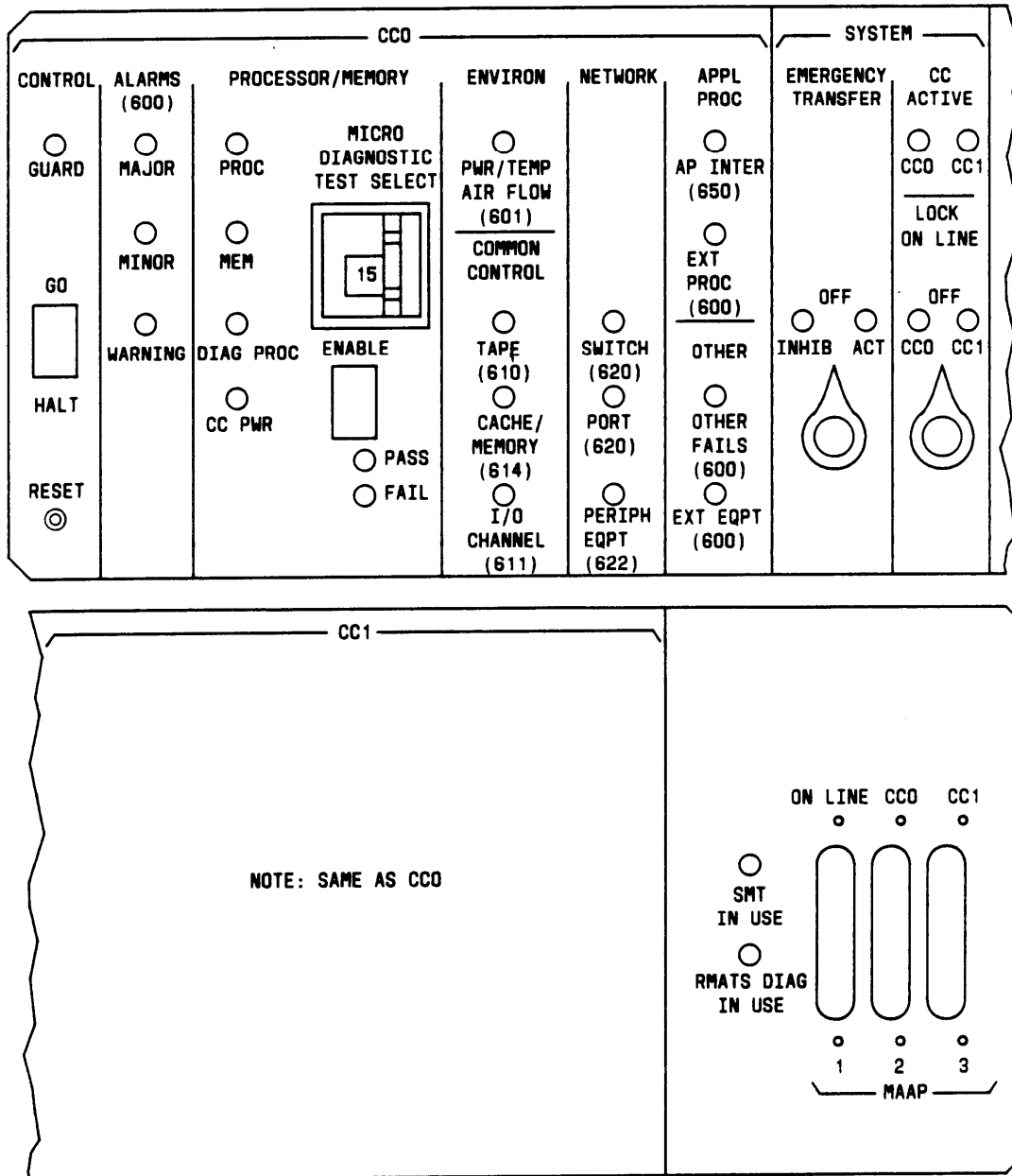


Figure 3. Duplicated Common Control Alarm Panel

The alarm panel permits effective use of the maintenance fault isolation and repair procedures. Some indicators on the alarm panel are associated with a number in parentheses adjacent to the indicators. This number designates a **PROC** which may be used to access specific information about system problems, such as the location of faulty equipment or the exact cause of a problem.

Troubleshooting the main processing unit can be done from the alarm panel. Troubleshooting the main processor is accomplished with microdiagnostic tests of the main processor and memory. The results are displayed by **PASS** and **FAIL** indicators on the alarm panel.

In addition to troubleshooting capabilities, the alarm panel provides:

- a. Manual control of the emergency transfer capability.
- b. Go/halt control of the common control processor.
- c. Control over which processor is on-line in a duplicated common control system.
- d. Reset of the suicide timer after time-out.

A description of each alarm panel indicator is given in Table A. A description of each alarm panel switch and connector is given in Table B.

MICRODIAGNOSTICS

Overview

Microdiagnostics consist of a series of test programs used by the processor for fault detection and isolation of the main processor and its associated components.

Microdiagnostics are performed because:

- a. The switch is down (indicated by **MJ**, **PROC**, and **FAIL** indicators being lighted).
- b. Emergency transfer is indicated on the alarm panel.
- c. The generic or XRAY tape can not be loaded.
- d. To ensure that the main processor and its associated circuitry is in proper working condition.
- e. **PROC 612** (initialization causes) indicates the cache is off for recovery (fault code 37) and it is desired to test the cache memory (microdiagnostic test 14).
- f. A more complete test of the cache in an off-line common control of a duplicated common control switch is desired (microdiagnostic test 14).
- g. **PROC 600** (alarm causes/error log) indicates diagnostic processor failures (unit type 60) and it is desired to test the diagnostic processor (microdiagnostic test 0).
- h. Of unusual circumstances in which hardware or software causes for problems are equally likely.

Note: For these cases, successful pass of microdiagnostics indicates that hardware in the common control switch is less likely the cause of these types of problems.

TABLE A.

ALARM PANEL INDICATORS				
SECTION	INDICATION	COLOR	DEFINITION	ORIGIN
CONTROL	GUARD	red	Warns that processor is halted.	hardware
ALARMS	MAJOR	red	Indicates major alarm is active.	both
	MINOR	red	Indicates minor alarm is active.	both
	WARNING	red	Indicates warning alarm is active.	both
PROCESSOR/ MEMORY	PROC	red	A processor failure has been detected.	hardware
	MEM	red	A memory failure has been detected.	hardware
	DIAG PROC	red	Indicates that the diagnostic processor has failed.	hardware
	CC PWR	red	Indicates that common control power has been interrupted.	hardware
	PASS	green	This LED is used as a system "heartbeat". It also indicates that the processor passed the selected microdiagnostic test.	software
	FAIL	red	Indicates that the processor failed the selected microdiagnostic test or CC suicide.	software
ENVIRON	PWR/TEMP AIR FLOW	red	A power, temperature, or airflow failure has been detected.	software
COMMON CONTROL	TAPE	red	Indicates that tape errors of some kind have been found.	software
	CACHE MEMORY	red	Indicates that cache memory errors have been detected.	software
	I/O CHANNEL	red	Indicates a failure in a CC I/O channel.	software
NETWORK	SWITCH	red	Indicates a failure in a digital network module.	software
	PORT	red	Indicates a failure in a port circuit.	software
	PERIPH EQPT	red	Indicates a network peripheral (e.g., terminal) problem.	software
APPL PROCR	AP INTER	red	Indicates a DCIU or applications processor (adjunct) link failure.	software
	EXT PROC	red	Indicates an external processor problem.	hardware

TABLE A. (Contd)

ALARM PANEL INDICATORS (Contd)				
SECTION	INDICATION	COLOR	DEFINITION	ORIGIN
OTHER	OTHER FAILS	red	Indicates some software detected problem not covered by the equipment failure LEDs listed above.	software
	EXT EQPT	red	Indicates a failure outside the system proper which is not detectable by software.	hardware
EMERGENCY TRANSFER	INHIB	yellow	Indicates that an automatic switch to the emergency transfer condition is inhibited.	hardware
	ACT	red	Indicates emergency transfer has been activated.	both
CC ACTIVE	CC0	green	Indicates common control 0 is on-line.	software
	CC1	green	Indicates common control 1 is on-line.	software
LOCK ON LINE	CC0	yellow	Indicates common control 0 has been locked on-line.	hardware
	CC1	yellow	Indicates common control 1 has been locked on-line.	hardware
MAAP	SMT IN USE	red	Indicates System Management Terminal (SMT) is connected to the switch which locks out RMATS or MAAP operation.	hardware
	RMATS DIAG IN USE	red	Indicates Remote Maintenance, Administration and Traffic System (RMATS) is connected to the switch and is executing microdiagnostic test.	hardware

TABLE B.

ALARM PANEL CONTROLS			
SECTION	CONTROL CONNECTOR	COMPONENT TYPE	REASON FOR USE
CONTROL	GO/HALT	switch	Normally in the GO position for system operation. Halts the common control processor when pressed to HALT position.
	RESET	button	Allows the suicide time in the common control to be reset.
PROCESSOR/MEMORY	MICRO DIAGNOSTIC TEST SELECT	thumbwheel switch	Allows a microdiagnostic test to be selected for execution.
	ENABLE	switch	Causes the microdiagnostic test selected to be executed.
SYSTEM	EMERGENCY TRANSFER	switch	Allows the emergency transfer capability to be manually activated or inhibited.
	CC LOCK ON LINE	switch	Allows one or the other common control, in a duplicated system, to be locked on-line, which prevents a software switch between common controls.
MAAP	MAAP	connector	This is the connector between the MAAP and a common control processor. In a duplicated system, there is one connector for each common control and one connector for whichever processor is currently on-line.

- i. When a tape is reloaded and the current memory is not desired.
- j. After replacing an X-ray tape with a generic tape.

Caution: When a tape is reloaded or an X-ray tape is replaced with a generic tape, performing microdiagnostic test 15 does not clear MSTAT memory. False alarms may be service affecting and emergency transfer can occur. Perform all microdiagnostic tests (0 through 15) when reloading a tape or replacing an X-ray tape with a generic tape.

Sixteen microdiagnostic tests are provided. With the exception of Test 0, each test uses circuits tested by the previous test. The 16 tests are run in numerical order starting with Test 0 and progressing to Test 15.

In testing a particular part of the main processor, each test uses parts outside the area under test. A test may fail and the fault lie outside the part of the main processor under test.

Microdiagnostic tests are described according to increasing interdependencies. Execution of the microdiagnostic tests should follow this same ordering scheme. Microdiagnostic tests invoked from the alarm panel are:

- a. Test 0 - Diagnostic processor circuit pack demand test.
- b. Test 1 - Maintenance bus demand test.
- c. Test 2 - Alarm interface circuit pack demand test.
- d. Test 3 - Spare (reserved for future use).
- e. Test 4 - Spare (reserved for future use).
- f. Test 5 - Spare (reserved for future use).
- g. Test 6 - Spare (reserved for future use).
- h. Test 7 - 501CC processor circuit packs demand test.
- i. Test 8 - System bus and buffered bus demand test.
- j. Test 9 - 501CC instruction set demand test.
- k. Test 10 - Tape subsystem demand test.
- l. Test 11 - Main memory system demand test.
- m. Test 12 - Memory protect circuit pack demand test.
- n. Test 13 - Spare (reserved for future use).
- o. Test 14 - Cache memory circuit pack demand test.
- p. Test 15 - An abbreviated test and a forced load.

Microdiagnostics are performed starting with Test 0 and progressing in numerical order to Test 15. If a failure is indicated, corrective action is performed and the test is repeated. If the test passes after corrective action, all tests are repeated starting with Test 0 and progressing through Test 15.

Functional Description

The functions tested by each microdiagnostic test are covered in the following paragraphs.

Test 0 checks the diagnostic processor circuit pack and parts of the remote interface. The diagnostic processor performs self-tests to verify the CRC checksum of the ROM, conducts a memory test of its RAM and data RAM, tests the status register and I/O registers, and performs a preliminary test of the maintenance bus control interface.

Test 1 checks the maintenance bus. The maintenance bus test begins by lighting the **RED** LEDs on all circuit packs in the common control for approximately 3 seconds. The test continues with an inventory of the circuit packs in the common control carrier, writes and reads back the complement of each circuit pack board-select number, tests for stuck-at faults and performs a test of the board select leads.

Test 2 checks the alarm interface circuit pack and the alarm panel. During this test, the alarm panel LEDs may momentarily change. As part of the test, the INIT* lead is set and cleared (causing and canceling the suicide condition). The software controlled alarm register and external alarm register are also tested.

Tests 3 through 6 are spare tests reserved for future use.

Note: When Tests 3 through 6 are selected and executed, an immediate **PASS** indication on the alarm panel is provided.

Test 7 checks the 501CC processor circuit packs. The 501CC processor test consists of four Signature Accumulator Chip (SAC) tests, one for each processor circuit pack.

Test 8 checks the ability of the 501CC circuit packs to communicate. Major portions of UN153, TN404, and TN491 are tested. Faults are detected on 501CC circuits that affect the ability to communicate over the system and buffered bus.

Test 9 checks the 501CC instruction set. The function of the 501CC instruction set test is to exercise the emulation microcode, verify the correct operation of most of the instruction set, and verify the correct operation of the 501CC at full speed.

Test 10 checks the tape subsystem. The test of the tape subsystem and tape interface (TN430) is performed by a call to the subsystem to perform its own self-tests.

- a. Information concerning the success or failure of these self-tests is made available in a status register. The status register bits indicate which part of the tape subsystem is faulty.
- b. The **MAAP** displays the value of the status register bits.

Test 11 checks the main memory system. The functions of main memory are tested by performing a main memory test, an Error Correction Circuitry (ECC) test, a memory fabric test, and parity tests.

- a. **Main Memory Test:** The main memory test reads the ID chip on each memory circuit pack, translates the code into a memory circuit pack density and decides if ECC is to be tested.
 1. **RED** and **GREEN** LEDs on the memory circuit packs light momentarily as part of the ID chip tests.
 2. If the ID chip contains a code that is not in the testable range, the main memory test fails immediately.
 3. If an empty memory slot between two occupied memory slots exists, the main memory test fails immediately.
 4. The common control carrier must not contain memory circuit packs of different densities, as this also causes the main memory test to fail.
- b. **Memory Fabric Test:**

Note: The memory fabric test destroys all information in the memory configuration, including the MSTAT data.

1. The memory fabric test checks many functions on the equipped memory circuit packs in a series (i.e., one function is tested on all circuit packs before testing the next function).
2. During two of the memory fabric sub-tests, the **GREEN** LED on the memory circuit pack currently being tested is lighted to indicate test progression.

c. ECC and Parity Tests:

1. The test of the error correcting circuitry involves testing the RAM used to store the six check bits.
2. The **GREEN** LED on the memory circuit pack currently being tested is lighted to indicate test progression.

Test 12 checks the memory protect circuit pack. The memory protect circuit pack (TN368) contains the system write-protect circuit, the system fetch-protect circuit, the system bus mastership-arbitration circuit, the I/O SANITY1 timer, and the power-on and clear flip-flops.

Test 13 is a spare test reserved for future use.

Note: When Test 13 is selected and executed, an immediate **PASS** indication on the alarm panel is provided.

Test 14 checks the cache memory circuit pack (TN369) and the bus interface circuit pack (UN153) to the cache memory.

Test 15 performs an abbreviated test and a forced load. When the abbreviated test and forced load sequence is selected, the system is cycled through a number of tests before the load is attempted. Test 15 does **not** clear MSTAT memory.

- a. The diagnostic processor circuit pack requests the 501CC to perform the SAC tests (microdiagnostic test 7). Each of the four SAC tests is executed and the results verified.
- b. The system bus and buffered bus tests (microdiagnostic test 8) are performed interactively between the 501CC and the diagnostic processor circuit pack.
- c. The 501CC instruction set test (microdiagnostic test 9) may be performed.
- d. If any of these tests fail, the load from tape is aborted and the diagnostic processor circuit pack forces **suicide**.
- e. The forced load is now executed.

Note: The forced load procedure does not interrogate main memory before it makes a decision whether or not to load from tape. It assumes main memory is corrupted and initiates a load from tape.

CIRCUIT PACK LEDs

Overview

Except for the DC/DC converter boards, each circuit pack in the digital network and common control carriers contains an ID chip.

- a. The ID chip has provision for driving RED and GREEN LEDs on the circuit pack edge. When lighted, the RED LED indicates that the circuit pack is defective (failed) and the GREEN LED indicates that the circuit pack is good (passed).
- b. There may also be a GREEN **pilot** LED, and possibly one or more YELLOW **in-use** LEDs on the circuit pack edge.

LED Strategy

The RED and GREEN maintenance LEDs are useful in the demand verification mode, and in the periodic detection mode when the **MAAP** is connected to the switch.

Demand Verification Mode: The two kinds of demand verification are normal and automatic.

- a. **Normal Verification:** Maintenance personnel are able to run a verification test on a given circuit pack by using appropriate maintenance procedures.
 1. When the verification test is complete, the results are displayed on the **MAAP** and the RED or GREEN LED on the circuit pack tested is lighted depending on the outcome of the test; i.e., GREEN for pass, RED for fail.
 2. The lighting of the circuit pack's LED provides additional feedback to maintenance personnel on the outcome of the verification test and aids in locating the faulty circuit pack.
- b. **Automatic Verification:** When the diagnostic analysis and verification test is run from appropriate maintenance procedures, a faulty circuit location is displayed that points to the circuit pack to replace.
 1. At the same time the RED LED on that circuit pack's edge is lighted.
 2. While a circuit pack's RED LED is lighted in this mode, the circuit pack is scanned at a high rate to determine when it is unseated, and a circuit pack reseated or replaced.
 3. After the circuit pack is reseated or replaced, a verification sequence is run on the circuit pack, and the results are displayed. The appropriate LED on the circuit pack edge is lighted.

Periodic Mode: Feedback on the frequency and coverage of periodic tests in the digital network is valuable for isolating serious software problems in the field. Feedback is only provided when the **MAAP** is connected to the switch.

- a. To provide this feedback, each periodic test associated with the digital network recognizes when the **MAAP** is connected and lights the GREEN LED on the edge of the main circuit pack under test. The LED is left on until the conclusion of the test.
- b. This use of the GREEN LED provides a maintenance **heartbeat** that indicates the frequency and coverage of periodic test routines in the network.

Green Pilot LEDs:

- a. Green **pilot** LEDs are used to denote that a circuit pack has power and is operational. The power supply boards, High Capacity Minirecorder (HCMR), and 20 Hz ringing generators have GREEN pilot LEDs.
- b. The tape interface circuit pack (TN430) has a GREEN LED which provides a **heartbeat** that indicates the state of the tape subsystem. A fast heartbeat (5 Hz) indicates when TN430 is off the bus. A slow heartbeat (1 Hz) indicates when TN430 is allowed on the bus.
- c. The module interface circuit pack (TN480) in the TMS carrier has a GREEN LED in position 4 which indicates communication with the associated light guide interface circuit pack (TN481) in the module control carrier.
- d. The light guide interface circuit pack (TN481) in the module control carrier has a GREEN LED in position 4 which indicates communication with the associated module interface circuit pack (TN480) in the TMS carrier.

Yellow In-Use LEDs: Yellow **in-use** LEDs are used to denote that a circuit pack is in an **idle** or an **in-use** state. The following circuit packs contain YELLOW **in-use** LED indicators:

- a. TMS or module control channel (MCC) circuit pack (TN401): The MCC has two YELLOW LEDs; one flashes when the MCC is communicating with CC0, and the other flashes when the MCC is communicating with CC1.
- b. Duplication channel circuit pack (TN530): The duplication channel circuit pack has one YELLOW LED to indicate if it is in the on-line side of the common control carrier.
- c. Light guide interface circuit pack (TN481): The light guide interface circuit pack has one YELLOW LED to indicate if it is in the on-line side of the module control carrier.
- d. Port circuit packs: Except for the tone plant and the touch-tone dialing senders and receivers, each port circuit pack has one YELLOW LED that is the **OR** of activity in any of the ports on the circuit pack.
 1. If any one of the ports on a port circuit pack are in-use, then the YELLOW LED is lighted. Removal of the circuit pack when the YELLOW LED is lighted disrupts service on the circuit(s) in-use.
 2. The touch-tone dialing sender and receiver circuit packs have one YELLOW LED per port (four per circuit pack).

System clock synchronizer (SCS) circuit pack (TN463)

The SCS circuit pack has eight LEDs which consist of:

- a. A yellow LED in positions one and two which are dedicated to the primary and secondary synchronization reference sources respectively. If either of these LEDs are lighted, it indicates the associated reference is unusable (out of lock).
- b. A yellow LED in positions 14, 15, and 16 that indicate, when lighted which reference is on-line.

LED position 14 is for the internal High Accuracy Clock (HAC), position 15 is for the primary synchronization reference, and position 16 is for the secondary synchronization reference.
- c. A yellow LED in position 17 is used for duplicated module control (single module system) or duplicated TMS (multi-module system) carrier applications. When lighted, it indicates that the synchronization reference is receiving clock reference from the synchronization reference in the on-line duplicated carrier. This LED should always be lighted in the off-line carrier.
- d. A red and green LED in positions 18 and 19 indicating when lighted the FAIL and PASS status of the circuit pack when a diagnostic test is performed.

Remote Module Interface (RMI) Circuit Pack (TN456)

The RMI circuit pack has seven LEDs which consist of:

- a. A yellow LED in position 7 indicating the on-line status when lighted.
- b. A yellow LED in position 9 indicating the MAAP in-use status when lighted.
- c. A red LED in position 11 indicating the LFAIL status when lighted.
- d. A green LED in position 14 indicating the transmit (FTA) status when lighted.

- e. A green LED in position 16 indicating the receive (FRA) status when lighted.
- f. A red and green LED in positions 18 and 19 indicating when lighted the FAIL and PASS status of the circuit pack when a diagnostic test is performed.

DS-1 Circuit Pack (ANN11)

The DS-1 circuit pack has five LEDs which consist of:

- a. A green LED in position 7 indicating a red alarm if not lighted.
- b. A green LED in position 8 indicating a yellow alarm if not lighted.
- c. A yellow LED in position 9 indicating initialization or busy when lighted.
- d. A red and green LED in positions 18 and 19 indicating when lighted the FAIL and PASS status of the circuit pack when a diagnostic test is performed.

Remote Carrier Group Circuit Packs

The remote carrier group contains one or two Remote Carrier Control (RCC) circuit packs (ANN16) and from three to six port circuit packs.

The RCC circuit pack has four LEDs which consist of:

- a. A GREEN LED which provides a **heartbeat** that indicates the state of the remote carrier group. A fast heartbeat indicates that communication with the Remote Carrier Local (RCL) circuit pack in the switch has been lost. A slow **heartbeat** indicates that communications with the RCL is established.
- b. A yellow LED in position 9 indicating initialization or busy when lighted.

Note: The **YELLOW** LED on the general purpose port (SN270 or SN271) circuit pack in the remote carrier group is not used.

- c. A red and green LED in positions 18 and 19 indicating when lighted the FAIL and PASS status of the circuit pack when a board insertion test is performed.

Except for the **YELLOW** LED on the general purpose port (SN270 or SN271) circuit pack (which is not used) the port circuit packs in the remote carrier group have the same type of LEDs as they do in the local carriers of the switch.

Primary Rate Port Circuit Pack (ANN35)

The primary rate port circuit pack has five LEDs which consist of:

- a. A green LED in position 7 indicating local framing status. If on, the local primary rate port is framing properly. If off, it indicates that either a local loss of framing alignment has occurred or the local receiver is shut down due to a loss of the incoming signal.
- b. A green LED in position 8 indicating remote framing status. If on, both the local primary rate port and the remote end are framing properly. If off, it indicates that a remote frame alarm is received by the primary rate port circuit pack or that local framing is lost for any reason.

- c. A yellow LED in position 9 indicating that the signaling channel is active.
- d. A red and green LED in positions 18 and 19 indicating when lighted the FAIL and PASS status of the circuit pack when a diagnostic test is performed.

Physical Placement of LEDs

There are 19 LED positions on the edge of each circuit pack. The positions start from the top of the circuit pack (as it sits in a carrier) and extend most of the way down to the circuit pack's connector. The position at the top is number one and at the bottom is number 19.

The standard configuration places the maintenance ID chip RED and GREEN LEDs in positions 18 and 19, respectively. When there is a single YELLOW **in use** LED it is placed in position nine. If there are several YELLOW LEDs they are placed from position one down to as many contiguous positions as are needed. GREEN **pilot** LEDs are placed in position one to prevent confusing the pilot LED with the GREEN maintenance LED.

TOOLS AND TEST EQUIPMENT

Tools and test equipment required for maintenance of the System 85 switch consist of:

- a. Alarm Panel.
- b. **MAAP**.
- c. Digital multimeter KS-20599, L4 or equivalent.
- d. Loop around test fixtures.
- e. Touch-tone telephone set.
- f. Rotary dial telephone set.
- g. W1AP test cords. (2)
- h. 249A adapter.
- i. Telephone set.
- j. 1013 type hand set.
- k. ANI Data Link Test Set (J59204AJ) and connector cable (List 4).

The alarm panel and **MAAP** are used with the switch as on-site maintenance tools.

- a. The alarm panel provides LED indicators to denote the state of health of the system. The LEDs are used to identify the problem area(s) when a switch failure occurs. The alarm panel also provides controls for processor operation and emergency transfer.
- b. The **MAAP** is the basic interface between maintenance personnel and the switch. It provides access to maintenance procedures which are used for interrogation, testing, and fault isolation.
- c. The alarm panel and **MAAP** are covered in detail in other sections of this service manual.

A digital multimeter KS-20599, L4 or equivalent is required when performing **PROC 601** (environmental tests) to measure voltages at test points to determine corrective action to be performed.

Looparound test fixtures are required when performing **PROC 650** (DCIU) and **PROC 651** (processor communication circuit (PCC) tests) when manual external or end-to-end looparound tests are performed.

A telephone set with W1AP test cords and a 249A adapter or a 1013 hand test set and 249A adapter are required when making terminal-to-trunk test calls or listening to transmitted tones at the test line. These tools are used in performing **PROC 642** (terminal-to-trunk test call), **PROC 643** (terminal-to-tone test call), and **PROC 644** (terminal-to-auxiliary tone test call).

The ANI Data Link Test Set (J59204AJ) and connector cable (List 4) are required when running Tests 2 through 4 of **PROC 623** (ANI failures) to prevent test messages being sent to the central office. A diagram of the test configuration is shown in Figure 4.

PREVENTIVE MAINTENANCE

Preventive maintenance tasks should be performed as part of the maintenance visit. Maintenance tasks are determined by the user of the switch.

As a minimum, the following maintenance tasks should be performed after maintenance activities are completed.

- a. Check with the user of the switch to determine if any type of intermittent problems exist. Perform corrective action as appropriate.
- b. Examine the switch error log of the on-line and off-line side (if duplicated) using **PROC 600** Test 2, to determine if potential problems exist. Take corrective action as necessary.
- c. If backup batteries are provided, check replacement date(s) and replace batteries if required.
- d. Replace Gates batteries comcode 403736291 in the J87462A power unit at least once every 2 years.
- e. Replace Gates batteries comcode 403736291 in the 3965-2 battery charger at least once every 2 years.
- f. Replace battery comcode 844665836 on the TN492 circuit pack 5 years after date of installation of the TN492 circuit pack.

The next replacement date of the battery is established by adding 5 years to the date of installation (month and year) of the TN492 circuit pack.

- g. Clean high capacity minirecorder tape head.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on cleaning the high capacity minirecorder tape head.

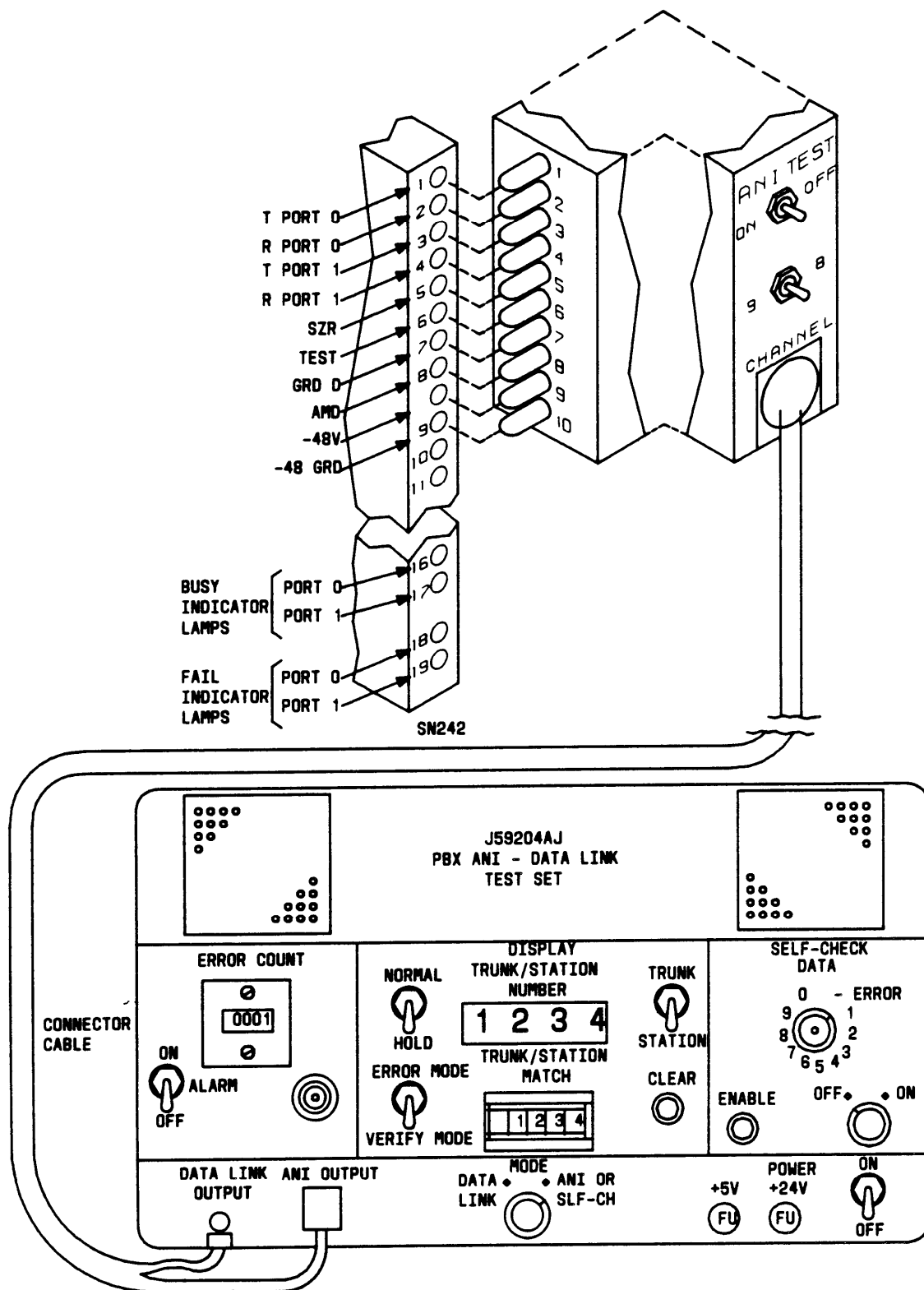


Figure 4. ANI Data Link Test Set

TROUBLE CLEARING

GENERAL

Overview

There are four ways of indicating trouble within the switch. The indications may be investigated locally or by a remote maintenance facility. The trouble indications are:

- a. Alarmed troubles.
- b. User reported troubles.
- c. No response from the switch.
- d. Maintenance polling.

Trouble clearing is based on the type of indication received and is covered in the paragraphs entitled: **Alarmed Troubles; User Reported Troubles; and No Response from the Switch.**

All of the trouble indications may initially be investigated by user personnel or a remote maintenance facility (depending on the status of the switch).

It is recommended that YOU read the paragraph entitled: **Recovery** prior to performing trouble clearing on System 85.

Items Affecting Trouble Clearing

1. The customer order document is required to identify the system assignments necessary to perform trouble clearing procedures.
2. Trouble clearing is directed to troubles within the System 85 switch. When troubles involve terminals or trunks, it is assumed that equipment and circuitry external to System 85 is functioning and the trouble is isolated to the System 85 switch.
3. The System 85 service manual is not intended to solve all levels of trouble. It is limited to troubles that can be solved by using the **MAAP**, common test equipment, and component replacements. When the limit of the trouble clearing analysis is reached and the trouble is still not cleared, the user is directed to a source of further trouble clearing information.
4. The equipment frame of the cabinet should always be touched before touching wiring, circuit packs or components to prevent electrostatic damage.

WARNING: All personnel who handle circuit packs, components, or wiring should be properly grounded. When using a ground wrist strap, the strap should not be worn over clothing but should touch the individual's skin.

5. The electromagnetic compatibility (EMC) wrist strap and cable assembly (cc900698226) is placed in the bottom of the module control cabinet in a poly bag (cc900492372) next to the AC distribution unit.

Note: This wrist strap is to be used when troubleshooting or performing maintenance or handling any circuit packs associated with the System 85 switch.

The EMC wrist strap assembly is used in the following manner:

- Attach the wrist strap to either wrist.
- Connect the alligator clip to the cabinet frame.

A good ground connection for the alligator clip is:

- In equipment coded cabinets which have removable sides, attach the alligator clip to any convenient screw head that fasten the hinges to the cabinet or to the screws that fasten the door latch to the frame.
 - In equipment coded cabinets which have integrated sides, the alligator clip may be attached to any of the front and rear cabinet formed faces (front door area or back area when viewed in an open position) which are coated with a conductive paint.
 - In either case, an area close to the vertical center of the cabinet should be selected for the alligator clip allowing a more central position from which to operate.
6. Option settings (as appropriate) on original and replacement circuit packs must be verified prior to replacement.
 7. The service manual assumes that all replacement items and test equipment used are correct and functional, to simplify trouble clearing analysis.
 8. When replacement of equipment does not clear the trouble, the original equipment should be installed.
 9. The AC circuit breakers on all cabinet power supplies should be checked prior to performing trouble clearing analysis.
 10. The DC/DC converter handle should **not** be toggled when replacing circuit packs in the TMS and/or module control carriers.

Trouble Clearing Priority

When more than one category of trouble is either indicated or reported, the no response from switch trouble must be cleared first, followed by alarmed troubles, and then user reported troubles.

Maintenance Polling

Prior to maintenance personnel leaving the user's premises the switch should be polled to determine if potential problems exist. This polling can be accomplished by examining Test 2 of **PROC 600** to determine if any alarms or recorded errors exist for any circuit or unit type.

1. The data displayed for each unit type and circuit should be recorded and maintained for future use.
2. When the entry for a particular unit type and circuit is determined to be severe, the maintenance procedure for that unit type and circuit should be entered and the associated trouble analysis procedure performed.

When the switch is duplicated, both the on-line and off-line side should be examined.

RECOVERY

Overview

System 85 has built in recovery software to restore the switch integrity and availability after power failures and hardware failures.

When some of the longer recovery processes are being executed, maintenance personnel may be tempted to take such actions as operating the **GO/HALT** switch, forcing a reload by depressing the **ENABLE** switch, etc.

Note: If such actions are taken, the recovery process may be prolonged. In addition, test equipment (i.e., TN514 scamper) can interfere with the recovery process.

The estimated time for recovery software to rebuild is approximately 15 seconds per module or a maximum of 5 minutes for a large switch.

Maintenance personnel should wait the appropriate amount of time when the switch is not providing service before taking additional (or premature) trouble clearing actions in the following areas:

- a. Short power failures.
- b. Long power failures.
- c. Use of **GO/HALT** switch or **RESET** switch.

Short Power Failures

When short power failures (less than 10 minutes) are experienced in systems without optional holdover, the common control continues to operate but the modules and TMS processors stop operating after power is removed for more than 100 ms.

In duplicated 501CC switches, the common controls attempt a soft switch.

- a. The soft switch takes about a minute in switches with 2 megawords of memory.
- b. The modules initialize when power to modules are restored.

Note: Maintenance personnel should observe the module processors (TN380) for a heartbeat indicating initialization.

- c. Initialization of the modules takes less than 20 seconds for the switch.
- d. A rebuild takes place following TMS/module processor initialization.

Note: Maintenance personnel should observe the yellow LED on the on-line module control channels (TN401) which indicates the rebuild is taking place.

Long Power Failures

For long power failures, (longer than 312A holdover capacity - approximately 10 to 30 minutes), the switch recovers by loading from tape and initializing hardware.

The time for the tape load depends on the configuration of the switch and initialization takes approximately another minute or so. Maintenance personnel should wait approximately 5 minutes before taking any additional action.

The tape load should be monitored by plugging the **MAAP** into the appropriate connector and observing the LEDs on TN430 in the common control carrier.

- a. The **RED** LED in position 2 of TN430 and the **YELLOW** LED at the middle of the circuit pack are lighted to indicate the beginning of the tape load.
- b. Next, the **GREEN** LED in position 1 of TN430 starts flashing (indicating tape interface is being initialized).
- c. Then the **GREEN** LED in position 1 goes either steady on or off while the tape is moved to a load position.
- d. Next, data is read from tape and the **MAAP** is updated. (Encodes 1 through 4.)
- e. When the tape load is completed and successful, the **PASS** indicator on the alarm panel flashes at a 1-second on, 1-second off rate.

Note: There may be a small delay before the heartbeat appears.

Initialization of the modules takes less than 20 seconds for the switch.

Note: Maintenance personnel should observe the module processors (TN380) for a heartbeat indicating initialization.

GO/HALT Switch and RESET Switch

When the system is halted using the **GO/HALT** switch, the recovery action takes approximately 20 seconds when the switch is returned to the **GO** position.

The same recovery action is taken when the system is removed from suicide or emergency transfer by depressing **RESET** and no serious hardware faults are experienced.

If serious hardware faults are experienced, recovery may take the rebuilding or reloading actions described above.

Before taking additional trouble clearing action, maintenance personnel should try to determine what the switch is doing by:

- a. Observing **MAAP** indications.
- b. Observing LEDs on the alarm panel, module control carriers (i.e., TN380 and TN401), and critical port circuits (i.e., touch-tone receivers).
- c. Waiting the appropriate time for the automatic recovery actions to take place.

ALARM TROUBLES

Overview

Alarms can be visually observed by maintenance personnel on the customer's premises via the alarm panel or on the customer's attendant consoles. In addition, major and minor alarms are automatically reported to a remote maintenance facility (if provided).

The alarm panel contains alarm and fault indicators which are used for determining system status. Various alarms are displayed on the panel such as major, minor, and warning. Fault indicators are associated with major functional areas of the system.

Retiring Alarms

Alarms are retired by investigating, isolating, and repairing the cause of the alarm condition. After making a repair the appropriate verification test is run using the maintenance procedure associated with testing the circuit to ensure that the problem is corrected.

1. When the circuit verification test is successfully run without a failure, the alarmed entry in PMIDS is automatically resolved and the associated fault indicator is turned off (if no other alarmed entries are affecting the same fault indicator).
2. When more than one alarm cause exists at a particular level, all alarm causes must be resolved before the fault indicator is automatically turned off.
3. When it is necessary to further isolate an alarm cause, **PROC 600** (alarm causes/error log) may be used to manually turn off one or all fault indicators while retaining the failure history. The fault indicator is reactivated by any subsequent errors that cause an alarm threshold to be exceeded.

Trouble Clearing of Alarmed Troubles

Alarms are generated by hardware and/or software detection.

1. Maintenance diagnostics, which are an integral part of the system software, monitor system parameters and turn on alarm indicators when unacceptable limits are exceeded.
2. Specific on- and off-line maintenance procedures which are designated near the fault indicators are used to isolate the cause of the fault indicator being lighted.
3. When multiple fault indicators are lighted on the alarm panel it is difficult for maintenance personnel to determine where to start. One lighted fault indicator may affect or be the cause of other fault indicators being lighted.
4. **Therefore, the primary maintenance aid for investigating and isolating the cause of the lighted fault indicator is PROC 600, Test 1 which provides the sequence of maintenance procedures to be performed.**

Test 1 of **PROC 600** provides a display of alarms by order of severity and by priority (functional areas) within alarm levels.

1. All major alarms are displayed first, then minor alarms, and last is warning alarms. Each level of alarm is displayed by importance of functional area.

2. When two or more alarms of the same level are displayed, the functional area that is most important to the operation of the switch is displayed first. This alarmed entry is investigated first as its cause may affect the rest of the alarmed entries.
3. The maintenance procedure referenced in Field 15 of **PROC 600** is used to diagnose and isolate the cause of the alarm trouble.

Maintenance procedures (in general) consist of at least three types of tests:

1. Failure history - this test displays the results of on-line routine maintenance testing which is active during normal call processing. It is the starting point for alarm indicator trouble analysis. The failing circuits are recorded and maintained for comparison of results in later tests.
2. Active diagnostic testing of all circuits - these tests which are under the control of maintenance personnel can check all circuits of the same type. A list of maintenance failures (if any) is recorded and maintained to determine the corrective action required to clear the alarm indicator. Corrective action to be taken is based upon failure codes, failure patterns, and/or failing circuits.
3. Continuous testing of individual circuits - the primary purpose of this test is to check for intermittent failures and to facilitate checking of wiring problems. Circuits recorded in the failure history, but not in active diagnostic testing, should be checked using this test.

Comparison of results - when corrective action is taken (replacement of circuit pack, etc.) as a result of active diagnostic testing, the active diagnostic test is repeated to determine if the failure is corrected and to turn off the alarm indicator.

1. When failures still exist, a comparison must be made to determine if the **same** failure code, failure pattern, or failing circuit is the problem. This is required because all circuits of the same type may be tested.
2. The comparison can be accomplished by recording each failure and comparing the new list against the original list, or by using **NEXT CIRCUIT** (or another appropriate key) and comparing the failures displayed against those initially recorded.
3. Further corrective action is dependent upon the results of the comparison.

Duplicated common control switches, TMS/network control complexes

When troubles exist in both common controls, the alarm indicator(s) lighted on the active (on-line) common control should be cleared first, unless the maintenance procedure referenced in Field 15 of **PROC 600**, Test 1 can be performed off-line.

PROCs 600 (alarm causes/error log), 610 (tape tests), 611 (common control tests), 612 (initialization causes), 614 (memory read/memory match tests), 615 (**MAAP** test), 616 (alarm panel test), 618 (diagnostic processor/remote interface/alarm interface test) except Tests 4 and 5, 650 (DCIU tests), and 652 (time-of-day clock synchronizer) can be performed on-line and off-line.

When alarm troubles in a duplicated TMS/network complex are indicated, tests should be performed off-line by soft locking the TMS/network complex on-line to prevent unexpected switches (if possible); repair action taken; test on-line (after releasing the soft lock) to verify the trouble is cleared; then switch to the best side of the TMS/network complex (if appropriate or required).

Prior to leaving the user's premises, maintenance personnel should investigate both common controls in a duplicated common control switch by using **PROC 600**, Test 2 to determine if potential problems exist. Corrective action as necessary should be performed when conditions are such that the problem could affect customer service.

Release of Busied Out Circuits

When the **BUSY OUT LED** is lighted on the **MAAP**, the use of **RLS BUSY OUT** may release busied out circuits, trunk groups, or carriers if the capability is provided by the maintenance procedure entered.

1. If the capability is not provided by the maintenance procedure or the **BUSY OUT LED** remains on because some other type of circuit may be busied out, **PROCs 630, 631, 632, and 635** can be used as necessary to release busy out circuits, trunk groups, or carriers.
2. **PROCs 630, 631, 632, and 635** (as necessary) should be entered to determine the type and number of circuits, trunk groups, or carriers busied out.
3. If circuits, trunk groups, or carriers are maintenance busied, the reason for their status must be determined and corrective action taken (if required) before they are released from busy.
4. If the **BUSY OUT** indicator on the **MAAP** is still lighted after all terminals, trunk groups, or carriers are released from busy, **PROC 635**, Test 2 should be examined to determine the non-network port users of the lighted busy out lamp.
 - a. Non-network port users are designated with an encode of 90 or higher in Field 2 of **PROC 635**, Test 2.
 - b. The **PROCs** referenced in Field 13 of **PROC 635**, Test 2 should be entered to determine the busy out status of the appropriate non-network port user.

Releasing ISDN ports (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN ports from busy out. If the far end does not agree, the ISDN port will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN port in a maintenance busy state the ISDN port will return to a busy out state at the far end, even though release busy out is depressed at the local switch.

Depressing **RLS BUSY OUT** does **not** mean the ISDN port(s) is available for use. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN port(s) are released from busy by checking the circuit status of the ISDN port(s). The circuit status of the ISDN port(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

USER REPORTED TROUBLES

Overview

User reported troubles are normally generated as the result of troubles encountered and reported by the user. Reported troubles are normally those problems that concern a single instrument or a service. Some examples of user reported troubles are: loss of dial tone, disconnect, no ringing, or poor transmission.

The user reported trouble can also be caused by an inadvertent translation change, or be of an intermittent nature.

User trouble reports are divided into four separate types of failures: basic call failures (such as terminal or trunk), data module failures, failures of features provided by the switch, and attendant console.

Several methods are used to determine the cause of the user's reported trouble.

1. Determining if errors are recorded against the suspect circuit by using the alarm causes/error log maintenance procedure **PROC 600**, Test 2. The circuit may have errors recorded against it in Test 2 which do not exceed the threshold to raise an alarm.
2. Using the appropriate maintenance procedure for the suspect circuit and testing the circuit on a continuous basis to determine if the reported trouble is intermittent.
3. Performing a functional test of the user's reported trouble, e.g., call terminal extension (if possible).
4. Checking translation to determine if the suspect circuit is properly administered.
5. Using the following **PROC**s at the user's premises to determine the usability of the equipment:
PROC 642 - Terminal-to-trunk test call.
PROC 643 - Terminal-to-tone test call.
PROC 644 - Terminal-to-auxiliary tone test call.
6. Performing self-tests (if available) for the suspect equipment. The self-test must be performed at the customer's premises.
7. Performing a continuity test of station wiring (whether analog, hybrid, or digital) using the port tester described in **PROC 622**.

The rest of this section covers some of the troubles that may be reported by the user.

72, 73, and 74 Series Terminals

When troubles with terminals connected to the switch are reported by the user, perform the following steps as appropriate.

No dial tone

Use **PROC 622**, Test 1 to check for errors recorded against the terminal and perform **PROC 622**, Test 3 to isolate the trouble.

Cannot dial

Replace the terminal.

Cannot receive calls

Use **PROC 622**, Test 1 to check for errors recorded against the terminal and perform **PROC 622**, Test 3 to isolate the trouble.

Does not ring

Assuming that there are no other indications of an incoming call, perform the dial-up test for ringer.

Note: Refer to **AT&T System 75 and System 85 User's Guide, Terminal Installation and Test, 999-700-214IS Issue 1, June 1985** for steps on performing the terminal dial-up test.

1. If the ringer dial-up test does not pass, replace the 72, 73, or 74 series terminal.
2. Repeat the ringer dial-up test. If the ringer dial-up test fails again, use **PROC 620**, Test 4 to check the associated port circuit. Replace the port circuit as necessary.

Indicator does not light

Perform the dial-up test for indicator. In addition, for MFAT or MFDT set perform a self test. If the indicator dial-up test or self test fails, replace the terminal.

Note: Refer to **AT&T System 75 and System 85 User's Guide, Terminal Installation and Test, 999-700-214IS Issue 1, June 1985** for steps on performing the terminal dial-up test.

Buttons do not work

Perform the dial-up test for buttons. If the button dial-up test fails, replace the terminal. If the button dial-up test passes, check translation of the buttons assigned to the terminal.

Note: Refer to **AT&T System 75 and System 85 User's Guide, Terminal Installation and Test, 999-700-214IS Issue 1, June 1985** for steps on performing the terminal dial-up test.

Cannot hear

Replace the handset or terminal.

Cannot be heard

Replace the handset or terminal.

Intermittent troubles

If intermittent troubles are suspected or reported by the user, perform the following steps:

1. Determine if errors are recorded against the suspect circuit by using **PROC 600**, Test 2. The circuit may have errors recorded against it in Test 2 which do not exceed the threshold to raise an alarm.
2. Use the appropriate maintenance procedure for the suspect circuit and test the circuit on a continuous basis.

Take corrective action as necessary.

3. Use the following **PROC**s to determine the usability of the equipment:

PROC 642 - Terminal-to-trunk test call.

PROC 643 - Terminal-to-tone test call.

PROC 644 - Terminal-to-auxiliary tone test call.

74 Series Terminals Connected to a Personal Computer

When troubles with 74 series terminals connected to a personal computer are reported by the user, the user should be informed to power down the personal computer.

Note: It may not be possible for periodic or demand maintenance software to detect a defective 74 series terminal when it is connected to a powered-up personal computer.

A personal computer can consist of an AT&T PC6300, AT&T PC7300, IBM personal computer, or equivalent. The personal computer is connected to a DCPI interface card to allow an interface to the switch.

The signaling channels S1 and S2 from a GPP port is connected to the DCPI interface card and then to the 74 series terminal.

Since the DCPI interface card interprets and responds to S channel messages, even if the 74 series terminal is not connected, maintenance of the terminal is impossible from switch software when the personal computer is powered-up.

Request the customer to power down the personal computer before repeating maintenance on the defective 74 series telephone.

The terminal is not tested if the personal computer is powered up and the DCPI interface card is in the PC control mode.

Note: If the personal computer is powered down, the 74 series terminal being tested fails with a fault code of 28 (odd channel of digital set is stuck in loop-around).

A display of fault code 28 indicates the terminal is good. When a fault code other than 28 is displayed, use the appropriate repair procedure for the terminal being tested.

Data Modules

When troubles with data modules PDM, TDM, or DTDM are reported by the user, perform the following steps as appropriate.

Cannot originate calls

Run a self test on the data module and 74 series terminal (if DTDM).

1. If the self test fails, replace the data module or 74 series terminal.
2. If the self test passes, use **PROC 622**, Test 1 to check for errors recorded against the data module or 74 series terminal. Use **PROC 622**, Test 3 to isolate the trouble.

Cannot receive calls

Run a self test on the data module and 74 series terminal (if DTDM).

1. If the self test fails, replace the data module or 74 series terminal.
2. If the self test passes, use **PROC 622**, Test 1 to check for errors recorded against the data module or 74 series terminal. Use **PROC 622**, Test 3 to isolate the trouble.

Data call is apparently set up, but no data can be sent or received

Run the following local tests (Steps 1 through 3) on the data module.

1. Self test - If this test fails, replace the data module.
2. Local loop back - If this test fails, there is a problem between the user's terminal equipment and the data module.

If the data module is optioned for terminal dialing, try to set up a data call. If dialed characters are echoed, the connection is good between the data module and terminal.

3. Remote loop back or remote loop back and self test combined.

Note: If a remote loop back test using the user's terminal equipment can be performed, it is the preferred test.

Set up a connection to the remote data terminal and operate the remote loop back button.

Note: For DTL mode 0 and 1 operation, the remote loop back button must be operated before the call is set up.

Perform a remote loop back test or operate the self test button.

If the test fails, the trouble could be in either data module or in any of the circuits between the data modules.

Intermittent troubles

If intermittent troubles are suspected or reported by the user, perform the following steps:

1. Determine if errors are recorded against the suspect data module by using **PROC 600**, Test 2. The data module may have errors recorded against it in Test 2 which do not exceed the threshold to raise an alarm.
2. Use the appropriate maintenance procedure for the suspect circuit and test the circuit on a continuous basis.

Take corrective action as necessary.

MPDM or MTDM Self Tests

The MPDM is a DCE-type device used to transmit and receive serial data over a 4-wire DTL link in the System 85. It provides an interconnection (without a voice terminal) between the system and customer-provided data terminal equipment.

The MTDM serves as a data terminal equipment (DTE) to interface the System 85 data capabilities to a private line data channel via a data set or a data service unit, using an RS-232C interface.

Self tests on MPDM (refer to Figure 5) or MTDM (refer to Figure 6) data modules are performed as follows.

Caution: Operating the SELF TEST switch without operating the REMOTE LOOP BACK switch during a call terminates the call.

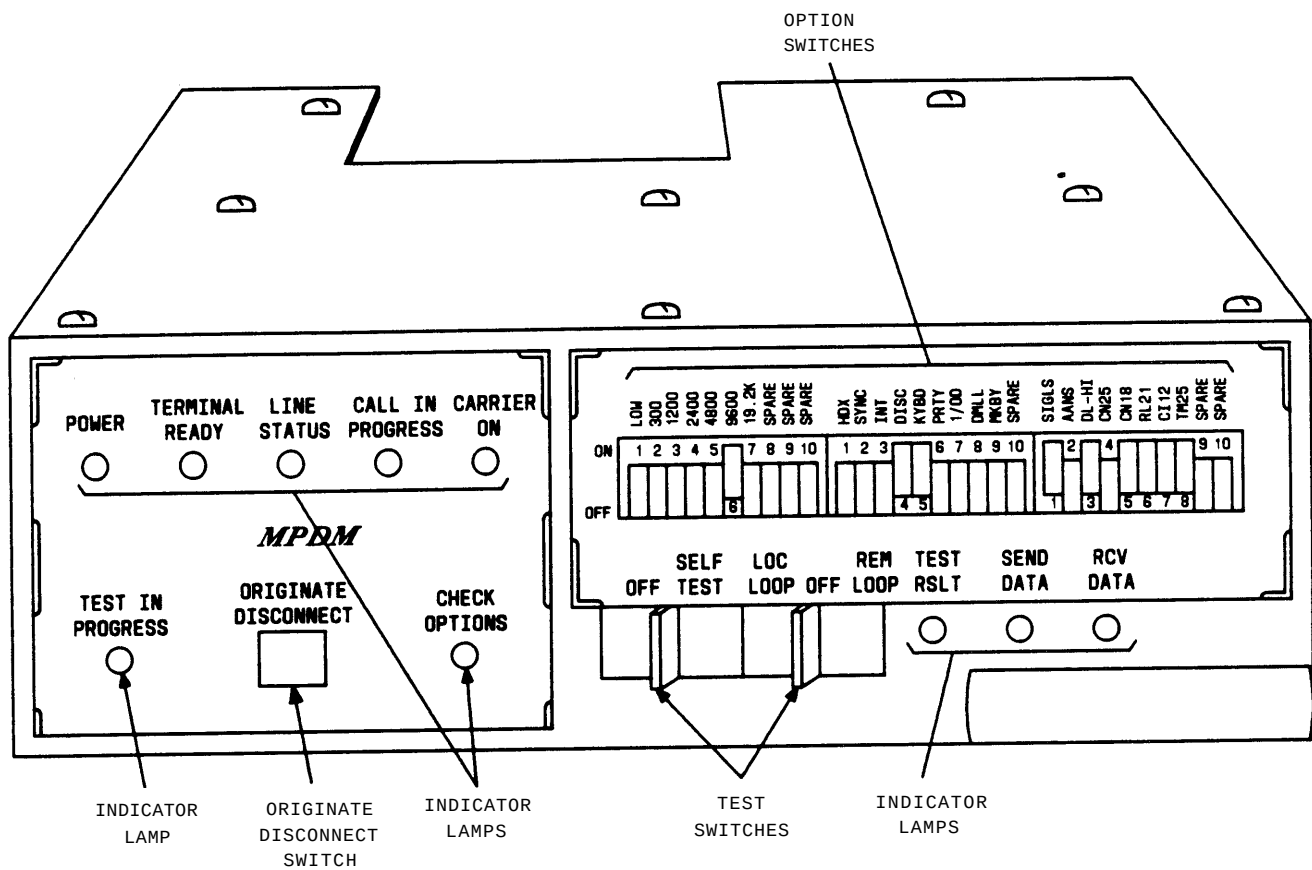


Figure 5. Modular Processor Data Module (MPDM)

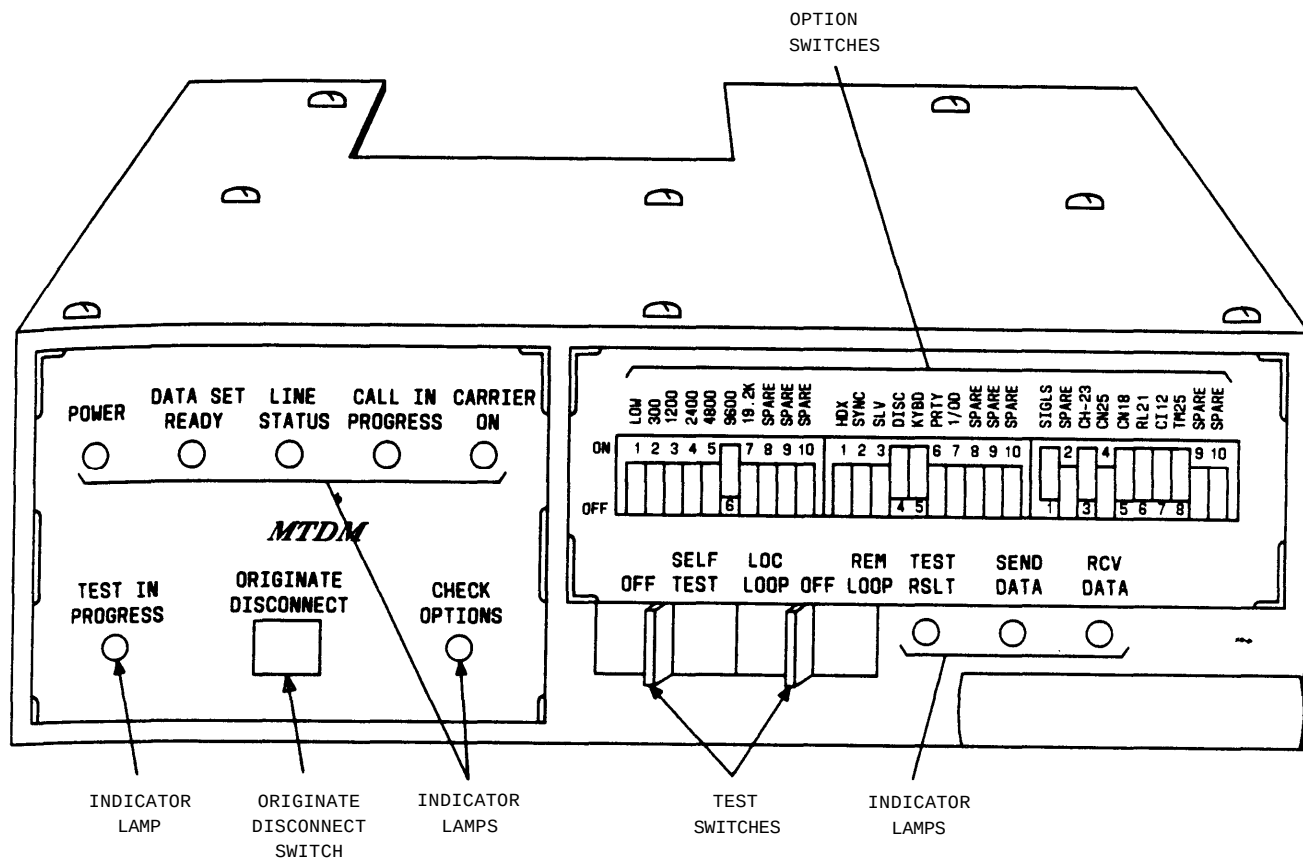


Figure 6. Modular Trunk Data Module (MTDM)

Self Test

1. Place the **SELF TEST** switch in the **SELF TEST** position.
The internal circuits of the MPDM or MTDM are checked.
2. During the test, the **TEST IN PROGRESS** indicator stays on.
3. The **TEST RSLT** indicator is steadily **ON** if the internal circuits test passes.
The **TEST RSLT** indicator flashes if the internal circuits test fails.

4. If the MPDM or MTDM passes the internal circuits test, a known bit sequence is looped through the internal data path and checked for errors.

Any bit error causes the **TEST RSLT** indicator to flutter momentarily.

If no bit errors occur, the **TEST RSLT** indicator is steadily **ON**.

5. At the end of the test, place the **SELF TEST** switch in the **OFF** position.

The **TEST IN PROGRESS** and **TEST RSLT** indicators are turned **OFF**.

Local Loop Test

Caution: If a MPDM or MTDM is placed in a local loop back mode while a call is in progress, the call is terminated.

Note: A DTE is required for MPDM testing which provides an internal loop back prior to DTL link interface. A data terminal and a data set or data service unit is required for MTDM testing which provides an internal loop back prior to DTL link interface.

1. Place the **LOC LOOP/REM LOOP** switch in the **LOC LOOP** position.

The EIA interface is active in this mode and the data transmitted by the terminal is looped back to the terminal.

2. During the test, the **TEST IN PROGRESS** indicator is **on**.

3. Check the data transmitted against the data displayed on the DTE.

The test passes if no errors are found.

4. At the end of the test, place the **LOC LOOP/REM LOOP** switch in the **OFF** position.

The **TEST IN PROGRESS** indicator is turned **OFF**.

Remote Loop Test

1. Place the **LOC LOOP/REM LOOP** switch in the **REM LOOP** position during a call.

Data transmitted by the local DTE is looped back from the remote module prior to its EIA interface.

2. During the test, the **TEST IN PROGRESS** indicators on both the local and remote modules are lighted and the remote module is disabled for data transmission and reception.

3. Check the data transmitted against the data displayed on the DTE.

The test passes if no errors are found.

4. The remote module, if necessary, terminates the call by turning the **CD** interface lead (data terminal ready) **OFF**.

5. Data transmission can be restored by placing the **LOC LOOP/REM LOOP** switch in the **OFF** position.

Caution: The call is terminated if the switch is placed in the LOC LOOP position.

The **TEST IN PROGRESS** indicator is turned **OFF**.

Remote Loop back/Self Test

1. Place the **LOC LOOP/REM LOOP** switch in the **REM LOOP** position after a call is set up to put the remote module into remote loop.
2. Place the **SELF TEST** switch in the **SELF TEST** position.
3. The module generates a known bit sequence and transmits it to the remote module where the data is looped back prior to the EIA interface of the remote module.
The local module, upon receiving the bit sequence, checks it with the transmitted bit sequence for error.
4. The **TEST RSLT** indicator flashes every time an error is detected and stays steadily **ON** if no error bit is detected.

Caution: *If the **REM LOOP** switch is placed in the **OFF** position before the **SELF TEST** switch is placed in the **OFF** position, any call is terminated.*

5. After test completion, place the **SELF TEST** switch in the **OFF** position.
6. Place the **REM LOOP** switch in the **OFF** position.

DTDM Self Tests

The DTDM (Figure 7) is a data communications equipment (DCE) type device used to transmit and receive serial customer data from an EIA RS-232C interface over a 4-wire DTL link in the System 85.

The DTDM provides an interconnection between the System 85 and customer-provided data terminal equipment (DTE). The DTDM serves as an adjunct module to a digital voice terminal.

The digital voice terminal provides the interconnect function to the DTL link interface. The digital voice terminal and the DTDM integrate both voice and data communications onto the same link allowing for simultaneous transmission.

Self tests on DTDM data modules (refer to Figure 8) are performed as follows.

All incoming calls or call origination requests are not accepted while switches are in the test position. The **DTDM TEST IN PROGRESS** indicator remains **on** for the duration of each test.

Caution: *Established calls are disconnected when test switches are moved from their **OFF** position.*

Note: Placing the **LOCAL LOOP/REMOTE LOOP** switch in the **REMOTE LOOP** position does not disconnect an established call.

Self Test

1. Place the **SELF TEST** switch in the **SELF TEST** position.
This test first checks the DTDM integrity.

2. If the test fails, the **TEST RESULTS** indicator flashes continuously.
If the test passes, the **TEST RESULTS** indicator comes **on**.
3. After the DTDM integrity test passes, the self test continues.
A known bit sequence is looped through the internal data path and checks for errors.
4. Any errors detected cause the **TEST RESULTS** indicator to momentarily flutter.
5. If the data is looped back without any detected errors, the **TEST RESULTS** indicator comes **on**.
6. The indicator remains **on** until the **SELF TEST** switch is returned to the **OFF** position.

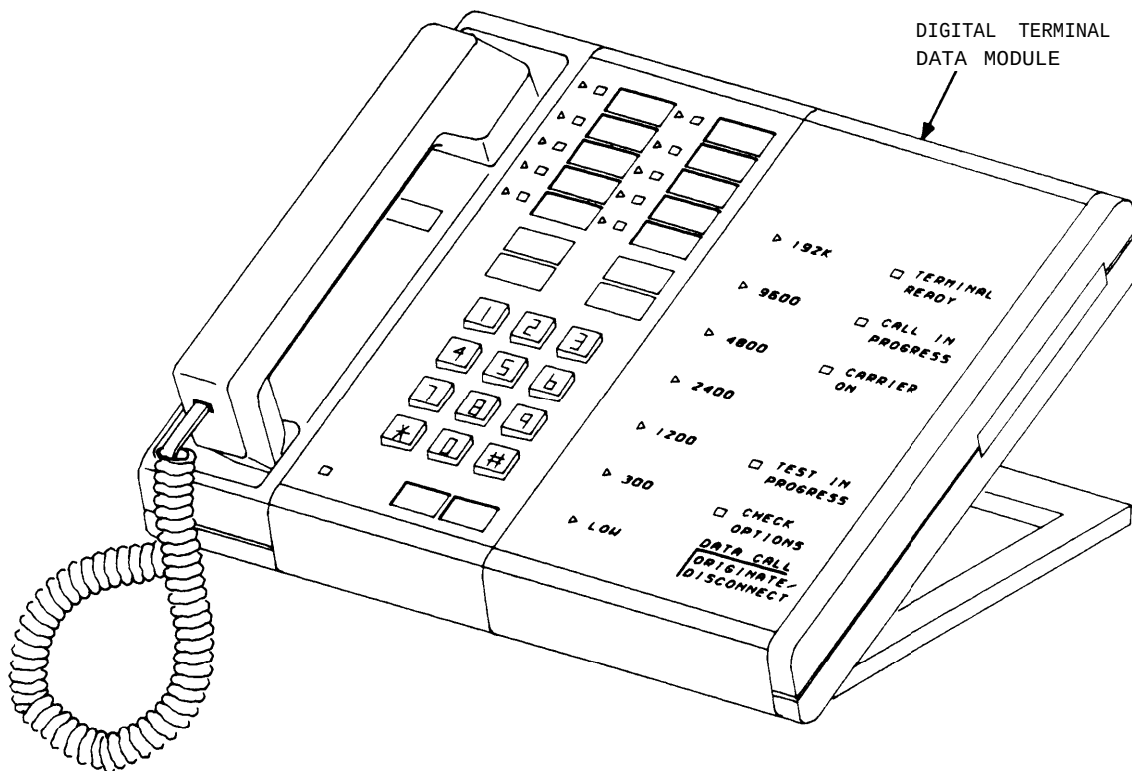


Figure 7. Voice Terminal with a Digital Terminal Data Module (DTDM)

Local Loop Test

1. Place the **LOCAL LOOP/REMOTE LOOP** switch in the **LOCAL LOOP** position.
This test checks the data path prior to the DTL link interface.
2. Enter several DTE keyboard characters.
The DTE display should show the same characters as entered.
3. When the test is complete, return the **LOCAL LOOP/REMOTE LOOP** switch to the **OFF** position.

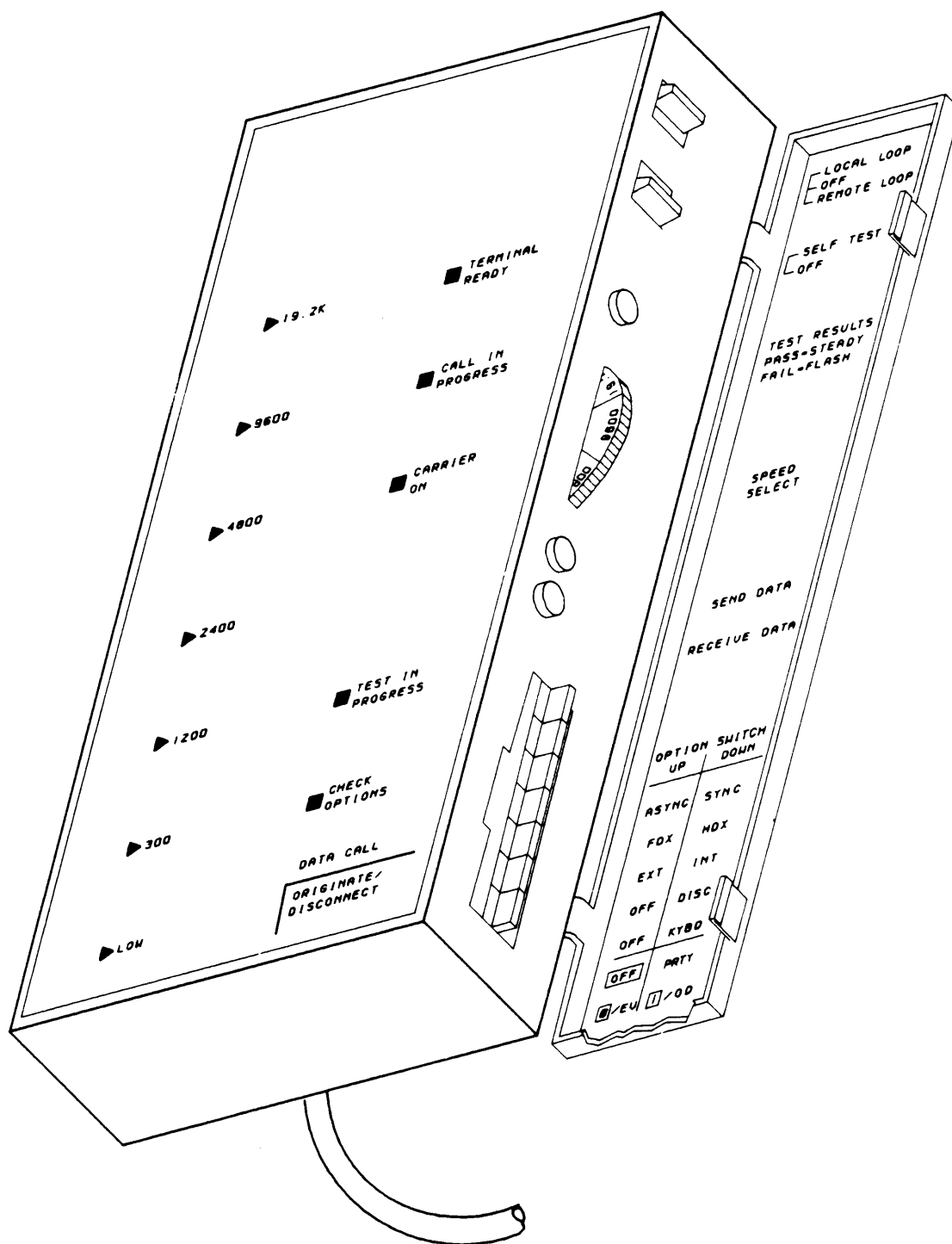


Figure 8. Digital Terminal Data Module (DTDM) with Side Door Open

Remote Loop Test

1. Place a call to another data module.
2. Place the **LOCAL LOOP/REMOTE LOOP** switch in the **REMOTE LOOP** position.
This test checks the data path from the DTE to the EIA interface of the called module.
3. Enter several DTE keyboard characters.
The DTE display should show the same characters as entered.
4. When the test is complete, return the **LOCAL LOOP/REMOTE LOOP** switch to the **OFF** position.

Remote Loop/Self Test

1. Place a call to a data module.
2. Place the **LOCAL LOOP/REMOTE LOOP** switch in the **REMOTE LOOP** position.
3. Place the **SELF TEST** switch in the **SELF TEST** position.
A known bit sequence is looped through the data path from the DTDM to the EIA interface of the called module and checks for errors.
4. Any errors detected cause the **TEST RESULTS** indicator to momentarily flutter.
If the data is looped back without any detected errors, the indicator comes **on**.
5. The indicator remains **on** until the **SELF TEST** switch is returned to the **OFF** position.

Caution: *The **SELF TEST** switch must be returned to the **OFF** position before the **REMOTE LOOP** switch is returned to the **OFF** position or the call is terminated.*

3270 Data Modules Self Test and Switch Connection Test

The 3270 data module consists of a family of protocol converters that allow 3270-type terminals to communicate with a host computer through the switch using standard twisted-pair building wiring instead of coaxial cable.

The complete family of 3270 data modules consists of the 3270A (Asynchronous) data module or 3270T (Terminal) data module (Figure 9) located at the terminal end of the switch, and the 3270C (Controller) data module (Figure 10) located at the cluster controller end.

The 3270A data module (Figure 9) allows a 3270-type terminal to appear as an asynchronous ASCII terminal to an ASCII endpoint. In ASCII emulation mode, the 3270A data module does not require a 3270 data module at the other end of the switch.

The 3270T data module (Figure 9) appears as a cluster controller to the terminal. The terminal sends messages for the cluster controller in coaxial cable category A protocol, which the data module converts to DCP protocol.

Data and messages are then sent through the switch to the 3270C data module (Figure 10) at the cluster controller side of the switch. The 3270C data module decodes the DCP information back to coaxial cable protocol and sends it to the cluster controller.

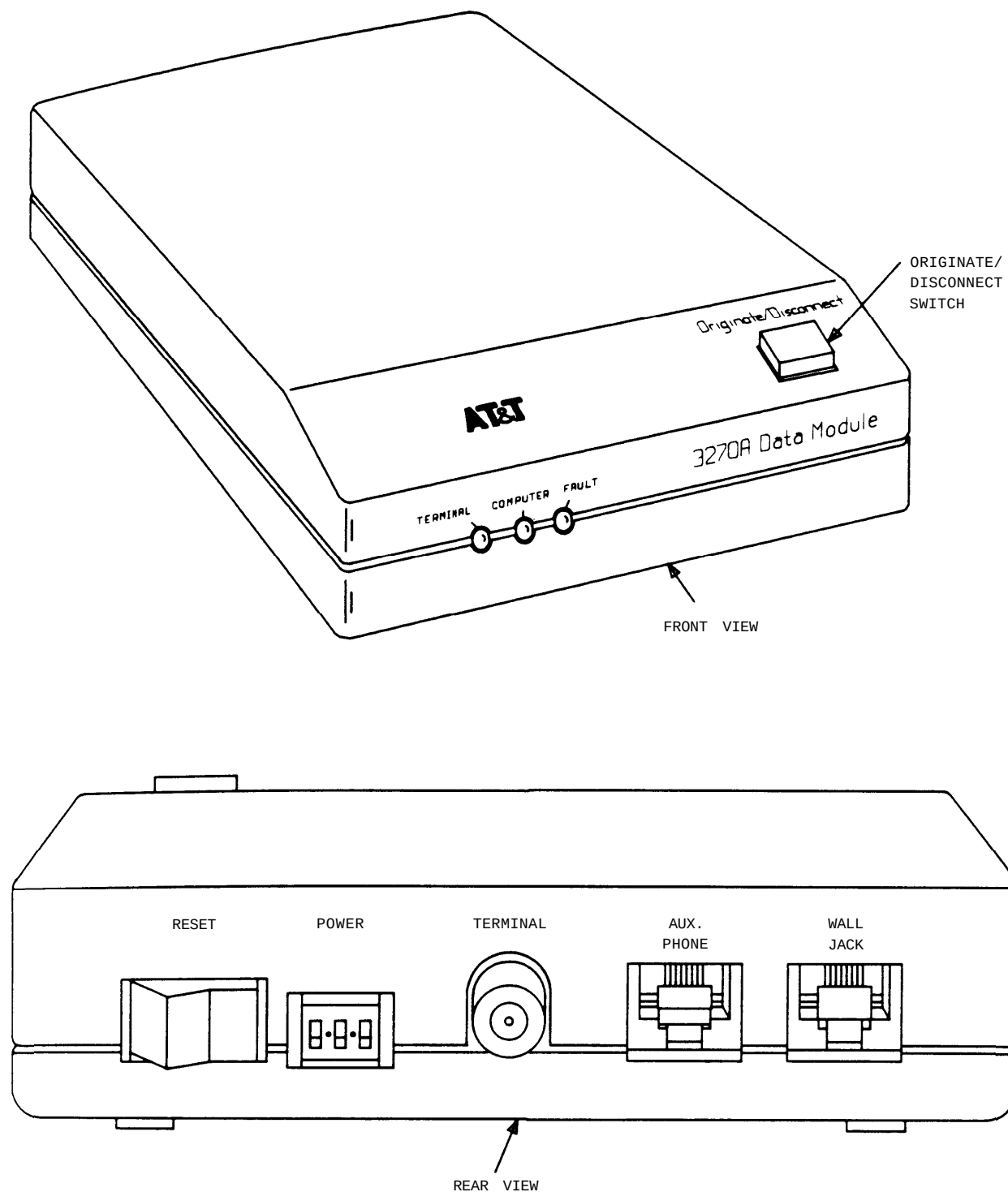


Figure 9. 3270A and 3270T Data Module (Protocol Converter)

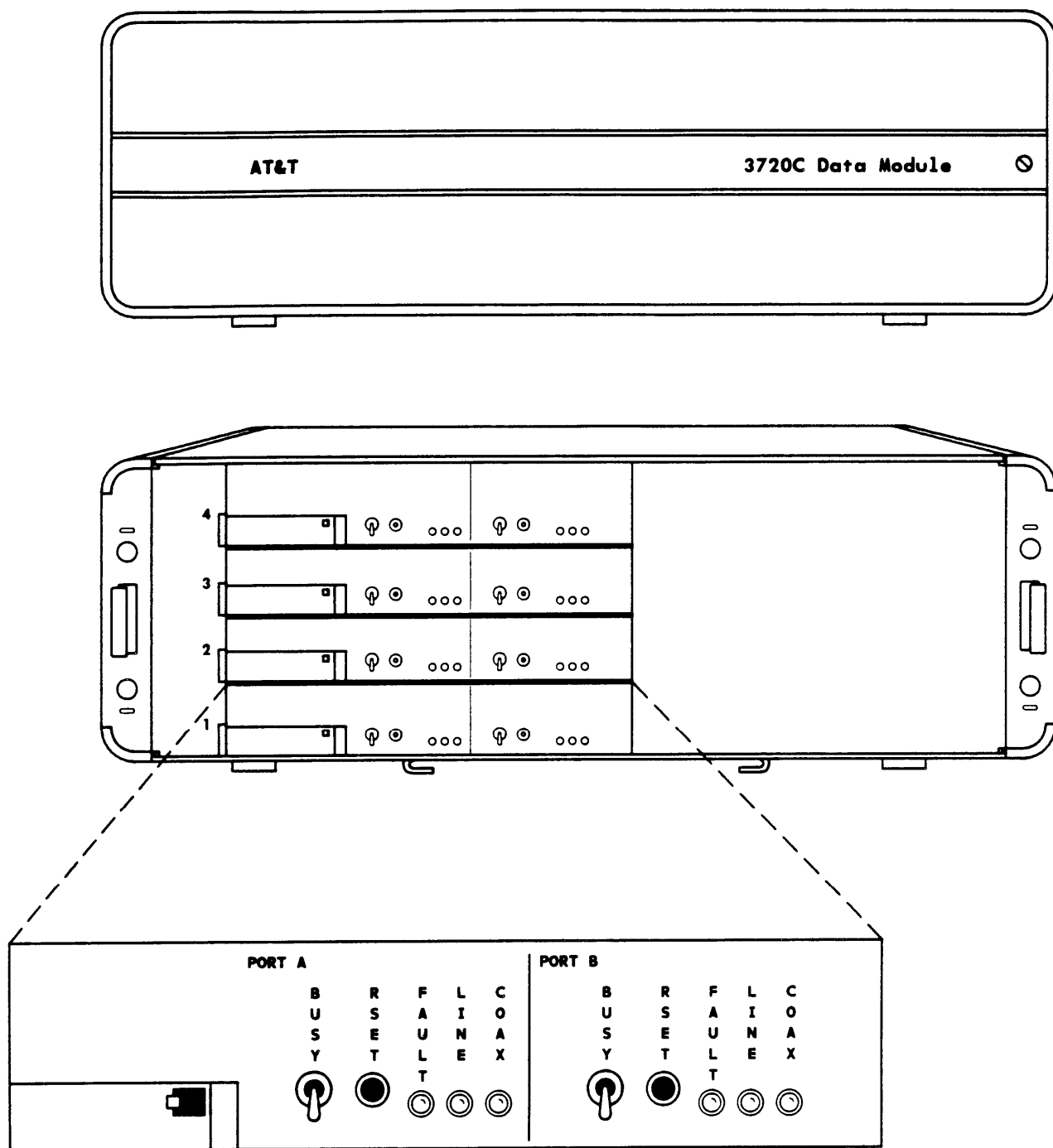


Figure 10. 3720C Data Module (Protocol Converter)

The protocol conversion sequence is reversed for cluster controller messages to the terminal.

Note: This method of communicating with a host computer is transparent to the computer system.

3270 Data Modules Self Test

The self test runs automatically whenever the data module is powered on. It may also be run manually by pressing the **RESET** switch on the 3270A or 3270T data module, or the **RSET** button on the 3270C data module.

The self test is actually a series of tests designed to check the health of the data module hardware. The tests are initiated by the data module's microprocessor.

Self tests include reading and writing to the Random Access Memory (RAM), performing a timer check, performing a checksum of the Erasable Programmable Read-Only Memory (EPROM), looping test words around the Advanced Data Link Control (ADLC) interface to check the DCP S (signaling) and I (data) channel receiver and transmitter, and looping test words around the Asynchronous Receiver Transmitter and Variable Addressable RAM Controller (ARTVARC) to check the coaxial cable interface.

During the self test, the coaxial cable interface is disabled and the switch Digital Line Interface (DLI) is ignored. The self test may be run without a connection to a terminal, cluster controller, or the switch.

If coaxial cable or switch connections are not in place, the GREEN or YELLOW LEDs will not light. The self test fails if the RED LED remains lit.

Note: If the data module's microprocessor or any of its immediate logic is faulty, the self test may not detect an error or may fail to light the RED LED. If a data module appears to be causing problems even though its RED LED fails to light, exchange it with a known good data module to verify if the problem is corrected.

Caution: *Running the self test disconnects any call that may be in progress. Because the self test momentarily interrupts power to the data module, S channel errors may be recorded by the switch and 3270A data module ASCII emulation options are erased. The self test should only be run when necessary.*

3270A and 3270T Data Module Self Test

To run the self test on the 3270A or 3270T data module (Figure 9), perform the following steps:

1. **If a terminal is attached:** Turn power on and make sure the **TEST/NORMAL** switch is in the **NORMAL** position.
2. Toggle the **RESET** switch at the rear of the data module.
3. All three LEDs on the front panel should light briefly, then the **RED** LED should light for about 1 second as the data module performs the self test.

Note: If one of the LEDs fails to light, the data module should be replaced.

4. The **RED** LED should go out and the **GREEN** LED should light, indicating a good coaxial connection to the terminal.

Note: If the terminal is not connected or if the **TEST/NORMAL** switch is in the **TEST** position, the **GREEN** LED will not light.

5. If the **RED** LED remains lighted, the data module has detected an error and should be replaced.

3270C Data Module Self Test

To run the self test on the 3270C data module (Figure 10), perform the following steps:

1. Open the front cover of the 3270C data module assembly to access the LEDs and switches.

Note: Turn the screw on the springlock latch and unhook the cover on the left.

2. Depress the **RSET** button on the front panel of the port to be tested.
3. All three LEDs on the front panel should light briefly, then the **RED** LED should light for about 4 seconds as the port performs the self test.

Note: If one of the LEDs fails to light, the circuit pack should be replaced.

4. The **RED** LED should go out and the **GREEN** LED should light, indicating a good coaxial connection to the cluster controller.

Note: If the 3270C data module is not connected with coaxial cable to the cluster controller, the **GREEN** LED will not light.

5. If the **RED** LED remains lighted, the self test has detected an error. The circuit pack should be replaced.
6. In the event of an error, toggle the **BUSY** switch on the front panel to the up (make-busy) position to prevent 3270A or 3270T data modules from attempting to access the faulty port until the circuit pack can be replaced.
7. After running the self test, place the **BUSY** toggle in the up (make-busy) position a couple of times for each port to synchronize the data module with the switch. The **YELLOW** LED should light for about 10 seconds when the data module is synchronized.

Note: The toggling action sends an off-hook message to the switch. The switch then sends the equivalent of a **DIAL:** prompt (the **YELLOW** LED lights). Returning the **BUSY** switch to the normal position ensures the switch knows the data module is back on-hook.

8. After tests on all ports are run, close the front cover of the 3270C data module by positioning the cover over the hook on the left, lining up the cover with the front of the assembly, and turning the screw on the springlock latch.

3270 Data Modules Switch Connection Test

The switch connection test tests the connection from the data module through the building wiring to a port on the switch. This test can detect faulty wiring from the 3270 data module to the switch or improper translation of the port board on the switch.

The switch connection test **must** be run without the coaxial cable for a terminal or cluster controller attached to the data module. The port board on the switch must also be correctly administered and translated before this test can be run.

3270A and 3270T Data Module Switch Connection Test

The 3270A or 3270T data module must be powered on and attached to the switch through the wall jack to perform the switch connection test.

To run the switch connection test on the 3270A or 3270T data module, perform the following steps:

1. **If a terminal is attached to the data module:** Set the **TEST/NORMAL** switch on the terminal in the **TEST** position and leave it there (this disconnects the coax).

Note: You may also physically disconnect the coaxial cable from the **TERMINAL** connector to run this test.

2. Depress the Originate/Disconnect button.

Note: This action sends an **OFF HOOK** message on the DCP S (signaling) channel to the switch port board.

3. The **YELLOW** LED should light for about 10 seconds, indicating a good connection to the switch.

If the YELLOW LED does not light: Depress the Originate/Disconnect button several times, waiting about 5 seconds between depressions. One of the depressions should cause the **YELLOW** LED to light.

Note: This action is equivalent to the switch sending a **DIAL:** prompt to a terminal. If no dialing action is taken, the switch times out in 10 seconds.

4. If the **YELLOW** LED still does not light, the switch interface in the data module may be faulty, the wiring to the switch may be faulty, or the port boards may be incorrectly translated.

Note: See your system administrator if you believe the port boards are the problem.

5. When the test is complete, reattach the coaxial cable to the data module (if the cable was disconnected), or set the **TEST/NORMAL** switch to the **NORMAL** position.

3270C Data Module Switch Connection Test

The 3270C data module must be powered on and the **DCP** connector must be attached to the cross-connect field to perform the switch connection test.

To run the switch connection test on the 3270C data module, perform the following steps:

1. **If a cluster controller is attached to the data module:** Disconnect the coaxial cables from the ports on the back of the 3270C data module assembly.

Note: The **GREEN** LEDs may take a moment to go out.

2. Remove the front cover to reveal the LEDs and switches.

Note: Turn the screw on the springlock latch and unhook the cover on the left side.

3. Toggle the **BUSY** switch to the up (make-busy) position.

Note: This action sends an **OFF HOOK** message on the DCP S (signaling) channel to the switch port board.

4. The **YELLOW** LED should light for about 10 seconds, indicating a good connection to the switch.

If the YELLOW LED does not light: Move the toggle to and from the make-busy position several times, waiting about 5 seconds between toggles. One of the toggling actions should cause the **YELLOW** LED to light.

Note: This action is equivalent to the switch sending a **DIAL:** prompt to a terminal. If no action is taken, the switch times out in 10 seconds.

5. If the **YELLOW** LED still does not light, the switch interface in the data module may be faulty, the wiring to the switch may be faulty, or the port boards may be incorrectly translated.

Note: See your system administration if you believe the port boards are the problem.

6. When the test is complete, reattach the coaxial cables to the data module connectors.
7. Replace the front cover by positioning it over the hook on the left, lining it up with the front of the assembly, and turning the screw on the latch.

MADU/ADU EIA Port Board (SN238) Looparound Test

The Multiple Asynchronous Data Unit (MADU) provides an RS-232C compatible, full duplex, asynchronous data access to host computers.

The MADU accepts information from the host computer and passes it through its ports to a switch port which converts the data to Digital Communications Protocol (DCP). The digital information is then transferred through the switch to another port that accepts DCP data.

The second port could attach to a variety of data devices, including an MPDM, digital terminal, computer, Z3A Asynchronous Data Unit (ADU), or a MTDM leading to a modem.

Z3A ADUs interface directly with switch EIA port boards that contain a built-in ADU at each port. EIA port boards enable an RS-232C device to access the switch without going through a modem or a data module.

The Z3A ADU is roughly equivalent in function to one of the ports on the MADU board. It can translate the ADU protocol generated by the MADU back to RS-232C protocol required by the attached terminal.

When a user reports a trouble with a terminal connected to an ADU or MADU which cannot access the switch, receives no dial prompt or disconnect prompt, and **PROC 620** and/or **PROC 622** cannot isolate the problem, a looparound test on the EIA (SN238) port board should be performed.

MADU EIA Port Board (SN238) Looparound Test

The following looparound test may be performed on an MADU which is attached to an SN238 EIA port board on the switch.

The looparound test checks the MADU port and the wiring between the MADU and the EIA port board.

The looparound test may be performed even if the EIA port board is not translated.

The looparound test requires an ASCII terminal.

1. Adjust the option switches on the EIA port board if needed to activate keyboard dialing.

Note: The switches KYBD0 to KYBD3 activate keyboard dialing for the four EIA ports when they are set down away from the label.

2. Attach an ASCII terminal to one of the RS-232C connectors on the octopus cable leading to the MADU port you wish to test.

Note: Disable parity on the ASCII terminal if enabled.

3. Depress the **BREAK** key on the terminal.

Note: If auto-baud is enabled, follow the **BREAK** key with a carriage return.

If the EIA port board is translated and not busy: A **DIAL:** prompt appears on the terminal screen.

If the EIA port board is busy or not translated: No response is received.

4. Type **L** or **CONTROL-G** (bell) to activate the looparound feature.

Note: The command varies on different boards.

If you typed a **CONTROL-G**, the tone indicates you are in looparound mode.

5. Begin typing characters on the ASCII terminal's keyboard.

The characters should be looped back to the screen exactly as they were typed.

6. If characters do not appear or if errors occur, a problem may exist in the building wiring, the MADU port, or the EIA port board.

Note: Occasional character errors indicate a parity problem. Make sure parity is disabled for this test.

7. To end the looparound test, depress the **BREAK** key on the terminal for 2 seconds.
A **DISCONNECTED** message appears on the screen.
8. Reattach the octopus cable to the correct computer port.
Hook up the next octopus connector to be tested and repeat the test.
9. When testing is complete, return the option switches on the EIA port board to their original settings (if they were adjusted for this test) and reactivate parity on the terminal if desired.

ADU EIA Port Board (SN238) Looparound Test

The following test may be performed on an ADU which is attached to an SN238 EIA port board on the switch.

The looparound test checks the wiring between the ADU and the port board.

The looparound test may be performed even if the EIA port board is not translated.

The looparound test requires an ASCII terminal.

1. Adjust the option switches on the EIA port board if needed to activate keyboard dialing.

Note: The switches KYBD0 to KYBD3 activate keyboard dialing for the four EIA ports when they are set down away from the label.

2. Make sure the ADU is attached to the RS-232C connector on the ASCII terminal.

Note: Disable parity on the ASCII terminal if enabled.

3. Depress the **BREAK** key on the terminal or the Originate/Disconnect switch.

Note: If auto-baud is enabled, follow the **BREAK** key with a carriage return.

If the EIA port board is translated and not busy: A **DIAL:** prompt appears on the terminal screen.

If the EIA port board is busy or not translated: No response is received.

4. Type **L** or **CONTROL-G** (bell) to activate the looparound feature.

Note: The command varies on different boards.

If you typed a **CONTROL-G**, the tone indicates you are in looparound mode.

5. Begin typing characters on the ASCII terminal's keyboard.

The characters should be looped back to the screen exactly as they were typed.

6. If characters do not appear or if errors occur, a problem may exist in the building wiring, the ADU, or the EIA port board.

Note: Occasional character errors indicate a parity problem. Make sure parity is disabled for this test.

7. To end the looparound test, depress the **BREAK** key on the terminal or the Originate/Disconnect switch for 2 seconds.

A **DISCONNECTED** message appears on the screen.

8. Return the option switches on the EIA port board to their original settings (if they were adjusted for this test) and reactivate parity on the terminal if desired.

Remote Carrier Group Circuit Pack Insertion Test

When the user suspects a trouble with a remote carrier group circuit pack, he may wish to perform a circuit pack insertion test.

The circuit pack insertion test consists of a hardware test for all circuit packs in the remote carrier group and a software test for the RCC (ANN16) circuit pack. In order to perform the software test, the maintenance mode in the **MODE** display procedure **must not** be active.

Indications on the progress and results of the hardware and software tests are given by lighting LEDs on the circuit pack inserted.

The remote carrier group circuit pack insertion test LED indications depend on which circuit pack is inserted; i.e., Remote Carrier Controller (RCC) ANN16 circuit pack or a remote port circuit pack.

RCC (ANN16) Circuit Pack Insertion

When the ANN16 (RCC) circuit pack is inserted in the remote carrier group, the following occurs.

Note: When a GPP circuit pack is tested all translated peripherals should be connected and have power on (when required) or the test may fail.

1. The hardware test on the RCC (ANN16) is performed.

The **RED** LED on the RCC circuit pack is turned on, then off.

The **GREEN** LED on the RCC circuit pack is turned on, then off.

2. If the RCC hardware test passes, both LEDs remain off.

If the RCC hardware test fails, the **RED** LED is lighted on the RCC circuit pack.

Note: The RCC circuit pack's **GREEN heartbeat** LED indicates a fast heartbeat after the firmware test is performed.

3. Then the hardware test on all port boards is performed.

Note: The hardware test on the port boards is only performed if the hardware test on the RCC passed.

The **RED** LEDs are lighted on all port boards.

Then the **GREEN** LEDs are lighted on all port boards.

4. If the port board hardware test passes, both LEDs remain off.

If the port board hardware test fails, the **RED** LED is lighted on the failing port circuit pack(s).

5. After the hardware test on the RCC and all port boards is completed, communications with the switch is attempted.

Note: The hardware test on the RCC has to pass before communications with the switch is attempted.

The RCC circuit pack's **GREEN heartbeat** LED indicates a slow heartbeat and the RCC circuit pack's **YELLOW** LED is lighted indicating communication with the switch is established.

6. If the hardware test on the RCC passes, then the software test is executed on the RCC circuit pack.

Note: No software test is executed for any port circuit packs.

7. The **GREEN** LED on the RCC circuit pack is lighted during the software test.

8. If the **GREEN** LED is not lighted on the RCC circuit pack within five minutes after the hardware test is completed, the maintenance mode bit is probably activated by another facility.

Contact the local or remote maintenance facility and ask them to release the maintenance mode bit in the **MODE** display procedure.

9. When the RCC circuit pack being tested passes the software test, both LEDs are turned off.

The **RED** LED is lighted if the RCC circuit pack fails the software test.

10. If any of the circuit packs fail the hardware test or the RCC circuit pack fails the software test indicated by a **RED** LED being lighted, replace the circuit pack and repeat the circuit pack insertion test.

Note: If more than one of the circuit packs fail, and one of the circuit packs is the RCC (ANN16), replace the RCC circuit pack first.

Port Circuit Pack Insertion

When a port circuit pack is inserted in the remote carrier group, the following occurs.

Note: When a GPP circuit pack is tested all translated peripherals should be connected and have power on (when required) or the test may fail.

1. The hardware test on the port circuit pack is performed.

The **RED** LED on the port circuit pack is turned on, then off.

The **GREEN** LED on the port circuit pack is turned on, then off.

2. If the port circuit pack hardware test passes, both LEDs remain off.

If the port circuit hardware test fails, the **RED** LED is lighted on the port circuit pack.

Note: No software test is executed for any port circuit packs.

3. If the port circuit pack fails the hardware test indicated by a **RED** LED being lighted, replace the circuit pack and repeat the circuit pack insertion test.

Features

When troubles with features provided by the switch are reported by the user, perform the following steps:

1. Determine if the feature trouble is isolated to a single terminal or experienced by all terminals.

If the feature trouble is isolated to a single terminal, proceed to Step 3.

If the feature trouble is experienced by all terminals, proceed to Step 2.

2. Check the customer order document to determine if the feature is a valid feature.

If the feature is not valid, check with customer assistance or notify the user.

If the feature is valid, check switch translation and administer as necessary.

3. Check switch translation for the terminal experiencing the trouble.

Administer the feature as necessary

If the feature is administered, determine from the user if the trouble is intermittent.

4. If the trouble is not intermittent, replace the terminal.

If the trouble is intermittent, proceed to Step 5.

5. Determine if errors are recorded against the suspect circuit by using **PROC 600**, Test 2. The circuit may have errors recorded against it in Test 2 which do not exceed the threshold to raise an alarm.

6. Use the appropriate maintenance procedure for the suspect circuit and test the circuit on a continuous basis.

Take corrective action as necessary.

If the feature reported by the user as having trouble is a 74 series terminal connected to a personal computer, the user should be informed to power down the personal computer.

Note: It may not be possible for periodic or demand maintenance software to detect a defective 74 series terminal when it is connected to a powered-up personal computer.

A personal computer can consist of an AT&T PC6300, AT&T PC7300, IBM personal computer, or equivalent. The personal computer is connected to a DCPI interface card to allow an interface to the switch.

The signaling channels S1 and S2 from a GPP port is connected to the DCPI interface card and then to the 74 series terminal.

Since the DCPI interface card interprets and responds to S channel messages, even if the 74 series terminal is not connected, maintenance of the terminal is impossible from switch software when the personal computer is powered-up.

Request the customer to power down the personal computer before repeating maintenance on the defective 74 series telephone.

The terminal is not tested if the personal computer is powered up and the DCPI interface card is in the PC control mode.

Note: If the personal computer is powered down, the 74 series terminal being tested fails with a fault code of 28 (odd channel of digital set is stuck in loop-around).

A display of fault code 28 indicates the terminal is good. When a fault code other than 28 is displayed, use the appropriate repair procedure for the terminal being tested.

Attendant Console

When a continuous audible tone at the attendant console is reported by the user (caused by a system power interruption or the attendant console headset is plugged in), perform the following.

Operate the test switch on the left side of the attendant console to remove the tone.

Note: The test switch is located on the front panel of the storage area containing the card for attendant use.

NO RESPONSE FROM SWITCH

Overview

Trouble clearing when there is no response from the switch depends on the symptoms of the total switch failure.

No dial tone, can't dial out, etc., reported by the customer or loss of communications between the switch and a remote maintenance facility (if provided) are types of total switch failure.

If no dial tone is reported and the common control appears to have the normal heartbeat, a condition of multiple simultaneous seizures that are not followed by dialing may be occurring.

PROC 420 allows maintenance personnel to display processor occupancy to further verify that the lack of dial tone is not the result of an overloaded processor.

If the system has alarmed DS-1 circuit packs, maintenance personnel should consider busying out the alarmed DS-1 circuit packs to eliminate a potential source of multiple seizures.

Contact with the user and examination of the alarm panel helps to determine how the switch is functioning and the type of trouble clearing procedure to perform.

If no LEDs on the alarm panel are lighted, a total switch failure has probably occurred. Perform the trouble clearing steps listed under **System Down - No LEDs Lighted** to restore the switch.

If the switch is in emergency transfer (**EMERGENCY TRANSFER ACT** indicator lighted), perform the trouble clearing steps listed under **Emergency Transfer - Processor Suicide Suspected** to restore the switch.

If a remote maintenance facility (if provided) cannot communicate with the switch, perform the trouble clearing steps listed under **Communications with Remote Maintenance Facility Lost** to restore communications.

System Down - No LEDs Lighted

1. Verify AC power is on at customer provided AC panel.
If AC power is available, proceed to Step 2.
If AC power is not available, contact the customer.
2. Visually inspect all fuses, circuit breakers, on/off switches (bulk OLS power supply), and power cables.
If no problem is found with fuses, circuit breakers, on/off switches, and power cables, proceed to Step 3.
If a problem is found, replace the fuse(s), reset circuit breaker(s) or on/off switches, or replace power cable(s).
3. Check rectifier, DC/DC converter output voltages, and the GREEN LED on bulk OLS power supplies. (Refer to Table C, Cabinet Power Supply Voltage Measurements and Table D, DC/DC Converter Voltage Measurements.)
If all voltages are within acceptable limits or the GREEN LED on bulk OLS power supplies are on, proceed to Step 4.
If abnormal voltages are noted or the GREEN LED is off, replace DC/DC converter circuit packs, DC/DC converter, rectifier, or bulk OLS power supply as appropriate.
4. Perform **Microdiagnostic Testing**.

Emergency Transfer - Processor Suicide Suspected

1. Inspect the alarm panel.
If the **EMERGENCY TRANSFER ACT** indicator is on and the **PASS** indicator is flashing, ensure that the **EMERGENCY TRANSFER** switch is set to **OFF** and proceed to Step 7.
If the **EMERGENCY TRANSFER ACT** and **MAJOR** indicators are on, and the **CC PWR** indicator is off, proceed to Step 2.
If the **EMERGENCY TRANSFER ACT**, **MAJOR**, and **CC PWR** indicators are on, proceed to Step 5.
2. Inspect network cabinets for tripped circuit breakers, blown fuses, and on/off switches (bulk OLS power supplies).
If no problem is found with circuit breakers, fuses, and on/off switches, proceed to Step 3.
If a problem is found, reset the circuit breakers or on/off switches, and/or replace blown fuses.
3. At network cabinets, measure rectifier and DC/DC converter output voltages and check the GREEN LED on bulk OLS power supplies. (Refer to Table C, Cabinet Power Supply Voltage Measurements and Table D, DC/DC Converter Voltage Measurements.)

TABLE C.

CABINET POWER SUPPLY VOLTAGE MEASUREMENTS			
CABINET	TYPE OF RECTIFIER	MINIMUM	MAXIMUM
COMMON CONTROL, MODULE CONTROL, PORT, TMS, and RMI	309A/310	-46 V	-52 V
	334A	-46 V	-52 V
	BATT	-46 V	-52 V

TABLE D.

DC/DC CONVERTER VOLTAGE MEASUREMENTS			
CONVERTER	VOLTAGE	MINIMUM	MAXIMUM
490AA	5 V	4.9 V	5.3 V
494GA	5 V	4.9 V	5.3 V
495FA	5 V	4.9 V	5.3 V

4. If all voltages are within acceptable limits and the GREEN LED is lighted, proceed to Step 7.
If some voltages are out of acceptable limits or the GREEN LED is not lighted, replace DC/DC converter circuit packs, rectifier or associated circuit packs, bulk OLS power supply, or wiring (as appropriate) to restore voltages to within acceptable limits. Proceed to Step 7.
5. Inspect common control cabinet for tripped circuit breakers, on/off switches (bulk OLS power supplies) and/or blown fuses.
If no problem is found with circuit breakers, on/off switches and fuses, proceed to Step 6.
If a problem is found, reset the circuit breakers, on/off switches and/or replace blown fuses.
6. At the common control cabinet measure rectifier, DC/DC converter output voltages, or check the GREEN LED on bulk OLS power supplies.
If all voltages are within acceptable limits or the GREEN LED is lighted, proceed to Step 7.
If some voltages are out of acceptable limits or the GREEN LED is not lighted, replace DC/DC converter circuit packs, rectifier or associated circuit packs, bulk OLS power supply, or wiring (as appropriate) to restore voltages to within acceptable limits. Proceed to Step 7.
7. At the alarm panel, depress **RESET**, and momentarily set **HALT/GO** switch to **HALT**, then to **GO**.
If the **PASS** indicator is flashing, and the **CC PWR**, **MAJOR** and **ACT** indicators are off, the processor suicide trouble is corrected. Perform **PROC 600**, Test 1 and 2 to determine the health of the switch.
If the **PASS** indicator is not flashing, proceed to Step 8.
8. Perform **Microdiagnostic Testing**.

Communications with Remote Maintenance Facility Lost

1. At the common control carrier, verify that circuit breaker **CB2** is not tripped.
If circuit breaker **CB2** is not tripped, proceed to Step 3.
If circuit breaker **CB2** is tripped, reset the circuit breaker and proceed to Step 2.
2. Determine if contact with the remote maintenance facility is established.
If contact is established, corrective action is complete.
If contact is not established, proceed to Step 3.
3. At the data set associated with the remote maintenance facility, verify that power is provided and appropriate LEDs are lighted.
If power to the data set is provided and appropriate LEDs are lighted, proceed to Step 5.
If power to the data set is not available or appropriate LEDs are not lighted, correct the problem and proceed to Step 4.
4. Determine if contact with the remote maintenance facility is established.
If contact is established, corrective action is complete.
If contact is not established, proceed to Step 5.
5. At the cross-connect field, visually inspect wiring for the remote maintenance facility.
If wiring is correct, proceed to Step 7.
If wiring is not correct, correct wiring and proceed to Step 6.
6. Determine if contact with the remote maintenance facility is established.
If contact is established, corrective action is complete.
If contact is not established, proceed to Step 7.
7. Replace circuit pack TN492 and proceed to Step 8.

Note: Prior to replacement of circuit pack TN492, insure that the battery (comcode 844665836) is connected (or connect) to the back side of the circuit pack.

Mark the date of the next battery replacement (month and year) on the **Date Label** that is attached to the battery.

Note: The battery replacement date is established by adding 5 years to the date of installation of the TN492 circuit pack and associated battery. Example: TN492 circuit pack replaced July 1987; date to be written on the label is July 1992.

Affix the **Date Label** to the faceplate of the TN492 circuit pack.

Note: If the YELLOW LED is lighted, after the circuit pack is replaced, the battery is **not** connected or wired correctly.

8. Determine if contact with the remote maintenance facility is established.
If contact is established, corrective action is complete.
If contact is not established, proceed to Step 9.
9. Replace the data set associated with the remote maintenance facility and proceed to Step 10.
10. Determine if contact with the remote maintenance facility is established.
If contact is established, corrective action is complete.
If contact is not established, check the wiring between the circuit breaker, cross-connect field, TN492, and data set.

Microdiagnostics - General

Microdiagnostic test execution requires that the common control carrier is operable and can perform the tests.

Circuit packs **TN370B**, **TN491B**, and **UN152B** **must** be installed in addition to the new memory circuit pack **TN394** (4 megawords) for the microdiagnostics tests to pass.

- a. Tests 0 through 6 require power from DC/DC converters in the common control power carrier (slots 1 and 2 for CC0 and slots 4 and 5 for CC1).
- b. Tests 7 through 15 require power from all three DC/DC converters for each common control (slots 0, 1, and 2 for CC0 and slots 3, 4, and 5 for CC1).
- c. The **HALT/GO** switch associated with the common control being tested **must** be set to the **GO** position.

Microdiagnostics are performed starting with Test 0 and progressing in numerical order to Test 15. If a failure is indicated corrective action is performed and the test is repeated. If the test passes after corrective action, all tests are repeated starting with Test 0 and progressing through Test 15.

Microdiagnostic Tests 3 through 6 and 13 are spare tests which are reserved for future use. Each spare test is executed in microdiagnostic test sequence.

Test 7 requires coordination between vintages of UN151, UN152B, UN153, TN370B, and TN491B circuit packs.

- a. Before replacing a circuit pack, check the vintage of the circuit packs.
- b. The maintenance control location should be contacted if the corresponding vintages are not known.

Test 10 tests the tape subsystem. For this test, a tape is placed in the transport and the **MAAP** is connected for consultation on failures.

Test 15 provides an abbreviated subset of tests (7, 8, and 9) and a memory load of the data on the tape. For this test, a tape is placed in the transport and the **MAAP** is connected to determine the progress of the memory load.

Test execution is accomplished by:

- a. Selecting the test to be executed.
- b. Momentarily depressing the **RESET** switch.
- c. Momentarily depressing the **ENABLE** switch.

Test execution starts by clearing most of the alarm panel LEDs and lighting the LEDs related to the test.

- a. The **PASS** and **FAIL** LEDs are cleared until the test result is determined.
- b. If a test passes, the **PASS** LED on the alarm panel is lighted.
- c. If a test fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is most likely the cause of the fault.

Other circuit packs that could be causing the test to fail are listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, in the order of their likelihood as causes of the problem.

- a. CKT 1 in Table E is the failing circuit with the **RED** LED lighted.
- b. The second most likely circuit pack is indicated as CKT 2 in Table E.
- c. In some cases, one of the circuit packs listed in Table E may be the same as the circuit pack with the **RED** LED lighted.
- d. When a circuit pack is listed in Table E as a replacement which has already been replaced, the sequence in Table E to be followed is the lowest circuit pack **not** replaced.

Requirement: If circuit pack 4 (CKT 4) has been replaced, replace CKT 3, then CKT 5, etc.

If a test fails and the circuit pack replacements listed in Table E do not correct the problem, the following is performed:

- a. Table F, Circuit Packs Required to Perform Microdiagnostic Tests, is checked to determine which circuit packs are required to perform the failing test.
- b. Circuit packs **not** required to perform the test are **unseated** and the test repeated.
- c. If the test passes, the circuit packs are reseated one-at-a-time, repeating the failing test until the failing circuit pack(s) are located.

Microdiagnostic tests 0 through 10, 13, and 14 can be executed and call processing can be restarted from **INITA** by rocking the **HALT/GO** switch after the test is performed. A reload of the switch is not performed by rocking the **HALT/GO** switch if Test 15 is not performed. This method of testing is not the preferred method of microdiagnostic testing but is helpful to isolate unique problems without taking the switch down.

Caution: *Transient calls (calls not fully established) are lost when this method of testing is performed. Do not use this method of testing when performing microdiagnostic tests 11, 12, and 15 as memory is destroyed or a forced reload is performed taking the switch down.*

TABLE E.

MICRODIAGNOSTICS								
CIRCUIT PACK REPLACEMENT SEQUENCE								
TEST	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8
0	[1]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
1	[1] [2]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
2	[1]	TN490 Slot 22	TN491B Slot 31	TN492 Slot 32				
3	[1]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
4	[1]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
5	[1]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
6	[1]	TN491B Slot 31	TN492 Slot 32	TN490 Slot 22				
7	[1]	UN152B Slot 02	TN491B Slot 31	TN370B Slot 00				
8	[1]	TN404 Slot 21	UN153 Slot 03	TN491B Slot 31	TN368 Slot 06			
9	[1]	UN152B Slot 02	UN153 Slot 03	TN370B Slot 00	UN151 Slot 01	TN394 Slot 07	TN404 Slot 21	TN368 Slot 06
10	[1]	TN430 Slot 20	UN153 Slot 03	TN394 Slot 07	TN368 Slot 06			
11	[1]	TN368 Slot 06	TN404 Slot 21	UN153 Slot 03	TN370B Slot 00			
12	[1]	TN368 Slot 06	TN404 Slot 21	UN153 Slot 03	TN370B Slot 00			
13	[1]	TN370B Slot 00	TN491B Slot 31	TN492 Slot 32				
14	[1]	TN369 Slot 04 [3]	UN152B Slot 02	TN490 Slot 22	UN153 Slot 03	TN370B Slot 00		
[1] = Circuit pack with RED LED lighted. [2] = For Test 1, replace all circuit packs with RED LED lighted and all circuit packs with no LEDs lighted. [3] = Replace TN369 (Slot 04) if installed.								

Microdiagnostic Testing

Test 0 - Diagnostic processor circuit pack demand test

To execute microdiagnostic Test 0:

1. Set **TEST SELECT** switch to 0.
2. Depress **RESET, ENABLE**.

Note: While Test 0 is executing, the **MAJOR** and **DIAG PROC** indicators are lighted.

3. If Test 0 fails to affect alarm panel LEDs, power and cabling should be checked.

Note: Test 0 requires power from DC/DC converters in the common control power carrier (slots 1 and 2 for CC0 and slots 4 and 5 for CC1).

4. If the **PASS** indicator turns on, Test 0 executed successfully.

Note: The **DIAG PROC** indicator is also lighted when Test 0 passes.

Continue with microdiagnostic Tests 1 through 15.

5. If Test 0 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, continue with microdiagnostic Tests 1 through 15.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 0.

7. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, continue with microdiagnostic Tests 1 through 15.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 0.

8. Repeat Step 7 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 0 are replaced.
9. If Test 0 continues to fail and all circuit pack replacements listed in Table E for Test 0 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 1 - Maintenance bus demand test

To execute microdiagnostic Test 1:

1. Set **TEST SELECT** switch to 1.
2. Depress **RESET, ENABLE**.

Note: While Test 1 is executing, the **MAJOR** indicator is lighted.

3. In Test 1, the **RED** and **GREEN** LEDs (positions 18 and 19 respectively) are lighted on all common control carrier circuit packs.

Note: After the **ENABLE** switch is depressed, the **RED** LED is lighted for approximately 3 seconds and the **GREEN** LED is on until another test is selected.

4. If any circuit packs fail to light or remain with a **RED** LED lighted in position 18, the circuit pack(s) should be replaced.

Note: If a circuit pack was replaced in Step 4, repeat all microdiagnostic tests starting with Test 0.

5. If the **PASS** indicator turns on, Test 1 executed successfully.

Continue with microdiagnostic Tests 2 through 15.

6. If Test 1 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

7. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 1.

8. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 1.

9. Repeat Step 8 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 1 are replaced.

10. If Test 1 continues to fail and all circuit pack replacements listed in Table E for Test 1 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 2 - Alarm interface circuit pack demand test

To execute microdiagnostic Test 2:

1. Set **TEST SELECT** switch to 2.
2. Depress **RESET, ENABLE**.

Note: While Test 2 is executing, the **MAJOR** and **PROC** indicators are lighted.

3. If the **PASS** indicator turns on, Test 2 executed successfully.

Note: The **PROC** indicator is also lighted when Test 2 passes.

Continue with microdiagnostic Tests 3 through 15.

4. If Test 2 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.
Replace the circuit pack with the **RED** LED lighted.
5. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 2.
6. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 2.
7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 2 are replaced.
8. If Test 2 continues to fail and all circuit pack replacements listed in Table E for Test 2 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 3 - Spare (reserved for future use)

Note: Test 3 is reserved for future use but should be executed when microdiagnostic testing is being performed.

To execute microdiagnostic Test 3:

1. Set **TEST SELECT** switch to 3.
2. Depress **RESET, ENABLE**.
3. The **PASS** indicator is always turned on indicating Test 3 executed successfully.
Continue with microdiagnostic Tests 4 through 15.

Test 4 - Spare (reserved for future use)

Note: Test 4 is reserved for future use but should be executed when microdiagnostic testing is being performed.

To execute microdiagnostic Test 4:

1. Set **TEST SELECT** switch to 4.
2. Depress **RESET, ENABLE**.
3. The **PASS** indicator is always turned on indicating Test 4 executed successfully.
Continue with microdiagnostic Tests 5 through 15.

Test 5 - Spare (reserved for future use)

Note: Test 5 is reserved for future use but should be executed when microdiagnostic testing is being performed.

To execute microdiagnostic Test 5:

1. Set **TEST SELECT** switch to 5.
2. Depress **RESET, ENABLE**.
3. The **PASS** indicator is always turned on indicating Test 5 executed successfully.
Continue with microdiagnostic Tests 6 through 15.

Test 6 - Spare (reserved for future use)

Note: Test 6 is reserved for future use but should be executed when microdiagnostic testing is being performed.

To execute microdiagnostic Test 6:

1. Set **TEST SELECT** switch to 6.
2. Depress **RESET, ENABLE**.
3. The **PASS** indicator is always turned on indicating Test 6 executed successfully.
Continue with microdiagnostic Tests 7 through 15.

Test 7 - 501CC processor circuit packs demand test

To execute microdiagnostic Test 7:

1. Set **TEST SELECT** switch to 7.
2. Depress **RESET, ENABLE**.

Note: While Test 7 is executing, the **MAJOR** and **PROC** indicators are lighted.

3. If the **PASS** indicator turns on, Test 7 executed successfully.

Note: The **PROC** indicator is also lighted when Test 7 passes.

Continue with microdiagnostic Tests 8 through 15.

4. If Test 7 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

Note: Check that the circuit pack being replaced is the correct vintage and type.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 7.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 7.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 7 are replaced.
8. If Test 7 continues to fail and all circuit pack replacements listed in Table E for Test 7 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 8 - System bus and buffered bus demand test

To execute microdiagnostic Test 8:

1. Set **TEST SELECT** switch to 8.
2. Depress **RESET, ENABLE**.

Note: While Test 8 is executing, the **MAJOR** and **I/O CHANNEL** indicators are lighted.

3. If the **PASS** indicator turns on, Test 8 executed successfully.

Note: The **I/O CHANNEL** indicator is also lighted when Test 8 passes.

Continue with microdiagnostic Tests 9 through 15.

4. If Test 8 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 8.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 8.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 8 are replaced.
8. If Test 8 continues to fail and all circuit pack replacements listed in Table E for Test 8 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 9 - 501CC instruction set demand test

To execute microdiagnostic Test 9:

1. Set **TEST SELECT** switch to 9.
2. Depress **RESET, ENABLE**.

Note: While Test 9 is executing, the **MAJOR** and **PROC** indicators are lighted.

3. If the **PASS** indicator turns on, Test 9 executed successfully.

Note: The **PROC** indicator is also lighted when Test 9 passes.

Continue with microdiagnostic Tests 10 through 15.

4. If Test 9 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 9.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 9.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 9 are replaced.
8. If Test 9 continues to fail and all circuit pack replacements listed in Table E for Test 9 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 10 - Tape subsystem demand test

To execute microdiagnostic Test 10:

1. Ensure that a tape is in the High Capacity Minirecorder (HCMR) and is firmly seated.

2. Plug the **MAAP** into the **MAAP** connector for an unduplicated common control switch or connector CC0 or CC1 for the common control being tested in a duplicated common control switch.
3. Set **TEST SELECT** switch to 10.
4. Depress **RESET, ENABLE**.

Note: While Test 10 is executing, the **MAJOR** and **TAPE** indicators are lighted.

5. Test 10 takes approximately 50 to 75 seconds to complete. The LEDs on TN430 can be used to monitor progress of Test 10.

Initially the **RED** LED in position 2 on TN430 is lighted.

Next, the **GREEN** LED in position 1 on TN430 is lighted providing a heartbeat while the tape is read.

6. If the **PASS** indicator turns on, Test 10 executed successfully.

Note: The **TAPE** indicator is also lighted when Test 10 passes.

Continue with microdiagnostic Tests 11 through 15.

7. If Test 10 fails, the **FAIL** LED on the alarm panel is lighted.
8. The left side of the **MAAP** displays eight digits which are designated 1 through 8 reading from left to right.
9. If there is no display (blanked) on the **MAAP**, replace TN403 in Slot 23 and proceed to Step 22.
10. If all eight digits display 00000000, perform the following:
 - Verify the tape is in the transport.
 - Inspect power and cabling to the HCMR.
 - Proceed to Step 22.

Caution: *If multiple failures are indicated on the MAAP display, a 1 in more than 1 field, perform the following steps in the order listed. Do not replace the HCMR until all circuit packs within the HCMR are replaced when multiple failures are displayed.*

11. If digit 1 or digit 8 displays a 1, replace TN430 in Slot 20 and proceed to Step 22.

Caution: *Prior to replacing circuit packs in the HCMR, the power to the circuit packs must be removed or damage to the tape pin connectors or components on the circuit pack being replaced (or other circuit packs) can occur. Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of HCMR circuit packs.*

12. If digit 6 displays a 1, replace SN446 (power supply) in the HCMR and proceed to Step 20.
13. If digit 2 displays a 1, replace SN441 (controller) in the HCMR and proceed to Step 20.
14. If digit 5 displays a 1, replace SN442 (data electronics) in the HCMR and proceed to Step 20.

15. If digit 4 displays a 1, replace SN443 (tape transport and preamp) in the HCMR and proceed to Step 20.
16. If digit 3 displays a 1, replace SN445 (servo) in the HCMR and proceed to Step 20.
17. If digit 7 displays a 1, perform the following:
Reinsert tape.
Depress **RESET, ENABLE** and proceed to Step 18.
18. If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the tape.
Depress **RESET, ENABLE** and proceed to Step 19.
19. If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace SN443 (tape transport and preamp) in the HCMR and proceed to Step 20.
20. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the HCMR and proceed to Step 21.
21. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, check the wiring between the HCMR and the common control carrier.
22. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 10 and proceed to Step 23.
23. Depress **RESET, ENABLE**.
If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.
If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 10 and proceed to Step 24.
24. Repeat Step 23 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 10 are replaced.
25. If Test 10 continues to fail and all circuit pack replacements listed in Table E for Test 10 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 11 - Main memory system demand test

Note: TN394 (4 megawords) in slots 08 and 09 are tested if installed.

To execute microdiagnostic Test 11:

1. Set **TEST SELECT** switch to 11.
2. Depress **RESET, ENABLE**.

Note: While Test 11 is executing, the **MAJOR** and **MEM** indicators are lighted.

3. If the **PASS** indicator turns on, Test 11 executed successfully.

Note: The **MEM** indicator is also lighted when Test 11 passes.

Continue with microdiagnostic Tests 12 through 15.

4. If Test 11 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 11.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 11.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 11 are replaced.
8. If Test 11 continues to fail and all circuit pack replacements listed in Table E for Test 11 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 12 - Memory protect circuit pack demand test

Note: TN394 (4 megawords) in slots 08 and 09 are tested if installed.

To execute microdiagnostic Test 12:

Note: If installed, remove TN514 (scamper) prior to performing Test 12.

1. Set **TEST SELECT** switch to 12.
2. Depress **RESET, ENABLE**.

Note: While Test 12 is executing, the **MAJOR** and **MEM** indicators are lighted.

3. If the **PASS** indicator turns on, Test 12 executed successfully.

Note: The **MEM** indicator is also lighted when Test 12 passes.

Continue with microdiagnostic Tests 13 through 15.

4. If Test 12 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 12.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 12.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 12 are replaced.
8. If Test 12 continues to fail and all circuit pack replacements listed in Table E for Test 12 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 13 - Spare (reserved for future use)

Note: Test 13 is reserved for future use but should be executed when microdiagnostic testing is being performed.

To execute microdiagnostic Test 13:

1. Set **TEST SELECT** switch to 13.
2. Depress **RESET, ENABLE**.
3. The **PASS** indicator is always turned on indicating Test 13 executed successfully.

Continue with microdiagnostic Tests 14 and 15.

Test 14 - Cache memory circuit pack demand test

Note: TN369 (cache memory) in slot 04 is tested if installed.

To execute microdiagnostic Test 14:

1. Set **TEST SELECT** switch to 14.

2. Depress **RESET, ENABLE**.

Note: While Test 14 is executing, the **MAJOR** and **CACHE MEMORY** indicators are lighted.

3. If the **PASS** indicator turns on, Test 14 executed successfully.

Note: The **CACHE MEMORY** indicator is also lighted when Test 14 passes.

Continue with microdiagnostic Test 15.

4. If Test 14 fails, the **FAIL** LED on the alarm panel is lighted and a **RED** LED is lighted on position 18 of the circuit pack that is failing.

Replace the circuit pack with the **RED** LED lighted.

5. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 14.

6. Depress **RESET, ENABLE**.

If the **PASS** indicator turns on, repeat all microdiagnostic tests starting with Test 0.

If the **FAIL** indicator turns on, replace the next circuit pack listed in Table E, Microdiagnostics Circuit Pack Replacement Sequence, for Test 14.

7. Repeat Step 6 until the **PASS** indicator turns on, or until all circuit packs listed in Table E for Test 14 are replaced.
8. If Test 14 continues to fail and all circuit pack replacements listed in Table E for Test 14 do not correct the problem, perform additional corrective action as listed under Repair Guide for Microdiagnostic Testing (after Test 15).

Test 15 - Abbreviated test and forced load

Caution: If microdiagnostic test 15 is executed without performing microdiagnostic tests 0 through 14 during a reload of tape, false alarms and emergency transfer can occur which may be service affecting. MSTAT memory is not cleared by test 15.

To execute microdiagnostic Test 15:

1. Ensure that a tape is in the High Capacity Minirecorder (HCMR) and is firmly seated.
2. Plug the **MAAP** into the **MAAP** connector for an unduplicated common control switch or connector CC0 or CC1 for the common control being tested in a duplicated common control switch.
3. Set **TEST SELECT** switch to 15.
4. Depress **RESET, ENABLE**.

Note: While Test 15 is executing, the **MAJOR, PROC** and **TAPE** indicators are lighted.

5. Test 15 provides an abbreviated subset of tests (7 through 9).

If Tests 7 through 9 pass, memory is loaded with the data on the tape.

6. The first signs of a passing sequence are the LEDs on TN430.

The **RED** LED in position 2 and the **YELLOW** LED at the middle of the circuit pack are lighted.

Next, the **GREEN** LED in position 1 of the circuit pack starts flashing (indicating tape interface is being initialized).

Then the **GREEN** LED in position 1 goes either steady on or off while the tape is moved to a load position.

7. Next, data is read from tape and the **MAAP** is updated.

8. The area currently being read from tape is indicated in the procedure number field of the **MAAP** as follows:

Encode 0 = Directory information is being read from tape.

Encode 1 = Program information is being read from tape and is being written to memory.

Encode 2 = Translation information is being read from tape and is being written to memory.

Encode 3 = Patch information is being read from tape and is being written to memory.

Encode 4 = The reading of information from tape is complete and hardware is being tested and initialized.

Encode 5 = Hardware tests failed.

Encode 6 = Tape subsystem was successfully initialized but load attempt failed because an uncorrectable error was encountered (e.g., bad tape, no tape, bad cable to HCMR, etc.).

Encode 7 = Failed tape subsystem initialization (either HCMR, TN430, or both), or if encode 7 is seen only momentarily followed by an encode 9 then incomplete load.

Encode 8 = Not enough memory or memory bad.

Encode 9 = Too many reloads attempted or interrupts during load process after load counter incremented.

9. When the tape load is completed and successful, the **PASS** indicator on the alarm panel flashes at a 1-second on, 1-second off rate.

In addition, the **GREEN** LED in position 2 of TN430 is flashing (indicating a heartbeat).

Note: There is a slight delay prior to the heartbeat appearing.

10. If the tape load is not successful, failure indicators **MAJOR**, **PROC** and **TAPE** are lighted. The **PASS** indicator does not flash.
11. If the **PASS** indicator does not flash or if any of the failure cases (Encodes 5 through 9) are displayed in the procedure number field of the **MAAP**, microdiagnostic tests 0 through 14 **must** be executed in order to find the cause of the failure.

Repair Guide For Microdiagnostic Testing

1. Determine from Table F, Circuit Packs Required to Perform Microdiagnostic Tests, which circuit packs are required to perform the microdiagnostic test being executed.
2. Unseat all circuit packs in the common control carrier that are **not** required to perform the microdiagnostic test being executed.
3. Depress **RESET, ENABLE**.
If the **FAIL** indicator turns on, reseal all circuit packs and proceed to Step 11.
If the **PASS** indicator turns on, reseal one circuit pack.
4. Depress **RESET, ENABLE**.
If the **FAIL** indicator turns on, proceed to Step 5.
If the **PASS** indicator turns on, proceed to Step 8.
5. Replace the reseated circuit pack, and depress **RESET, ENABLE**.
If the **FAIL** indicator turns on, proceed to Step 6.
If the **PASS** indicator turns on, proceed to Step 8.
6. Replace the circuit pack in the same slot.

Requirement: Do not replace more than 2 circuit packs in the same slot.

Proceed to Step 7.

7. Depress **RESET, ENABLE**.
If the **FAIL** indicator turns on, reseal any unseated circuit packs and proceed to Step 11.
If the **PASS** indicator turns on, proceed to Step 8.
8. Determine if other circuit packs are to be reseated.
If all circuit packs are reseated, proceed to Step 10.
If any circuit packs are unseated, reseal the next circuit pack and proceed to Step 9.
9. Depress **RESET, ENABLE**.
If the **FAIL** indicator turns on, go to step 5.
If the **PASS** indicator turns on, repeat Step 8.
10. Determine if any circuit pack(s) were replaced in Steps 4 through 9.
If no circuit packs were replaced, proceed to Step 11 and suspect an intermittent trouble.
If a circuit pack was replaced, repeat all microdiagnostic tests starting with Test 0.
11. If the circuit pack replacements or the power and cabling checks do not reveal the source of the problem, check the backplane wiring.

TABLE F.

CIRCUIT PACKS REQUIRED TO PERFORM MICRODIAGNOSTIC TESTS	
TEST	CIRCUIT PACKS REQUIRED FOR TEST TO EXECUTE
0	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
1	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
2	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
3	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
4	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
5	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
6	TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
7	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
8	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
9	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN394 (Slot 07), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
10	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN394 (Slot 07), TN430 (Slot 20), TN404 (Slot 21), TN490 (Slot 22), TN403 (Slot 23), TN491B (Slot 31), and TN492 (Slot 32).
11 [1]	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN394 (Slot 07), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
12 [1]	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN394 (Slot 07), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
13	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
14 [2]	TN370B (Slot 00), UN151 (Slot 01), UN152B (Slot 02), UN153 (Slot 03), TN368 (Slot 06), TN404 (Slot 21), TN490 (Slot 22), TN491B (Slot 31), and TN492 (Slot 32).
[1] = TN394 in slots 08 and 09 are tested (if installed). [2] = TN369 in slot 04 is tested (if installed).	

MAINTENANCE PROCEDURES

PROCEDURAL FORMAT AND CONTENT

Maintenance procedures presented in this section are divided into three to five parts depending upon the content and purpose of the procedure. The five parts of the procedure, preceded by a flipchart, consist of: purpose, field definitions and codes, test equipment required, operation of procedure, and repair guide. Each procedure consists of at least three parts; i.e., purpose, field definitions and codes, and operation of procedure.

Purpose

States the purpose of the procedure in general terms and briefly covers the contents and purpose of each test.

Field Definitions and Codes

Defines each field and the allowable values that are entered or displayed by the fields.

Test Equipment Required

States the test equipment required in order to execute one or more of the tests. The test equipment is not necessarily required for repair activities, but is required for operation of the procedure.

Operation of Procedure

Provides simplified instructions for calling up and running the procedure. Describes each test that can be run and presents the possible results, including indications that the test ran successfully.

Repair Guide

Based on the failure response provided by the test, this part lists the recommended corrective action to be taken.

- a. The recommended corrective action does not represent an exhaustive isolation procedure, but serves as a guide to isolate and repair the suspected items.
- b. Isolation and repair of elusive troubles are based primarily on switch familiarity (e.g., applicable schematic diagrams, circuit descriptions, etc.) and is not contained in the repair guide.
- c. The repair guide for some maintenance procedures includes a repair procedure table. For a given failure code or indication, a list of corrective action steps are provided. The steps are to be performed in the order listed.

Requirement: When the corrective action lists a circuit pack to be replaced, the first action is to reseal the original circuit pack; repeat the applicable test; and based on the results, replace the circuit pack (if necessary).

- d. Each replacement of a component must be followed by a rerun of the applicable test.
- e. When replacement of a circuit pack or component does not clear the failure, the original circuit pack or component is reinstalled.

MAINTENANCE PROCEDURE SELECTION

Overview

There are two methods of selecting maintenance procedures. One is the use of alarm causes/error log maintenance procedure (**PROC 600**) and the other is visual inspection of the alarm panel.

Alarm causes/error log

Maintenance procedure selection is directly related to the contents of PMIDS. Therefore, the starting point to determine which procedure to perform first for alarmed conditions and recorded errors is **PROC 600** (alarm causes/error log).

- a. The reason for starting with **PROC 600** is that **PROC 600** dictates maintenance procedure sequencing (which maintenance procedure to perform and the order in which to perform them) by sorting the contents of PMIDS.
- b. **PROC 600** displays the contents of PMIDS by alarm severity and in the order of priority dictated by the importance of the functional area(s) (unit types) which are alarmed. All alarms are displayed: first, major alarms within priority order; second, minor alarms in priority order; and last, warning alarms by priority order.
- c. In addition, **PROC 600** provides by unit number (functional area) errors recorded for each circuit identified in PMIDS. This information may be of particular interest in isolating user reported troubles and during maintenance polling.
- d. **PROC 600** references the maintenance procedure (if any) to perform in order to investigate and isolate the cause of alarmed conditions and recorded errors. Also identified is the circuit location (if applicable) of the probable cause for each displayed entry.

PROC 600 is also valid as the starting point for user reported troubles and maintenance polling. Maintenance polling should be accomplished prior to maintenance personnel leaving the customer's premises to determine the health of the switch.

Alarm Panel

The fault indicators in the **ALARM**, **ENVIRON**, **COMMON CONTROL**, **NETWORK**, **APPL PROC**, and **OTHER** sections of the alarm panel furnish reference to:

- a. Maintenance procedures for diagnosis and repair of the failure. For example, the **SWITCH** fault indicator references **PROC 620**.
- b. Maintenance procedures that serve as a pointer to other procedures for diagnosis and repair. For example, the **OTHER FAILS** fault indicator references **PROC 600** which in turn references other procedures.

PROC 620 (network) investigates and isolates multiple unit types and functional areas. As indicated on the alarm panel, **PROC 620** is referenced by two fault indicators: **SWITCH** and **PORT**.

The **OTHER FAILS** fault indicator references **PROC 600** which in turn references other procedures to isolate the cause of the lighted fault indicator. Such causes can be: SMDR, ANI, calling number display, Force Administration Data System (FADS), real time clock synchronizer, attendant console, etc.

General

The maintenance procedures that are not alarm panel oriented are used primarily to test a particular facility, busy out or release busied-out circuits, or make test calls.

The following **PROC**s can be performed both on- and off-line in a duplicated common control switch.

- a. **PROC 600** - Alarm causes/error log.
- b. **PROC 610** - Tape tests.
- c. **PROC 611** - Common control I/O tests.
- d. **PROC 612** - Initialization causes.
- e. **PROC 614** - Memory read/memory match tests.
- f. **PROC 615** - **MAAP** test.
- g. **PROC 616** - Alarm panel test.
- h. **PROC 618** - Diagnostic processor/remote interface/alarm interface test (Tests 1 through 3 only).
- i. **PROC 650** - DCIU tests.
- j. **PROC 652** - Time-of-day clock synchronizer.

When the switch is duplicated, it may be necessary to examine both the on-line and off-line side to determine the maintenance procedure to be performed. The problem that exists could have caused a switch to the healthier common control. When the problem is corrected, both the on-line and off-line sides should be examined to determine if potential problems exist.

MAINTENANCE PROCEDURE DESCRIPTION

Overview

Organization of the maintenance procedures is based on:

- a. Procedures relating to the entire switch.
- b. Procedures organized by functional area according to the area's importance to continued call processing integrity.

Each of the maintenance procedures is briefly described under the following titles:

- General switch procedures.
- Common control procedures.
- Network procedures.
- Common control peripherals procedures.
- Connection status procedures.
- Other procedures.

General Switch Maintenance Procedures

This group of maintenance procedures deals with the entire switch or with switch components that are concerned with the entire switch. General switch maintenance procedures include **PROC 600** and **PROC 601**.

PROC 600 - Alarm Causes/Error Log displays the contents of the current PMIDS error log.

- a. The unit type, present alarm status of the circuit, number of failures recorded for the circuit, time of the first and last errors recorded, and time the circuit was alarmed or resolved are displayed.
- b. The maintenance procedure used to run further tests on a circuit that is alarmed or has errors recorded is also displayed.
- c. **PROC 600** allows entries in the error log to be cleared (zeroed- out) from PMIDS singly or by unit type. Alarmed entries, either resolved or unresolved, can be cleared individually or as a whole.

PROC 601 - Environmental Test displays information as to whether the alarm is caused by a cabinet or TMS/module control carrier power, fuse/circuit breaker, DC/DC converter, frequency generator, memory holdover, airflow, or temperature problem. **PROC 601** displays the location of the trouble and provides other information to assist maintenance personnel in investigating, isolating, and repairing the alarm cause.

Common Control Maintenance Procedures

This group of maintenance procedures tests the common control and associated components. Common control procedures include **PROC 610** through **PROC 616** and **PROC 618**.

PROC 610 - Tape Tests displays the failure history for tape errors, performs an ID chip test and parity checker/generator function test of TN430, resets TN430, and diagnoses the High Capacity Mini-Recorder (HCMR).

PROC 611 - Common Control I/O Tests is used to test the I/O capabilities of the common control and to display the failure history associated with these capabilities. The I/O capabilities tested include the 4 MHz data channels and the dual-speed data channels.

PROC 612 - Initialization Causes displays the failures which caused the common control processor to be initialized. In addition, all error log data (the entire PMIDS table) can be cleared (zeroed-out) when maintenance personnel consider it necessary to further isolate potential troubles.

PROC 613 - Duplicate Processor Control & Test displays the failures associated with processor duplication and tests the common control duplication channel. **PROC 613** allows memory updating in the off-line processor so that a soft switch can be attempted, and performs the soft switch when allowed. The health code indicators of the duplicate processors are displayed as well as the present status of the processor currently being used for testing.

PROC 614 - Memory Read/Memory Match Tests displays the recorded failure history and allows alarmed entries in the error log to be marked resolved. **PROC 614** tests identical areas of memory in both processors of a duplicated switch and provides the ability to test all or any part of main or cache memory. In addition, **PROC 614** reads and displays the contents of one or more memory locations in one processor whether the switch is duplicated or unduplicated.

PROC 615 - MAAP Test is used to test all functions of the **MAAP** which can be tested through the common control and provides indications of the severity and extent of any problems with the **MAAP**.

PROC 616 - Alarm Panel Test is used to test all software controlled LED indicators on the alarm panel and the ACK indicator on the attendant console.

PROC 618 - Diagnostic Processor/Remote Interface/Alarm Interface Test is used to test the capabilities of the diagnostic processor complex and to display the failure history associated with these capabilities. The capabilities tested include the alarm interface, diagnostic processor, remote interface, 1200 baud modem serving RMATS, and maintenance bus. External alarms originated by the external processor, external equipment, and auxiliary equipment are also reported via **PROC 618**.

Network Area Maintenance Procedures

This group of maintenance procedures deals with the digital network and its peripheral devices. Included are testing and recording capabilities for much of the hardware. Some of the network procedures are general purpose types; i.e., busy out procedures, and test calls. Network procedures include **PROC 620** through **PROC 625**, **PROC 630** through **PROC 632**, **PROC 635**, **PROC 640**, **PROC 642** through **PROC 644**, **PROC 646**, **PROC 647**, and **PROC 648**.

PROC 620 - Network Procedure displays the failure history, resolves alarmed entries, turns off alarms, and runs a test or diagnostic on any part of the network down through the port level. Each functional group of circuit packs in the network is assigned a 2-digit designation called the unit type. These unit types correspond with the unit types used in **PROC 600**.

PROC 621 - Network Duplication Channel displays the last seven switches, performs transparent soft switches (transparent to voice users), and performs hard switches of the TMS or module control complex. A re-initialization of the TMS or network module control complex can be performed whether or not the TMS or network module control complex is duplicated. Either side of a TMS or network module control complex can be soft locked off-line.

PROC 622 - Network Peripherals displays the failure history of network peripheral devices and resolves the alarmed entries. Tests necessary for fault isolation and verification of correct equipment operation can be performed.

PROC 623 - ANI Failures displays failure history for and tests ANI circuits. All available information which assists in fault isolation and repair is given.

PROC 624 - Contact Interface Test is a manual test used to determine if a contact interface circuit pack is defective. Any of all relay contacts on a selected contact interface circuit pack can be tested. Verification of relay operation must be visually observed at the customer's premises by monitoring associated LEDs on the circuit pack faceplate.

PROC 625 - Synchronization Reference Monitor displays the time and cause of the last eight reference switches and allows the monitoring of health for all DS-1 trunk interface circuit packs including the synchronization references. **PROC 625** provides the capability to switch between synchronization reference sources, and allows the disabling or re-enabling of the automatic reference switching by both software and hardware.

PROC 630 - Busy Out/Release Busy Out displays the busy out status and provides for the busy out or release busy out of terminals, trunks, and tone plants.

PROC 631 - Trunk Group Busy displays the busy out status for any trunk or trunk group and provides for the busy out or release busy out of trunks individually or by trunk group.

PROC 632 - Carrier Busy is used to busy out or release busy out circuits by the entire carrier or individually within a carrier. **PROC 632** also searches for and displays carriers which are completely or partially busied out. The type of task which maintenance busied the circuit is also displayed.

PROC 635 - Cause of Busy Out provides the ability to search for all busied out ports, to busy out or release busy all ports, or to examine and change the status (idle, in-use, or busied out) of all ports in user definable ranges. **PROC 635** also provides the ability to discover why the **MAAP** busy out lamp is lighted by ports or non-port uses of the busy out lamp. In addition an extension number can be entered to determine and change the status of the port assigned to that extension.

PROC 640 - Trunk Failures displays failure history for trunks and allows the resolving of alarmed entries singly or as a whole. **PROC 640** also provides dynamic recording and concurrent or later display of single trunk data. Trunk dial access code, type of data on the trunk when a failure occurred, and the trunk equipment location is provided to aid in isolating a trouble.

PROC 642 - Terminal-to-Trunk Test Call is used to test trunks by placing test calls from a specific terminal to the trunk being tested. Trunks can be tested singly, on the basis of dial access code, or on the basis of a trunk group.

PROC 643 - Terminal-to-Tone Test Call is used to transmit tones from the tone plant to the test line to aid in diagnosing user reported tone failures. All tones generated by the tone plant or a selected set of these tones can be sent sequentially.

PROC 644 - Terminal-to-Auxiliary Tone Test Call is used to transmit tones from the auxiliary tone circuit to the test line to aid in diagnosing user reported auxiliary tone failures. All tones generated by the auxiliary tone circuit or a selected set of these tones can be sent sequentially.

PROC 646 - Modem Pooling and Facility Testing is used to test the Analog/Digital Facility (ADFTC) test circuit, perform detection and diagnostic tests on modem pool members, digital facilities, EIA and CP interfaces and display the test results.

PROC 647 - Automatic Transmission Measurement System (ATMS) displays failure history from PMIDS and performs demand transmission and supervision testing. Measurement and test results for each trunk tested is displayed.

PROC 648 - Integrated Services Digital Network (ISDN) Facility Testing displays failure history of ISDN level 2 errors for the primary rate interface and performs end-to-end verification of the transmission path. It performs an ISDN level 2 test and establishes a level 3 loopback test.

Common Control Peripherals Maintenance Procedures

This group of maintenance procedures tests any equipment which can directly communicate with the common control through a non-network path. Common control peripheral procedures include **PROC 650** through **PROC 656**.

PROC 650 - DCIU Tests is used to display the DCIU failure history, perform an ID chip and parity checker/generator function test on the DCIU circuit packs and execute loop around testing on DCIU data links. A demand reinitialization of the DCIU can also be performed.

PROC 651 - Processor Communication Circuit (PCC) Tests is used to display the PCC failure history, performs a PCC verification test by testing individual components of the circuit pack, and executes a PCC end-to-end loop around test out to the peripheral.

PROC 652 - Time-of-Day Clock Synchronizer displays failure history for the time-of-day clock and allows alarmed error log entries to be resolved. The hardware and software clocks can be tested, their boundary conditions checked, and alarms reset if the clocks test good. In addition, the time-of-day clock can be set.

PROC 653 - Attendant Console Tests displays failure history for attendant consoles, allows alarmed error log entries to be resolved and tests all attendant consoles.

PROC 654 - Display Terminals Test displays failure history associated with display terminals, allows alarmed error log entries to be resolved, and tests the display terminals.

PROC 655 - Station Message Detail Recorder (SMDR) Test is used to test the SMDR function and its hardware components connected to the switch only. **PROC 655** also displays failure history associated with the SMDR equipment and resolves alarmed error log entries.

PROC 656 - Network Control Operations Support System (NCOSS) Port Test provides the capability to test NCOSS and CDRUs on demand and display the results to assist in fault isolation and repair.

Connection Status Maintenance Procedures

This group of maintenance procedures displays the connection status and provides the capability to trace a call through the switch. Connection status procedures include **PROC 960** through **PROC 962**.

PROC 960 - Queue Activity displays queue information for a particular equipment location or the equipment locations associated with a particular queue.

PROC 961 - Connection Activity displays connection information; i.e., connection number, accumulator number, and equipment location.

PROC 962 - Facility Connection displays the trunk number linkages for line records and the facility and conference facility linkages for trunk records.

Other Maintenance Procedures

To assist in trouble shooting memory problems, **PROC 999** is provided as an aid in displaying the data contents of a memory address via the software tables.

PROC 600 - ALARM CAUSES/ERROR LOG

FLIPCHART ISSUE 1		ALARM CAUSES/ERROR LOG										845552223	
UNIT TYPE (FIELD 2):	1 = ENVIRONMENT	17 = ATTENDANT CONSOLE	34 = TIE TRUNK/DATA PORT	52 = SYSTEM CLOCK SYNC.	68 = DS1	ALARM STATUS (FIELD 8): 0 = NO ERRORS RECORDED 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED							
	2 = TAPE	18 = CACHE	35 = DIGITAL TRUNK	53 = MULTIPLEXER	69 = MFAT								
	3 = INIT CAUSES	19 = DCIU	36 = DIGITAL USER PROBLEM	54 = FANOUT	70 = AUTO. TRANS. MEASUREMENT SYS.								
	4 = COMMON CONTROL I/O	20 = SMDR	37 = CALLING NUMBER DISPLAY	55 = MODULE INTERFACE	71 = REMOTE MODULE INTERFACE								
	5 = MEMORY	21 = ANI	38 = REAL TIME CLOCK SYNC	56 = INTERMODULE DATA STORE	72 = EIA								
	6 = MODULE CONTROL CHANNEL	22 = PROCESSOR DUPLICATION	39 = FADS DISPLAY	57 = LIGHT GUIDE INTERFACE	73 = DEDICATED SWITCH CONN. (DSC)								
	7 = TMS/MODULE PROCESSOR	23 = TMS/NETWORK DUPLIC.	40 = NON-NETWORK PERIPHERALS	58 = FANIN	74 = REMOTE CARRIER GROUP (RCG)								
	8 = MAINT INTERFACE	24 = TT SENDER	41 = TRUNK, SOFTWARE	59 = TMS MAINTENANCE	75 = PRIMARY RATE INTERFACE (PRI)								
	9 = MODULE CLOCK	25 = TT RECEIVER	42 = CALLS ABORTED	60 = DIAGNOSTIC PROCESSOR/	76 = ISDN ERROR PROCESSING								
	10 = TSI ALU	26 = NETWORK I/O	43 = STATUS MEMORY AUDITS	REMOTE INTERFACE	77 = PROC. COMM. CKT. (PCC)								
	11 = TSI PSTORE	27 = GENERAL PURPOSE PORT	44 = ATTENDANT CONSOLE INTF	61 = CONFIGURATION AUDITS	STAMP INDEX (FIELD 11): 1 = TIME OF MOST RECENT ERROR/ TIME ALARM RESOLVED 2 = TIME WHEN ERROR BEGINS 3 = TIME WHEN ERROR WAS ALARMED								
	12 = I/O BUS INTERFACE	28 = 72 SERIES (MFET) PORT	45 = AUXILIARY TRUNK	62 = ANALOG/DIGITAL FACILITY TST									
	13 = PORT DATA STORE	29 = LINE CIRCUIT	46 = ATTENDANT CONFERENCE	63 = EXTERNAL EQUIPMENT									
	14 = PORT CONTROL INTERFACE	30 = EVEN PORT PERIPHERALS	47 = ODD PORT PERIPHERALS	64 = EXTERNAL PROCESSOR									
	15 = PORT DATA INTERFACE	31 = AUXILIARY TONE PLANT	48 = MAINT. AND ADMIN. PANEL	65 = MODEM POOLING									
	16 = TONE PLANT	32 = CO TRUNK	49 = TMS CLOCK OSCILLATOR	66 = TONE DETECTOR 2									
	33 = DID TRUNK	50 = LOCAL CLOCK TERMINATION	67 = UNDEFINED EXCEPTION FIFO CODE										
					GENERAL SYSTEM 600								

FLIPCHART ISSUE 1		ALARM CAUSES/ERROR LOG										845552223								
TEST 1: DISPLAYS FAILURE HISTORY IN ORDER OF IMPORTANCE FOR ALARMED FAILURES. USE 'NEXT CIRCUIT' TO DISPLAY NEXT ALARMED CIRCUIT. USE 'NEXT DATA' TO DISPLAY NEXT TIME STAMP. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARM FOR DISPLAYED ENTRY OR ALL ALARMS WHEN EXECUTED WITH A SUMMARY DISPLAYED.							TEST 2: DISPLAYS FAILURE HISTORY FOR CIRCUITS WHICH HAVE BEEN ALARMED OR WHICH HAVE ERRORS RECORDED BY UNIT TYPE. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILED CIRCUIT. USE 'NEXT UNIT' TO SELECT NEXT UNIT TYPE. USE 'NEXT DATA' TO DISPLAY NEXT TIME STAMP. USE 'CLEAR DATA', 'EXECUTE' TO CLEAR FAILURE HISTORY OF THE DISPLAYED LOCATION OR ALL ENTRIES FOR THE ENTERED UNIT TYPE.							TEST 3: DISPLAYS RESOLVED ALARMED ENTRIES BY UNIT TYPE. USE 'NEXT CIRCUIT' TO DISPLAY NEXT RESOLVED CIRCUIT. USE 'NEXT UNIT' TO DISPLAY NEXT UNIT TYPE. USE 'NEXT DATA' TO DISPLAY NEXT TIME STAMP. USE 'CLEAR DATA', 'EXECUTE' TO CLEAR FAILURE HISTORY FOR DISPLAYED ENTRY OR ALL ENTRIES WHEN EXECUTED WITH A DASH IN FIELD 2.						
NOTE: THE TEST NUMBER CAN ONLY BE CHANGED BY 'NEXT TEST'.							(CONTINUED ON WORD 0)													
TEST NO	UNIT TYPE	MODULE OR STATUS MEMORY	EQUIPMENT LOCATION				CIRCUIT	ALARM STATUS	TOTAL FAILS	CIRCUIT ENTRY INDEX	TIME STAMP				PROC REFER.	GENERAL SYSTEM				
			CABINET	CARRIER	SLOT						STAMP INDEX	DAY	HOUR	MINUTE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	600					

Purpose

PROC 600 is the starting point for all maintenance activities.

PROC 600 is used to display the contents of the current PMIDS error log.

Each entry displayed identifies:

- Unit type.
- Present alarm status.
- Number of recorded errors.
- A time stamp for the first or last recorded error or when the entry was alarmed or resolved.
- A reference to the maintenance procedure (if applicable) to perform to determine the cause of the error.

PROC 600 dictates maintenance procedure sequencing by sorting the contents of PMIDS, displaying the results in alarm severity order and then by errors recorded.

PROC 600 is used to:

- Display alarmed entries in descending order with major alarmed entries displayed first, followed by minor alarmed entries, and warning alarmed entries displayed last.

PROC 600

2. Display entries within each alarm category corresponding to the most important functional area to the least important functional area of the switch.

Note: Alarmed entries are **not** displayed in numerical order by unit type. The most important functional area unit type is displayed first no matter what the unit type number may be.

3. Display circuits with errors recorded by unit type in numerical order.
4. Display resolved alarm entries by unit type in numerical order.
5. Resolve alarmed entries, individually or all at once (which turns off the associated fault indicator, or turns off all alarms and fault indicators).
6. Clear (zero) the failure history in PMIDS for all entries in a given unit type, or an individual entry for a particular unit type.
7. Clear (zero) resolved alarmed entries, individually or all at once.

When the switch is duplicated, both the on-line and off-line side should be examined using **PROC 600**, Test 2 to determine if potential problems exist.

Field Definitions and Codes

Each field of **PROC 600** flipchart and the possible displays for the fields during execution of the different tests are defined in Table G, PROC 600 - Field Definitions and Codes.

Field 2 is an optional entry field to enter the unit type to be investigated (Test 2 or 3 only) or to enter a null unit (Test 3 only).

Operation of Procedure

Overview

PROC 600 can display which entries are alarmed (causing alarm and fault indicators to be turned on), entries with errors recorded against them, and/or resolved alarm entries.

To call in **PROC 600**, perform the following:

1. Depress **PROC NO; 600; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Alarm order display.
2. Test 2 - Unit type display.
3. Test 3 - Resolved alarm entry display.

TABLE G.

PROC 600 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	2 (Contd)	18	Cache.
2	1-77	Unit Type: Number designation of the functional unit of equipment which is being displayed.		19	Data communications interface unit (DCIU).
	1	Environment.		20	Station message detail recorder (SMDR).
	2	Tape.		21	Automatic number identification (ANI).
	3	Initialization causes.		22	Processor duplication (501CC).
	4	Common control I/O.		23	TMS or network duplication channel.
	5	Memory.		24	Touch-tone sender.
	6	Module control channel (MCC).		25	Touch-tone receiver.
	7	TMS or module processor.		26	Network I/O.
	8	Maintenance interface.		27	General purpose port (GPP).
	9	Module clock.		28	72 Series (MFET) port.
	10	Time slot interchanger (TSI) - ALU.		29	Line circuit.
	11	Time slot interchanger (TSI) - PSTORE.		30	Even port peripherals.
	12	I/O bus interface (IOBI).		31	Auxiliary tone plant.
	13	Port data store (PDS).		32	CO trunk (hardware).
	14	Port control interface (PCI).		33	DID trunk (hardware).
	15	Port data interface (PDI).		34	TIE trunk/data port (hardware).
	16	Tone plant.		35	Digital trunk.
	17	Attendant console.		36	Digital user problem.

TABLE G. (Contd)

PROC 600					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
2 (Contd)	37	Calling number display.	2 (Contd)	58	Fan in (FI).
	38	Real time clock synchronizer.		59	TMS maintenance.
	39	Force administration display system (FADS).		60	Diagnostic processor/remote interface.
	40	Non-network peripherals.		61	Configuration audits.
	41	Trunk, software.		62	Analog/digital facility test (ADFTC).
	42	Calls aborted.		63	External equipment.
	43	Status memory audits.		64	External processor.
	44	Attendant console interface.		65	Modem pooling.
	45	Auxiliary trunk.		66	Tone detector 2.
	46	Attendant conference.		67	Undefined exception FIFO errors.
	48	Odd port peripherals.		68	DS-1.
	49	Maintenance and Administration Panel (MAAP).		69	Multifunctional analog terminal (MFAT).
	50	TMS clock oscillator (TCO).		70	Automatic transmission measurement system (ATMS).
	51	Local clock termination (LCT).		71	Remote Module Interface (RMI).
	52	System Clock Synchronizer (SCS).		72	EIA Interface.
	53	Multiplexer (MPX).		73	Dedicated switch connection (DSC).
	54	Fan out (FO).		74	Remote Carrier Group (RCG).
	55	Module interface (MI).		75	Primary rate interface.
	56	Intermodule data store (IDS).		76	ISDN error processing.
	57	Light guide interface (LGI).		77	Processor communication circuit (PCC).

TABLE G. (Contd)

PROC 600 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
3-7		Equipment location of PMIDS error log entry.	3-7		Dedicated switch connection (DSC):
3-7		Status memory error:	3-5	1-1023	Connection number.
3	1-31	Status memory audit encode.	6	Dashed	Not applicable for DSC.
6	0-99	Status memory audit fault code.	7	1-4	DSC fault code.
4,5, & 7	Dashed	Not applicable for status memory entries.	3-7		External equipment error:
3-7		Undefined exception FIFO error:	3	1-32	Unit number of external equipment.
3	0-30	Module number.	4	1-8	External equipment encode.
4-5	Dashed	Not applicable for undefined exception FIFO entries.	5-7	Dashed	Not applicable for external equipment entries.
6	1-12	Undefined exception FIFO encode.	3-7		External processor error:
7	Dashed	Not applicable for undefined exception FIFO entries.	3	1-32	Unit number of external processor.
			4-7	Dashed	Not applicable for external processor entries.
3-7		Diagnostic processor error:	3-7		Configuration audit error:
3	0-30	Module number.	3	0-99	Configuration audit fault code.
4	0-7	Cabinet number.	4-7	Dashed	Not applicable for configuration audit errors.
5	0-3	Carrier number.			
6	22,31, or 32	Slot number.	3-7		All other PMIDS error log entries:
7	Dashed	Not applicable for diagnostic processor entries.	3	0-30	Network cabinet module.
				99	Common control cabinet module number.

TABLE G. (Contd)

PROC 600 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
3-7		All other PMIDS error log entries (Contd):	11	1-3	Stamp Index (Time Stamp Index):
4	0-7	Cabinet number.	11	1	Latest time the displayed error log entry failed a test (Test 1 or Test 2) or time alarm was resolved for the displayed error entry (Test 3).
5	0-3	Carrier number.		2	Time of the first recorded error for the displayed error log entry.
6	0-32	Slot number.		3	Time when the displayed error log entry was alarmed.
7	0-7	Circuit number or Dashed.	12-14		Time stamp: A time stamp showing the day of the month, hour, and minute when the first or last error occurred, or when the alarm was activated or resolved for the displayed error log entry.
8	0-5	Alarm status of displayed error log entry.			
	0	No errors recorded.			
	1	Major.			
	2	Minor.			
	3	Warning.			
	4	Errors recorded.			
	5	Alarm resolved.			
9	0-999	Total failures recorded for displayed error log entry.	12	1-31	Day of the month.
10	0-99	Circuit entry index: Summary of total number of alarmed circuits (Test 1); circuits with recorded errors (Test 2); resolved alarmed entries (Test 3).	13	0-23	Hour of the day.
			14	0-59	Minute.
			15	01-56	PROC reference: The two digits displayed are the last two digits of a maintenance procedure (PROC 6XX) to be performed in order to obtain detailed information about the cause of the displayed error log entry.

Test 1

Test 1 of **PROC 600** is used locally or remotely to investigate an alarmed condition or a user reported trouble.

Test 1 of **PROC 600** is also performed prior to maintenance personnel leaving the customer's premises to ensure that all alarmed conditions (including warning alarms) are cleared.

When Test 1 is executed, any unacknowledged alarms are acknowledged by **PROC 600** causing the attendant console acknowledge (ACK) indicator to be turned on.

1. When **EXECUTE** is depressed in Test 1 of **PROC 600**, the system alarm status (alarm level indicators on the alarm panel) is checked for a **MAJOR** and/or **MINOR** alarm.
2. If the **MAJOR** and/or **MINOR** alarm indicators are lighted, the ACK indicator on the attendant console is turned on (if not already lighted).
3. The ACK indicator on the attendant console can only be turned off by clearing or resolving the cause of the alarms in PMIDS.

Test 1 displays PMIDS error log data for alarmed entries.

1. Alarmed entries are displayed in descending order with major alarmed entries displayed first, entries with minor alarms second, and entries with warning alarms last.
2. Within each alarm category entries are displayed by unit type priority.
3. Unit type priority is assigned according to the order of their importance to service to the customer (most important to least important functional area) and are **not** in numerical order.
4. Within each unit type and alarm category, (circuits with the same unit type and alarm), alarmed entries are displayed as most recent first.

Test 1 allows for all alarmed entries or an individual alarmed entry to be manually resolved.

Resolving individual alarmed entries or all alarmed entries results in an individual fault indicator or all alarms and fault indicators being turned off.

Test 1 does not allow clearing (zeroing) of alarmed entries from the PMIDS error log.

1. Test 1 is the default test when entering **PROC 600** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. To start Test 1, depress **EXECUTE**.

The PMIDS error log is sorted and a summary of the total number of alarmed entries is displayed.

3. If no alarmed entries exist, the following summary is displayed:

Field 1 - 1.

Field 10 - 0 (Indicating no alarmed entries).

4. If any alarmed entries exist, the summary displays a 1 in Field 1 and the total number of alarmed entries in Field 10.

PROC 600, Test 1

5. Depressing **NEXT CIRCUIT** displays the first alarmed entry as follows:

Field 1 - 1.

Field 2 - Unit type of alarmed entry (number designation of the type of equipment - See Table G, PROC 600 - Field Definitions and Codes).

Field 3 - Dashed, unit number of external equipment/processor, or module number of alarmed entry.

Field 4 - Dashed, external equipment encode, or cabinet number of alarmed entry.

Field 5 - Dashed or carrier number of alarmed entry.

Note: Fields 3 through 5 may display the dedicated connection number for unit type 73 (dedicated switch connection).

Field 6 - Dashed or slot number of alarmed entry.

Field 7 - Dashed, circuit number of alarmed entry, or fault code for unit type 73 (dedicated switch connection).

Field 8 - Alarm status of displayed entry (1 = major, 2 = minor, 3 = warning).

Field 9 - Total number of times alarmed entry failed.

Field 10 - Total number of alarmed entries.

Field 11 - 3 (Indicating that Fields 12 through 14 display the time when the entry was alarmed).

Fields 12 through 14 - Day, hour, and minute the displayed entry was alarmed.

Field 15 - Dashed or a 2-digit reference to a maintenance procedure.

6. Further diagnosis of the displayed alarmed entry is performed by using the maintenance procedure referenced in Field 15 (if any) to isolate and repair the cause of the alarmed entry displayed in Fields 2 through 7.
7. The two digits referenced in Field 15 are preceded by a 6 to determine the maintenance procedure to be performed. (Example: 20 displayed in Field 15 indicates that **PROC 620** is the maintenance procedure to be performed.)

Note: When a displayed entry does not reference a maintenance procedure to be performed (Field 15 = dash), refer to the Repair Guide part of **PROC 600** to determine the type of diagnosis or repair action to be performed (if any).

8. Depressing **NEXT DATA** changes the stamp index and time stamp. Field 11 (stamp index) displays a 2 indicating that the time displayed in Fields 12 through 14 is the time the first error was recorded for the alarmed entry displayed in Fields 2 through 7.

Depressing **NEXT DATA** once more changes the stamp index and time stamp. Field 11 (stamp index) displays a 1 indicating that the time displayed in Fields 12 through 14 is the time the last error was recorded for the alarmed entry displayed in Fields 2 through 7.

Depressing **NEXT DATA** again cycles back to the initial display providing a stamp index of 3 in Field 11, and the time the entry was alarmed in Fields 12 through 14.

9. Depressing **NEXT CIRCUIT** repeatedly displays the remaining alarmed entries in the PMIDS error log.

Each time **NEXT CIRCUIT** is depressed, Field 10 is decremented by 1 to show the number of remaining alarmed entries to be displayed.

The circuit entry index (Field 10) includes in its count the alarmed entry currently being displayed.

10. Depressing **NEXT CIRCUIT** after all alarmed entries are displayed dashes Fields 2 through 15.

Depressing **NEXT CIRCUIT** again causes the display sequence to start over beginning with the summary.

11. The **CLEAR DATA; EXECUTE** sequence can be used to resolve individual alarmed entries or all alarmed entries after **EXECUTE** is used to initiate Test 1.

Note: When alarmed entries are resolved, the circuits' failure history is not deleted from the PMIDS error log. The failure history is updated to show that the alarm status now equals 5 (alarm resolved).

12. To resolve individual alarmed entries (turn off its associated fault indicator - when no other alarmed entries affect the same fault indicator), perform the following:

Use **NEXT CIRCUIT** to display the alarmed entry on the **MAAP**.

Requirement: The alarmed entry cannot be resolved or the fault indicator turned off unless the alarmed entry is displayed on the **MAAP**.

Depress **CLEAR DATA; EXECUTE**.

13. Field 8 (alarm status) displays a 5 indicating the alarmed entry is resolved.

The fault indicator associated with the alarmed entry is turned off if no other alarmed entries affecting the same fault indicator exist.

14. All alarmed entries can be resolved when the summary is initially displayed; i.e., upon entry to **PROC 600**, Test 1 and after displaying and recording all alarmed entries and then using **NEXT CIRCUIT** to display the summary.

Caution: *The alarmed entries should be displayed and recorded prior to resolving the alarmed entries and turning off their associated alarm and fault indicators in order that a record of the causes of the alarmed entries are available for maintenance personnel.*

15. After entering Test 1 and depressing **EXECUTE** (summary is displayed), depress **CLEAR DATA; EXECUTE**.

The alarmed entries are resolved and all alarms and fault indicators are turned off.

Field 10 displays a 0 indicating no alarmed entries exist.

16. After displaying and recording all alarmed entries, depress **NEXT CIRCUIT** until the summary is displayed, then depress **CLEAR DATA; EXECUTE**.

All alarmed entries are resolved and all alarms and fault indicators are turned off.

Field 10 displays a 0 indicating no alarmed entries exist.

PROC 600, Test 1 and Test 2

17. When an alarmed entry equipment location is left displayed in Test 1, the entry can be passed to other maintenance procedures as a default equipment location for further testing.

Note: Only **PROC 601, PROC 611, PROC 620, PROC 622, PROC 646, PROC 647, PROC 648,** and **PROC 651** have the capability to accept default equipment locations passed to them by **PROC 600**.

Test 2

Test 2 of **PROC 600** is used to investigate user reported troubles or to determine if further analysis of potential troubles are to be performed.

Test 2 of **PROC 600** is also performed prior to maintenance personnel leaving the customer's premises to ensure that all potential troubles are investigated and cleared to eliminate future alarm conditions.

Test 2 displays alarmed circuits and circuits with errors recorded against them by unit type in numerical order.

Alarmed circuits are displayed within a unit type; therefore, all of the same type of alarms (i.e., major, minor, or warning) are not displayed by alarm category as in Test 1.

Individual entries within a unit type or all entries for a single unit type may be cleared (zeroed out) from the PMIDS error log. When entries are cleared (zeroed out), the circuit(s) failure history is deleted from the PMIDS error log.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. To start Test 2, depress **EXECUTE**.
3. The PMIDS error log is sorted and a summary of the total number of circuits with recorded errors for all unit types is displayed.
4. If no circuits with recorded errors exist, the following summary is displayed:
Field 1 - 2.
Field 10 - 0 (Indicating no circuits with recorded errors).
5. If any circuits with recorded errors exist, the summary displays a 2 in Field 1 and the total number of entries with recorded errors in Field 10.

Note: A display of 99 in Field 10 indicates that 99 or more entries with recorded errors exist in the error log.

6. When the initial summary is displayed, Field 2 (unit type) is flashed indicating it is an optional entry field. To select a particular unit type of interest, enter the following:

(Unit type); ENTER.

Proceed to Step 8.

7. A particular unit type of interest may also be selected by use of **NEXT UNIT**.

Depress **NEXT UNIT** until the unit type of interest is displayed in Field 2.

Proceed to Step 9.

8. Depress **EXECUTE**.

Note: **EXECUTE** must be depressed to display the contents for the unit type entered.

9. The first entry (if any) for the unit type entered is displayed. See Step 11 below for the description of the display.

Field 10 (circuit entry index) decreases to show the number of remaining entries to be displayed (if any) from the unit type entered, including the entry presently displayed.

If no recorded entries exist for the unit type entered, Fields 3 through 7, 9, and 11 through 15 are dashed.

Field 8 (alarm status) displays a 0 and Field 10 displays the number of remaining entries (if any) to be displayed.

10. When the summary is displayed and a particular unit of interest is not selected, use of **NEXT CIRCUIT** or **NEXT UNIT** displays the first PMIDS entry with recorded errors.

NEXT CIRCUIT is used to step through all individual circuit entries or all entries within a unit type.

NEXT UNIT is used to step to the first entry of the next unit type in numerical sequence.

11. The first entry with recorded errors is displayed as follows:

Field 1 - 2.

Field 2 - Unit type of entry with recorded errors (number designation of the type of equipment - See Table G, PROC 600 - Field Definitions and Codes).

Field 3 - Dashed, status memory audit encode, configuration audit fault code, unit number of external equipment/processor, or module number of entry with recorded errors.

Field 4 - Dashed, external equipment encode, or cabinet number of entry with recorded errors.

Field 5 - Dashed or carrier number of entry with recorded errors.

Note: Fields 3 through 5 may display the dedicated connection number for unit type 73 (dedicated switch connection).

Field 6 - Dashed, status memory audit fault code, undefined exception FIFO encode, or slot number of entry with recorded errors.

Field 7 - Dashed, circuit number of alarmed entry, or fault code for unit type 73 (dedicated switch connection).

Field 8 - Alarm status of entry with recorded errors (1 = major, 2 = minor, 3 = warning, 4 = errors recorded).

Field 9 - Total number of times entry with recorded errors failed.

Field 10 - Total number of entries with recorded errors.

PROC 600, Test 2

Field 11 - 1 (Indicating that Fields 12 through 14 display the time when the last error was recorded for the displayed entry).

Fields 12 through 14 - Day, hour, and minute of the last error recorded for the displayed entry.

Field 15 - Dashed or a 2-digit reference to a maintenance procedure.

12. Further diagnosis of the displayed entry can be performed by using the maintenance procedure referenced in Field 15 (if any) to isolate and repair the cause of the entry displayed in Fields 2 through 7.

The two digits referenced in Field 15 are preceded by a 6 to determine the maintenance procedure to be performed. (Example: 20 displayed in Field 15 indicates that **PROC 620** is the maintenance procedure to be performed.)

Note: When a displayed entry does not reference a maintenance procedure to be performed (Field 15 = dash), refer to the Repair Guide part of **PROC 600** to determine the type of diagnosis or repair action to be performed (if any).

13. Depressing **NEXT DATA** changes the stamp index and time stamp. Field 11 (stamp index) displays a 2 indicating that the time displayed in Fields 12 through 14 is the time the first error was recorded for the entry displayed in Fields 2 through 7.

If the displayed entry is an alarmed PMIDS entry (indicated by a 1, 2, or 3 in Field 8), depressing **NEXT DATA** once more changes the stamp index and time stamp. Field 11 (stamp index) displays a 3 indicating that the time displayed in Fields 12 through 14 is the time the entry was alarmed.

14. If the displayed entry is not an alarmed PMIDS entry (or after displaying the time the entry was alarmed), depressing **NEXT DATA** cycles back to the initial display providing a stamp index of 1 in Field 11 and the time of the last recorded error for the entry in Fields 12 through 14.

15. Depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the next entry with recorded errors in display order or another unit type of interest can be selected for display.

16. To select another unit type of interest after the first unit type is selected or **NEXT CIRCUIT** or **NEXT UNIT** is depressed, perform the following:

CHANGE FIELD; 2; ENTER; (Unit type); ENTER.

EXECUTE must be depressed to display the contents of the unit type selected.

17. Each time **NEXT CIRCUIT** is depressed, Field 10 is decremented by 1 to show the number of remaining entries with recorded errors to be displayed.

The circuit entry index (Field 10) includes in its count the entry currently being displayed.

18. Field 10 is decremented by a multiple corresponding to the number of entries within a unit type when **NEXT UNIT** is used to step from unit to unit without examining the entries within a unit type or a unit type of interest is selected by the **CHANGE FIELD** sequence.

The circuit entry index (Field 10) includes in its count the entry currently being displayed.

19. When the last entry in a unit is currently displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the first entry of the next unit with recorded errors.

20. Depressing **NEXT CIRCUIT** or **NEXT UNIT** after all entries with recorded errors are displayed dashes Fields 2 through 15.

Depressing **NEXT CIRCUIT** or **NEXT UNIT** again causes the display sequence to start over beginning with the summary.

21. The **CLEAR DATA; EXECUTE** sequence can be used to clear (zero out) individual entries with recorded errors or all entries with recorded errors in a particular unit type after **EXECUTE** is used to initiate Test 2.

Note: When an entry with recorded errors is an alarmed entry (indicated by a 1, 2, or 3 displayed in Field 8), the fault indicator associated with that entry is turned off if no other entries affecting the same fault indicator exist.

22. To clear (zero out) individual entries with recorded errors from the PMIDS error log, perform the following:

Use **NEXT CIRCUIT** and/or **NEXT UNIT** to display the entry to be cleared.

Requirement: The entry with recorded errors cannot be cleared (zeroed out) from the PMIDS error log unless the entry is displayed on the **MAAP**.

Depress **CLEAR DATA; EXECUTE**.

23. Field 8 (alarm status) displays a 0 indicating the entry is cleared from PMIDS.

Fields 9 and 11 through 15 are dashed.

Field 10 displays the number of remaining entries (if any) to be displayed.

Note: A display of 99 in Field 10 indicates that 99 or more entries with recorded errors still exist in the error log.

24. All entries with recorded errors within a unit type are cleared (zeroed out) in two ways: when the summary is initially displayed and after displaying and recording the entries with recorded errors in the unit type to be cleared.

Caution: *The entries with recorded errors should not be cleared (zeroed out) for a unit type until all entries are displayed and recorded in order that a record of the causes of the entries are available for maintenance personnel.*

25. After entering Test 2, depress **EXECUTE** to display the summary, enter the unit type to be cleared (zeroed out) in Field 2, and depress **CLEAR DATA; EXECUTE:**

(Unit type); ENTER; CLEAR DATA; EXECUTE.

26. Field 8 displays a 0 indicating no entries with recorded errors exist for the unit type displayed in Field 2.

Fields 9 and 11 through 15 are dashed.

Field 10 displays the number of remaining entries (if any) to be displayed.

Note: A display of 99 in Field 10 indicates that 99 or more entries with recorded errors still exist in the error log.

PROC 600, Test 2 and Test 3

27. After displaying and recording all entries with recorded errors in the unit type to be cleared (zeroed out), use the **CHANGE FIELD** sequence to enter the unit type in Field 2, and depress **CLEAR DATA; EXECUTE**:

CHANGE FIELD; 2; ENTER; (Unit type); ENTER; CLEAR DATA; EXECUTE.

28. Field 8 displays a 0 indicating no entries with recorded errors exist for the unit type displayed in Field 2.
Fields 9 and 11 through 15 are dashed.
29. Field 10 displays the number of remaining entries (if any) to be displayed.

Note: A display of 99 in Field 10 indicates that 99 or more entries with recorded errors still exist in the error log.

30. When an entry with recorded errors is left displayed in Test 2, the equipment location of the entry can be passed as a default equipment location to other maintenance procedures for further testing.

Note: Only **PROC 601, PROC 611, PROC 620, PROC 622, PROC 646, PROC 647, PROC 648, and PROC 651** have the capability to accept default equipment locations passed to them by **PROC 600**.

Test 3

Test 3 of **PROC 600** is used to investigate which entries in the PMIDS error log are resolved.

Resolved alarmed entries in the PMIDS error log are identical whether an alarmed entry is resolved by isolating, repairing, and testing the circuit or by manually resolving the alarmed entry using **CLEAR DATA; EXECUTE** in Test 1.

Test 3 of **PROC 600** is performed by maintenance personnel to obtain an archive of alarmed entries from the PMIDS error log which are resolved.

1. The resolved alarmed entries display such information as the unit type, circuit identification, time the entry was resolved, time the entry was alarmed, and the time of the first recorded error for the displayed entry.
2. Such information can be beneficial when the same entry is later displayed as an alarmed entry or as an entry with recorded errors.

Test 3 displays resolved alarmed entries by unit type in numerical order.

Individual resolved alarmed entries or all resolved alarmed entries may be cleared (zeroed out) from the PMIDS error log. When entries are cleared (zeroed out), the circuit(s) failure history is deleted from the PMIDS error log.

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. To start Test 3, depress **EXECUTE**.

3. The PMIDS error log is sorted and a summary of the total number of resolved alarmed entries is displayed.
4. If no resolved alarmed entries exist, the following summary is displayed:
Field 1 - 3.
Field 10 - 0 (Indicating no resolved alarmed entries).
5. If any resolved alarmed entries exist, the summary displays a 3 in Field 1 and the total number of resolved alarmed entries is displayed in Field 10.
6. When the initial summary is displayed, Field 2 (unit type) is flashed indicating it is an optional entry field. To select a particular unit type of interest, enter the following:
(Unit type); ENTER.
Proceed to Step 8.
7. A particular unit type of interest may also be selected by use of **NEXT UNIT**.
Depress **NEXT UNIT** until the unit type of interest is displayed in Field 2.
Proceed to Step 9.
8. Depress **EXECUTE**.

Requirement: **EXECUTE** must be depressed to display the contents for the unit type entered.
9. The first entry (if any) for the unit type entered is displayed. See Step 11 below for the description of the display.
Field 10 (circuit entry index) decreases to show the number of remaining entries to be displayed in order (if any) from the unit type entered, including the entry presently displayed.
If no recorded entries exist for the unit type entered, Fields 3 through 7, 9, and 11 through 15 are dashed.
Field 8 (alarm status) displays a 0 and Field 10 displays the number of remaining entries (if any) to be displayed.
10. When the summary is displayed and a particular unit of interest is not selected, use of **NEXT CIRCUIT** or **NEXT UNIT** displays the first PMIDS resolved alarmed entry.
NEXT CIRCUIT is used to step through all individual resolved alarmed entries or all entries within a unit type.
NEXT UNIT is used to step to the first entry of the next unit type in numerical sequence.
11. The first resolved alarmed entry is displayed as follows:
Field 1 - 3.
Field 2 - Unit type of resolved alarmed entry (number designation of the type of equipment - See Table G, PROC 600 - Field Definitions and Codes).
Field 3 - Dashed, unit number of external equipment/processor, or module number of resolved alarmed entry.
Field 4 - Dashed, external equipment encode, or cabinet number of resolved alarmed entry.

PROC 600, Test 3

Field 5 - Dashed or carrier number of resolved alarmed entry.

Note: Fields 3 through 5 may display the dedicated connection number for unit type 73 (dedicated switch connection).

Field 6 - Dashed or slot number of resolved alarmed entry.

Field 7 - Dashed, circuit number of alarmed entry, or fault code for unit type 73 (dedicated switch connection).

Field 8 - 5 (Indicating alarmed entry is resolved).

Field 9 - Total number of times resolved alarmed entry failed.

Field 10 - Total number of resolved alarmed entries.

Field 11 - 1 (Indicating that Fields 12 through 14 display the time when the alarmed entry was resolved).

Fields 12 through 14 - Day, hour, and minute the displayed entry was resolved.

Field 15 - Dashed.

12. Depressing **NEXT DATA** changes the stamp index and time stamp. Field 11 (stamp index) displays a 3 indicating that the time displayed in Fields 12 through 14 is the time the entry was alarmed.
13. Depressing **NEXT DATA** once more changes the stamp index and time stamp. Field 11 (stamp index) displays a 2 indicating that the time displayed in Fields 12 through 14 is the time the first error was recorded for the resolved alarmed entry displayed in Fields 3 through 7.

Depressing **NEXT DATA** again cycles back to the initial display providing a stamp index of 1 in Field 11, and the time the alarmed entry was resolved in Fields 12 through 14.

14. Depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the next resolved alarmed entry in display order or another unit type of interest can be selected for display.
15. To select another unit type of interest after the first unit type is selected or **NEXT CIRCUIT** or **NEXT UNIT** is depressed, perform the following:

CHANGE FIELD; 2; ENTER; (Unit type); ENTER.

EXECUTE must be depressed to display the contents of the unit type selected.

16. Each time **NEXT CIRCUIT** is depressed, Field 10 is decremented by 1 to show the number of remaining resolved alarmed entries.

The circuit entry index (Field 10) includes in its count the entry currently being displayed.

17. Field 10 is decremented by a multiple corresponding to the number of entries within a unit type when **NEXT UNIT** is used to step from unit to unit without examining the entries within a unit type, or a unit type of interest is selected by the **CHANGE FIELD** sequence.

The circuit entry index (Field 10) includes in its count the entry currently being displayed.

18. When the last entry in a unit is currently displayed, depressing **NEXT UNIT** or **NEXT CIRCUIT** displays the first entry of the next unit with resolved alarmed entries.

19. Depressing **NEXT CIRCUIT** or **NEXT UNIT** after all resolved alarmed entries are displayed, dashes Fields 2 through 15.

Depressing **NEXT CIRCUIT** or **NEXT UNIT** again causes the display sequence to start over beginning with the summary.

20. The **CLEAR DATA; EXECUTE** sequence can be used to clear (zero out) individual resolved alarmed entries or all resolved alarmed entries from PMIDS after **EXECUTE** is used to initiate Test 3.

Caution: *The resolved alarmed entries should not be cleared (zeroed out) until all entries are displayed and recorded in order to provide an archive of resolved alarmed entries.*

21. To clear (zero out) individual resolved alarmed entries from the PMIDS error log, perform the following:

Use **NEXT CIRCUIT** and/or **NEXT UNIT** to display the entry to be cleared.

Requirement: The resolved alarmed entry can not be cleared (zeroed out) from the PMIDS error log unless the entry is displayed on the **MAAP**.

Depress **CLEAR DATA; EXECUTE**.

22. Field 8 (alarm status) displays a 0 indicating the entry is cleared from PMIDS.

Fields 9 and 11 through 15 are dashed.

Field 10 displays the number of remaining entries (if any) to be displayed.

Note: A display of 99 in Field 10 indicates that 99 or more resolved entries still exist in the error log.

23. If the **CLEAR DATA; EXECUTE** sequence is performed when the summary is displayed or when a **null** unit is entered in Field 2, all resolved alarmed entries are cleared (zeroed out) from the PMIDS error log.

24. To clear (zero out) all resolved alarmed entries using the **null** unit method, perform the following:

CHANGE FIELD; 2; ENTER; ENTER; CLEAR DATA; EXECUTE.

Field 10 displays a 0 indicating that no resolved alarmed entries exist.

25. All resolved alarmed entries can be cleared (zeroed out) when the summary is initially display; i.e., upon entry to **PROC 600**, Test 3 and after displaying and recording all resolved alarmed entries.

26. After entering Test 3 and depressing **EXECUTE** (summary is displayed), depress **CLEAR DATA; EXECUTE**.

Field 10 displays a 0 indicating no resolved alarmed entries exist.

27. After displaying and recording all resolved alarmed entries, depress **NEXT CIRCUIT** until the summary is displayed, then depress **CLEAR DATA; EXECUTE**.

Field 10 displays a 0 indicating no resolved alarmed entries exist.

Repair Guide

PROC 600 displays a dash in Field 15 for several unit type entries. A dash in Field 15 indicates that a maintenance procedure is not available to diagnose and isolate these failures.

In general, unit types 42, 43, 61, 67, and 73 are the only unit types that display a dash in Field 15.

Unit type 42 (calls aborted), unit type 43 (status memory audit), unit type 61 (configuration audits), unit type 67 (undefined exception FIFO code), and unit type 73 (dedicated switch connection) do not raise an alarm or reference a maintenance procedure. Entries for these unit types are displayed in Test 2 of **PROC 600** and Field 15 is dashed.

The following corrective action should be taken when entries in unit types 42, 43, 61, 67, and 73 are displayed by Test 2.

Unit type 42 (calls aborted):

1. Record the information displayed in Fields 2 through 14 of each entry displayed in Test 2 and clear (zero out) the unit type (42) from PMIDS.
2. When excessive entries (based on experience) for unit type 42 are noted, refer the problem to switch software engineers for further diagnosis.

Unit type 43 (status memory audits):

1. Record the status memory encode displayed in Field 3 and the related information displayed in Fields 9 through 14 of each entry displayed in Test 2, and clear (zero out) the unit type (43) from PMIDS.
2. Table H, PROC 600 - Status Memory Audit Encodes, provides a definition for each status memory encode presently being used.
3. Refer these type of software errors to the switch software engineers for further diagnosis.

Note: The remainder of the fault signature data for each status memory audit entry is not displayed in **PROC 600**.

Unit type 61 (configuration audits):

1. Record the configuration audit fault code displayed in Field 3 and the related information displayed in Fields 9 through 14 of each entry displayed in Test 2, and clear (zero out) the unit type (61) from PMIDS.
2. Table I, PROC 600 - Configuration Audit Fault Codes, provides a definition for each configuration audit fault code presently being used.
3. Refer these type of software errors to the switch software engineers for further diagnosis.

Note: The remainder of the fault signature data for each configuration audit entry is not displayed in **PROC 600**.

TABLE H.

PROC 600 STATUS MEMORY AUDIT ENCODES		
FIELD 3 ENCODE	FIELD 6 ENCODE	DEFINITION
1	1 64	Error Bad Look PMIDS Cleared by PROC 612
2	4 1	Bad Linkage Digit Error Bad Linkage
3	1	Error No Activity
4	1	Error Stuck Connection Number
5	1	Error Stuck Accumulator
6	1 64	Error Electronic Telephone Tone PMIDS Cleared by PROC 612
7	1	Error Electronic Telephone Status
8	8	DCIU Hardware Error
9	8	DCIU Software Error
10	1 4 2 16	Bad Port Audit Bad Port Digit Bad Port Information Initialization Translation Error
11	1	Bad Time Slot Interchanger Count
12	2 1	Bad Port Equipment Number Bad Port Equipment Number Audit
13	1	Accumulator Zero Error
14	16	Input/Output Selection Error
15	4	Digit Collection Message Error
16	4	Digit Send Error
17	4	Busy Trunk Digit
18	2 32	Bad originating number Invalid module FIFO 15 code
19	2	Bad scanner message
20	1	Queue Fault
21	1	Bad Blind Map
22	1	Accumulator inconsistent
23	1	Bad TMS Link error
24	32	Invalid TMS FIFO 15 code
29	29	TSI PSTORE double connect

TABLE I.

PROC 600 CONFIGURATION AUDIT FAULT CODES	
FAULT CODE	DEFINITION
1	Control register on memory board 0
2	Control register on memory board 1
3	Control register on memory board 2
4	Control register on memory board 3
5	Control register on memory board 4
6	Control register on memory board 5
7	Control register on memory board 6
8	Control register on memory board 7
17	501CC write protect
18	Scamper write protect
19	Duplicate controller write protect
23	Fetch protect boundary
24	Double write select register
25	Double write enable register (control register)

Unit type 67 (undefined exception FIFO code):

1. Record the module number displayed in Field 3, the undefined exception FIFO encode displayed in Field 6, the related information displayed in Fields 9 through 14 of each entry displayed in Test 2 and clear (zero out) the unit type (67) from PMIDS.
2. Table J, PROC 600 - Exception FIFO Encodes, provides a definition for each exception FIFO encode presently being used.
3. Refer these type of software errors to the switch software engineers for further diagnosis.

Note: The remainder of the fault signature data for each undefined exception FIFO entry is not displayed in **PROC 600**.

Unit type 73 (dedicated switch connection):

1. Record the dedicated connection number displayed in Fields 3 through 5, the fault code displayed in Field 7, and the related information displayed in Fields 9 through 14 of each entry displayed in Test 2, and clear (zero out) the unit type (73) from PMIDS.
2. Table K, PROC 600 - Dedicated Switch Connection Fault Codes, provides a definition for each fault code presently being used.
3. If an excessive amount of fault code 1's are recorded, enter **PROC 360**.

Enter the dedicated switch connection number in Field 2 and perform a **DISPLAY, EXECUTE**.

Record the port equipment locations displayed in Fields 3 through 8 and 10 through 15 of **PROC 360**.

4. Use **PROC 620** Test 4 and test both port equipment locations, using the appropriate unit type.

If the port equipment locations fail, take the appropriate corrective action.

If the port equipment locations pass, proceed to Step 5.

5. Refer these type of software errors to the switch software engineers for further diagnosis.

Note: The remainder of the fault signature data for each dedicated switch connection entry is not displayed in **PROC 600**.

TABLE J.

PROC 600—EXCEPTION FIFO ENCODES		
ENCODE	DEFINITION	
1	PXF_BAD_SPN	Port type incompatible with error code
2	PXF_BAD_CODE	Error code not defined
3	PXF_TTD_SNDR	Touch-tone digit send error
4	PXF_NET_ORD	Network order error
5	PXF_DIG_COLL	Digit collecting on for an inappropriate board type
6	PXF_RING_TYP	Ringing is on for an inappropriate board type
7	MXF_BAD_MIN	Invalid module interface number reported
8	MXF_BAD_CODE	Error code not defined
9	MXF_ILEG_CON	Illegal connection
10	MXF_ILEG_BSY	Illegal busy out
11	MXF_ADMIN_ER	Administration error
12	MXF_NET_ORD	Network order error

TABLE K.

PROC 600 DEDICATED SWITCH CONNECTION FAULT CODES	
FAULT CODE	DEFINITION
1	Fatal error (connection broken). Repair attempt failed.
2	Non-fatal error (connection intact). Repair attempt failed.
3	Fatal error (connection broken). Repaired by system audit.
4	Non-fatal error (connection intact). Repaired by system audit.

PROC 601

PROC 601 - ENVIRONMENTAL TESTS

FLIPCHART ISSUE 1		ENVIRONMENTAL TEST														845552223			
TEST 1: DISPLAYS FAILURE HISTORY BY ALARM SEVERITY. USE "CLEAR DATA," "EXECUTE" TO RETIRE ALARM.		TEST 2: TESTS ALL CABINETS OR RANGE OF CABINETS IN SYSTEM FOR ALARM CONDITIONS.				FIELD LIMITS: MCC STATUS (FIELD 4): 0 = OFF LINE 1 = ON LINE				ALARM STATUS (FIELD 15): DISPLAYS HIGHEST CABINET ALARM 0 = NO ERRORS RECORDED 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED				NOTES: 1. THE TEST NUMBER CAN ONLY BE CHANGED BY "NEXT TEST."		SPECIAL ERROR CODES: 80-NO ALARMS 81-MESSAGE TRANSMISSION TO MODULE CONTROL CHANNEL FAILED			
USE "NEXT UNIT" TO READ ALARM CONDITIONS FROM OFF-LINE MODULE CONTROL CHANNEL.		CABINET ALARM CAUSE (FIELDS 5-14): 0 = PASS 1 = ALARM CONDITION PRESENT																	
USE "NEXT CIRCUIT" TO DISPLAY NEXT CIRCUIT LOCATION																			
TEST NO	EQUIPMENT LOCATION		MCC STATUS	CABINET ALARM CAUSE										ALARM STATUS	NUMBER OF CABINETS OR NUMBER TESTED	TOTAL FAILURES	FAILURE INDEX	GENERAL SYSTEM	
	TEST 2			CABINET POWER	48 VOLT	FUSE/BKBR	DC/DC CONV	FREQ GEN	AIR FLOW	TEMPERATURE	HOLDOVER	MODULE CTRL CARRIER POWER	LEFT						RIGHT
1	MODULE	CABINET		AC														601	

Purpose

PROC 601 is used when referenced from **PROC 600** (alarm causes/error log) or when the **ENVIRON PWR/TEMP AIR FLOW** and **MAJOR** or **MINOR** alarm indicators on the alarm panel are lighted.

PROC 601 is used to:

1. Display environmental failure history for the switch cabinets (system control (TMS and common control) and network cabinets).

Note: Auxiliary cabinets or any cabinet (other than TMS and common control cabinets) not containing port or module control carriers are not covered by **PROC 601**.

2. Display environmental alarm causes from all equipped cabinets or a selected cabinet in the switch.

The alarm causes consist of cabinet power, fuse, breaker DC/DC converter, frequency generator, air flow, temperature, nominal or extended holdover, and module control carrier power trouble conditions.

3. Display environmental alarm causes from both on-line and off-line module control channels (TMS and network) when duplicated module control channels are provided.
4. Automatically turn off the **ENVIRON PWR/TEMP AIR FLOW** fault indicator when all cabinets pass Test 2 and the **MAJOR** or **MINOR** alarm indicator(s) if no other major or minor alarm source(s) exist.

Note: Environmental alarmed circuit entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 601** flipchart and the possible displays for the fields during execution of the different tests are defined in Table L, PROC 601 - Field Definitions and Codes.

Optional input fields are:

1. Field 2 - Select a specific module to be tested (Test 2 only).
2. Fields 2 and 3 - Select a specific module and cabinet to be tested (Test 2 only).

TABLE L.

PROC 601 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-2	Test number.	15	0-5	Alarm status of displayed equipment location.
2-3		Equipment location of displayed cabinet.		0	No errors recorded.
2	0-30	Network cabinet module number.		1	Major.
	99	System control cabinet module number.		2	Minor.
3	0-7	Cabinet number.		3	Warning.
4	0-1	Status of module control channel.		4	Errors recorded.
	0	Off-line.		5	Alarm resolved.
	1	On-line.	16	0-999	Total number of cabinets in switch or number of cabinets tested.
5-14	0-1	Cabinet alarm cause failure code.	17	0-999	Total number of failed cabinets.
	0	Pass.	18	0-999	Index into failure table.
	1	Alarm condition present.			

Operation of Procedure

Overview

PROC 601 is used to determine the cause of the **ENVIRON PWR/TEMP AIR FLOW** and **MAJOR** or **MINOR** alarm indicators being lighted resulting from an environmental failure.

To call in **PROC 601**, perform the following:

1. Depress **PROC NO; 601; ENTER**.
2. Test 1 is automatically selected.

Field 1 displays a 1 and Field 16 displays the total number of cabinets in the switch. All other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

PROC 601, Test 1

Two tests are available:

1. Test 1 - Displays failure history by order of alarm severity.
2. Test 2 - Tests all cabinets or a range of cabinets for environmental alarm conditions.

Test 1

Test 1 provides a failure history of the environmental alarm causes detected by the on-line software.

Test 1 is also used to manually turn off the **ENVIRON PWR/TEMP AIR FLOW** fault indicator.

1. Test 1 is the default test when entering **PROC 601** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. When Test 1 is initially called in, Field 1 displays a 1, and Field 16 displays the total number of cabinets in the switch.
3. To start Test 1, depress **EXECUTE**.
4. The environmental failure history is sorted and a summary is displayed.
5. If no environmental failures exist, the following summary is displayed:

Field 1 - 1.

Field 16 - Total number of cabinets in the switch.

Field 17 - 0 (indicating no failures).

6. If any environmental failures exist, the summary displays a 1 in Field 1, the total number of cabinets in the switch in Field 16, and the total number of cabinet failures in Field 17.
7. Depressing **NEXT CIRCUIT** displays the first failure in order of severity, as follows:

Field 1 - 1.

Fields 2 and 3 - Equipment location of failing cabinet.

Field 4 - Dashed.

Fields 5 through 14 - 0 or 1 (cabinet alarm cause - 0 = passed, 1 = alarm condition present).

Field 15 - Alarm status of failing cabinet.

Field 16 - Total number of cabinets in switch.

Field 17 - Total number of failed cabinets.

Field 18 - 1 (indicating the first failing cabinet).

8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing cabinets in order of severity; i.e., major alarm status first, followed by minor alarm status, and errors recorded but not alarmed.

Each time **NEXT CIRCUIT** is depressed, Field 18 (failure index) is incremented by 1.

Note: The failure index includes in its count, the failing cabinet currently being displayed.

9. After the last failing cabinet is displayed (indicated by Field 17 equaling Field 18), depressing **NEXT CIRCUIT** again dashes Fields 2 through 18.

Depressing **NEXT CIRCUIT** once more displays the summary, and the failure history can be stepped through again by use of **NEXT CIRCUIT**.

10. The **CLEAR DATA; EXECUTE** sequence can be used to manually resolve individual environmental failures or all environmental failures after **EXECUTE** is used to initiate Test 1.
11. The failures that are resolved are those failures with an alarm status of 1 or 2 displayed in Field 15.

Caution: *The environmental failures should be displayed and recorded prior to resolving the environmental circuit alarmed entries in order that a record of the equipment location and cause of the failures(s) is available for maintenance personnel.*

12. To resolve individual environmental failures with an alarm status of 1 or 2, perform the following:
 - a. Use **NEXT CIRCUIT** to display the failing cabinet with an alarm status of 1 or 2 on the **MAAP**.

Requirement: Individual environmental failures cannot be resolved unless the failing cabinet is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.

13. Field 15 (alarm status) displays a 5 indicating that the failing cabinet is resolved.

The **ENVIRON PWR/TEMP AIR FLOW** fault indicator is turned off if no other environmental failures exist.

14. All environmental failures with an alarm status of 1 or 2 can be resolved when the summary is initially displayed; i.e., upon entry to **PROC 601**, Test 1 and after displaying and recording all environmental failures and then using **NEXT CIRCUIT** to display the summary.
15. After entering Test 1 and depressing **EXECUTE**, the summary is displayed.
Depress **CLEAR DATA; EXECUTE**.

Note: All environmental failures with an alarm status of 1 or 2 are marked as resolved in PMIDS and the **ENVIRON PWR/TEMP AIR FLOW** fault indicator is turned off.

16. After displaying and recording all environmental failures, depress **NEXT CIRCUIT** until the summary is displayed, then depress **CLEAR DATA; EXECUTE**.

Note: All environmental failures with an alarm status of 1 or 2 are marked as resolved in PMIDS and the **ENVIRON PWR/TEMP AIR FLOW** fault indicator is turned off.

17. The **MAJOR** or **MINOR** alarm indicator is also turned off when no other sources affecting the **MAJOR** or **MINOR** alarm indicator are present.

PROC 601, Test 2

Test 2

Test 2 reads the alarm signals from each on-line MCC circuit pack and displays the status of those alarms for each of the MCC's associated cabinets.

Test 2 also reads the off-line module control channel status (TMS and network) when duplicated module control channels are provided.

In addition, Test 2 reads the alarm signals from on-line common controls' alarm interface (TN490).

Test 2 automatically turns off the **ENVIRON PWR/TEMP AIR FLOW** fault indicator when all cabinets that raised an alarm pass Test 2.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 2 and 3 and the total number of cabinets in the switch is displayed in Field 16.

Field 2 is blinking, indicating an optional entry field.

Note: The default equipment location can be the last equipment location displayed in Test 1 of **PROC 601** or can be passed from **PROC 600** (alarm causes/error log) while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

3. The entire switch, a range of cabinets, a specific cabinet, or the default equipment location can be selected for testing.
4. To test the default equipment location displayed in Fields 2 and 3, proceed to Step 8.
5. A specific cabinet can be selected for testing by use of **NEXT CIRCUIT** or by entering the module and cabinet numbers in Fields 2 and 3 as follows.
 - a. Depress **NEXT CIRCUIT** to step through the cabinets until the cabinet to be tested is displayed in Fields 2 and 3.
 - b. Enter the module and cabinet numbers in Fields 2 and 3 whether or not a default equipment location is displayed:
(Module number of cabinet to be tested); ENTER; (Cabinet number); ENTER.

Proceed to Step 8.

6. To select a range of cabinets to be tested, a module number must be entered in Field 2.
 - a. If Fields 2 and 3 are dashed (no default equipment location displayed), enter the module number as follows:
(Module number to be tested); ENTER.
 - b. If a default equipment location is displayed, enter the module number as follows:
(Module number to be tested); ENTER; CLEAR ENTRY; ENTER.

All cabinets in the module selected are tested.

Proceed to Step 8.

7. To select the entire switch to be tested, Fields 2 and 3 must not contain an equipment location.
 - a. If no default equipment location is displayed, proceed to Step 8.
 - b. If a default equipment location is displayed, perform the **CHANGE FIELD** sequence as follows:

CHANGE FIELD; 2; ENTER.

Note: Field 2 is blanked and Field 3 is dashed.

Test 2 starts with the first module and first cabinet in the switch and runs until the last cabinet in the switch is tested.

Proceed to Step 8.

8. To start Test 2, depress **EXECUTE**.

Test 2 operation and display of test results is different when a specific cabinet or default equipment location is tested and when the entire switch or a range of cabinets is tested.

9. For test operation and display of test results for a default equipment location or a specific cabinet, proceed to Step 10.

For test operation and display of test results for the entire switch or a range of cabinets, proceed to Step 15.

10. When Test 2 is completed for a default equipment location or a specific cabinet, the following is displayed:

Field 1 - 2.

Fields 2 and 3 - Equipment location of cabinet being tested.

Field 4 - 1 (indicating on-line module control channel was read).

Fields 5 through 14 - Cabinet alarm cause (0 = passed, 1 = alarm condition present).

Field 15 - Alarm status of cabinet tested.

Field 16 - 1 (indicating the cabinet selected was tested).

Field 17 - 0 (indicating no failures were detected for the cabinet tested) or 1 (indicating that the cabinet failed the test).

Field 18 - Dashed.

11. When testing a specific cabinet or default equipment location, depressing **NEXT UNIT** causes the off-line module control channel's status registers to be read for the cabinet displayed in Fields 2 and 3.

Note: Depressing **NEXT UNIT** when a duplicated module control channel is not provided results in error code 74 (equipment not part of system) being displayed, or error code 06 (wrong key, press right key and continue) being displayed when a duplicated common control cabinet is displayed in Fields 2 and 3.

12. Field 4 changes from 1 to 0 when **NEXT UNIT** is depressed.

EXECUTE must be depressed to read the off-line status registers.

PROC 601, Test 2

13. Depressing **NEXT UNIT** again reverts to the on-line status registers (Field 4 = 1) when **EXECUTE** is depressed.

Note: **NEXT UNIT** cannot be used to read the off-line MCC status registers when testing a range of cabinets.

14. When another cabinet is to be tested, the **CHANGE FIELD** sequence must be used to select the specific cabinet:

CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER.

Note: **EXECUTE** must be depressed to test the specific cabinet selected for testing.

15. When the entire switch or a range of cabinets is being tested for environmental failures, the **WAIT** indicator is turned on and the following fields are incremented momentarily:

Fields 2 and 3 - Equipment location being tested.

Field 16 - Number of cabinets tested.

Field 17 - Total failures (if any).

16. **STOP** can be depressed when the entire switch or a range of cabinets is being tested.

Depressing **STOP** displays the next equipment location to be tested in Fields 2 and 3, the number of cabinets tested in Field 16, and the number of failures detected in Field 17. The **WAIT** indicator is turned off.

17. If no failures are detected for the cabinets tested when **STOP** is depressed, a 0 is displayed in Field 17.

If any failures are detected for the cabinets tested when **STOP** is depressed, proceed to Step 20.

18. When **STOP** is depressed while testing the entire switch or a range of cabinets (halting the test before all cabinets are tested), the range of cabinets or the entire switch must be reentered by using the **CHANGE FIELD** sequence in order to complete the test.

19. When the entire switch or a range of cabinets is tested, the **WAIT** indicator is turned off and a summary is displayed.

20. If no cabinets failed, the following summary is displayed:

Field 1 - 2.

Field 16 - Number of cabinets tested.

Field 17 - 0 (indicating no failures).

21. If any cabinets failed, the summary displays a 2 in Field 1, the total number of cabinets tested in Field 16, and the total number of failures in Field 17.

22. Depressing **NEXT CIRCUIT** displays the first failure, as follows:

Field 1 - 2.

Fields 2 and 3 - Equipment location of failing cabinet.

Field 4 - 1 (indicating on-line module control channel was read).

Fields 5 through 14 - 0 or 1 (Cabinet alarm cause - 0 = passed, 1 = alarm condition present).

Field 15 = Alarm status of failing cabinet.

Field 16 - Total number of cabinets tested.

Field 17 - Total number of failed cabinets.

Field 18 - 1 (indicating the first failing cabinet).

23. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing cabinets.

Each time **NEXT CIRCUIT** is depressed, Field 18 (failure index) is incremented by 1.

Note: The failure index includes in its count, the failing cabinet currently being displayed.

24. After the last failing cabinet is displayed (indicated by Field 17 equaling Field 18), depressing **NEXT CIRCUIT** again dashes Fields 2 through 18.

Depressing **NEXT CIRCUIT** once more displays the summary, and the failing cabinets can be stepped through again by use of **NEXT CIRCUIT**.

25. To select another range of cabinets to test, the **CHANGE FIELD** sequence must be used:

CHANGE FIELD; 2; (Module number); ENTER.

Note: All cabinets in the module entered in Field 2 are tested when **EXECUTE** is depressed.

26. The **ENVIRON PWR/TEMP AIR FLOW** fault indicator is automatically turned off when Test 2 is completed with no failures detected for all cabinets that had an alarm status of 1 or 2 (major or minor).

Note: Environmental circuit alarmed entries in PMIDS are marked as resolved.

27. The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting the major or minor alarm indicators.

Repair Guide

Overview

When the **ENVIRON PWR/TEMP AIR FLOW** and **MAJOR** or **MINOR** alarm indicators on the alarm panel are lighted (indicating an environmental failure) or when **PROC 601** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and manually record the failure history generated by the on-line maintenance software.

Determine which failures have an alarm status code of 1 or 2 (major or minor).

2. Execute Test 2.

Note: Test 2 runs a variable length of time depending on the number of cabinets being tested; e.g., the entire switch, a range of cabinets, a specific cabinet, or the default equipment location.

Test 2 must be run for each equipment location recorded in Test 1 with an alarm status of 1 or 2 (major or minor) and for the default equipment location passed from **PROC 600** Test 1 or 2.

3. The alarm(s) are turned off if no failures are detected in Test 2 from all of the locations for which the alarm status was recorded in Test 1 as 1 or 2 (major or minor).
4. If any failures are detected in Test 2, step through the failures and record the equipment locations and cabinet alarm cause(s).

The cabinet alarm cause fields (Fields 5 through 14) indicate which function is detected as failing by displaying a 1 in the appropriate cabinet alarm cause field.

5. When more than one cabinet alarm cause is displayed for the failing cabinet, the alarm causes are isolated and repaired from left to right (Field 5 through Field 14).

One cabinet alarm cause may affect other cabinet alarm causes for the failing cabinet.

6. When multiple cabinet alarm causes exist and the first cabinet alarm cause is corrected, the other causes may not be valid.
7. Maintenance personnel must determine the effect one cabinet alarm cause has on other cabinet alarm causes and the appropriate repair action to be taken (if any).

Note: When repeating Test 2 for one cabinet alarm cause, it may be possible that the other multiple cabinet alarm causes no longer exist.

8. Isolation and repair steps for the cabinet alarm causes are detailed in:

Cabinet Power AC.

Cabinet Power 48 Volts.

Fuse/Breaker.

DC/DC Converter.

Frequency Generator.

Air Flow.

Temperature.

Holdover.

Module Control Carrier Power (Left or Right).

Other Repair Steps.

9. After making the necessary repair, repeat Test 2 for the appropriate equipment location.
10. In order to turn off the **ENVIRON PWR/TEMP AIR FLOW** fault indicator, all failing cabinets with an alarm status of 1 or 2 (major or minor) must pass Test 2.
11. The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting the major or minor alarm indicator.

Cabinet Power AC

The cabinet power AC alarm cause usually indicates that the power source's internal circuitry is not functioning properly.

1. Determine the type of power source installed in the equipment location displayed in Fields 2 and 3.
 - a. If the equipment location is a duplicated common control cabinet, a Time Multiplexed Switch (TMS) cabinet, or a Remote Module Interface (RMI) cabinet, the power source is a 334A power unit or a Bulk OLS power supply.
 - b. If the equipment location is a module control cabinet or a port cabinet, the power source is a 309A/310A power supply or a Bulk OLS power supply.
2. If the power source is a Bulk OLS power supply, proceed to Step 16.
If the power source is not a Bulk OLS power supply, proceed to Step 3.
3. At the equipment location displayed in Fields 2 and 3, determine if the circuit breaker on the power source is tripped.
If the circuit breaker is tripped, proceed to Step 4.
If the circuit breaker is not tripped, proceed to Step 9.
4. Reset the circuit breaker.
 - a. If the circuit breaker trips again, perform Steps 5 through 8 (as required).
 - b. If the circuit breaker does not trip, repeat Test 2.
If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.
If Test 2 does not fail, corrective action is complete.
5. Replace the AEN1 circuit pack in the 334A power unit or 310A power supply, by performing the following:
 - a. Set the AC circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **OFF**.
 - b. Remove 2 screws (1 on each side) from the front panel of the 334A power unit or 310A power supply (as appropriate).
 - c. Unplug AEN1 circuit pack and remove the circuit pack from the 334A power unit or 310A power supply (as appropriate).
 - d. Replace the AEN1 circuit pack.
 - e. Secure the 334A power unit or 310A power supply front panel (as appropriate) with the 2 screws.
 - f. Set the circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **ON**.
6. If the circuit breaker trips again after replacing the AEN1 circuit pack, proceed to Step 7.
 - a. If the circuit breaker does not trip, repeat Test 2.
 - b. If Test 2 fails again, proceed to Step 7.
If Test 2 does not fail, corrective action is complete.

7. Replace the 334A power unit or 309A/310A power supply (as appropriate).

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the 309A/310A power supply.

8. If the circuit breaker trips again after replacing the 334A power unit or 309A/310A power supply (as appropriate), check the wiring associated with the 334A power unit or 309A/310A power supply (as appropriate).

- a. If the circuit breaker does not trip, repeat Test 2.
- b. If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.

If Test 2 passes, corrective action is complete.

9. Determine if the proper AC power to the power source is present.

If AC power to the power source is absent, proceed to Step 10.

If AC power to the power source is present, proceed to Step 11.

10. If AC power to the power source is absent, correct the problem and measure the power source output voltages at the test points using a digital multimeter. (Refer to Table M, Cabinet Power Supply Voltage Measurements.)

- a. If the power source voltages are not within tolerance, proceed to Step 12.
- b. If the power source voltages are within tolerance, repeat Test 2.

If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.

If Test 2 does not fail, corrective action is complete.

11. Measure the power source output voltages at the test points using a digital multimeter. (Refer to Table M, Cabinet Power Supply Voltage Measurements.)

- a. If the power source voltages are not within tolerance, proceed to Step 12.
- b. If the power source voltages are within tolerance, repeat Test 2.

If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.

If Test 2 does not fail, corrective action is complete.

12. Replace the AEN1 circuit pack in the 334A power unit or 310A power supply by performing the following:

- a. Set the AC circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **OFF**.
- b. Remove 2 screws (1 on each side) from the front panel of the 334A power unit or 310A power supply (as appropriate).
- c. Unplug AEN1 circuit pack and remove the circuit pack from the 334A power unit or 310A power supply (as appropriate).
- d. Replace the AEN1 circuit pack.
- e. Secure the 334A power unit or 310A power supply front panel (as appropriate) with the 2 screws.
- f. Set the circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **ON**.

13. Repeat Test 2.

If Test 2 fails again, proceed to Step 14.

If Test 2 does not fail, corrective action is complete.

14. Replace the 334A power unit or 309A/310A power supply (as appropriate).

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the 309A/310A power supply.

15. Measure the power source output voltages. (Refer to Table M, Cabinet Power Supply Voltage Measurements.)

- a. If the voltages are not within tolerance, check the wiring associated with the power source.
- b. If the voltages are within tolerance, repeat Test 2.
If Test 2 passes, corrective action is complete.
If Test 2 fails again, check the wiring associated with the power source.

TABLE M.

CABINET POWER SUPPLY VOLTAGE MEASUREMENTS			
CABINET	TYPE OF RECTIFIER	MINIMUM	MAXIMUM
COMMON CONTROL, MODULE CONTROL, PORT, TMS, and RMI	309A/310	-46 V	-52 V
	334A	-46 V	-52 V
	BATT	-46 V	-52 V

16. At the equipment location displayed in Fields 2 and 3, determine the status of the Bulk OLS power supply on/off switch.

If the on/off switch is off, proceed to Step 17.

If the on/off switch is on, proceed to Step 18.

17. Turn the on/off switch to on.

- a. Repeat Test 2.
- b. If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.
If Test 2 does not fail, corrective action is complete.

18. Determine if the proper AC power to the Bulk OLS power supply is present.

If AC power to the Bulk OLS power supply is absent, proceed to Step 19.

If AC power to the Bulk OLS power supply is present, proceed to Step 20.

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19. If AC power to the Bulk OLS power supply is absent, correct the problem and repeat Test 2.
If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.
If Test 2 does not fail, corrective action is complete.
20. Replace the Bulk OLS power supply.
Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the Bulk OLS power supply.
21. Repeat Test 2.
If Test 2 passes, corrective action is complete.
If Test 2 fails, check the wiring associated with the Bulk OLS power supply.

Cabinet Power 48 Volts

A green pilot LED located on the front panel of the power source is on when the power source is producing -48 volts on its output.

The green pilot LED does not indicate that the output voltage is within regulation limits.

Appropriate test points are available on the front panel of the power source for measuring the output voltage and determining the power source performance.

Note: Output voltage measurements and power supply performance for the Bulk OLS power supply cannot be determine as the Bulk OLS power supply does not have test points.

1. Determine the alarm status (displayed in Field 15) of the failing cabinet.
If the alarm status displayed in Field 15 is 1 (major), proceed to Step 4.
If the alarm status displayed in Field 15 is 2 (minor) or 4 (errors recorded), proceed to Step 2.
2. At the rear of the failing cabinet, replace alarm board AEH4.
Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of alarm board AEH4.
3. Repeat Test 2.
If Test 2 passes, corrective action is complete.
If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.
4. Determine the type of power source installed in the equipment location displayed in Fields 2 and 3.
 - a. If the equipment location is a duplicated common control cabinet, a Time Multiplexed Switch (TMS) cabinet, or a Remote Module Interface (RMI) cabinet, the power source is a 334A power unit or Bulk OLS power supply.
 - b. If the equipment location is a module control cabinet or a port cabinet, the power source is a 309A/310A power supply or Bulk OLS power supply.

5. If the power source is a Bulk OLS power supply, proceed to Step 19.
If the power source is not a Bulk OLS power supply, proceed to Step 6.
6. At the equipment location displayed in Fields 2 and 3, determine if the green pilot LED is on at the power source.
If the green pilot LED is not on, proceed to Step 7.
If the green pilot LED is on, proceed to Step 14.
7. At the equipment location displayed in Fields 2 and 3, determine if the circuit breaker on the power source is tripped.
If the circuit breaker is tripped, proceed to Step 8.
If the circuit breaker is not tripped, proceed to Step 14.
8. Reset the circuit breaker.
 - a. If the circuit breaker trips again, perform Steps 9 through 12 (as required).
 - b. If the circuit breaker does not trip, repeat Test 2.
If Test 2 fails again, proceed to Step 13.
If Test 2 does not fail, corrective action is complete.
9. Replace the AEN1 circuit pack in the 334A power unit or 310A power supply, by performing the following:
 - a. Set the AC circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **OFF**.
 - b. Remove 2 screws (1 on each side) from the front panel of the 334A power unit or 310A power supply (as appropriate).
 - c. Unplug AEN1 circuit pack and remove the circuit pack from the 334A power unit or 310A power supply (as appropriate).
 - d. Replace the AEN1 circuit pack.
 - e. Secure the 334A power unit or 310A power supply front panel (as appropriate) with the 2 screws.
 - f. Set the circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **ON**.
10. If the circuit breaker trips again after replacing the AEN1 circuit pack, proceed to Step 11.
 - a. If the circuit breaker does not trip, repeat Test 2.
 - b. If Test 2 fails again, proceed to Step 11.
If Test 2 does not fail, corrective action is complete.
11. Replace the 334A power unit or 309A/310A power supply (as appropriate).

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the 309A/310A power supply.

12. If the circuit breaker trips again after replacing the 334A power unit or 309A/310A power supply (as appropriate), check the wiring associated with the 334A power unit or 309A/310A power supply (as appropriate).

13. If the circuit breaker does not trip, repeat Test 2.

If Test 2 fails again, refer to isolation and repair step **Other Repair Steps**.

If Test 2 passes, corrective action is complete.

14. Measure the power source output voltages at the test points using a digital multimeter to determine if voltages are within tolerance, marginal, or fluctuating. (Refer to Table M, Cabinet Power Supply Voltage Measurements.)

If all voltages are within tolerance without fluctuation, refer to isolation and repair step **Other Repair Steps**.

If the voltages are marginal or fluctuating, proceed to Step 15.

15. Replace the AEN1 circuit pack in the 334A power unit or 310A power supply, by performing the following:

- a. Set the AC circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **OFF**.
- b. Remove 2 screws (1 on each side) from the front panel of the 334A power unit or 310A power supply (as appropriate).
- c. Unplug AEN1 circuit pack and remove the circuit pack from the 334A power unit or 310A power supply (as appropriate).
- d. Replace the AEN1 circuit pack.
- e. Secure the 334A power unit or 310A power supply front panel (as appropriate) with the 2 screws.
- f. Set the circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **ON**.

16. Repeat Test 2.

If Test 2 fails again, proceed to Step 17.

If Test 2 does not fail, corrective action is complete.

17. Replace the 334A power unit or 309A/310A power supply (as appropriate).

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the 309A/310A power supply.

18. Measure the power source output voltages. (Refer to Table M, Cabinet Power Supply Voltage Measurements.)

- a. If the voltages are not within tolerance or fluctuate, check the wiring associated with the power source.
- b. If the voltages are within tolerance, repeat Test 2.

If Test 2 passes, corrective action is complete.

If Test 2 fails again, check the wiring associated with the power source.

19. At the equipment location displayed in Fields 2 and 3, determine if the green pilot LED is on at the Bulk OLS power supply.
 If the green pilot LED is not on, proceed to Step 20.
 If the green pilot LED is on, proceed to Step 22.
20. Determine the status of the Bulk OLS power supply on/off switch.
 If the on/off switch is off, proceed to Step 21.
 If the on/off switch is on, proceed to Step 22.
21. Turn the on/off switch to on.
 - a. Repeat Test 2.
 - b. If Test 2 fails again, refer to isolation repair step **Other Repair Steps**.
 If Test 2 does not fail, corrective action is complete.
22. Replace the Bulk OLS power supply.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the Bulk OLS power supply.
23. Repeat Test 2.
 If Test 2 passes, corrective action is complete.
 If Test 2 fails, check the wiring associated with the Bulk OLS power supply.

Fuse/Breaker

Fuses and circuit breakers provide visual indications when they operate.

1. At the equipment location displayed in Fields 2 and 3, determine if any fuses are blown or circuit breakers tripped.
 If no fuses are blown or circuit breakers tripped, refer to isolation and repair step **Other Repair Steps**.
 If any fuse is blown or circuit breaker tripped, proceed to Step 2.
2. Replace the blown fuse, or reset the circuit breaker.
 If the fuse does not blow again or circuit breaker trip, repeat Test 2.
 If the fuse blows again or circuit breaker trips, proceed to Step 3.
3. The corrective action to be taken depends on the blown fuse or tripped circuit breaker.
 - a. If the circuit breaker is associated with the DC/DC converter, perform isolation and repair step **DC/DC Converter**.
 - b. If the fuse is associated with the frequency generator, perform isolation and repair step **Frequency Generator**.
 - c. If the fuse is associated with the fans, perform isolation and repair step **Air Flow**.
 - d. If the fuse is part of the port carrier, perform Steps 4 through 6 below.
 - e. If the fuse is associated with the consoles, perform Steps 7 through 9 below.

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4. Disconnect all circuit packs associated with the blown fuse.
Replace the blown fuse.
5. Reconnect one circuit pack at a time observing the associated fuse.
If the fuse blows again, replace the faulty circuit pack.
6. Replace the blown fuse.
If the fuse does not blow again, reconnect all circuit packs and repeat Test 2.
If the fuse blows again, check the wiring associated with the faulty circuit pack.
7. Disconnect the console mounting cord associated with the blown fuse.
Replace the blown fuse.
If the fuse does not blow again, replace the console and repeat Test 2.
8. If the fuse blows again, disconnect the console connector cable from the common control connector.
9. Replace the blown fuse.
If the fuse blows again, check the wiring between the fuse and the associated console.

DC/DC Converter

The faulty DC/DC converter is identified within a cabinet by its illuminated RED LED.

In the event of protective shutdown, a reset toggle switch is located behind the front panel faceplate of the DC/DC converter.

1. Check the circuit breaker associated with the DC/DC converter.
If the circuit breaker is tripped, proceed to Step 2.
If the circuit breaker is not tripped, proceed to Step 4.
2. Reset the circuit breaker.
3. If the circuit breaker does not trip, repeat Test 2.
If the circuit breaker trips again, check the wiring between the circuit breaker and the DC/DC converter.
4. At the equipment location displayed in Fields 2 and 3, measure the output voltage using a Digital Voltmeter (DVM) at the test points of the failing DC/DC converter with the RED LED lighted. (Refer to Table N, DC/DC Converter Voltage Measurements.)
If the voltage reading is greater than 0, perform Steps 5 through 7.
If the voltage reading is 0, perform Steps 8 through 12.
5. Replace the DC/DC converter and repeat Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the DC/DC converter.

6. If Test 2 fails again, the problem could be in the program resistors on the circuit packs in the 1/2 carrier served by the DC/DC converter.

Replace circuit packs one-at-a-time in the 1/2 carrier served by the DC/DC converter, repeating Test 2 after each circuit pack is replaced.

7. If Test 2 passes, install the original circuit packs that did not cause the trouble.

If Test 2 does not pass, install all the original circuit packs and check the wiring associated with the DC/DC converter.

8. Unseat all circuit packs in the 1/2 carrier associated with the failing DC/DC converter.

Caution: Ensure that the toggle switch is in the up position before reseating the handle.

Activate the reset toggle switch by pulling the DC/DC converter handle halfway out without unseating the DC/DC circuit board, and then reseating the handle.

9. Measure the output voltage at the DC/DC converter. (Refer to Table N, DC/DC Converter Voltage Measurements.)

TABLE N.

DC/DC CONVERTER VOLTAGE MEASUREMENTS			
CONVERTER	VOLTAGE	MINIMUM	MAXIMUM
490AA	5 V	4.9 V	5.3 V
494GA	5 V	4.9 V	5.3 V
495FA	5 V	4.9 V	5.3 V

10. If the voltage reading is 0, reseal all circuit packs, replace the DC/DC converter, and repeat Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the DC/DC converter.

If trouble remains after replacing the converter, check the backplane wiring for a short causing overcurrent shutdown.

11. If the voltage reading is greater than 0, reseal the circuit packs one at a time.

Note: The RED LED lights on the DC/DC converter when the faulty circuit pack is seated.

Replace the faulty circuit pack, reseal any disconnected circuit packs and repeat Test 2.

12. If Test 2 fails again, check the wiring associated with the faulty circuit pack.

Frequency Generator

1. Determine the type of frequency generator installed in the equipment location displayed in Fields 2 and 3.

If the frequency generator is a 124B, proceed to Step 4.

If the frequency generator is a 124B1 or 124B2, proceed to Step 2.

2. Check the reset button (1 amp) at the front of the frequency generator.

If the reset button is flush (not popped out), proceed to Step 4.

If the reset button has popped out, proceed to Step 3.

3. Push the reset button in.

If the reset button pops out again, check the wiring to the output load(s) to determine the cause of the trouble.

If the reset button does not pop out, repeat Test 2.

4. Check the fuse (2 amp) on the fuse panel associated with the frequency generator.

If the fuse is blown, proceed to Step 5.

If the fuse is not blown, proceed to Step 6.

5. Replace the blown fuse.

If the fuse does not blow, repeat Test 2.

If the fuse blows again, check the wiring between the fuse and the frequency generator.

6. At the equipment location displayed in Fields 2 and 3, replace the frequency generator.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the frequency generator.

7. Repeat Test 2.

If Test 2 fails again, replace alarm board AEH4 at the back of the cabinet.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of alarm board AEH4.

8. Repeat Test 2.

If Test 2 fails again, check the wiring associated with the frequency generator.

Air Flow

Insufficient air flow for cooling the cabinet may be caused by dirty air filters or improperly operating fans.

1. At the equipment location displayed in Fields 2 and 3, inspect for restriction in air flow or a dirty filter.
2. If a restriction in air flow or a dirty filter is found, proceed to Step 3.

If no restrictions are found and the filter is clean, proceed to Step 4.

3. Clear the restriction or replace the filter.
Allow sufficient time for cabinet interior to cool and repeat Test 2.
4. Determine if the fans are running.
If no fans are running, proceed to Step 6.
If fans are running, proceed to Step 5.
5. Determine if all fans are operating properly.
If all fans are operating properly, refer to isolation and repair step **Other Repair Steps**.
Replace any defective fan, allow sufficient time for cabinet interior to cool, and repeat Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of fans.
6. Check the fuse (F1 or F2) associated with the fans. (F1 controls the upper fan assembly and F2 controls the lower fan assembly.)
If the fuse is blown, proceed to Step 7.
If the fuse is not blown, refer to isolation and repair step **Other Repair Steps**.
7. Replace the blown fuse.
If the fuse does not blow again, allow sufficient time for cabinet interior to cool and repeat Test 2.
8. If the fuse blows again, replace the fan assembly associated with the blown fuse.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the fan assembly.
9. Replace the blown fuse, allow sufficient time for the cabinet interior to cool, and repeat Test 2.

Temperature

An overtemperature alarm cause signifies that a predetermined cabinet temperature is exceeded.

1. At the equipment location displayed in Fields 2 and 3, determine if fans are provided.
If no fans are provided, proceed to Step 9.
If fans are provided, proceed to Step 2.
2. Determine if fans are running.
3. If no fans are running, proceed to Step 5.
If fans are running, proceed to Step 4.
4. Determine if all fans are operating properly.
 - a. If all fans are operating properly, refer to isolation and repair step **Other Repair Steps**.

- b. Replace any defective fan and allow sufficient time for cabinet interior to cool before repeating Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of fans.

5. Check the fuse (F1 or F2) associated with the fans. (F1 controls the upper fan assembly and F2 controls the lower fan assembly.)

If the fuse is blown, proceed to Step 6.

If the fuse is not blown, it may be possible for excessive heat in the room to cause the temperature alarm. Proceed to Step 9.

6. Replace the blown fuse.

If the fuse does not blow again, allow sufficient time for cabinet interior to cool and repeat Test 2.

7. If the fuse blows again, replace the fan assembly associated with the blown fuse.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the fan assembly.

8. Replace the blown fuse, allow sufficient time for the cabinet interior to cool, and repeat Test 2.

9. When no fans are provided, or excessive heat in the room is suspected, determine if environmental temperature is above maximum for the switch.

- a. If the environmental temperature is above the maximum, leave the cabinet open to allow cooling, and refer the problem to local engineering.
- b. If the environmental temperature is not above the maximum, refer to isolation and repair step **Other Repair Steps**.

Holdover

Nominal or extended holdover is provided by a 312 power unit, a J87462A power unit (consisting of a charger and battery system), or a 3965-2 battery charger.

The LEDs on the 312 holdover power unit, J87462A holdover power unit, or 3965-2 battery charger determine whether the switch failed or is drawing battery power because cabinet AC voltage is absent.

Appropriate test points are available on the 312 holdover power unit, J87462A holdover power unit, or 3965-2 battery charger for determining the holdover unit's performance.

1. Determine the type of holdover unit installed in the equipment location displayed in Fields 2 and 3.
2. Determine the type of power source installed in the equipment location displayed in Fields 2 and 3.

- a. If the equipment location is a duplicated common control cabinet, a Time Multiplexed Switch (TMS) cabinet, or a Remote Module Interface (RMI) cabinet, the power source is a 334A power unit or a Bulk OLS power supply.
 - b. If the equipment location is a module control cabinet or a port cabinet, the power source is a 309A/310A power supply or a Bulk OLS power supply.
3. If the power source is a Bulk OLS power supply, proceed to Step 12.
If the power source is not a Bulk OLS power supply, proceed to Step 4.
4. At the equipment location displayed in Fields 2 and 3, determine the cause of the holdover alarm by checking the LEDs on the appropriate holdover unit.
If the **BTY ON LINE** LED is lighted, check the cabinet AC voltage (the cabinet is being powered from the battery system of the appropriate power unit).
5. If the **RSV FAIL** or **RSV ALM** LED is lighted, use the test points on the appropriate holdover unit to determine the cause of the problem.
 - a. Check for -48 volts using a digital voltmeter connected between test points **-48V** and **GRD**.
 - b. Check for BTY (-48 volts) using a digital voltmeter connected between test points **BTY** and **GRD**.
6. If -48 volts is present but BTY is not, proceed to Step 7.
If -48 volts is absent, check the wiring between the appropriate holdover unit and the voltage source.
7. Replace the CP1 circuit pack (charger and alarm board) in the 312 holdover power unit or the AMC-1 circuit pack (power board) in the J87462A holdover power unit by performing the following.

Note: If the AMC-1 circuit pack in the J87462A holdover power unit has a AMD-1 circuit pack (logic board) attached to it, replace both circuit packs as a set.

- a. Set the battery circuit breaker on the 312 holdover power unit or J87462A holdover power unit (as appropriate) to **OFF**.
- b. Set the AC circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **OFF**.
- c. Disconnect the AC power cord from the 334A power unit or 309A power supply (as appropriate).
- d. Remove 4 screws from the front panel of the 312 holdover power unit or J87462A holdover power unit (as appropriate).

Note: Do not disconnect the grounding wire from the panel of the J87462A holdover power unit.

- e. Unplug the CP1 or AMC-1 circuit pack (as appropriate) and remove the circuit pack from the 312 holdover power unit or the J87462A holdover power unit (as appropriate).
- f. Replace the CP1 or AMC-1 circuit pack (as appropriate).

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- g. Secure the 312 holdover power unit or J87462A holdover power unit front panel (as appropriate) with the 4 screws.
 - h. Connect the AC power cord to the 334A power unit or 309A power supply (as appropriate).
 - i. Set the circuit breaker on the 334A power unit or 309A power supply (as appropriate) to **ON**.
 - j. Set the battery circuit breaker on the 312 holdover power unit or J87462A holdover power unit (as appropriate) to **ON**.
8. Repeat Test 2.
If Test 2 fails again, proceed to Step 9.
If Test 2 does not fail, corrective action is complete.
9. If the nominal or extended holdover is a 312A or 312C holdover power unit, or a J87462A List 6 or List 7 holdover power unit, repeat Steps 7 through 9 for the other CP1 or AMC-1 circuit pack.
 - a. If the nominal or extended holdover is a 312B holdover power unit or a J87462A List 5 holdover power unit, proceed to Step 10.
 - b. If both CP1 or AMC-1 circuit packs are replaced, proceed to Step 10.
10. At the equipment location displayed in Fields 2 and 3, replace the 312 holdover power unit or J87462A holdover power unit (as appropriate).
11. Repeat Test 2.
If Test 2 fails again, check the wiring associated with the 312 holdover power unit or J87462A holdover power unit (as appropriate).
If Test 2 passes, corrective action is complete.
12. At the equipment location displayed in Fields 2 and 3, determine the cause of the holdover alarm by checking the LEDs on the 3965-2 battery charger holdover unit.
If the **YELLOW** LED is lighted, check the cabinet AC voltage (the cabinet is being powered from the 3965-2 battery charger holdover unit).
13. If the **GREEN** LED is lighted, use the test points on the appropriate holdover unit to determine the cause of the problem.
14. Check for -48 volts using a digital voltmeter connected between test points **BATT** and **-**.
 - a. If the voltage is between 0 and -48 volts, proceed to Step 15.
 - b. If -48 volts is absent, check the wiring between the appropriate holdover unit and the voltage source.
 - c. If -48 volts is present, refer to isolation and repair step **Other Repair Steps**.
15. Replace the battery pack.
16. Repeat Test 2.
If Test 2 fails again, proceed to Step 17.
If Test 2 does not fail, corrective action is complete.

17. At the equipment location displayed in Fields 2 and 3, replace the 3965-2 battery charger holdover unit.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the 3965-2 battery charger holdover unit.

18. Repeat Test 2.

If Test 2 fails again, check the wiring associated with the 3965-2 battery charger holdover unit.

If Test 2 passes, corrective action is complete.

Module Control Carrier Power

The module control carrier power (left or right) cabinet alarm cause indicates that a change in the power to the module control carrier occurred.

1. At the equipment location displayed in Fields 2 and 3, measure the output voltage using a DVM at the test points of the left or right DC/DC converter associated with the cabinet alarm cause (left or right) to determine if the voltages are marginal or fluctuating.
2. If all voltages are within tolerance without fluctuation, refer to isolation and repair step **Other Repair Steps**.

If the voltages are marginal or fluctuating, proceed to Step 3.

3. Replace the DC/DC converter and measure the output voltages.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the DC/DC converter.

4. If all voltages are within tolerance and do not fluctuate, repeat Test 2.

If voltages are not within tolerance, or fluctuate, check the wiring associated with the DC/DC converter.

Other Repair Steps

1. In the event an alarm cause is present but the equipment associated with the alarm cause is functioning properly (or unable to function because of a suspected sensor or detector malfunction), the sensor, detector, or alarm board corresponding to the cabinet alarm cause is probably faulty.
2. At the rear of the failing cabinet, replace alarm board AEH4 (if not already replaced).

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of alarm board AEH 4.

3. Repeat Test 2.

If Test 2 fails again, proceed to Step 4.

4. Check the sensor or detector and replace as appropriate.

Repeat Test 2 (as applicable). If Test 2 passes, the failure is corrected.

5. If the sensor or detector is functioning correctly or after replacement of the sensor or detector the failure still exists, the wiring between the sensor or detector and the module control channel may be at fault.
6. A correlation of the TMS/module control carrier backplane lead names to the sensor or detector corresponding to the cabinet alarm causes displayed in Fields 5 through 14 are listed below:

Field 5 - Cabinet power AC = RCTALM (n*).

Field 6 - Cabinet power 48 Volts = L48ALM (n*).

Field 7 - Fuse/breaker = FUSALM (n*).

Field 8 - DC/DC converter = CNVALM (n*).

Field 9 - Frequency generator = FGNALM (n*).

Field 10 - Air flow = FANALM (n*).

Field 11 - Temperature = OTPALM (n*).

Field 12 - Holdover = HVRALM (n*).

Field 13 - Module control carrier power left = PFAILL (n*).

Field 14 - Module control carrier power right = PFAILR (n*).

n* = Cabinet number 0 through 7.

PROC 610 - TAPE TESTS

FLIPCHART ISSUE 4		+		+		TAPE TEST		+		+		845552223				
TEST 1: DISPLAYS ALARMED TAPE FAILURES. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARM.				TEST 2: PERFORM RESET OF TN430 AND DIAGNOSE OF HCMR.				FIELD LIMITS: FIELDS 2-8: 1-FIRST INDICTMENT 2-SECOND INDICTMENT (IF ANY) 3-THRD INDICTMENT (IF ANY)				ALARM STATUS (FIELD 9) 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED				
USE 'NEXT CIRCUIT' TO DISPLAY FAILURES (TESTS 1 AND 2)								USE 'NEXT DATA' TO CYCLE THROUGH BEGINNING & ENDING TIME STAMP. (TEST 1)								
TEST NUMBER	TAPE INTC	EQUIPMENT						ALARM STATUS	NUMBER FAILURES	INTR	FAULT CODE	TEST 1			HOURS SINCE LAST RUN TAPE	COMMON CONTROL TESTS
		HCMR										TIME				
		CNT	DATA	SPORT	SERV	POWER	CARTRIDGE					DAY	HR	MIN		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	610

Purpose

PROC 610 is used when referenced from **PROC 600** (alarm causes/error log) or when the **COMMON CONTROL TAPE** and **MAJOR** or **MINOR** fault indicators on the alarm panel are lighted.

PROC 610 is used to:

1. Display failures associated with the tape subsystem.
2. Manually resolve the **COMMON CONTROL TAPE** fault indicator.

Note: Tape alarmed entries in PMIDS are marked as resolved.

3. Test the tape subsystem. The tape subsystem consists of:

TN430 - Tape interface circuit pack.

Cable between the tape interface circuit pack and the High Capacity Minirecorder (HCMR).

SN441 - HCMR controller circuit pack.

SN442 - HCMR data electronics circuit pack.

SN443 - HCMR transport circuit pack.

SN445 - HCMR servo circuit pack.

SN446 - HCMR power circuit pack.

Tape cartridge.

4. Automatically turn off the **COMMON CONTROL TAPE** fault indicator when the tape subsystem passes Test 2.

Note: Tape alarmed entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 610** flipchart and the possible displays for the fields during execution of the different tests are defined in Table O, PROC 610 - Field Definitions and Codes.

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There are no optional input fields for **PROC 610**.

TABLE O.

PROC 610 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-2	Test number.	9 (Contd)	4	Errors recorded.
2-8		Equipment.		5	Alarm resolved.
2		Tape interface:	10		Number of failures recorded.
	-	Not applicable.		0-6	Number of failures recorded by the periodic test (Test 1).
	1	Indicates failure (Test 1).		0-9	Number of failures recorded by the demand test (Test 2).
	1-3	Indicates replacement sequence number (Test 2).			
3-7		High Capacity Minirecorder (HCMR):	11		Index.
	-	Not applicable.		0-9	Number of failure being displayed (Test 1 or Test 2).
	1	Indicates failure (Test 1).			
	1-3	Indicates replacement sequence number (Test 2).	12	0-970	Specific fault code.
8		Cartridge:	13-15		Time stamp of displayed failure (Test 1 only).
	-	Not applicable.	13	1-31	Day of month failure was recorded.
	1	Indicates failure (Test 1).	14	0-23	Hour of day failure was recorded.
	1-3	Indicates replacement sequence number (Test 2).	15	0-59	Minute of hour failure was recorded.
9	1-5	Alarm status of displayed failure (Test 1 only).			
	1	Major.	16	0-99	Hours since last run tape (99 indicates 99 or more).
	2	Minor.			
	3	Warning.			

Operation of Procedure

Overview

PROC 610 is used to determine the cause of the **COMMON CONTROL TAPE** and **MAJOR** or **MINOR** fault indicators being lighted resulting from a tape failure.

To call in **PROC 610**, perform the following:

1. Depress **PROC NO; 610; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Displays the alarmed tape failures and manually turns off the fault indicator.
2. Test 2 - Performs an ID chip test on TN430 and a parity checker/generator function test.
Test 2 performs a single test of the tape subsystem. TN430 is reset if Test 2 cannot be successfully completed.

Test 1

Test 1 provides a failure history of the tape alarm causes detected by periodic on-line maintenance software.

Test 1 is also used to manually turn off the **COMMON CONTROL TAPE** fault indicator.

1. Test 1 is the default test when entering **PROC 610** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. To start Test 1, depress **EXECUTE**.
3. The tape failure history is sorted and a summary is displayed.
4. If no tape failures exist, the following summary is displayed:
Field 1 - 1.
Field 10 - 0 (Indicating no failures).
Field 16 - Hours since last run tape operation.
5. If any tape failures exist, the summary displays a 1 in Field 1, the total number of failures in Field 10, and the number of hours since the last run tape operation in Field 16.
6. Depressing **NEXT CIRCUIT** displays the first failure in order of severity, as follows:
Field 1 - 1.
Fields 2 through 8 - Dashed or 1 (indicating equipment failure area).

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Field 9 - Alarm status of displayed failure.

Field 10 - Number of failures recorded.

Field 11 - Index (number of fault codes for displayed failure).

Field 12 - Specific fault code.

Fields 13 through 15 - Beginning time stamp of displayed failure (indicates day, hour, and minute when the failure was first recorded by periodic on-line software).

Field 16 - Hours since last run tape operation.

7. Depressing **NEXT DATA** displays the ending time stamp (indicates day, hour, and minute when the failure was last recorded by periodic on-line maintenance software).

Depressing **NEXT DATA** again displays the beginning time stamp.

8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures in order of severity.

Each time **NEXT CIRCUIT** is depressed, Field 10 (number of failures) decrements by 1.

Depressing **NEXT DATA** steps through the beginning and ending time stamp associated with the failure displayed.

9. Depressing **NEXT CIRCUIT** after all failures are displayed dashes Fields 2 through 16.

Depressing **NEXT CIRCUIT** once more displays the summary, and the failure history can be stepped through again by use of **NEXT CIRCUIT** and **NEXT DATA**.

10. The **CLEAR DATA; EXECUTE** sequence can be used to manually resolve individual tape failures or all tape failures after **EXECUTE** is used to initiate Test 1.

The tape failures that are resolved are those failures with an alarm status of 1 or 2 displayed in Field 9.

11. To manually resolve individual tape failures with an alarm status of 1 or 2, perform the following:
 - a. Use **NEXT CIRCUIT** to display the tape failure with an alarm status of 1 or 2 on the **MAAP**.

Requirement: Individual tape failures cannot be resolved unless the tape failure is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.

Field 9 (alarm status) displays a 5 indicating the tape failure is resolved in PMIDS.

Note: The **COMMON CONTROL TAPE** fault indicator is turned off if no other tape failures exist.

12. All tape failures with an alarm status of 1 or 2 can be manually resolved when the summary is initially displayed; i.e., upon entry to **PROC 610**, Test 1 and after displaying and recording all tape failures and then using **NEXT CIRCUIT** to display the summary.

Caution: *The tape failures should be displayed and recorded prior to resolving all tape failure alarmed entries in order that a record of the cause of the failure(s) is available for maintenance personnel.*

13. After entering Test 1 and depressing **EXECUTE**, the summary is displayed.

Depress **CLEAR DATA; EXECUTE**.

Note: All tape failures with an alarm status of 1 or 2 are marked as resolved in PMIDS and the **COMMON CONTROL TAPE** fault indicator is turned off.

14. After displaying and recording all tape failures, depress **NEXT CIRCUIT** until the summary is displayed, then depress **CLEAR DATA; EXECUTE**.

All tape failures with an alarm status of 1 or 2 are marked as resolved in PMIDS and the **COMMON CONTROL TAPE** fault indicator is turned off.

15. The **MAJOR** or **MINOR** alarm indicator is also turned off when no other sources affecting the **MAJOR** or **MINOR** alarm indicator are present.

Test 2

Test 2 performs an ID chip test on the tape interface (TN430). The **GREEN** and **RED** LEDs are checked for shorts and opens. A parity/checker function is performed on TN430. If Test 2 cannot be successfully completed, TN430 is reset and the tape subsystem is initialized. A diagnose opcode with read/write option is invoked and self-tests are performed on the tape subsystem.

Test 2 automatically turns off the **COMMON CONTROL TAPE** fault indicator when all alarmed tape failures pass Test 2.

Requirement: Ensure that a tape cartridge is in the HCMR prior to performing Test 2 or the test fails and an invalid replacement sequence is indicated in Fields 2 through 8.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator is turned on.

3. When Test 2 is completed, the **WAIT** indicator turns off and a summary is displayed.

4. If no tape failures exist, the following summary is displayed:

Field 1 - 2.

Field 10 - 0 (Indicating no failures).

5. If any tape failures exist, the summary displays a 2 in Field 1 and the total number of failures in Field 10.

6. Depressing **NEXT CIRCUIT** displays the first failure as follows:

Field 1 - 2.

Fields 2 through 8 - replacement sequence of failing equipment (1, 2, or 3 if appropriate).

Field 9 - Dashed.

Field 10 - Number of failures recorded.

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Field 11 - Index (number of fault codes for displayed failure).

Field 12 - Specific fault code.

Fields 13 through 16 - Dashed.

7. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures.
8. Depressing **NEXT CIRCUIT** after all failures are displayed dashes Fields 2 through 16.
Depressing **NEXT CIRCUIT** once more displays the summary, and the failure history can be stepped through again by use of **NEXT CIRCUIT**.
9. The **COMMON CONTROL TAPE** fault indicator is automatically turned off when Test 2 is completed with no failures detected for all failures that had an alarm status of 1 or 2.

Note: Tape alarmed entries in PMIDS are marked as resolved.

10. The **MAJOR** or **MINOR** alarm indicator is also turned off when no other sources affecting the alarm indicator(s) is present.

Repair Guide

When the **COMMON CONTROL TAPE** and **MAJOR** or **MINOR** fault indicators on the alarm panel are lighted (indicating a tape failure) or when **PROC 610** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Execute Test 1.

Step through the failure history and record the specific fault code for each failure.

Requirement: Ensure that a tape cartridge is in the HCMR prior to performing Test 2 or the test fails and an invalid replacement sequence is indicated in Fields 2 through 8. In addition, ensure that the power switch located on SN446 is in the **ON** position.

2. Execute Test 2 and record the test results including the specific fault code for each tape failure.
 - a. If no tape failures exist, the **COMMON CONTROL TAPE** fault indicator is turned off.

Note: Tape alarmed entries in PMIDS are marked as resolved.

- b. If alarmed tape entries are displayed in Test 1 and no failures are detected in Test 2, perform microdiagnostic 10 when traffic permits to determine if intermittent tape failures exist.
3. If any failures are detected in Test 2, display the tape failure on the **MAAP**.

Note: If TN430 (tape interface) is failing, the **RED** LED in position 18 of TN430 is lighted.

4. Fields 2 through 8 indicate the replacement sequence to be performed in correcting the tape failure by displaying a 1, 2, and 3 in the appropriate fields.

Note: The replacement sequence for tape failures may not have 3 units to replace.

5. Replace the type of equipment indicated by a 1 displayed in one of the equipment type fields (2 through 8).
6. Repeat Test 2.

If Test 2 passes, the **COMMON CONTROL TAPE** fault indicator is turned off and the tape alarmed entries in PMIDS are marked as resolved.

7. If Test 2 fails, replace the next type of equipment (if any) indicated by a 2 displayed in one of the equipment type fields (2 through 8).

Note: Replacement sequence 1 may now be different than the original replacement 1 sequence (indicating the original replacement corrected part but not all of the problem). If replacement sequence 1 is different, replace the type of equipment indicated by a 1 in one of the equipment type fields (2 through 8) instead of the type of equipment indicated by a 2.

If no other replacements are indicated, proceed to Step 10.

8. Repeat Test 2.

If Test 2 passes, the **COMMON CONTROL TAPE** fault indicator is turned off and the tape alarmed entries in PMIDS are marked as resolved.

9. If Test 2 fails, replace the next type of equipment (if any) indicated by a 3 displayed in one of the equipment type fields (2 through 8).

Note: Replacement sequence 2 may now be different than the original replacement 2 sequence (indicating the original replacement corrected part but not all of the problem). If replacement sequence 2 is different, replace the type of equipment indicated by a 2 in one of the equipment type fields (2 through 8) instead of the type of equipment indicated by a 3.

If no other replacements are indicated, proceed to Step 10.

10. Replace the HCMR.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the HCMR.

11. Repeat Test 2.

If Test 2 passes, the **COMMON CONTROL TAPE** fault indicator is turned off and the tape alarmed entries in PMIDS are marked as resolved.

12. If Test 2 fails, further isolation of a tape failure may be accomplished by analyzing the specific fault codes recorded from Test 1 (PMIDS) and Test 2 (DMIDS).
 - a. Determine from Table P, PROC 610 - Specific Fault Code Definitions, if any additional corrective action can be performed (i.e., cabling, connectors, etc.).
 - b. Check the wiring associated with the circuit pack(s) replaced (point to point depending upon specific fault code(s) recorded) and the cabling between the tape interface (TN430) and the HCMR (especially when SN441 and SN446 are indicted).

TABLE P.

PROC 610 - SPECIFIC FAULT CODE DEFINITIONS				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
791	SN443	SN445	SN442	TAPE FAILED TO OPEN
792	TN430			WAITING FOR READ DIRECTORY FOLLOWING AN AUTO OPEN
793	CART			TAPE CARTRIDGE NOT FULLY INSERTED
794	TN430			DIAGNOSE OPCODE TIMED OUT, NO RESPONSE
795	SN446	SN441	TN430	INIT_TAP OPCODE TIMED OUT, DID NOT INITIALIZE
796	TN430			TN430 MAILBOX NOT INITIALIZED
797	TN430			WRITE WITH GOOD PARITY FAILED
798	TN430			CMD WITH BAD PARITY ON HIGH BYTE FAILED
799	TN430			CMD WITH BAD PARITY ON LOW BYTE FAILED
800	TN430			ACCESS TO TN430 FAILED OVER MAINTENANCE BUS
801	TN430			ACCESS TO TN430 FAILED OVER SYSTEM BUS
802	TN430			ACCESS DENIED TO TAPE MONITOR
803	TN430			TAPE SUBSYSTEM IS SHUTDOWN
804	TN430			TAPE SUBSYSTEM RECOVERY IN PROGRESS
805	TN430			INITIALIZATION FAILED
806	TN430			INIT_TAP OPCODE NOT PRECEDED BY RESET
807	TN430			WRITE PROTECT CHECK FAILED IN INITIALIZATION
808	TN430			PARITY CHECK FAILED IN INITIALIZATION
809	TN430			MAILBOX TEST FAILED IN INITIALIZATION
810	TN430			MEMORY MAPPER FAILED IN INITIALIZATION
811	TN430			TN430 BIT SET IN MAINTENANCE REGISTER
812	SN441	SN446		HCMR CONTROLLER BIT SET IN MAINTENANCE REGISTER

TABLE P. (Contd)

PROC 610 - SPECIFIC FAULT CODE DEFINITIONS (Contd)				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
813	SN445	SN443		HCMR SERVO BIT SET IN MAINTENANCE REGISTER
814	SN443	CART	SN445	HCMR TRANSPORT BIT SET IN MAINTENANCE REGISTER
815	SN442	SN441		HCMR DATA ELECTRONICS BIT SET IN MAINTENANCE REGISTER
816	SN446			HCMR POWER BIT SET IN MAINTENANCE REGISTER
817	CART			TAPE PRESENT BIT IS SET
818	TN430			MAINTENANCE REGISTER COPIES DO NOT MATCH
819	SN441	SN446	TN430	NO REPLY FROM HCMR FROM DIAGNOSE OPCODE
820	*	*	*	ERROR IN HCMR FROM DIAGNOSE OPCODE
920	TN430			MONITOR DETECTED ERROR IN TN430 WHILE PROCESSING TAPE REQUEST
921	TN430			MONITOR I/O FAILURE, TIMEOUT, OR TOO MANY RESETS ATTEMPTED
922	SN441			MONITOR DETECTED ERROR IN HCMR WHILE PROCESSING TAPE REQUEST
923	CART			MONITOR DETECTED ERROR WITH TAPE CARTRIDGE WHILE PROCESSING TAPE REQUEST
924	TN430			PATCH RUN TAPE FAILED
925	TN430			RUN TAPE FAILED (ON- OR OFF-LINE)
940	TN430	SN441		ILLEGAL COMMAND TO HCMR. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
941	CART	SN443	SN442	ERROR IN BLOCK HEADER
942	CART			BLOCK NUMBER ERROR. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
943		SN441	TN430	HCMR BUS PARITY ERROR. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
944	CART	SN443	SN445	TAPE MOTION ERROR
945	SN441	SN442	SN443	HCMR DIAGNOSTIC ERROR
946	CART	SN445	SN443	CORRECTABLE DATA ERROR ON TAPE

TABLE P. (Contd)

PROC 610 - SPECIFIC FAULT CODE DEFINITIONS (Contd)				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
947	CART	SN445	SN443	REREAD WAS DONE
948	CART			UNCORRECTABLE DATA ERROR ON TAPE
949		CART		UNABLE TO LOCATE BLOCK. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
950	SN441	SN443	SN445	TAPE OPENING FAILURES
951				RETENSIONS SINCE TN430 RESET
952	SN446	SN441	TN430	NO REPLY FROM HCMR TO A COMMAND
953	SN441	TN430		HCMR RESETS
954	SN446	TN430	SN441	HCMR POWER SUPPLY OUT OF TOLERANCE
955		TN430		SYSTEM BUS TIMEOUTS 1. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
956		TN430		SYSTEM BUS SINGLE 1-BYTE PARITY ERROR. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
957	TN394	SYSBUS		SYSTEM BUS DOUBLE 1-BYTE PARITY ERROR. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
958	TN430			TN430 SANITY TIMEOUTS 1
959		TN430		SYSTEM BUS WRITE ABORTS 1. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
960		TN430		ILLEGAL OPCODE FROM SYSTEM. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
961		TN430		ILLEGAL BLOCK RANGE. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
962		TN430		INCONSISTENT BLOCK RANGE. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
963	CART	SN445	SN443	RETENSIONS IN EXCESS OF LIMITS
964		TN430		OPCODE ABORTED. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
965	TN430	TN394		COMPARISON FAILURES BETWEEN SHARED BUFFER AND SWITCH PROCESSOR MEMORY

TABLE P. (Contd)

PROC 610 - SPECIFIC FAULT CODE DEFINITIONS (Contd)				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
966	SN443			TAPE INSERTIONS SINCE RESET
967	TN430			TIMER AUDIT ERRORS
968	TN430	CART	SN443	DIRECTORY AUDIT ERRORS
969	TN430			MEMORY MAPPER AUDIT ERRORS
970	SN446	TN430		HCMR POWER UP FAILURES. PROBLEM MAY NOT BE IN TAPE SUBSYSTEM
* = Refer to Fields 2 through 8 (equipment) for replacement sequence.				

PROC 611

PROC 611 - COMMON CONTROL TESTS

FLIPCHART ISSUE 2			COMMON CONTROL TESTS										845552223				
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARM. USE 'NEXT CIRCUIT' TO DISPLAY 'NEXT CIRCUIT' TO DISPLAY 'NEXT NEXT FAILED CIRCUIT.'			TEST 2: TESTS ALL CIRCUITS. USE 'NEXT CIRCUIT' TO DISPLAY 'NEXT FAILED CIRCUIT.'			TEST 3: TESTS A PARTICULAR CIRCUIT CONTINUOUSLY. USE 'NEXT CIRCUIT' TO DISPLAY 'NEXT CIRCUIT.'			FIELD LIMITS: ALARM STATUS (FIELD 7): 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED			CIRCUIT TYPE (FIELD 8): 1 = 4MHZ CHANNEL 2 = DUAL SPEED CHANNEL 3 = I/O BUFFER BOARD REMOTE STATUS (FIELD 9): 0 = LOCAL 1 = REMOTE			SPECIAL ERRORS CODES: 81-PCC CIRCUIT RESIDES IN THIS SLOT. TEST IN PROC 651.		
TEST NUMBER	EQUIPMENT LOCATION						ALARM STATUS	CIRCUIT TYPE	REMOTE STATUS	FAILURE INDEX	SPECIAL FAULT CODE	TEST 1		COMMON CONTROL TEST			
	TEST 3											NO OF CHANNELS TRANSLATED	NO OF I/O CKT PACKS				
												TEST 3					
												NUMBER OF TIMES TESTED	NUMBER OF TIMES FAILED				
1	MOD	CAB	CAR	SLOT	CHANNEL					10		11	12	13	611		

Purpose

PROC 611 is used when referenced from **PROC 600** (alarm causes/error log) or when the **COMMON CONTROL I/O CHANNEL** and **MAJOR** fault indicators on the alarm panel are lighted.

PROC 611 is used to:

1. Display the failure history for 4-MHz channels and dual-speed data channels.
2. Manually turn off the fault indicator(s) activated because of 4-MHz channel and/or dual-speed data channel failures.

Note: Common control I/O alarmed circuit entries in PMIDS are marked as resolved.

3. Perform good data test with loop around; serial parity test with loop around; serial parity test with no loop around; and good data test with no loop around on 4-MHz channels and dual-speed data channels.
4. Display 4-MHz and dual-speed data channel failures and indict the I/O buffer circuit when over 50 percent of translated I/O channels fail the tests.
5. Continuously test a specific 4-MHz channel or dual-speed data channel to determine if intermittent failures exist.
6. Automatically turn off the **COMMON CONTROL I/O CHANNEL** fault indicator when all circuits pass Test 2.

Note: Common control I/O alarmed circuit entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 611** flipchart and the possible displays for the fields during execution of the different tests are defined in Table Q, PROC 611 - Field Definitions and Codes.

Optional input fields are: Fields 2 through 6 - Select equipment location of 4-MHz channel or dual-speed data channel to be tested continuously (Test 3 only).

TABLE Q.

PROC 611 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	8	1-3	Circuit type.
2-6		Equipment location.		1	4 MHZ channel.
2	0-99	Module number.		2	Dual speed channel.
3	0-7	Cabinet number.		3	I/O buffer board.
4	0-3	Carrier number.	9	0,1	Remote status.
5	21, 23-30	Slot number.		0	Local.
6	Dash, 0-15	Channel number.		1	Remote.
7	0-5	Alarm status.	10	0-64	Failure index.
	0	No errors recorded.		0-6	Index into PMIDS failures (Test 1 only).
	1	Major.		0-64	Index into DMIDS failures (Test 2 only).
	2	Minor.	11	0-912	Specific fault code.
	3	Warning.	12	0-128	Number of translated I/O Channels (Test 1 only).
	4	Errors recorded.		0-999	Number of times tested (Test 3 only).
	5	Alarm resolved.	13	0-9	Number of I/O channel circuit packs installed (Test 1 only).
				0-99	Number of times failed (Test 3 only).

Operation of Procedure

Overview

PROC 611 is used to determine the cause of the **COMMON CONTROL I/O CHANNEL** and **MAJOR** fault indicators being lighted resulting from a common control 4-MHz channel and/or dual-speed data channel failure.

To call in **PROC 611**, perform the following:

1. Depress **PROC NO; 611; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

PROC 611, Test 1

Three tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Tests all 4-MHz channels and dual-speed data channels.
3. Test 3 - Tests a specific 4-MHz channel or dual-speed data channel continuously.

Test 1

Test 1 provides a failure history of 4-MHz channels, dual-speed data channels, and I/O buffer failures. The failure history is recorded by the on-line periodic software tests.

Test 1 is also used to manually turn off the **COMMON CONTROL I/O CHANNEL** fault indicator.

1. Test 1 is the default test when entering **PROC 611** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. To start Test 1, depress **EXECUTE**.
3. The failure history is sorted first by alarm status and then by circuit type, and a summary is displayed.
4. If no failures occurred, the summary displays a 1 in Field 1, a 0 in Field 10 (indicating no channel failures), the total number of translated channels in Field 12, the total number of I/O circuit packs in Field 13, and all other fields are dashed.
5. If one or more failures occurred, the following summary is displayed:
Field 1 - 1.
Fields 2 through 9 - Dashed.
Field 10 - Total number of channel failures (maximum of 6).
Field 11 - Dashed.
Field 12 - Total number of translated channels.
Field 13 - Total number of 4-MHz and dual-speed circuit packs.
6. Depressing **NEXT CIRCUIT** displays the first failure in order of severity, as follows:
Field 1 - 1.
Fields 2 through 6 - Equipment location of the first failing channel.

Note: If the failure displayed is the I/O buffer circuit pack, Field 6 is dashed.

- Field 7 - Alarm status of failing channel.
Field 8 - Circuit type (1 = 4-MHz channel, 2 = dual-speed data channel, 3 = I/O buffer).
Field 9 - Remote status of failing channel (0 = local, 1 = remote).
Field 10 - Failure index (total number of failures recorded in PMIDS).
Field 11 - Specific fault code recorded for the failing channel.

Field 12 - Total number of channels translated.

Field 13 - Total number of 4-MHz and dual-speed circuit packs.

7. Depressing **NEXT CIRCUIT** repeatedly displays the failure histories of the remaining failing channels.

Each time **NEXT CIRCUIT** is depressed, Field 10 (failure index) is decremented by one.

8. Depressing **NEXT CIRCUIT** after all failing channels are displayed, dashes all fields except Field 1.

Depressing **NEXT CIRCUIT** once more causes Test 1 to be executed, reading and sorting the failure history in PMIDS, and displaying a new summary.

9. The **CLEAR DATA; EXECUTE** sequence can be used to manually resolve individual common control I/O channel failures or all common control I/O channel failures after **EXECUTE** is used to initiate Test 1.

The failures that are resolved are those failures with an alarm status of 1, 2, or 3 displayed in Field 7.

10. To resolve individual common control I/O channel failures with an alarm status of 1, 2, or 3, perform the following:
 - a. Use **NEXT CIRCUIT** to display the failing common control I/O channel with an alarm status of 1, 2, or 3 on the **MAAP**.

Requirement: Individual common control I/O channel failures cannot be resolved unless the failing common control channel is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.

11. Field 7 (alarm status) displays a 5 indicating that the failing common control I/O channel is resolved.

The **COMMON CONTROL I/O CHANNEL** fault indicator is turned off if no other common control channel failures exist.

12. All common control I/O channel failures with an alarm status of 1, 2, or 3 can be resolved when the summary is initially displayed; i.e., upon entry to **PROC 611**, Test 1 and after displaying and recording all common control I/O channel failures and then using **NEXT CIRCUIT** to display the summary.

Caution: *The common control I/O channel failures should be displayed and recorded prior to resolving the common control I/O channel alarmed entries in order that a record of the equipment location and specific fault code of the failure(s) is available for maintenance personnel.*

13. After entering Test 1 and depressing **EXECUTE**, the summary is displayed.

Depress **CLEAR DATA; EXECUTE**.

14. All common control I/O channel failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **COMMON CONTROL I/O CHANNEL** fault indicator is turned off.

Field 10 (failure index) displays a 0 indicating no alarmed common control I/O failures exist.

PROC 611, Test 1 and Test 2

15. After displaying and recording all common control I/O channel failures, depress **NEXT CIRCUIT** until the summary is displayed, then depress **CLEAR DATA; EXECUTE**.
16. All common control I/O channel failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **COMMON CONTROL I/O CHANNEL** fault indicator is turned off.
Field 10 (failure index) displays a 0 indicating no alarmed common control I/O failures exist.
17. The **MAJOR** alarm indicator is also turned off when no other sources affecting the alarm indicator are present.

Test 2

Test 2 performs the following tests to determine the status of 4-MHz channels and dual-speed data channels.

1. Good data test with loop around (data with accurate parity is looped from output to input on the circuit pack without affecting the peripheral) on 4-MHz channels and dual-speed data channels.
2. Serial data-channel parity test with loop around (bad parity is generated and sent with serial data while loop around is in effect) on 4-MHz channels and dual-speed data channels.
3. Good data test with no loop around (correct parity is generated and sent with serial data through the peripheral) on 4-MHz channels only.
4. Serial data-channel parity test with no loop around (bad parity is generated and sent with serial data when loop around is not in effect) on 4-MHz channels only.
5. Buffered bus parity check test with loop around (bad parity is forced on the system and buffered busses) on 4-MHz channels and dual-speed data channels.
6. ID chip test on all 4-MHz channels and dual-speed data channels.

Test 2 also indicates the I/O buffer circuit when over 50 percent of translated channels fail the tests.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

3. While the **WAIT** indicator is on, Test 2 can be halted by depressing **STOP**.

The **WAIT** indicator is turned off and the results of the test up to the time **STOP** was depressed are available beginning with a summary.

Proceed to Step 5.

4. When Test 2 completes, the **WAIT** indicator is turned off and a summary is displayed.

Note: The **GREEN** LED is turned on for any circuit pack that passes Test 2 (TN402, TN403, and/or TN404) if the I/O buffer circuit pack is not failing.

5. If no failures occurred, the summary displays a 2 in Field 1, a 0 in Field 10 (indicating no channel failures), and all other fields are dashed.

6. If one or more failures occurred, the following summary is displayed:

Field 1 - 2.

Fields 2 through 9 - Dashed.

Field 10 - Total number of channel failures.

Fields 11 through 13 - Dashed.

7. Depressing **NEXT CIRCUIT** displays the first failure as follows:

Field 1 - 2.

Fields 2 through 6 - Equipment location of the first failing channel.

Note: If the failure displayed is the I/O buffer circuit pack, Field 6 is blank.

Field 7 - Dashed.

Field 8 - Circuit type (1 = 4-MHz channel, 2 = dual-speed data channel, 3 = I/O buffer).

Field 9 - Remote status of failing channel (0 = local, 1 = remote).

Field 10 - Failure index (total number of failures recorded in DMIDS).

Field 11 - Specific fault code recorded for the failing channel.

Fields 12 and 13 - Dashed.

8. While the failing channel is displayed on the **MAAP**, the **RED** LED on the failing circuit pack is turned on. The **RED** LED is turned off when the display on the **MAAP** no longer corresponds to it.

Note: If over 50 percent of the translated channels fail Test 2, the **RED** LED on the I/O buffer circuit pack is turned on instead of the **RED** LEDs on the channels that failed because of the failing I/O buffer circuit pack.

9. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing channels.

Note: The **RED** LED on the original circuit pack is turned off and the **RED** LED on the displayed circuit pack in Fields 2 through 5 is turned on. The **RED** LED is turned off when the display on the **MAAP** no longer corresponds to it.

Each time **NEXT CIRCUIT** is depressed, Field 10 (failure index) is decremented by one.

10. Depressing **NEXT CIRCUIT** after all failing channels are displayed, dashes all fields except Field 1.

Depressing **NEXT CIRCUIT** once more causes the failure summary information to be displayed again.

11. The **COMMON CONTROL I/O CHANNEL** fault indicator is automatically turned off (indicating the common control I/O alarm cause is resolved) when all common control channels pass Test 2.

Note: Common control I/O alarm entries in PMIDS are marked as resolved.

12. When no other alarm sources affecting the **MAJOR** alarm indicator are present in the switch, the **MAJOR** alarm indicator is also turned off.

PROC 611, Test 3

Test 3

Test 3 is used to continuously test any 4-MHz channel or dual-speed data channel suspected of having intermittent failures, when using test equipment to further isolate a problem, or to trace wiring problems.

Note: I/O buffer circuit packs are not tested in Test 3.

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. When Test 3 is initially called in, a default equipment location may be displayed in Fields 2 through 6.

The alarm status and specific fault code associated with the default equipment location may be displayed in Fields 7 and 11.

Field 2 (module) is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Test 1 or 2 of **PROC 611** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

Either the default equipment location can be tested, or another 4-MHz channel or dual-speed data channel can be selected for testing.

4. A specific 4-MHz channel or dual-speed data channel can be selected for testing by entering the equipment location in Fields 2 through 6 whether or not a default equipment location is displayed:

(Module number of 4-MHz channel or dual-speed data channel to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Channel number to be tested); ENTER.

Proceed to Step 8.

5. A specific 4-MHz data channel or dual-speed data channel can also be selected for testing by use of **NEXT CIRCUIT**.
6. Depress **NEXT CIRCUIT** until the 4-MHz channel or dual-speed channel to be tested is displayed in Fields 2 through 6.

Proceed to Step 8.

7. To test the default equipment location displayed in Fields 2 through 6, proceed to Step 8.
8. To start Test 3 after selecting the 4-MHz channel, dual-speed data channel, or default equipment location to be tested, depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

Note: Special error code 81 (PCC circuit resides in this slot. Test in PROC 651.) will be displayed in the **MAAP** error code field if the specific circuit selected for testing is a Processor Communications Circuit (PCC) instead of a 4-MHz channel or dual-speed data channel.

9. When a default equipment location, 4-MHz channel, or dual-speed data channel is being tested continuously in Test 3, the following fields are updated:

Field 11 - Specific fault code (if any).

Field 12 - Number of times the 4-MHz channel or dual-speed data channel is tested.

Note: If the circuit is tested more than 999 times, Field 12 starts counting over from 0 (i.e., 998, 999, 0, 1, 2, etc.).

Field 13 - Number of times the 4-MHz channel or dual-speed data channel failed Test 3 (if any).

Note: Test 3 stops automatically if the 4-MHz channel or dual-speed data channel tested reaches 99 failures.

10. While Test 3 is executing, the **RED** and **GREEN** LEDs on the circuit pack corresponding to the 4-MHz channel or dual-speed data channel being tested is updated.
- If Test 3 continues to pass, the **GREEN** LED is turned on.
 - At the first failure detected, the **RED** LED is turned on.
 - If the channel being tested passes Test 3 after failing, the **GREEN** LED is turned on.

Note: Only one LED is lighted at a time. If the channel being tested is failing intermittently, the **RED** and **GREEN** LEDs turn on and off to correspond with the failing and passing interactions of each test (as appropriate).

11. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
12. When Test 3 stops automatically (after 99 failures) or after depressing **STOP** while testing a default equipment location, a specific 4-MHz data channel, or dual-speed data channel, the following summary is displayed:

Field 10 - Failure index (number of failure records if any).

Field 12 - Number of times the 4-MHz channel or dual-speed data channel is tested.

Field 13 - Number of times the 4-MHz channel or dual-speed data channel failed Test 3 (if any).

Note: The **GREEN** LED is lighted on the corresponding circuit pack if the 4-MHz channel or dual-speed data channel passed Test 3.

13. When the 4-MHz channel or dual-speed data channel fails Test 3 (indicated by Fields 10 and 13), depressing **NEXT FAULT** displays the first failure record as follows:

Field 1 - 3.

Fields 2 through 6 - Equipment location of 4-MHz channel or dual-speed data channel tested.

Field 7 - Dashed.

Field 8 - Circuit type (1 = 4-MHz channel, 2 = dual-speed data channel).

PROC 611, Test 3

Field 9 - Remote status of failing channel (0 = local, 1 = remote).

Field 10 - Failure index (number of failure records).

Field 11 - Specific fault code.

Field 12 - Number of times the 4-MHz channel or dual-speed data channel was tested.

Field 13 - Number of times the 4-MHz channel or dual-speed data channel failed Test 3.

Note: The **RED** LED is lighted on the corresponding circuit pack if the 4-MHz channel or dual-speed data channel failed Test 3.

14. Depressing **NEXT FAULT** repeatedly displays all the failure records for the 4-MHz channel or dual-speed data channel being tested.

Field 10 (failure index) is decremented each time **NEXT FAULT** is depressed.

15. Depressing **NEXT FAULT** after all failure records are displayed dashes Fields 10 through 13.

Depressing **NEXT FAULT** once more displays the summary information (failure index, number of times tested, and number of times failed).

16. When another 4-MHz channel or dual-speed data channel is to be continuously tested, **NEXT CIRCUIT** or the **CHANGE FIELD** sequence can be used to select the specific circuit:

Depress **NEXT CIRCUIT** until the 4-MHz channel or dual-speed data channel to be tested is displayed in Fields 2 through 6.

CHANGE FIELD; 2; ENTER; (Module number of 4-MHz channel or dual-speed data channel to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Channel number to be tested); ENTER.

17. **EXECUTE** must be depressed to test the 4-MHz channel or dual-speed data channel selected for testing.

Repair Guide

When the **COMMON CONTROL I/O CHANNEL** and **MAJOR** fault indicators on the alarm panel are lighted (indicating a common control channel failure) or when **PROC 611** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Execute Test 1.

Step through the failure history and record the specific fault code for each failure.

2. Execute Test 2 and record the test results including the specific fault code for each common control I/O channel failure.
3. If all common control I/O channels pass Test 2 the common control I/O channel alarm cause(s) is resolved, and the **COMMON CONTROL I/O CHANNEL** fault indicator is turned off.

Note: Common control I/O channel alarmed entries in PMIDS are marked as resolved.

4. If Test 2 passes and 4-MHz channel or dual-speed data channel failures are recorded in Test 1 with an alarm status of 1, 2, or 3 (major, minor, or warning) proceed to Step 10 for further testing to ensure that no intermittent failures exist.
5. If any failures are detected in Test 2, display the common control I/O channel failure on the **MAAP**.

Note: While the failing channel is displayed on the **MAAP**, the **RED** LED on the failing circuit pack is turned on.

6. If over 50 percent of the translated channels fail Test 2, the **RED** LED on the I/O buffer circuit pack is turned on instead of the **RED** LEDs on the channels that failed because of the failing I/O buffer circuit pack.
7. Replace the circuit pack with the **RED** LED lighted.
8. Repeat Test 2.

If Test 2 passes, the **COMMON CONTROL I/O CHANNEL** fault indicator is turned off.

Note: Common control I/O channel alarmed entries in PMIDS are marked as resolved.

9. If Test 2 fails, step through the failures to determine if the same failure exists.
If different failures exist, repeat Steps 3 through 7 (as appropriate).
If the same failure exists, proceed to Step 12.
10. Execute Test 3 and continuously test the suspect 4-MHz channel or dual-speed data channel to determine if it fails.
If the 4-MHz channel or dual-speed data channel passes Test 3, corrective action is complete.
If the 4-MHz channel or dual-speed data channel fails Test 3, replace the circuit pack with the **RED** LED lighted at the equipment location displayed in Fields 2 through 5.
11. Repeat Test 3.
If Test 3 passes, repeat Test 2 to retire the cause of the **COMMON CONTROL I/O CHANNEL** fault indicator.
If Test 3 fails, proceed to Step 12.
12. If Test 2 or 3 fails, further isolation of a common control channel failure may be accomplished by analyzing the specific fault codes recorded from Test 1 (PMIDS) and Test 2 (DMIDS).
 - a. Determine from Table R, PROC 611 - Specific Fault Code Definitions, if any additional corrective action can be performed (i.e., cabling, connectors, etc.).
 - b. Check the wiring associated with the circuit pack(s) replaced (point to point depending upon specific fault code (s) recorded).

TABLE R.

PROC 611—SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
0	NO FAILURE
1	SIO ERROR FROM A MAINTENANCE ROUTINE
826	INVALID SOFTWARE GENERATED FAULT
827	CANNOT SET BOARD TEST STATUS FOR GOOD DATA TEST WITH LOOP-AROUND
828	CANNOT CLEAR BOARD TEST STATUS FOR GOOD DATA TEST WITH LOOP-AROUND
829	CANNOT WRITE TEST VECTOR FOR GOOD DATA TEST WITH LOOP-AROUND
830	ECHO CHECK FAILURE FOR GOOD DATA TEST WITH LOOP-AROUND
831	CANNOT READ STATUS REGISTER FOR GOOD DATA TEST WITH LOOP-AROUND
832	READ FAILED FROM DATA NOT READY FOR GOOD DATA TEST WITH LOOP-AROUND
833	READ FAILED FROM UNKNOWN CAUSE FOR GOOD DATA TEST WITH LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD
834	READ FAILED FROM UNKNOWN CAUSE FOR GOOD DATA TEST WITH LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
835	READ FAILED FROM SERIAL PARITY ERROR FOR GOOD DATA TEST WITH LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD
836	READ FAILED FROM SERIAL PARITY ERROR FOR GOOD DATA TEST WITH LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
837	CANNOT SET BOARD TEST STATUS FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
838	CANNOT CLEAR BOARD TEST STATUS FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
839	CANNOT WRITE TEST VECTOR FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
840	READ DID NOT FAIL FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
841	CANNOT READ STATUS REGISTER FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
842	READ FAILED FROM DATA NOT READY FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
843	READ FAILED FROM UNKNOWN CAUSE FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD

TABLE R. (Contd)

PROC 611—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
844	READ FAILED FROM UNKNOWN CAUSE FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
845	ECHO CHECK FAILED FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
846	CANNOT SET BOARD TEST STATUS FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
847	CANNOT CLEAR BOARD TEST STATUS FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
848	CANNOT WRITE TEST VECTOR FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
849	CANNOT READ STATUS REGISTER FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
850	READ DID NOT FAIL FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
851	READ FAILED FROM DATA NOT READY FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
852	READ FAILED FROM UNKNOWN CAUSE FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD
853	READ FAILED FROM UNKNOWN CAUSE FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
854	ECHO CHECK FAILED FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
855	CANNOT SET BOARD TEST STATUS FOR GOOD DATA TEST WITH NO LOOP-AROUND
856	CANNOT CLEAR BOARD TEST STATUS FOR GOOD DATA TEST WITH NO LOOP-AROUND
857	CANNOT WRITE TEST VECTOR FOR GOOD DATA TEST WITH NO LOOP-AROUND
858	ECHO CHECK FAILURE FOR GOOD DATA TEST WITH NO LOOP-AROUND
859	CANNOT READ STATUS REGISTER FOR GOOD DATA TEST WITH NO LOOP-AROUND
860	READ FAILED FROM DATA NOT READY GOOD DATA TEST WITH NO LOOP-AROUND
861	READ FAILED FROM UNKNOWN CAUSE FOR GOOD DATA TEST WITH NO LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD

TABLE R. (Contd)

PROC 611—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
862	READ FAILED FROM UNKNOWN CAUSE FOR GOOD DATA TEST WITH NO LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
863	READ FAILED FROM SERIAL PARITY ERROR FOR GOOD DATA TEST WITH NO LOOP-AROUND, HOWEVER, THE DATA ECHO CHECK WAS GOOD
864	READ FAILED FROM SERIAL PARITY ERROR FOR GOOD DATA TEST WITH NO LOOP-AROUND AND THE DATA ECHO CHECK WAS BAD
865	CANNOT SET BOARD TEST STATUS FOR BUFFERED BUS PARITY CHECK TEST WITH LOOP-AROUND
866	CANNOT CLEAR BOARD TEST STATUS FOR BUFFERED BUS PARITY CHECK TEST WITH LOOP-AROUND
867	BUFFERED BUS LOW BYTE ERROR NOT DETECTED
868	BUFFERED BUS HIGH BYTE ERROR NOT DETECTED
869	BUFFERED BUS BOTH BYTES IN ERROR NOT DETECTED
898	COMMON CONTROL CARRIER I/O BUFFER BOARD FAILURE
900	CONTROL STATUS REGISTER READ FAILURE FOR GOOD DATA TEST WITH LOOP-AROUND
901	CONTROL STATUS REGISTER ECHO CHECK FAILURE FOR GOOD DATA TEST WITH LOOP-AROUND
902	CONTROL STATUS REGISTER READ FAILURE FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
903	CONTROL STATUS REGISTER ECHO CHECK FAILURE FOR SERIAL DATA CHANNEL PARITY TEST WITH LOOP-AROUND
904	CONTROL STATUS REGISTER READ FAILURE FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
905	CONTROL STATUS REGISTER ECHO CHECK FAILURE FOR SERIAL DATA CHANNEL PARITY TEST WITH NO LOOP-AROUND
906	CONTROL STATUS REGISTER READ FAILURE FOR GOOD DATA TEST WITH NO LOOP-AROUND
907	CONTROL STATUS REGISTER ECHO CHECK FAILURE FOR GOOD DATA TEST WITH NO LOOP-AROUND
908	CONTROL STATUS REGISTER READ FAILURE FOR BUFFERED BUS TEST
909	CONTROL STATUS REGISTER ECHO CHECK FAILURE FOR BUFFERED BUS TEST
910	BUFFERED BUS LOW BYTE ECHO FAILURE
911	BUFFERED BUS HIGH BYTE ECHO FAILURE
912	BUFFERED BUS BOTH BYTES ECHO FAILURE

PROC 612 - INITIALIZATION CAUSES

FLIPCHART									
INITIALIZATION CAUSES									
845552223									
USE 'NEXT FAULT' TO DISPLAY NEXT INIT CAUSE. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARMS. SELECT INIT NO. = 99 AND USE 'CLEAR DATA', 'EXECUTE' TO ZERO ALL MAINTENANCE DATA. 99 IS ONLY VALID INPUT.									
INIT CAUSE CODES (FIELD 3): 1 = SHORT POWER FAIL 2 = MICRO MEM PARITY 3 = SANITY TIME OUT 4 = I/O SANITY TIME OUT 5 = MEMORY PARITY-LOW 6 = MEMORY PARITY-HIGH 7 = MEMORY PARITY-BOTH 8 = ILLEGAL OP CODE 9 = FETCH ABORT 10 = WRITE PROTECT 11 = ILLEGAL MICRO INST 12 = BUS TIME OUT 13 = DUP CHANNEL RECEIVE 14 = DUP ILLEGAL INST 15 = CACHE PARITY-LOW 16 = CACHE PARITY-HIGH 17 = CACHE PARITY-BOTH 18 = 501CC DIAG. REG. 19 = REC FROM SUICIDE 20 = HOLD/GET OVERFLOW 21 = LONG PWR FAIL 22 = MICRO DIAG 15 23 = HOLD GET AREA 24 = BRANCH TO ZERO 25 = INTERRUPT AREA 26 = FALSE ID 27 = 2 PROCESSORS ONLINE 28 = PROCESSOR SUICIDE 29 = 5 SHORT INITs 30 = DUP MEM MATCH 31 = PARITY AUDIT 32 = XRAY PROCESSOR 33 = XRAY MEMORY 34 = MICRO DIAGNOSTIC 35 = PROCESSOR SWITCH 36 = HALT/GO 37 = CACHE RECOVERY 38 = MEM RECOVERY 39 = EMER TRANSFER 40 = NETWORK TEST CONTROLLER 41 = DUPLICATION CHANNEL BAD 42 = I/O									
PROCESSOR HEALTH (FIELD 10): 0 = PASS 2 = SOFT B 1 = SOFT A 3 = HARDWARE NOTE: MEMORY BLOCK SIZE IS 256K.									
INIT FAULT NUMBER	UNIT TYPE	FAULT CODE	ADDRESS		TIME			COMMON CONTROL TESTS	612
			MEMORY BLOCK	ADDRESS IN BLOCK (OCTAL)	DAY	HOUR	MINUTE		
1	2	3	4	5	6	7	8	9	10

Purpose

PROC 612 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS**, **MEM** and/or **CACHE** fault indicator(s) resulting from an initialization cause.

PROC 612 is used to:

1. Display the reasons that caused the common control processor to be initialized.
2. Manually turn off the **OTHER FAILS**, **MEM** and/or **CACHE** fault indicator(s).
3. Clear all maintenance data (failure history) in memory, and turn off all lighted fault indicators (if any) and the **MAJOR**, **MINOR**, and/or **WARNING** alarm indicators if lighted.

Caution: *PROC 612 provides a special feature to clear (zero) all maintenance data (failure history) in the PMIDS portion of memory. Use of this feature removes all failure indications that would normally be investigated by the procedure associated with the failure. This feature is not used in normal troubleshooting activities.*

Field Definitions and Codes

Each field of **PROC 612** flipchart and the possible displays for the fields during execution of the procedure are defined in Table S, PROC 612 - Field Definitions and Codes.

Field 1 is an optional input field for clearing the maintenance data in PMIDS.

Operation of Procedure

PROC 612 is used to determine the cause of the **OTHER FAILS**, **MEM** and/or **CACHE** fault indicator(s) being lighted resulting from an initialization cause.

TABLE S.

PROC 612 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	0-99	Initialization number	3 (Contd)	12	Bus time out.
	0	Summary.		13	Duplication channel receive.
	1-18	Different causes.		14	Duplication illegal instruction.
	99	Used only to clear all failure history in PMIDS.		15	Cache parity low.
2	3, 5, 18	Unit type:		16	Cache parity high.
	3	Initialization.		17	Cache parity both.
	5	Main memory.		18	501CC diagnostic register loaded while 501CC running.
	18	Cache.		19	Recovery from suicide.
3	1-42	Fault code: Initialization causes associated with codes 1 through 18 in Field 1:		20	Hold/Get overflow.
	1	Short power failure.		21	Long power failure.
	2	Micro memory parity.		22	Microdiagnostic Test 15 executed.
	3	Sanity time out.		23	Hold get area overflow or underflow.
	4	Input/output sanity time out.		24	Branch to zero error.
	5	Memory parity low.		25	Interrupt area.
	6	Memory parity high.		26	False identification.
	7	Memory parity both.		27	Two processors (common control) on-line.
	8	Illegal operation code.		28	Processor (common control) suicide.
	9	Fetch abort.		29	Five short initializations.
	10	Write protect.			
	11	Illegal micro instruction.			

TABLE S. (Contd)

PROC 612 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
3 (Contd)	30	Duplication memory match failure.	6 - 8		Time stamp: A beginning time stamp showing the day of the month, hour, and minute when the first error occurred for the fault logged in PMIDS.
	31	Parity error during audit.			
	32	X-ray program detected processor failure.			
	33	X-ray program detected memory failure.	6	1-31	Day of the month.
	34	Microdiagnostic detected failure.	7	0-23	Hour of the day.
			8	0-59	Minute.
			9	0-5	Count to reload: An indicator of the seriousness of the initialization causes leading to a reload of memory.
	35	Processor (common control) switch.	10	0-3	Processor health status:
	36	Halt/Go.		0	No failure.
	37	Cache turned off for recovery.		1-3	Codes 1 through 3 apply to duplicated systems only.
	38	Memory error correction turned off for recovery.		1	Software A failure: Minor.
	39	Emergency transfer.		2	Software B failure: Possible problem in switching processors.
	40	Network test controller.		3	Hardware failure.
	41	Duplication channel bad.			
	42	I/O.			
4	0-77	Failed memory block.			
5	0-777777	Octal address in memory block.			

To call in **PROC 612**, perform the following:

1. Depress **PROC NO; 612; ENTER.**
2. A 0 is displayed in Field 1, and all other fields are dashed.

Note: There is no test selection in this procedure.

Determining Initialization Causes

Depressing **EXECUTE** takes a summary of the failure history and displays it on the **MAAP**.

1. If no failures occurred, Fields 1 and 10 display a 0.
2. If one or more failures occurred, the following is displayed:

Field 1 - Init fault number = 1.

Field 10 - Processor health (0 = pass, 1 = Soft A, 2 = Soft B, 3 = Hardware).

3. Depressing **NEXT FAULT** updates the display as follows:

Field 1 - Init fault number = 1.

Field 2 - Unit type (3 = initialization, 5 = main memory, 18 = cache).

Field 3 - Fault code (initialization cause).

Field 4 - Memory block location (or dashed).

Field 5 - Octal address in memory block (or dashed).

Note: Only certain types of initialization causes display memory block location and octal address in Fields 4 and 5.

Field 6 - Day of the month when the initialization fault code displayed in Field 3 began.

Field 7 - Hour of the day when the initialization fault code displayed in Field 3 began.

Field 8 - Minute of the hour when the initialization fault code displayed in Field 3 began.

Field 9 - Count to reload (indication of the seriousness of the initialization fault code displayed in Field 3 in leading to a reload of memory).

Field 10 - Processor health (0 = Pass, 1 = Soft A, 2 = Soft B, 3 = Hardware).

4. Depressing **NEXT FAULT** displays additional initialization fault codes if more than 1 was logged for the init fault number displayed in Field 1.

Depressing **NEXT FAULT** after all initialization fault codes are displayed, dashes Field 3.

Depressing **NEXT FAULT** once more displays the first initialization fault code starting the sequence over.

5. Depressing **NEXT FAULT** repeatedly sequences the display through the init fault numbers, in chronological order, until the last one is displayed.

Depressing **NEXT FAULT** after all init fault numbers are displayed dashes the display.

Depressing **NEXT FAULT** once more starts the sequence over with the failure history summary.

Turning Off Fault Indicator

To manually turn off the **OTHER FAILS**, **MEM** and/or **CACHE** fault indicator(s) (assuming no other sources are affecting the **OTHER FAILS** fault indicator), perform the following:

1. Depress **CLEAR DATA; EXECUTE**.
2. Fields 1 and 10 display a 0 and all other fields are dashed.

Note: Initialization causes are marked as resolved in PMIDS.

Clear all Maintenance Data

Failure history contained in PMIDS can be cleared (zeroed) when **PROC 612** is loaded from tape without first depressing **EXECUTE**, or when initialized by **RESET**, or after investigating the initialization causes.

Caution: *Using the following sequence removes all failure indications (alarmed entries and entries with recorded errors) that would normally be investigated with the procedure associated with the failure. This sequence is not used in normal troubleshooting activities.*

To clear (zero) maintenance data from PMIDS, perform the following:

1. For **RESET** and after initialization causes are investigated use:
CHANGE FIELD; 1; ENTER; 99; ENTER; CLEAR DATA; EXECUTE.
2. Prior to entering **PROC 612** use:
PROC NO; 612; ENTER; CHANGE FIELD; 1; ENTER; 99; ENTER; CLEAR DATA; EXECUTE.
3. The **WAIT** indicator turns off when the maintenance data is cleared from memory - several seconds after depressing **CLEAR DATA; EXECUTE**.
4. The **MAAP** displays a 0 in Field 10 (processor health status) and all other fields are dashed indicating the maintenance data is cleared from PMIDS.
All lighted fault indicators (if any) and the **MAJOR**, **MINOR**, or **WARNING** alarm indicators (if lighted) are turned off.
5. The only code that can be entered in Field 1 is 99.
Attempting to enter other codes causes special error code 03 (data wrong) to be displayed in the **MAAP** error code field.

Repair Guide

Initialization causes do not usually point to a faulty circuit pack.

1. Maintenance personnel should be aware of what has recently occurred in the switch to determine the corrective action to be taken.
2. Some causes of initialization may be a result of other repair action performed.
In such cases, no repair action is required and the alarm cause may be resolved, after recording pertinent maintenance data using **PROC 612**, by performing the **CLEAR DATA; EXECUTE** sequence.

3. For those situations when further investigation is required for the initialization causes, primary and secondary suspect circuit packs, or other possibilities that should be investigated are listed in Table T, PROC 612 - Initialization Causes Repair Procedure.

TABLE T.

PROC 612 INITIALIZATION CAUSES REPAIR PROCEDURE			
FAULT CODE	INITIALIZATION CAUSE	PRIMARY SUSPECT	SECONDARY SUSPECT
1	Short power failure	Primary dropout	
2	Micro memory parity	TN370, UN151, UN152, UN153	Software
3	Sanity time-out	UN152	Software
4	I/O sanity time-out	TN368	
5	Memory parity—low	TN394	
6	Memory parity—high	TN394	
7	Memory parity—both	TN394	
8	Illegal operation code	TN370, UN151, UN152, UN153	
9	Fetch abort	Look for other init causes	Software, TN368
10	Write protect	Look for other init causes	Software, TN368
11	Illegal micro instruction	TN370, UN151, UN152, UN153	
12	Bus time out	UN153, anything on bus	Software
13	Duplication channel receive	UN158	Cable between channels
14	Duplication illegal instruction	Software	
15	Cache parity—low	TN369	UN153
16	Cache parity—high	TN369	UN153
17	Cache parity—both	TN369	UN153
18	501CC diagnostic register loaded while 501CC running	TN491	
19	Recovery from suicide	Look for other init causes	
20	Hold/Get overflow	Software	UN151
21	Long power failure	Power outage	Power supply

TABLE T. (Contd)

PROC 612 INITIALIZATION CAUSES REPAIR PROCEDURE			
FAULT CODE	INITIALIZATION CAUSE	PRIMARY SUSPECT	SECONDARY SUSPECT
22	Microdiagnostic Test 15	Reload from microdiagnostic Test 15	
23	Hold get area underflow	Software	UN151
24	Branch to zero error	Software	TN370, UN151, UN152, UN153
25	Interrupt area	Software	TN370, UN151, UN152, UN153
26	False identification	Software	TN370, UN151, UN152, UN153
27	Two processors (common control) on-line	UN158	TN490
28	Processor (common control) suicide. Processor suicide is caused by: Entering long initialization four times, two processors (common controls) on line, or I/O failures in at least 75 percent of the cabinets.	Look for other init causes	
29	Five short initializations (Init B)	Look for other init causes	
30	Duplication memory match failure	Software (i.e., patches not in both machines, etc.)	TN390, UN158
31	Parity error during audit	TN394	TN370, UN151, UN152, UN153
32	XRAY program detected processor failure	TN370, UN151, UN152, UN153	
33	XRAY program detected memory failure	TN394	TN368
34	Microdiagnostic detected failure	TN370, UN151, UN152, UN153	
35	Processor (common control) switch	23-hour switch	Manual switch (PROC 613, Test 3), software recovery. (Refer to PROC 600.)
36	Halt/Go	Switch toggled	
37	Cache turned off for recovery	TN369	UN153

TABLE T. (Contd)

PROC 612 INITIALIZATION CAUSES REPAIR PROCEDURE			
FAULT CODE	INITIALIZATION CAUSE	PRIMARY SUSPECT	SECONDARY SUSPECT
38	Memory error correction turned off for recovery	Look for other init causes	No other init causes, refer to PROC 600
39	Emergency transfer	Ensure module processor is working	Ensure TMS is working
40	Network test controller	Software error	Sanity time out
41	Duplication channel bad	Check duplication circuit pack UN158	
42	I/O	Check SIO or TPIO failure	Check circuit pack indicated by address displayed in PROC 612, or check circuit pack TN404

PROC 613 - DUPLICATE PROCESSOR CONTROL AND TEST

FLIPCHART ISSUE 1		+ + DUPLICATE PROCESSOR CONTROL & TEST + +		845552223
(NOTE CONT FROM PROC 613) NOTES: 1. PROCESSOR STATUS (FIELD 2): 0 = OFFLINE 1 = ONLINE 2. SWITCH STATUS (FIELD 10): 0 = SWITCH PERMITTED 1 = SWITCH NOT PERMITTED		ALARM STATUS (FLD 9): 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED		SPECIAL ERROR CODE: 80 = ILLEGAL SWITCH ATTEMPT 81 = OFFLINE DCUI NOT INITIALIZED
WORD 1A				COMMON CONTROL TESTS 613

FLIPCHART ISSUE 5		+ + DUPLICATE PROCESSOR CONTROL & TEST + +		845552223												
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARM. USE 'NEXT FAULT' TO DISPLAY NEXT FAILURE. USE 'NEXT DATA' TO DISPLAY NEXT STAMP INDEX.		TEST 2: TESTS THE DUPLICATION CHANNEL AND DISPLAYS FAILURE CODE IN FIELD 12. USE ONLY IN ONLINE PROCESSOR. TEST 3: DISPLAYS HEALTH CODE OF BOTH PROCESSORS. USE 'NEXT UNIT' TO SWITCH PROCESSORS IF SWITCH STATUS PERMITS.		TEST 1 FAILURE CODES (FIELD 12): SEE DOCUMENTATION. TEST 2 AND 3 FAILURE CODES (FIELD 12): 0 = PASS 1-9 = PROCESSOR STATUS 11-19 = DOUBLE WRITE FF 21-29 = MEMORY UPDATE FF												
31-39 = READ/WRITE 41-49 = BLOCK TRANSFER 51-59 = ID CHIP 61-69 = PARITY 71-94 = UNUSED 95 = SWITCH ATTEMPT FAILED 96 = OFFLINE DCUI NOT INITIALIZED		97 = UNRESOLVED DUPLICATION FAILURE 98 = DUPLICATION STATUS REGISTER 99 = OFFLINE PROCESSOR RELOAD		(CONTINUED ON WORD 1A)												
TEST NO	PRELIMINARY STATUS	HEALTH CODE		HEALTH CODE OF OTHER PROCESSOR	ALARM STATUS	SWITCH STATUS	FAULT INDEX	FAILURE CODE	TIMES FAILED	TIME STAMP			COMMON CONTROL TESTS 613			
		HARDWARE	SWT B	SWT A	HARDWARE	SWT B	SWT A			STAMP INDEX	DAY	HOUR		MINUTE		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Purpose

PROC 613 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a duplicate processor control and test failure.

PROC 613 is used to:

1. Display duplication channel failures.
2. Perform various tests on the duplication circuitry in both processors.
3. Initiate a soft switch from the on-line processor.

Field Definitions and Codes

Each field of **PROC 613** flipchart and the possible displays for the fields during execution of the different tests are defined in Table U, PROC 613 - Field Definitions and Codes.

Field 1 is an optional input field for changing the test number to be executed.

TABLE U.

PROC 613 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	9 (Contd)	2	Minor.
2	0,1	Processor status:		3	Warning.
	0	Off-line.		4	Errors recorded.
	1	On-line.		5	Alarm resolved.
3	0,1	Health code (hardware):	10	0,1	Switch status:
	0	Healthy.		0	Switch permitted.
	1	Bad hardware.		1	Switch not permitted.
4	0,1	Health code (soft B):	11		Fault index:
	0	Healthy.		1-6	Index into failure table.
	1	Major software problem.	12	899-988	Specific fault code (Test 1 only).
5	0,1	Health code (soft A):	12	0-99	Failure codes (Test 2 and 3 only).
	0	Healthy.		0	No failures.
	1	Minor software problem.		1-9	Processor status:
6	0,1	Health code of other processor (hardware):		1	Processor status inconsistency.
	0	Healthy.		2-9	Unused.
	1	Bad hardware.		11-19	Double write flip-flop:
7	0,1	Health code of other processor (soft B):		11	Double write FF cannot be cleared (CDBL fails).
	0	Healthy.		12	Double write FF cannot be set (SDBL fails).
	1	Major software problem.		13-19	Unused.
8	0,1	Health code of other processor (soft A):		21-29	Memory update flip-flop:
	0	Healthy.		21	Memory update FF CF = 0 after CMU.
	1	Minor software problem.		22	Memory update FF cannot be cleared (CMU fails).
9	1-5	Alarm status.			
	1	Major.			

TABLE U. (Contd)

PROC 613					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
12 (Contd)		Failure codes (Contd)	12 (Contd)	41-49	Block transfer:
	21-29	Memory update flip-flop (Contd):		41	Block XFER CF = 0 after DBLK.
	23	Memory update FF CF = 0 after SMU.		42	Cannot read CF = 0 after RWD.
	24	Memory update FF cannot be set (SMU fails).		43	Data mismatch between on-line and off-line memories.
	25-29	Unused.		44-49	Unused.
	31-39	Read/write:		51-59	ID chip:
	31	Read double word CF = 0 on RWD of data X (5555).		51	ID chip test failure.
	32	Read double word CF = 0 on RWD of data X (AAAA).		52-59	Unused.
	33	Read double word CF = 0 on RWD of data X (FFFF).		61-69	Parity:
	34	Read double word CF = 0 on RWD of data X (0000).		61	Parity checker/generator failed on good parity test.
	35	Read double word data does not match X (5555).		62	Parity checker/generator failed on bad parity low byte test.
	36	Read double word data does not match X (AAAA).		63	Parity checker/generator failed on bad parity high byte test.
	37	Read double word data does not match X (FFFF).		64-69	Unused.
	38	Read double word data does not match X (0000).		71-94	Unused.
	39	Unused.		95	Switch attempt failed.
				96	Off-line DCIU not initialized.
				97	Unresolved duplication failure.

TABLE U. (Contd)

PROC 613 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
12 (Contd)	98	Duplication status register failure.	14 (Contd)	3	Time when the displayed failure was alarmed.
	99	Off-line processor in process of reloading.			
13	0-999	Times failed: Total number of times the specific fault code displayed in Field 12 occurred (Test 1 only).	15-17		Time stamp: A time stamp showing the day of the month, hour, and minute when the first or last error occurred, or when the alarm was activated for the displayed failure (Test 1 only).
14	1-3	Stamp Index (Test 1 only).			
	1	Latest time the displayed failure failed a test.		15	1-31 Day of the month.
	2	Time of the first recorded error for the displayed failure.		16	0-23 Hour of the day.
			17	0-59 Minute.	

Operation of Procedure

Overview

PROC 613 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a duplicate processor control and test failure.

To call in **PROC 613**, perform the following:

1. Depress **PROC NO; 613; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Displays processor status and health code of both processors, and tests the duplication channel.
3. Test 3 - Allows updating of the memory and performs a soft switch of processors.

Test 1

Test 1 provides a failure history of duplicate processor control and test failures.

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 613** or is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. A summary of the failure history is displayed.

If no failures (or entries with errors recorded) occurred, the summary displays a 1 in Field 1, a 0 in Field 11 (fault index), and all other fields are dashed.

If one or more failures (or entries with errors recorded) occurred, the summary displays a 1 in Field 1, the total number of failures in Field 11, and all other fields are dashed.

4. The failure history is displayed in alarm order severity. All major alarm failures are displayed first, then entries with errors recorded are displayed.
5. Depressing **NEXT FAULT** displays the first failure (or entry with errors recorded) as follows:

Field 1 - 1.

Field 2 - Processor status (0 = off-line, 1 = on-line).

Fields 3 through 8 - Dashed.

Field 9 - Alarm status of displayed failure (1 = major or 4 = errors recorded).

Field 10 - Dashed.

Field 11 - Total number of failures (maximum of 6).

Field 12 - Specific fault code.

Field 13 - Total number of times the specific fault code displayed in Field 12 occurred.

Field 14 - Stamp index of 1 if alarmed status displayed in Field 9 = 4 (errors recorded) or 3 if alarmed status displayed in Field 9 = 1 (major).

Note: A 1 in Field 14 indicates that Fields 15 through 17 display the time the last error was recorded for the displayed failure. A 3 in Field 14 indicates that Fields 15 through 17 display the time the failure was alarmed.

Fields 15 through 17 - Day, hour, and minute that last error for the displayed failure was recorded in PMIDS or the displayed failure was alarmed.

6. Depressing **NEXT DATA** changes the stamp index and time stamp. Field 14 (stamp index) displays a 2 indicating that the time displayed in Fields 15 through 17 is the time the first error was recorded for the displayed failure.
7. If the displayed failure is alarmed (indicated by a 1 displayed in Field 9), depressing **NEXT DATA** once more changes the stamp index and time stamp. Field 14 (stamp index) displays a 1 indicating that the time displayed in Fields 15 through 17 is the time the last error was recorded for the displayed failure.

PROC 613, Test 1 and Test 2

8. If the displayed failure is not alarmed, depressing **NEXT DATA** again cycles back to the initial display providing a stamp index of 1 or 3 in Field 14, and the time the last error was recorded or the displayed failure was alarmed in Fields 15 through 17.
9. Depressing **NEXT FAULT** repeatedly displays the remaining failures in the PMIDS error log.
10. Each time **NEXT FAULT** is depressed, Field 11 is decremented by 1 to show the number of remaining failures to be displayed.
The fault index (Field 11) includes in its count the failure currently being displayed.
11. **NEXT DATA** can be used to display the stamp index for each failure in the PMIDS error log.
12. Depressing **NEXT FAULT** after all failures are displayed dashes Fields 2 through 17.
Depressing **NEXT FAULT** again causes the display sequence to start over beginning with the summary.
13. The **CLEAR DATA, EXECUTE** sequence is used to manually resolve individual alarmed duplicate processor control failures after **EXECUTE** is used to initiate Test 1.

Note: When alarmed failures are resolved the circuits' failure history is not deleted from the PMIDS error log. The failure history is updated to show that the alarm status now equals 5 (alarm resolved).

14. To resolve individual alarmed failures with an alarm status of 1, perform the following:

Use **NEXT FAULT** to display the alarmed failure on the **MAAP**.

Requirement: Individual duplicate processor control failures cannot be resolved unless the failure is displayed on the **MAAP**.

15. Depress **CLEAR DATA; EXECUTE**.
16. Field 9 (alarm status) displays a 5 indicating that the duplicate processor control failure in PMIDS is marked as resolved.
The **OTHER FAILS** fault indicator is turned off if no other sources affecting the same fault indicator exist.

Test 2

Prior to performing Test 2, verify the following:

1. The **MAAP** is connected to the processor that is on-line; i.e., **CC0** or **CC1**.
2. The off-line processor is not halted.
3. An off-line procedure is not in the off-line processor.

Note: Test 2 may block transfer into the off-line processor's **MAAP** procedure memory buffer and cause the off-line processor to reload if a procedure is in the off-line processor.

4. The **LOCK ON LINE** switch on the alarm panel is set to the **OFF** position.

Test 2 tests the duplication channel with five diagnostic tests.

Caution: *The off-line processor may reload if a procedure is requested in the off-line processor while Test 2 is executing.*

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. To start Test 2, depress **EXECUTE**.
3. Depressing **EXECUTE** begins the diagnostic tests and brings up the following display:
Field 1 - 2.
Field 2 - Processor status (0 = off-line, 1 = on-line).
Fields 3 through 8 - Health codes of both processors.
Field 12 - Dashed or failure code.
4. Test 2 can be stopped and restarted by depressing:
STOP; EXECUTE.
5. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.
6. When **STOP** is depressed, the results of the test are displayed in Field 12.
Zero (0) displayed in Field 12 - Indicates the test passed.
One (1) through 99 displayed in Field 12 - Indicates the test failed.

Note: If 99 is displayed in Field 12, Test 2 should be repeated when the off-line processor completes reloading.
7. The **OTHER FAILS** fault indicator is automatically turned off (indicating the duplicate processor alarm cause is resolved) when Test 2 passes and all other sources of the **OTHER FAILS** fault indicator are cleared.

Test 3

A soft switch of the common controls **cannot** be performed if the local **MAAP/SMT**, remote ports, or run tape port contention modes are active (other than the access point **PROC 613** is using).

Prior to performing Test 3, verify the following:

1. The **MAAP** is connected to the processor that is on-line, i.e., **CC0** or **CC1**.
2. The off-line processor is not halted.
3. An off-line procedure is not in the off-line processor.

Note: Test 3 may block transfer into the off-line processor's **MAAP** procedure memory buffer and cause the off-line processor to reload if a procedure is in the off-line processor.

PROC 613, Test 3

4. The **LOCK ON LINE** switch on the alarm panel is set to the **OFF** position.
5. The port contention modes are not active.
 - a. Depress **MODE**.
 - b. Examine Fields 9 through 13 of the **MODE** display procedure to determine if encodes 0 through 4 are displayed.

If encode 0 is displayed, it should be the local **MAAP's** current port that you are using.

If encode 3 or 4 is displayed, determine from Fields 6 and 7 if the agent encode displayed is 10 (runtape).
 - c. If any of the encodes are displayed, obtain full release of all remote ports, and the pseudo port performing a **RUNTAPE** by contacting the appropriate users.

Note: After the soft switch is completed and the necessary repair action is performed, notify the previous users that you have completed your task in order for them to perform their task(s).

Test 3 allows for the memory updating of the off-line processor and the soft switching of processors.

Caution: *The off-line processor may reload if a procedure is requested in the off-line processor while Test 3 is executing.*

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. To start Test 3, depress **EXECUTE**.
3. Depressing **EXECUTE** allows operation of **NEXT UNIT** and displays the following:

Field 1 - 3.

Field 2 - Processor status (0 = off-line, 1 = on-line).

Fields 3 through 8 - Health code of both processors.

Field 10 - Processor switch status.

Field 12 - Dashed or failure code.
4. Depressing **NEXT UNIT** enables a processor switch if the switch status displayed in Field 10 allows a switch to be made.
5. To perform a soft switch of processors, check the switch status in Field 10.
6. If Field 10 equals 1, a soft switch cannot be performed.

Note: If a switch of processors is still required, a hard switch using the **HALT/GO** switch on the alarm panel **must** be used.

Caution: *A hard switch causes a disruption of service.*

7. If Field 10 equals 0, a soft switch of processors is possible.

8. Depress **NEXT UNIT** to initiate the switch.

Note: Special error code 09 (PROC must run on on-line processor) is displayed in the **MAAP** error code field if **NEXT UNIT** is depressed while the **MAAP** is connected to the off-line processor. Special error code 80 (illegal switch attempt) is displayed in the **MAAP** error code field if **NEXT UNIT** is depressed and the off-line processor is unhealthy or the remote ports and runtape port contention modes are active.

9. The **WAIT** indicator on the **MAAP** is lighted while the status memory is being transferred from the on-line memory to the off-line memory.

The **PASS** indicator (heartbeat) of the off-line common control goes off while the status memory is being transferred.

10. If, after the **WAIT** indicator turns off, the switch status in Field 10 equals 0 and Fields 2 through 8 and 12 are dashed, the switch is successful.

The **PASS** indicators on both common controls are flashing and the **CC** active indicator changes to the new on-line processor.

11. The processor is now off-line and the **OTHER FAILS** fault indicator is automatically turned off if a switch failure was its only cause.
12. The original off-line **MAAP** (if provided and connected to the alarm panel) displays **PROC 613**, Test 3 with a 1 displayed in Field 2 (processor status), 0's displayed in Fields 3 through 5 (health codes), and a 0 displayed in Field 10 (switch status).

Note: The now on-line **MAAP** is operational, however any translation or maintenance procedure (including **PROC 613**) to be used **must** be called in.

13. If the switch failed, indicated by a 1 displayed in Field 2 (processor status) and failure code 95 (switch attempt failed) displayed in Field 12 (failure code), the off-line processor is probably reloading.
14. After the off-line processor has reloaded (as the result of a switch failure), select Test 2, depress **EXECUTE**, and check the status of the duplication channel.

In addition, use the **MODE** display procedure to ensure that the remote ports and the runtape agent are not active.

Repair Guide

When a duplicate processor control and test failure is indicated; **PROC 613** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted; or when a soft switch is attempted and fails, perform the following steps in the order listed to isolate and repair the faulty unit.

Prior to performing the repair procedure, verify the following:

1. The **MAAP** is connected to the processor that is on-line; i.e., **CC0** or **CC1**.
2. The off-line processor is not halted.

PROC 613

3. An off-line procedure is not in the off-line processor.

Note: Test 2 or 3 may block transfer into the off-line processor's **MAAP** procedure memory buffer and cause the off-line processor to reload if a procedure is in the off-line processor.

4. The **LOCK ON LINE** switch on the alarm panel is set to the **OFF** position.

Caution: *The off-line processor may reload if a procedure is requested in the off-line processor while Test 2 or 3 is executing.*

5. The port contention modes are not active.
 - a. Depress **MODE**.
 - b. Examine Fields 9 through 13 of the **MODE** display procedure to determine if encodes 0 through 4 are displayed.

If encode 0 is displayed, it should be the local **MAAP's** current port that you are using.

If encode 3 or 4 is displayed, determine from Fields 6 and 7 if the agent encode displayed is 10 (runtape).
 - c. If any of the encodes are displayed, obtain full release of all remote ports and the pseudo port performing a **RUNTAPE** by contacting the appropriate users.

Note: After the soft switch is completed and the necessary repair action is performed, notify the previous users that you have completed your task in order for them to perform their task(s).

Duplicate processor control and test failure indicated

1. Execute Test 1 and record the failure history including the specific fault code for each failure.
2. Execute Test 2 and record the failure codes (if any).
3. If no failures are recorded in Test 2, attempt a soft switch of processors using Test 3.

If the soft switch is successful, repeat Test 2 to turn off the **OTHER FAILS** fault indicator (assuming no other sources are affecting the **OTHER FAILS** fault indicator).

If Test 2 passes, corrective action is complete and the duplicate processor control and test alarmed entry in PMIDS is marked as resolved.
4. If the soft switch fails, indicated by a 1 in Field 2 (processor status) and failure code 95 (switch attempt failed) displayed in Field 12 (failure code), proceed to Step 2 of the **Soft switch failure indicated** repair procedure (listed below).
5. When failures are recorded, refer to Table V, PROC 613 - Duplicate Processor Control and Test Repair Procedure, and perform the corrective action indicated for the failure code recorded.
6. After circuit pack replacement, use **PROC 612** to clear the health code of the off-line processor.
7. Enter **PROC 613** Test 3, and attempt a soft switch.

8. If the soft switch is successful, repeat Test 2 to turn off the **OTHER FAILS** fault indicator (assuming no other sources are affecting the **OTHER FAILS** fault indicator).
If Test 2 passes, corrective action is complete and the duplicate processor control and test alarmed entry in PMIDS is marked as resolved.
9. If Test 2 or the soft switch fails (indicated by a 1 in Field 2 and a failure code of 95 in Field 12), repeat Steps 5 through 8 until all circuit packs listed in Table V, PROC 613 - Duplicate Processor Control and Test Repair Procedure for the failure code recorded are replaced.
10. If the soft switch still fails and Test 2 passes, perform Steps 2 through 7 of the **Soft switch failure indicated** repair procedure (listed below).
If Test 2 still fails, refer to **Specific Fault Codes** for further isolation techniques.

Soft switch failure indicated

1. Execute Test 2 and record the results.
If Test 2 fails, perform steps 5 through 10 of the **Duplicate processor control and test failure indicated** repair procedure (above).
2. Use the **MODE** display procedure to ensure that the remote ports and the runtape agent are not active.
3. If the fault was not found in Test 2, replace the following circuit packs in the order listed:
UN158 - In the off-line processor.
UN158 - In the on-line processor.
4. After each circuit pack replacement, use **PROC 612** to clear the health code of the off-line processor.
5. Enter **PROC 613** Test 3, and attempt a soft switch.
6. If the soft switch is successful, repeat Test 2 to turn off the **OTHER FAILS** fault indicator (assuming no other sources are affecting the **OTHER FAILS** fault indicator).
If Test 2 passes, corrective action is complete and the duplicate processor control and test alarmed entry in PMIDS is marked as resolved.
7. If Test 2 or the soft switch fails (indicated by a 1 in Field 2 (processor status) and a failure code of 95 (switch attempt failed) in Field 12), repeat Steps 4 through 6 until all circuit packs listed in Step 3 are replaced.
If Test 2 or the soft switch still fails, refer to **Specific Fault Codes** for further isolation techniques.

Soft A or Soft B

After all repair actions are performed and soft A or soft B failure indications are still displayed (1 in Fields 4, 5, 7, and/or 8), execute **PROC 600** Test 2 to determine if any common control problems exist.

TABLE V.

PROC 613 DUPLICATE PROCESSOR CONTROL AND TEST REPAIR PROCEDURE	
FAILURE CODE	CORRECTIVE ACTION
1	Replace the following components in the order listed, testing after each replacement, until the failure is corrected: A. UN158 in the on-line processor. B. UN158 in the on-line processor. C. Cabling between the UN158 circuit packs. D. TN491 in the on-line processor.
11, 12, 51, 61 through 63, and 98	Replace UN158 in the on-line processor.
21 through 24	Replace UN151 in the on-line processor.
31 through 34, 41, and 42	Perform the necessary checking, then replace the following components in the order listed, testing after each replacement, until the failure is corrected: A. Investigate off-line common control failures using PROC 600 (Unit type 4). Take corrective action as appropriate. B. UN158 in the off-line processor. C. UN158 in the on-line processor. D. Cabling between the UN158 circuit packs.
35 through 38, 43, and 97	Replace the following components in the order listed, testing after each replacement, until the failure is corrected: A. UN158 in the off-line processor. B. UN158 in the on-line processor. C. Cabling between the UN158 circuit packs.
96	Check off-line DCIU status using PROC 650.
99	Stop and re-execute Test 2 after the off-line processor has completed reloading.

Specific Fault Codes

A specific fault code is a number used to provide a description of a failure.

1. This description provides more detail about the failure associated with a circuit.
2. Specific fault codes are recorded during periodic or time available testing in PMIDS.

Table W, PROC 613 - Specific Fault Code Definitions, lists the specific fault codes in numerical sequence with a definition for each specific fault code.

Further isolation of a failure may be accomplished as follows:

1. Analyze the specific fault codes recorded from PMIDS.
2. Determine from the specific fault codes recorded (using Table W, PROC 613 - Specific Fault Code Definitions) if any additional corrective action can be performed (i.e., cabling, connectors, etc.).
3. Check the wiring associated with the circuit pack(s) and/or components replaced (point to point depending upon specific fault codes recorded).

TABLE W.

PROC 613 - SPECIFIC FAULT CODE DEFINITIONS				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
899	UN158			UNABLE TO SWITCH COMMON CONTROLS
915	UN158			OFF-LINE COMMON CONTROL NOT EQUIPPED IDENTICALLY TO ON-LINE COMMON CONTROL
934	UN158			PERIODIC SWITCH OF COMMON CONTROL FAILED
973	UN158/F [1]			RWD CF FAILURE BECAUSE THE OFF-LINE SYSTEM BUS WAS BUSY
974	UN158			ATTEMPT TO SWITCH BECAUSE OF I/O FAILURES FAILED
975	UN158/F [1]	UN158/N [2]	CABLE	UN158 DOUBLE WRITE FAILURE ERROR FLAG FOUND BY THE MAINTENANCE PERIODIC TEST
976	UN158/F [1]	UN158/N [2]	CABLE	UN158 INSTRUCT FAR PROCESSOR FAILURE OR READ DOUBLE WORD FAILURE ERROR FLAG FOUND BY THE MAINTENANCE PERIODIC TEST
977	UN158/F [1]	UN158/N [2]	CABLE	UN158 NEAR END FAILURE ERROR FLAG FOUND BY THE MAINTENANCE PERIODIC TEST
978	UN158/F [1]	UN158/N [2]	CABLE	UN158 DOUBLE WRITE FAILURE ERROR FLAG SET BY THE MAINTENANCE PERIODIC TEST
979	UN158/F [1]	UN158/N [2]	CABLE	UN158 INSTRUCT FAR PROCESSOR FAILURE OR READ DOUBLE WORD FAILURE ERROR FLAG SET BY THE MAINTENANCE PERIODIC TEST
980	UN158/F [1]	UN158/N [2]	CABLE	UN158 NEAR END FAILURE ERROR FLAG SET BY THE MAINTENANCE PERIODIC TEST

TABLE W. (Contd)

PROC 613 - SPECIFIC FAULT CODE DEFINITIONS				
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
981	UN158/N [2]			UNABLE TO SET DOUBLE WRITE CAPABILITY
982	UN158/N [2]	UN158/F [1]	CABLE	READ DOUBLE WORD INSTRUCTION FAILED BY RETURNING A CONDITION FLAG OF ZERO
983	UN158/F [1]	UN158/N [2]	CABLE	READ DOUBLE WORD INSTRUCTION FAILED TO EXECUTE PROPERLY, SETTING THE READ DOUBLE WORD FAILURE ERROR FLAG
984	UN158/F [1]	UN158/N [2]	CABLE	DOUBLE WRITTEN TEST VECTOR FAILED THE ECHO CHECK
985	UN158/N [2]			UNABLE TO CLEAR THE STATUS REGISTER
986	UN158/N [2]			UN158 CONTROL REGISTER AND STATUS REGISTER DISAGREE AS TO DOUBLE WRITE STATUS
987	UN158/N [2]			UNABLE TO READ THE UN158 DOUBLE WRITE SELECT REGISTER
988	UN158/N [2]			UNABLE TO WRITE TO THE UN158 DOUBLE WRITE SELECT REGISTER
[1] F = FAR END OF THE DUPLICATION CHANNEL (MOST LIKELY IN THE OFF-LINE COMMON CONTROL) [2] N = NEAR END OF THE DUPLICATION CHANNEL (MOST LIKELY IN THE ON-LINE COMMON CONTROL)				

PROC 614 - MEMORY READ/MEMORY MATCH TESTS

FLIPCHART ISSUE 1		+ +		MEMORY READ/MEMORY MATCH TESTS		+ +		845552223	
NOTES: 1. THE MEMORY MATCH TESTS (2-4) COMPARE THE CONTENTS OF CORRESPONDING LOCATIONS IN DUPLICATED COMMON CONTROLS. THE RANGE OF MEMORY TESTED IS RESTRICTED TO THE PROGRAM PATCH AND TRANSLATION AREAS. TEST 5 IS NOT RESTRICTED AND ALLOWS THE CONTENTS OF MEMORY TO BE READ OVER THE FULL RANGE OF MEMORY. 2. MEMORY ADDRESSES AND CONTENTS ARE DISPLAYED IN OCTAL.		MEMORY AREA CODE (FIELD 7): 1 = PROGRAM ONLY 2 = PATCH ONLY 3 = PROGRAM & PATCH 4 = TRANSLATION ONLY 5 = PROGRAM & TRANSLATION 6 = PATCH & TRANSLATION 7 = PROGRAM PATCH & TRANSLATION		8 = OTHER 9 = PROGRAM & OTHER 10 = PATCH & OTHER 11 = PROGRAM, PATCH & OTHER 12 = TRANSLATION & OTHER		13 = PROGRAM, TRANSLATION & OTHER 14 = PATCH, TRANSLATION & OTHER 15 = PROGRAM, PATCH, TRANSLATION & OTHER		SPECIAL ERROR CODES: 74-MEMORY MATCH TEST NOT PERFORMED 80-LOCATION OUT OF MEMORY RANGE 82-USE PROC 613 TO CLEAR DUPLICATION CHANNEL FAILURES	
								NOTE: MEMORY BLOCK SIZE IS 256K.	
WMD O		FAILURE CODE (FIELD 8): 0 = NO FAILURES 1 = MEMORY MISMATCHES 2 = PARITY ERRORS 3 = MEMORY SCRUB ERROR 4 = DUPLICATION CHANNEL ERRORS 5 = MEMORY I/O ERRORS		6 = MEMORY ID CHIP ERRORS 7 = PARITY CHECK ERRORS 8 = HARD FAILURE 9 = ECC TURNED OFF 10 = CACHE NOT PRESENT 11 = CACHE TURNED OFF 12 = CACHE ID CHIP ERROR 13 = LESS THEN 50% SUPERSETS FAILED		14 = 50% OR MORE SUPERSET FAILED 15 = TAG/VALID ERROR 16 = CACHE I/O FAILURE 17 = CACHE INVALIDATION FAILURE		COMMON CONTROL TESTS	
								614	

FLIPCHART ISSUE 1		+	+	MEMORY READ/MEMORY MATCH TESTS		+	+	845552223			
TEST 1: DISPLAYS A MEMORY FAILURE. USE 'NEXT FAULT' TO ADVANCE AND DISPLAY NEXT FAILURE. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARM, OR ALL MEMORY ALARMS WHEN EXECUTED WITH A SUMMARY DISPLAYED.		TEST 2: TESTS MEMORY ID CHIPS AND LOCATIONS. DISPLAYS SUMMARY AND RANGE OF MEMORY TESTED.		TEST 3: TESTS MEMORY LOCATIONS AND DISPLAYS RANGE OF FAILED BLOCK. DISPLAYS TYPE OF FAILURE AND MEMORY AREA FOR FAILED BLOCK. USE 'NEXT FAULT' TO ADVANCE TO NEXT BLOCK. USE 'NEXT DATA' TO DISPLAY CONTENTS OF FIRST MEMORY LOCATION IN ON-LINE CC, THEN FIRST MEMORY LOCATION IN OFF-LINE CC, THEN ADVANCE TO NEXT MEMORY LOCATION IN ON-LINE CC.		TEST 4: TESTS SPECIFIED RANGE OF MEMORY CONTINUOUSLY.		TEST 5: READS THE CONTENTS OF ANY MEMORY LOCATION OR ANY RANGE OF MEMORY LOCATIONS. USE 'EXECUTE' TO DISPLAY CONTENTS OF FIRST MEMORY LOCATION IN ON-LINE CC. USE 'NEXT DATA' TO DISPLAY CONTENTS OF FIRST MEMORY LOCATION FOR OFF-LINE CC. SUBSEQUENT 'NEXT DATA' OPERATIONS FUNCTION AS IN TEST 3.		TEST 6: CONTINUOUS TEST OF ID CHIP AND SUPERSETS OF THE CACHE MEMORY. USE 'EXECUTE' TO DISPLAY FIRST FAILURE. USE 'EXECUTE' TO ADVANCE AND DISPLAY 'NEXT FAILURE'.	
TEST NO	MEMORY LOCATIONS			COMMON CONTROL	TESTS 2&3 TOTAL FAILED WORDS		MEMORY AREAS	TESTS 1,2,3 TOTAL FAILED BLOCKS		COMMON CONTROL TESTS	
	TESTS 3,4,&5				TESTS 3&5 CONTENTS OF FIRST MEMORY LOCATION			TESTS 1,3,4&6 FAILURE CODE			
	TESTS 4&5										
1	MEMORY BLOCK	2	TEST 6 CACHE TAG/VALID OR SUPERSET	3	MEMORY BLOCK	4	5	6	7	8	614

Purpose

PROC 614 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s) resulting from a memory and/or cache failure.

PROC 614 is used when the mismatch flag is set or to read the contents of a memory location.

The mismatch flag is set when any of the following conditions exist:

1. The on-line memory comparison test detects a mismatched memory condition.
2. A double write operation fails to function correctly.
3. The run tape program detects a mismatch.

PROC 614 tests main and cache memory subsystems:

1. All main memory circuit packs and the processor memory interface are tested.
2. The cache memory circuit pack is tested.

PROC 614

Field Definitions and Codes

Each field of **PROC 614** flipchart and the possible displays for the fields during execution of the different tests are defined in Table X, PROC 614 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 and 3 - Select a specific memory block and address within the memory block to begin testing (Tests 3 through 5 only).
3. Field 3 - Select a specific cache superset to test (Test 6) only.
4. Field 4 - Select a specific memory block to end the test (Tests 4 and 5 only).

Operation of Procedure

Overview

PROC 614 is used to determine the cause of the **MEM** and/or **CACHE MEMORY** fault indicator(s) being lighted resulting from a memory or cache failure.

To call in **PROC 614**, perform the following:

1. Depress **PROC NO; 614; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Six tests are available:

1. Test 1 - Displays main memory and cache memory failures detected by the on-line memory read/memory match and cache memory programs.
2. Test 2 - Provides a picture of the switch's overall memory (main and cache) health.
3. Test 3 - Provides specific groups of unbroken failure blocks and displays the contents of each of the failed main memory locations within the failed block for each processor.
4. Test 4 - Allows continuous testing of a specified range of main memory locations.
5. Test 5 - Reads the contents of any main memory location, or any range of main memory locations, for each processor in a duplicated switch.
6. Test 6 - Tests a specified range of supersets of cache memory.

Tests 2 and 3 perform an ID chip and parity check test on each memory circuit pack.

Tests 2 through 4 (memory match tests) compare the contents of corresponding locations in duplicated common controls. The range of memory compared in Tests 2 through 4 is restricted to the program, patch, and translation areas.

TABLE X.

PROC 614 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-6	Test number.	7		Memory area code:
2	0-77	Octal memory block number (1 block = 256K).		1	Program only.
3	0-777777	Octal address within the memory block of Field 2.		2	Patch only.
	0-255	Cache superset failing in decimal.		3	Program and patch.
4	0-77	Octal memory block number (1 block = 256K).		4	Translation only.
				5	Program and translation.
5		Processor memory is being read from:		6	Patch and translation.
	0	On-line common control.		7	Program, patch, and translation.
	1	Off-line common control.		8	Other.
				9	Program and other.
				10	Patch and other.
				11	Program, patch, and other.
				12	Translation and other.
				13	Program, translation, and other.
				14	Patch, translation, and other.
				15	Program, patch, translation, and other.
6	0-16777215	Total number of failed words in decimal (Test 2); total number of failed words in decimal which displays upon test completion (Test 3).	8	0-77	Total failed blocks (Test 2); total failed blocks which are displayed at the completion of the test (Test 3).
	0-177777	Octal contents of memory location in Fields 2 and 3 are displayed when NEXT DATA is pressed (Test 3); octal contents of memory location in Fields 2 and 3 are displayed when EXECUTE or NEXT DATA is pressed (Test 5).			Failure code (Tests 1, 3, 4, and 6):
				0	No failures.
				1	Memory mismatches.
				2	Parity errors.
				3	Memory scrub error.
				4	Duplication channel errors.

TABLE X. (Contd)

PROC 614 FIELD DEFINITIONS AND CODES (Contd)		
FIELD	CODE	DEFINITION
8 (Contd)		Failure code (Tests 1, 3, 4, and 6) (Contd):
	5	Memory I/O errors.
	6	Memory ID chip errors.
	7	Parity check errors.
	8	Hard failure.
	9	ECC turned off.
	10	Cache not present.
	11	Cache turned off.
	12	Cache ID chip error.
	13	Less than 50% supersets failed.
	14	50% or more supersets failed.
	15	Tag/valid error counter failure.
	16	Cache I/O failure.
	17	Cache invalidation failure.

In addition, Tests 2 through 4 perform a hard fault test over the full range of main memory.

Test 5 is not restricted and displays the contents of memory to be read over the full range of main memory.

All tests can be executed on an unduplicated switch. For an unduplicated switch, Tests 2 through 4 do not perform the memory comparison test.

Test 1

Test 1 provides a history of all failed memory locations (main and cache) recorded by the on-line memory read/memory match and cache memory programs.

Test 1 can also be used to manually turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s).

1. Test 1 is the default test when entering **PROC 614** or is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.

3. If the on-line program has not detected memory (main and cache) failures, a 0 is displayed in Field 8.
4. If failures are recorded, the following summary is displayed:
Field 1 - 1.
Fields 2 through 7 - Dashed.
Field 8 - Total failed blocks recorded.
5. Depressing **NEXT FAULT** displays the first failure as follows:
Field 1 - 1.
Field 2 - Starting block number or dashed.
Field 3 - 0 (main memory location for block number displayed in Field 2) or 1-255 (cache superset indicator).
Fields 4 through 7 - Dashed.
Field 8 - Failure code.

Note: Main memory failures are displayed first then cache memory failures. If no main memory failures are recorded, the initial display is a cache failure.
6. Depressing **NEXT FAULT** repeatedly displays the remaining failures.
When all failures are displayed, Fields 2 through 8 are dashed.
Depressing **NEXT FAULT** once more starts the sequence over displaying the failure summary.
7. Depressing **NEXT UNIT** when the summary is displayed or after displaying the first main memory failure (etc.) displays cache memory failures (if any).
Depressing **NEXT UNIT** when the summary is displayed decrements Field 8 corresponding to the number of main memory failures passed over (if any).
NEXT FAULT is used to display the cache memory failures.
8. To manually turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s) after Test 1 is executed at least once, perform the following:
 - a. Depress **NEXT FAULT** until a summary is displayed (Field 1 = 1, Field 8 = total number of failures and all other fields are dashed).
 - b. Depress **CLEAR DATA; EXECUTE**.

Note: Memory read/memory match failures are marked as resolved in PMIDS.

Test 2

Test 2 performs an ID chip and parity check test, then runs a single pass test of all testable main memory. If the common control is duplicated, a comparison of the two memories is performed by Test 2.

A memory area code (Field 7) indicates the area of memory where the failures occurred (i.e., program, patch, translation, other, or any combination of the four areas).

PROC 614, Test 2

Test 2 automatically turns off the **MEM** and/or **CACHE MEMORY** fault indicator(s) when all testable main memory locations are tested successfully.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. When Test 2 is initially called in, Fields 2 and 3 display a 0 (first block and address in memory) and Field 4 displays the last memory block in the switch.
3. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

Note: Test 2 takes approximately 5 minutes to test each block of 256K words. The total amount of time for Test 2 depends on the memory configuration of the switch (i.e., approximately 5 minutes times the number of 256K blocks).

4. While Test 2 is executing, Field 3 (address within the main memory block being tested) is updated every second.
5. The following fields are updated every second if failures occur:

Field 6 - Number of failed words.

Field 7 - Area of memory where the failure occurred.

Field 8 - Number of failed blocks.

Note: Field 2 (memory block) is updated when a memory block is tested (approximately every 5 minutes).

6. When Test 2 is completed, the **WAIT** indicator turns off and the following summary is displayed:

Field 1 - 2.

Fields 2 and 3 - Memory location of last location tested (block number and address in block).

Field 4 - Last memory block tested (equal to last memory block in the switch configuration).

Field 5 - Dashed.

Field 6 - Total number of failed words (if any).

Field 7 - Area of memory where the failure occurred (if any).

Field 8 - Total number of failed blocks (if any).

Note: Special error code 74 (memory match test not performed) is displayed in the **MAAP** error code field when Test 2 is performed on an unduplicated switch, indicating that tests other than the memory match test was performed.

7. If all testable memory locations are tested successfully, 0s are displayed in Fields 6 and 8.
8. Special error code 82 (use **PROC 613** to clear duplication channel failures) is displayed in the **MAAP** error code field after Test 2 completes if failure code 4 (duplication channel error) is detected.

Note: **PROC 613** is used to correct duplication channel errors.

9. Depressing **STOP**, while Test 2 is executing, halts the test and displays the last memory block and memory address in the block tested in Fields 2 and 3. Field 4 displays the last testable memory block in the switch configuration.
Field 6 displays the total number of failed words (if any), and Field 8 displays the total number of failed blocks (if any).
10. Depressing **EXECUTE** after depressing **STOP** starts Test 2 over from the beginning of memory.
11. The **MEM** and/or **CACHE MEMORY** fault indicator(s) is automatically turned off when Test 2 completes with no failures detected for all testable main memory locations.

Test 3

Test 3 is used to test all main memory locations of the program, patch, translation, and other areas from the first memory location to the end of testable memory. Test 3 also performs an ID chip and parity check test.

Test 3 stops when a contiguous block of failed main memory locations is identified. (A contiguous block may be as small as one memory location or as large as all of testable main memory.)

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. When Test 3 is initially called in, Fields 2 and 3 display a 0 (first block and address in memory) and Field 4 displays the last memory block in the switch configuration.
Field 2 is blinking indicating an optional entry field.
3. A starting memory block and memory location can be selected for testing or the entire main memory can be tested.
4. To test the entire main memory, proceed to Step 6.

Note: Test 3 takes approximately 5 minutes to test each block of 256K words. The total amount of time for Test 3 depends on the memory configuration of the switch (i.e., approximately 5 minutes times the number of 256K blocks).
5. A specific starting memory block and memory location can be selected for testing by performing one of the following:
 - a. **(Starting memory block to be tested); ENTER; (Memory location); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Starting memory block to be tested); ENTER; (Memory location); ENTER.**

Note: Special error code 80 (location out of memory range) is displayed in the **MAAP** error code field after **EXECUTE** is depressed if the specific memory block and memory location are not in the range of testable memory.

Proceed to Step 6.

6. To start Test 3 after selecting the main memory to be tested, depress **EXECUTE**.

PROC 614, Test 3

7. While Test 3 is executing, Field 3 (address within the main memory block being tested) is updated every second.

Note: Field 2 (memory block) is updated when a memory block is tested (approximately every 5 minutes).

8. When the first failure is located, the data in Fields 2 and 3 remains constant displaying the first memory location of the failed block.
9. Test 3 continues to execute until the end of the failed block is identified and then stops.
10. Special error code 82 (use **PROC 613** to clear duplication channel failures) is displayed in the **MAAP** error code field after Test 3 stops if failure code 4 (duplication channel error) is detected.

Note: **PROC 613** is used to correct duplication channel errors.

11. When Test 3 stops (after a failure is detected) the following is displayed:

Field 1 - 3.

Field 2 - Block number of failing block.

Field 3 - Last memory location to fail in the block.

Field 4 - Ending block number.

Fields 5 and 6 - Dashed.

Field 7 - Area of memory where the failure occurred.

Field 8 - Type of failure found (failure code).

12. Depressing **NEXT FAULT** causes Test 3 to continue from the location displayed in Field 4, plus one.

13. When Test 3 is completed (after the starting block and memory location entered, or the entire main memory is tested) the following is displayed:

Field 6 - 0 or total number of failed words.

Field 7 - 0 or memory area of failure.

Field 8 - 0 or total number of failed memory blocks.

Note: Special error code 74 (memory match test not performed) is displayed in the **MAAP** error code field when Test 3 is performed on an unduplicated switch, indicating that tests other than the memory match test was performed.

14. Depressing **STOP** while Test 3 is executing halts the test.

If Test 3 is halted by use of **STOP** in the middle of a failed block of memory locations, Field 4 displays the last testable memory block number for the switch configuration and Field 8 defines the type of failure detected.

15. If Test 3 is halted by use of **STOP** and no failures are detected, a dash is displayed in Field 8.

Field 4 displays the last testable main memory block location for the switch configuration and Fields 2 and 3 display the last tested memory location.

16. Depressing **NEXT FAULT** any time after Test 3 stops on its own (failure detected) causes the test to continue from where it was halted.

Note: If **STOP** is depressed to halt Test 3, **EXECUTE** must be depressed to restart Test 3. Test 3 will start from the beginning of memory after the **STOP; EXECUTE** sequence is used.

17. Depressing **NEXT DATA** after a failed block is identified displays the contents of the first failing memory location within a block of contiguous failures beginning at the memory location displayed in Fields 2 and 3.

The contents of the failing memory location for the on-line common control (indicated by a 0 in Field 5) are displayed in Field 6.

18. Depressing **NEXT DATA** again displays (in Field 6) the contents of the off-line common control (indicated by a 1 in Field 5) for the same memory location.

19. Depressing **NEXT DATA** once more steps to the next failing memory location.

Field 6 displays the contents of the memory location alternating between the on-line common control (0 in Field 5) and the off-line common control (1 in Field 5) each time **NEXT DATA** is depressed.

20. When all failing main memory locations are displayed, depressing **NEXT DATA** once more dashes the display.

Depressing **NEXT DATA** again starts the display over from the first failing main memory location.

Test 4

Test 4 is used to continuously test a specific range of main memory locations of the program, patch, translation, and other areas.

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 4; ENTER.

2. When Test 4 is initially called in, a default range of main memory may be displayed in Fields 2 through 4. Field 2 is blinking indicating an optional entry.
3. Either the default range of memory can be tested or another range of memory can be selected for testing.

Note: The default memory locations are the last block of failures displayed in Test 3.

4. To test the default range of memory, proceed to Step 7.
5. If no failures are found in Test 3, Fields 2 through 4 display the entire range of testable memory. Field 2 is blinking indicating an optional entry.

If starting and ending memory locations are not entered, Test 4 tests the entire range of testable main memory (i.e., program, patch, translation, and other areas).

PROC 614, Test 4

6. A specific range of main memory can be selected for testing by entering the following:

(Starting memory block); ENTER; (Starting address); ENTER; (Ending memory block); ENTER.

Note: Special error code 80 (location out of memory range) is displayed in the **MAAP** error code field after **EXECUTE** is depressed if the specific memory block, memory location, and ending block selected are not in the range of testable memory.

Proceed to Step 7.

7. To start Test 4, depress **EXECUTE**.

Note: Test 4 takes approximately 5 minutes to test each block of 256K words. The total amount of time for Test 4 depends on the memory configuration of the switch (i.e., approximately 5 minutes times the number of 256K blocks).

8. While Test 4 is executing, Fields 7 and 8 (memory area and failure code) are updated after every pass through the range of memory selected for testing.
9. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

Note: Special error code 74 (memory match test not performed) is displayed in the **MAAP** error code field when Test 4 is performed on an unduplicated switch, indicating that tests other than the memory match test was performed.

10. Special error code 82 (use **PROC 613** to clear duplication channel failures) is displayed in the **MAAP** error code field when Test 4 is stopped if failure code 4 (duplication channel error) is detected.

Note: **PROC 613** is used to correct duplication channel errors.

11. If no failures are detected, Fields 2 through 4 display the original range selected for testing, and Fields 7 and 8 display a 0.
12. If any failures are detected, the following is displayed:
Field 1 - 4.
Fields 2 and 3 - Lowest failed memory location within the range of memory selected for testing.
Field 4 - Highest failed memory block within the range of memory selected for testing.
Fields 5 and 6 - Dashed.
Field 7 - Area of memory where the failure occurred.
Field 8 - Failure code for the failed memory location.
13. Test 4 can be repeated from the same range of main memory entered by depressing **EXECUTE** or another range of main memory can be selected for testing by using the **CHANGE FIELD** sequence and depressing **EXECUTE**.

Test 5

Test 5 is used to read the contents of a single main memory location, or any range of main memory locations.

Test 5 can be used with either duplicated or unduplicated common controls.

1. Test 5 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 5; ENTER.

2. When Test 5 is initially called in, a default range of main memory may be displayed in Fields 2 through 4. Fields 2 and 3 (memory block and address) are blinking indicating an optional entry.
3. Either the default range of memory can be tested or another range of memory can be selected for testing.

Note: The default memory locations are the last block of failures displayed in Test 3.

4. To test the default range of memory, proceed to Step 8.
5. If no failures are found in Test 3 or if an unduplicated switch is being tested, Fields 2 through 4 display the entire range of testable memory.
6. If starting and ending memory locations are not entered, Test 5 will test the entire range of testable memory.
7. A specific range of main memory can be selected for testing by entering the following:

(Starting memory block); ENTER; (Starting address); ENTER; (Ending memory block); ENTER.

Note: Special error code 80 (location out of memory range) is displayed in the **MAAP** error code field after **EXECUTE** is depressed if the specific memory block, memory location, and ending block selected are not in the range of testable memory.

8. To start Test 5, depress **EXECUTE**.
9. When **EXECUTE** is depressed, the contents of the first memory location selected for testing is displayed in Field 6 for the on-line common control (indicated by a 0 in Field 5). The memory area of the memory location is displayed in Field 7.
10. Special error code 82 (use **PROC 613** to clear duplication channel failures) is displayed in the **MAAP** error code field if failure code 4 (duplication channel error) is detected.

Note: **PROC 613** is used to correct duplication channel errors.

11. Depressing **NEXT DATA** displays (in Field 6) the contents of the off-line common control (indicated by a 1 in Field 5) for the same memory location.

Note: If the switch is unduplicated, only the on-line common control can be read.

12. Depressing **NEXT DATA** steps through the memory range selected for testing (displayed in Fields 2 through 4) one at a time, alternating between the on-line common control (0 in Field 5) and the off-line common control (1 in Field 5), each time **NEXT DATA** is depressed.

PROC 614, Test 5 and Test 6

13. When all main memory locations selected for testing are displayed, depressing **NEXT DATA** once more dashes Fields 2 and 3. Field 4 displays the ending memory block selected for testing.

Depressing **NEXT DATA** again starts the display over at the first memory location selected for testing.

Test 6

Test 6 performs an ID chip test then tests the supersets of cache memory continuously.

1. Test 6 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 6; ENTER.
2. When Test 6 is initially called in, Field 3 displays a 0.
Field 3 is blinking indicating an optional entry field.
3. A starting cache superset can be selected for testing or the entire cache superset can be tested.
To test the entire cache superset, proceed to Step 5.
4. To start Test 6 from a specific cache superset, perform one of the following:
 - a. **ENTER; (Starting cache superset to be tested); ENTER.**
 - b. **CHANGE FIELD; 3; ENTER; (Starting cache superset to be tested); ENTER.**

Note: Test 6 starts from the cache superset entered and tests the remainder of the cache superset. If no failures are detected, Test 6 starts over from the beginning of the cache superset (0) and continuously tests the entire cache superset.

Proceed to Step 5.

5. To start Test 6 after selecting the cache superset to be tested, depress **EXECUTE**.
6. The testing interval is determined by maintenance personnel performing the test (as long as no failures are detected), and is ended by depressing **STOP**.
7. While Test 6 is executing and no failures are detected, Field 3 is updated with the number of times the entire cached superset is tested and Field 8 displays a 0 (indicating no failures).
8. If a cache superset failure is detected, Test 6 is stopped automatically and the following is displayed:
Field 1 - 6.
Field 2 - Dashed.
Field 3 - Cache superset failing.
Fields 4 through 7 - Dashed.
Field 8 - Failure code.
9. Depressing **EXECUTE** starts Test 6 from the failing cache superset displayed in Field 6.
If the same cache superset fails again, Test 6 stops. Field 3 displays the failing cache superset and Field 8 displays the failure code associated with the failing cache superset.

10. If the same cache superset does not fail, Test 6 continues testing the entire cache superset until a failure is detected, or until Test 6 is halted by depressing **STOP**.

Field 3 is updated with the number of times the entire cache superset is tested without a failure detected.

Repair Guide

When a memory read/memory match failure is indicated, **PROC 614** referenced from **PROC 600** as the cause for the **MEM** and/or **CACHE MEMORY** fault indicator(s) being lighted, perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and record the failure history generated by the on-line periodic maintenance software.
2. Execute Test 2.
Test 2 runs a variable length of time depending on the switch memory configuration.
3. If Test 2 passes, perform Test 4 (continuous test) on each memory block and address displayed in Test 1 to ensure no intermittent failures exist.
4. If Test 2 fails, perform Test 3 on the area of memory where the failure occurred (i.e., patch, program, translation, other, or any combination of the four areas).
5. Record the failure code displayed in Field 8 for the failed memory block and location detected in Test 3.
6. Isolation and repair steps for the failure codes are detailed in:

Failure Code 1.

Failure Codes 2, 3, 6, 7, or 8.

Failure Code 4.

Failure Code 5 or 16.

Failure Codes 10 through 15.

Failure Code 1 (Memory mismatch).

The repair guide for failure code 1 is presented in two parts: the translation repair guide (memory area encodes 4 through 7 or 12 through 15) and the patch/program repair guide (memory area encodes 1 through 3 or 9 through 11).

Good customer service is defined as follows:

1. The most recent changes made to the switch are added and are working properly.
2. No trouble reports exist.
3. Attendant consoles are not malfunctioning.

PROC 614

4. An abnormal number of status memory audit peg counts do not exist (refer to **PROC 600**, Test 2 - Unit type 43 to investigate status memory audit peg counts).
5. There are no initialization problems (refer to **PROC 612** to determine status of initialization problems).

Translation Repair Guide

1. Determine the status of customer service.
If customer service is good, proceed to Step 2.
If customer service is not good, proceed to Step 11.
2. Perform a run tape in the on-line processor and proceed to Step 3.
3. Load the off-line processor with the on-line tape by performing the following and proceed to Step 4.
 - a. Remove the tape cartridge from the on-line minirecorder and install the tape cartridge into the off-line minirecorder.
 - b. Set the off-line processor's **TEST SELECT** switch to 15, depress the off-line processor's **RESET, ENABLE**, and wait until the off-line processor completes reloading.
 - c. Remove the tape cartridge from the off-line minirecorder, and install the tape cartridge into the on-line minirecorder.
4. Execute **PROC 614**, Test 2 and check for a memory mismatch.
 - a. If the two processors match, proceed to Step 5.

Note: The **MEM** and/or **CACHE MEMORY** fault indicator is turned off when the memories match and no other failures are detected in Test 2.

- b. If the two processors do not match, perform **PROC 610** (tape test) in both processors to correct the problem.
5. Perform a run tape on the off-line tape by performing the following and proceed to Step 6.
 - a. Install the original off-line tape cartridge into the off-line minirecorder.
 - b. Depress **RUN TAPE, EXECUTE**.
6. Switch service to the off-line processor by performing a hard switch and proceed to Step 7.

Caution: A hard switch of common controls results in loss of service.

A hard switch of common controls is accomplished by setting the on-line common control's **GO/HALT** switch to **HALT**.

7. Set the new off-line processor's **GO/HALT** switch to the **GO** position and proceed to Step 8.
8. Determine the status of customer service in the new on-line processor.
If customer service is good, proceed to Step 9.
If customer service is not good, proceed to Step 10.

9. Execute **PROC 614**, Test 2 and check for a memory mismatch.

- a. If the two processors match, repair is complete.

Note: The **MEM** and/or **CACHE MEMORY** fault indicator is turned off when the memories match and no other failures are detected in Test 2.

- b. If the two processors do not match, perform **PROC 610** (tape test) in both processors to correct the problem.

10. Reload the new off-line processor by performing the following and proceed to Step 11.

Set the off-line processor's **TEST SELECT** switch to 15, depress the off-line processor's **RESET, ENABLE**, and wait until the off-line processor completes reloading.

Caution: A hard switch of common controls results in loss of service.

11. Perform a hard switch of common controls by setting the on-line common control **GO/HALT** switch to **HALT**.

Set the new off-line processor's **GO/HALT** switch to the **GO** position and proceed to Step 12.

12. Determine the status of customer service in the new on-line processor.

If customer service is good, go to Step 2 above.

If customer service is not good, proceed to Step 13.

13. At this point, both processors are reloaded independently without achieving good customer service.

Start at Step 2 with backup tapes in an attempt to provide good customer service.

Patch and Program Repair Guide

Customer service must be good before proceeding with the patch and program repair guide. If customer service is not good, perform the translation repair guide first. If customer service is good or after performing the translation repair guide above and customer service is still not good, proceed with Step 1 below.

1. Find the total number of patches on both the on-line and off-line common control tapes by using **PROC 490**.

If both tapes have the same number of patches, proceed to Step 5.

If both tapes do not have the same number of patches, proceed to Step 2.

2. Add the missing patches to the appropriate tape using **PROC 490**.

3. Reload the appropriate common control by performing the following:

Set the **TEST SELECT** switch to 15, depress **RESET, ENABLE**, and wait until the processor completes reloading.

4. Execute **PROC 614**, Test 2 and check for a memory mismatch.

- a. If a mismatch still exists, use **PROC 610** (tape test) to isolate the problem to the tape or minirecorder area.

PROC 614

- b. If there are no mismatches, repair is complete.

The **MEM** and/or **CACHE MEMORY** fault indicator is turned off when the memories match and no other failures are detected in Test 2.

5. If the problem is in the program memory area only (encode 1 displayed in Field 7), proceed to Step 6.

If the problem is in the patch memory area only (encode 2 displayed in Field 7) or in the program and patch memory area (encode 3 displayed in Field 7), proceed to Step 14.

6. Acquire second level maintenance assistance to determine which processor is in error.

Correct the failing processor using **PROC 999**.

7. Reload the appropriate common control by performing the following:

Set the **TEST SELECT** switch to 15, depress **RESET**, **ENABLE**, and wait until the processor completes reloading.

8. Execute **PROC 614**, Test 2 and check for a memory mismatch.

If there are no mismatches, proceed to Step 11.

If a mismatch still exists, proceed to Step 9.

9. Reload the incorrect common control with the tape from the correct common control by performing the following:

- a. Remove the tape cartridge from the correct common control minirecorder, and install the tape cartridge into the incorrect common control minirecorder.
- b. Set the **TEST SELECT** switch to 15, depress **RESET**, **ENABLE**, and wait until the processor completes reloading.
- c. Remove the tape cartridge from the incorrect common control minirecorder, and install the tape cartridge into the correct common control minirecorder.

10. Execute **PROC 614**, Test 2 and check for a memory mismatch.

- a. If there are no mismatches, the tape in the incorrect common control is probably defective. Replace the tape and rerun the test from the beginning.
- b. If a mismatch still exists, use **PROC 610** (tape test) to isolate the problem to the tape or minirecorder area on the incorrect common control.

11. Execute **PROC 614**, Test 4 on the failed memory locations.

If the two tapes match, the error was probably intermittent and repair is complete.

If the two tapes mismatch, proceed to Step 12.

12. Replace the defective memory board.

The memory block displayed in Field 2 indicates which memory board to replace; i.e., if Field 2 = 0, replace memory board in Slot 07 of the common control carrier.

Note: Block numbers and slot numbers are on a 16 to 1 basis when TN394 is installed in the common control carrier. Block numbers 0 through 17 (in octal) displayed in Field 2 correspond to slot number 7, block numbers 20 through 37 (in octal) displayed in Field 2 correspond to slot number 8, block numbers 40 through 57 (in octal) correspond to slot number 9 and block numbers 60 through 77 (in octal) correspond to slot number 10.

13. Reload the tape and execute **PROC 614** Test 2 to resolve the memory mismatch cause of the **MEM** and/or **CACHE MEMORY** fault indicator.
14. Execute **PROC 614**, Test 3 and determine which patch is missing from the defective tape by counting the number of failed locations.
15. Add the missing patch to the defective tape by using **PROC 490**.
16. Reload both tapes, and execute **PROC 614**, Test 2 to check for a memory mismatch.
If both tapes match, repair is complete.
The **MEM** and/or **CACHE MEMORY** fault indicator is turned off when the memories match and no other failures are detected in Test 2.
17. If the two tapes still mismatch, execute **PROC 610** (tape test) on both common controls.
Suspect a defective tape drive.

Failure Codes 2, 3, 6, 7, or 8 (Memory failures).

1. Replace circuit pack TN394 associated with the memory block displayed in Field 2.
Memory circuit packs in the common control carrier correspond to block numbers as listed in Step 2.
2. Block numbers and slot numbers are on a 16 to 1 basis when TN394 is installed in the common control carrier. Block numbers 0 through 17 (in octal) displayed in Field 2 correspond to slot number 7, block numbers 20 through 37 (in octal) displayed in Field 2 correspond to slot number 8, block numbers 40 through 57 (in octal) correspond to slot number 9 and block numbers 60 through 77 (in octal) correspond to slot number 10.
3. Repeat Test 3 on the memory block and location that failed with a failure code of 2, 3, 6, 7, or 8.
4. If Test 3 passes, perform Test 2 of **PROC 614** to turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s).
5. If Test 3 fails, check the wiring associated with the replaced circuit pack.

Failure Code 4 (Parity error).

1. Record the memory block and location displayed in Fields 2 and 3.
2. Perform **PROC 613** (duplicate processor control and test) to determine the cause of the parity error.

Failure Code 5 or 16 (I/O failures).

1. Perform **PROC 600** (alarm causes/error log), Test 2 and check for common control I/O failures (unit type 4).
2. Perform **PROC 611** (common control tests), Test 2 on the circuits displayed in Test 1 or 2 of **PROC 600**.
3. Perform corrective action (as appropriate) on failing I/O circuits.

PROC 614

4. Enter **PROC 614**, Test, 4 and continuously test the memory block and location that failed Test 3 with a failure code of 5 or 16.
5. If the memory block and location now passes, Perform Test 2 of **PROC 614** to turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s).

If the memory block and location fails, check the wiring between the memory or cache circuit and the common control interface.

Failure Codes 10 through 15 (Cache failures).

1. Replace TN369 in slot 04 of the common control carrier.
Repeat Test 3 on the memory block and location that failed with a failure code of 10 through 15.
2. If Test 3 passes, perform Test 2 of **PROC 614** to turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s).
3. If Test 3 fails, replace UN153 in slot 03 of the common control carrier.
Repeat Test 3 on the memory block and location that failed with a failure code of 10 through 15.
4. If Test 3 passes, perform Test 2 of **PROC 614** to turn off the **MEM** and/or **CACHE MEMORY** fault indicator(s).
5. If Test 3 fails, check the wiring associated with the replaced circuit packs.

PROC 615 - MAAP TEST

FLIPCHART ISSUE 5		+		+		MAAP TEST										+		+		845552223									
TEST 1: TESTS DIGITAL DISPLAYS. USE 'NEXT DATA' TO INCREMENT DISPLAYED NUMBER.			TEST 2: TESTS CONTROL KEYS SHOWN ON FLIP CHART. USE INDICATED CONTROL KEYS TO CHANGE DISPLAY FROM 0 TO 1.			TEST 3: TESTS DIAL KEYS. USE KEY 1-9 TO CHANGE THE DISPLAY FROM 0 TO THE KEY NUMBER. USE OTHER DIAL KEYS TO CHANGE THE DISPLAY FROM 0-1.			TEST 4: TESTS BUSY OUT, WAIT, IN-USE & SEE NOTE INDICATORS. USE 'NEXT DATA' TO TURN INDICATORS ON OR OFF.			TEST 5: DISPLAYS MAAP ALARM STATUS. USE 'CLEAR DATA', 'EXECUTE' TO RESET MAAP ALARM.			FIELD LIMITS: FIELD 1: 1-5 FIELDS 2-25: ALL 0 = ALARM RESET ALL 1 = ALARM SET			NOTES: THE TEST NUMBER CAN ONLY BE CHANGED BY 'NEXT TEST'.											
TEST NO	TEST 2					STOP	CLEAR DATA			WORD NO			BUS BUSY OUT	BUSY OUT	REMOVE	ADD		CHANGE FIELD	NEXT UNIT	NEXT FAULT	CHANGE	DISPLAY	EXECUTE	NEXT DATA	NEXT CIRCUIT	COMMON CONTROL TESTS 615			
	TEST 3	1	2	3	4	5	6	7	8	9	CLEAR ENTRY	0	ENTER																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25				

Purpose

PROC 615 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a transmission failure from or to the **MAAP**.

PROC 615 may also be used when a malfunction is suspected while using the **MAAP**.

Field Definitions and Codes

Each field of **PROC 615** flipchart and the possible displays for the fields during execution of the different tests are defined in Table Y, PROC 615 - Field Definitions and Codes.

There are no optional input fields for **PROC 615**.

Operation of Procedure**Overview**

PROC 615 is used to test the **MAAP** or its interface.

To call in **PROC 615**, perform the following:

1. Depress **PROC NO; 615; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields (including the error code field) are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

TABLE Y.

PROC 615					
FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	0-9	Digital display (Test 1).	8	0-9	Digital display (Test 1).
	1-5	Test number.			CLEAR DATA control key display (Test 2):
2	0-9	Digital display (Test 1).		1	Passed test.
3-25		For Tests 1 through 4: 0 (after key pressed) = default or test failure.		6	Dial key 6 display (Test 3): Passed test.
		For Test 5: 0 = OTHER FAILS alarm not set. 1 = OTHER FAILS alarm set.	9	0-9	Digital display (Test 1).
3	0-9	Digital display (Test 1).			Dial key 7 display (Test 3): Passed test.
		Dial key 1 display (Test 3): Passed test.	10	0-9	Digital display (Test 1).
4	0-9	Digital display (Test 1).			Dial key 8 display (Test 3): Passed test.
		Dial key 2 display (Test 3): Passed test.	11	0-9	Digital display (Test 1).
5	0-9	Digital display (Test 1).			WORD NO control key display (Test 2): Passed test.
		Dial key 3 display (Test 3): Passed test.		1	Passed test.
6	0-9	Digital display (Test 1).	12		Dial key 9 display (Test 3): Passed test.
		Dial key 4 display (Test 3): Passed test.		9	Passed test.
7	0-9	Digital display (Test 1).		0-9	Digital display (Test 1).
		STOP control key display (Test 2): Passed test.			Dial key CLEAR ENTRY display (Test 3): Passed test.
		Dial key 5 display (Test 3): Passed test.	13	0-9	Digital display (Test 1).
					RLS BUSY out control key display (Test 2): Passed test.

TABLE Y. (Contd)

PROC 615					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
13 (Contd)	1	Dial key 0 display (Test 3): Passed test.	20	0-9	Digital display (Test 1).
				1	NEXT FAULT control key display (Test 2): Passed test.
14	0-9	Digital Display (Test 1).	21	0-9	Digital display (Test 1).
	1	BUSY OUT control key display (Test 2): Passed test.		1	CHANGE control key display (Test 2): Passed test.
	1	Dial key ENTER display (Test 3): Passed test.		1	Passed test.
15	0-9	Digital display (Test 1).	22	0-9	Digital display (Test 1).
	1	REMOVE control key display (Test 2): Passed test.		1	DISPLAY control key display (Test 2): Passed test.
16	0-9	Digital display (Test 1).	23	0-9	Digital display (Test 1).
	1	ADD control key display (Test 2): Passed test.		1	EXECUTE control key display (Test 2): Passed test.
17	0-9	Digital display (Test 1).	24	0-9	Digital display (Test 1).
18	0-9	Digital display (Test 1).		1	NEXT DATA control key display (Test 2): Passed test.
	1	CHANGE FIELD control key display (Test 2): Passed test.	25	0-9	Digital display (Test 1).
19	0-9	Digital display (Test 1).		1	NEXT CIRCUIT control key display (Test 2): Passed test.
	1	NEXT UNIT control key display (Test 2): Passed test.			

PROC 615, Test 1 and Test 2

Five tests are available:

1. Test 1 - Tests **MAAP** digital readouts.
2. Test 2 - Tests **MAAP** control keys.
3. Test 3 - Tests **MAAP** dial keys.
4. Test 4 - Tests **MAAP** indicators **BUSY OUT**, **WAIT**, **SEE NOTE**, and **IN USE**.
5. Test 5 - Tests for a transmission failure.

Test 1

Test 1 displays all digits in Fields 1 through 25, and two digits in the error code field.

1. Test 1 is the default test when entering **PROC 615** or is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. To start Test 1, depress **EXECUTE**.

When **EXECUTE** is depressed, 0s are displayed in all **MAAP** fields including the error code field.

3. Depressing **NEXT DATA** increments the display to all 1s.

Each depression of **NEXT DATA** increments the display from all 0s through all 9s.

4. Depressing **NEXT DATA** after all 9s are displayed causes Test 1 to be executed, starting the sequence over. Field 1 displays a 1 and all other fields (including the error code field) are dashed.

Test 2

Test 2 tests all control keys except **PROC NO**, **RESET**, and **NEXT TEST**.

Caution: Do not attempt to test **RUN TAPE** using this procedure.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. To start Test 2, depress **EXECUTE**.

Depressing **EXECUTE** displays a 1 in Field 23 to indicate proper operation of the **EXECUTE** key, and displays 0s in the other control key fields (Fields 7, 8, 11, 13 through 16, 18 through 22, 24 and 25).

3. Depress the other control keys in the following order and note the transition from 0 to 1, in the appropriate field, which indicates proper operation of the control keys.

Note: Special error code 06 is displayed in the error code field when keys other than control keys are depressed.

STOP - Field 7.
CLEAR DATA - Field 8.
WORD NO - Field 11.
RLS BUSY OUT - Field 13.
BUSY OUT - Field 14.
REMOVE - Field 15.
ADD - Field 16.
CHANGE FIELD - Field 18.
NEXT UNIT - Field 19.
NEXT FAULT - Field 20.
CHANGE - Field 21.
DISPLAY - Field 22.
NEXT DATA - Field 24.
NEXT CIRCUIT - Field 25.

Test 3

Test 3 tests all dial keys.

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. To start Test 3, depress **EXECUTE**.

Zeros (0s) are displayed in Fields 3 through 14 after **EXECUTE** is depressed.

3. Depress each of the dial keys. If the dial key depressed operates properly, the correct number is displayed in the appropriate field as follows:

Dial key 1 - Field 3 display = 1.

Dial key 2 - Field 4 display = 2.

Dial key 3 - Field 5 display = 3.

Dial key 4 - Field 6 display = 4.

Dial key 5 - Field 7 display = 5.

Dial key 6 - Field 8 display = 6.

Dial key 7 - Field 9 display = 7.

Dial key 8 - Field 10 display = 8.

Dial key 9 - Field 11 display = 9.

Dial key **CLEAR ENTRY** - Field 12 display = 1.

Dial key 0 - Field 13 display = 1.

Dial key **ENTER** - Field 14 display = 1.

PROC 615, Test 4 and Test 5

Test 4

Test 4 tests the **IN USE**, **SEE NOTE**, **BUSY OUT**, and **WAIT** indicators.

1. Test 4 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 4.

2. To start Test 4, depress **EXECUTE**.

When **EXECUTE** is depressed, the **IN USE**, **SEE NOTE**, **BUSY OUT**, and **WAIT** indicators on the **MAAP** turn on.

3. Depressing **NEXT DATA** alternately turns the **MAAP** indicators on and off.
4. When exiting Test 4, the indicators return to their original state.

Test 5

Test 5 displays the **MAAP** alarm status and can be used to turn off the **OTHER FAILS** fault indicator.

1. Test 5 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 5.

2. To start Test 5, depress **EXECUTE**.

3. When **EXECUTE** is depressed:

Ones (1s) are displayed in all fields if the **OTHER FAILS** fault indicator is set because of a **MAAP** failure.

Zeros (0s) are displayed in all fields if the **OTHER FAILS** fault indicator is not caused by a **MAAP** failure.

Note: The **OTHER FAILS** fault indicator can be turned on by other failures in the system.

4. To turn off the **OTHER FAILS** fault indicator when 1s are displayed in all fields (assuming no other sources are affecting the **OTHER FAILS** fault indicator) after Test 5 is executed at least once, perform the following:

Depress **CLEAR DATA; EXECUTE**.

Note: The **MAAP** alarmed entries in PMIDS are marked as resolved.

Repair Guide

When a transmission failure is indicated (**PROC 615** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed.

1. Replace TN403 (dual-speed data channel) associated with the **MAAP**.
2. Execute Tests 1 through 4 to verify correct operation of the **MAAP**.

3. Execute Test 5 to determine if the **OTHER FAILS** fault indicator is still set.
4. If a failure is still indicated, check the cabling and wiring between TN403 and the **MAAP** connector.

When a malfunction of the **MAAP** is suspected, perform the following steps in the order listed.

1. At the alarm panel, check the **MAAP** circuit breaker.
 If the circuit breaker is not tripped, proceed to Step 3.
 If the circuit breaker is tripped, proceed to Step 2.
2. Reset the **MAAP** circuit breaker.
 If the circuit breaker trips again, check the cabling and wiring between the **MAAP** connector and the circuit breaker.
3. Execute Tests 1 through 4 to verify the extent of the problem.
 If a limited number of failures is indicated, replace the **MAAP**.
 If complete failure is indicated, replace the TN403 associated with the **MAAP**. Repeat Tests 1 through 4. If a failure is still indicated, replace the **MAAP**.
4. Repeat Tests 1 through 5. If a failure is still indicated, check the cabling and wiring between TN403 and the **MAAP** connector.

PROC 616

PROC 616 - ALARM PANEL TEST

FLIPCHART ISSUE 1				+		ALARM PANEL TEST										+		845552223									
TEST 1: SIMULTANEOUSLY TESTS ALL INDICATORS SHOWN ON FLIP CHART. USE 'NEXT DATA' TO TURN INDICATORS ON AND OFF.					TEST 2: INDIVIDUALLY TESTS INDICATORS BY FLASHING THEM AT A 1/2 SECOND ON/OFF RATE. USE 'NEXT DATA' TO ADVANCE TO NEXT INDICATOR OR USE CHANGE SEQUENCE TO SELECT A SPECIFIC FIELD AND ENTER A VALUE OF 1.															SPECIAL ERROR CODE: 80-UNABLE TO DISABLE AAOF AND DP BACKGROUND TESTS.							
TEST 2																									COMMON CONTROL TESTS 616		
TEST NO	ALARMS			PROCESSOR/MEMORY						ATND CNSL		ENV	COM CNTRL			NETWORK				APPL PROC		OTHER					
	MAJOR	MINOR	WARNING	MAJOR PREX	PREX	MEM	DIAG. PREX	PASS	FAIL	ACK	INTERNAL ACK	PWR/TMP AIRFLOW	TAPE	CALIB MEMORY	I/O CHANNEL	UNUSED	SWITCH	PORT	PERIPH INPUT	AP INTER	EXT PREX	OTHER FAILS	EXT INPUT	DIAGS DIAG.			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			25

Purpose

PROC 616 is used when there is a suspected malfunction in one or more of the software controlled alarm panel indicators.

PROC 616 displays the test states of the alarms (major, minor, warning), and processor/memory, attendant console, environment, common control, network, applications processor, and other fault indicators.

Maintenance personnel **must** be at the customer's premises to determine if the indicators are actually lighted when this maintenance procedure is executed.

The Automatic Alarm Origination Feature (AAOF) and the diagnostic background tests are disabled when performing **PROC 616**.

Field Definitions and Codes

Each field of **PROC 616** flipchart and the possible displays for the fields during execution of the different tests are defined in Table Z, PROC 616 - Field Definitions and Codes.

Optional input fields are:

- 1. Field 1 - Change test number.
- 2. Fields 2 through 25 - Select indicator to be tested (Test 2 only).

Note: Field 17 is unused.

Operation of Procedure

Overview

PROC 616 is used to test the alarm panel indicators.

TABLE Z.

PROC 616 FIELD DEFINITIONS AND CODES		
FIELD	CODE	DEFINITION
1	1, 2	Test number.
2-16 and 18-25	0	Indicator is off.
	1	Test 1: Indicator is on. Test 2: Indicator is flashing.
	dash	Alarm indicator is under on-line control.
17	dash	Unused

To call in **PROC 616**, perform the following:

1. Depress **PROC NO; 616; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Simultaneously tests all software controlled indicators.
2. Test 2 - Individually tests any or all of the software controlled indicators.

Test 1

Test 1 displays the status when testing all indicators simultaneously. The status is displayed in Fields 2 through 25.

1. Test 1 is the default test when entering **PROC 616** or is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER 1; ENTER.

2. To start Test 1, depress **EXECUTE**.

A 1 is displayed in Fields 2 through 16, a dash in Field 17, a 1 in Fields 18 through 25 and the alarm panel indicators corresponding to the fields on the flipchart are turned on.

3. **MAAP** display fields are grouped by alarm panel areas as follows:

Fields 2 through 4 = **ALARMS**.

Fields 5 through 10 = **PROCESSOR/MEMORY**

PROC 616, Test 1 and Test 2

Fields 11 and 12 = Attendant console.

Note: The **ACK** indicator is located on the attendant console and **not** on the alarm panel.

Field 13 = **ENVIRONMENT**.

Fields 14 through 16 = **COMMON CONTROL**.

Note: Field 17 is unused.

Fields 18 through 20 = **NETWORK**.

Fields 21 and 22 = **APPLICATIONS PROCESSOR**.

Field 23 through 25 = **OTHER**.

4. Depressing **NEXT DATA** turns off all the alarm panel indicators and a 0 is displayed in Fields 2 through 16, and 18 through 25.

Note: When **NEXT DATA** is depressed a dash is displayed in Field 17 which is unused.

Depressing **NEXT DATA** again turns on all the indicators and a 1 is displayed in Fields 2 through 16, and 18 through 25.

5. Depressing **NEXT DATA** repeatedly alternates between 0 and 1 in each field and turns the indicators off and on.

Note: While the indicators are off, **PROC 616** allows brief flashes of the normal indicator outputs from the on-line programs.

6. Test 1 is stopped by depressing **NEXT TEST** or **RESET**.
7. When Test 1 is exited, all indicator outputs are restored to their previous state and the AAOF and background tests are enabled.

Test 2

Test 2 tests a specific indicator. Testing status is displayed in Fields 2 through 25.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. When Test 2 is selected, a flashing 1 is displayed in Field 2 indicating an optional entry field and all other fields contain 0s.

Note: Field 17 which is unused displays a dash.

3. Either the indicator associated with Field 2 can be tested or another indicator can be selected in one of three ways (Steps 4 through 6).

To test the indicator displayed in Field 2, proceed to Step 7.

4. Using **NEXT DATA** to increment to the indicator to be tested.

Note: A 1 is placed in the next field and the previous field changes to a 0 each time **NEXT DATA** is depressed.

Proceed to Step 7.

5. Depressing **ENTER** repeatedly to select the field corresponding to the indicator to be tested and entering a 1 as follows:

1, ENTER.

Note: A 0 is placed in Field 1 when the indicator to be tested is selected by use of **ENTER**.

Proceed to Step 7.

6. Using the change field sequence:

CHANGE FIELD; (Field number of indicator to be tested); ENTER; 1; ENTER.

Note: A 0 is placed in Field 1 when the indicator to be tested is selected by use of the **CHANGE FIELD** sequence.

Proceed to Step 7.

7. To start Test 2 after selecting the indicator to be tested, depress **EXECUTE**.

The associated indicator on the alarm panel turns on and off at a 1/2-second on, 1/2-second off rate.

8. While the selected indicator is off, **PROC 616** allows brief flashes of the normal indicator outputs from the on-line programs.
9. Depressing **NEXT DATA** repeatedly, after **EXECUTE** is depressed, causes the alarm panel indicators to be tested in the sequence shown on the flipchart beginning with the indicator after the one that was selected initially for testing.
10. Depressing **NEXT DATA** after all indicators are cycled through using **NEXT DATA** dashes Fields 2 through 25.

Depressing **NEXT DATA** again without depressing **EXECUTE** begins the sequence over with the indicator associated with Field 2.

11. To select another indicator to test using the change field sequence requires the **EXECUTE** key to be depressed again to initiate the test for the new indicator.

Note: The previous field selected for testing is changed to a 0.

12. Test 2 is stopped by depressing **NEXT TEST** or **RESET**.
13. When Test 2 is exited, all indicator outputs are restored to their previous state and the AAOF and background tests are enabled.

Repair Guide

When an alarm panel malfunction is suspected, the following steps should be performed in the order listed to isolate and repair the faulty component.

1. Execute Test 1 to determine whether all the indicators respond to on/off control.
2. If interaction between two or more indicators is suspected, execute Test 2 and observe their individual operation.
3. If failures are observed, replace TN490 and repeat the appropriate test(s).

Caution: *Replacement of the alarm panel takes the entire switch down.*

4. If a failure is still indicated, tag the appropriate indicator(s) and replace the alarm panel when traffic permits.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the alarm panel.

5. When the alarm panel is replaced and failures still exist, check the wiring between TN490 and the alarm panel.

When Test 1 is executed, or the ack and external ack fault indicators are tested in Test 2, check the **ACK** indicator on the attendant console.

1. If the **ACK** indicator is not lighted, replace TN490 and repeat the appropriate test(s).
2. If a failure is still indicated, replace console component **lamp control and carrier**.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of console components.

3. Repeat the appropriate test(s).

If a failure is still indicated, replace the console.

4. Repeat the appropriate test(s).

If a failure is still indicated, check the wiring between TN490 and the console.

PROC 618 - DIAGNOSTIC PROCESSOR/REMOTE INTERFACE/ALARM INTERFACE TEST

FLIPCHART ISSUE 1	+	+	DIAGNOSTIC PROCESSOR/REMOTE INTERFACE TEST	+	+	INTERFACE/ALARM	+	+	845552223
UNIT TYPES (FIELD 2) 60 = DIAGNOSTIC PROCESSOR/REMOTE INTERFACE 63 = EXTERNAL EQUIPMENT 64 = EXTERNAL PROCESSOR	ALARM STATUS (FIELD 7): 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED	TESTS 4 AND 5 CALL STATE (FIELD 9): 0 = TESTS CALL NOT RUN 1 = DIALING IN PROGRESS 2 = REMOTE MODEM CONNECTED 3 = TEST DATA RECEIVED 4 = TEST CALL PASSED, MODEM 0 IDLE, AAOF DISABLED 5 = TEST CALL PASSED, MODEM 0 IDLE, AAOF ENABLED 6 = TEST CALL FAILED, I/O TO DIAGNOSTIC PROCESSOR FAILED 7 = TEST CALL FAILED, CALLING OUT FAILED 8 = TEST CALL FAILED, TEST DATA NOT RECEIVED	9 = TEST CALL FAILED, TEST CALL NOT TERMINATED 10 = TEST CALL FAILED, TEST CALL ABORTED 11 = TEST CALL FAILED, MODEM 0 BUSY 12 = TEST CALL FAILED, MODEM 1 BUSY 13 = TEST CALL FAILED, MODEMS 0 AND 1 BUSY	TEST 1 SPECIFIC FAULT CODES (FIELD 9): SEE DOCUMENTATION	TESTS 2 AND 3 SPECIFIC FAULT CODES (FIELD 9): 0 = PASS SEE DOCUMENTATION FOR ALL OTHER VALUES	STAMP INDEX (FIELD 11): 1 = TIME OF MOST RECENT ERROR/ TIME ALARM RESOLVED 2 = TIME WHEN ERROR BEGINS 3 = TIME WHEN ERROR WAS ALARMED			COMMON CONTROL TESTS 618

FLIPCHART ISSUE 1		+	DIAGNOSTIC PROCESSOR/REMOTE INTERFACE TEST				+	INTERFACE/ALARM				+	845552223				
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA' 'EXECUTE' TO RETIRE ALARM. USE 'NEXT UNIT' TO DISPLAY NEXT UNIT TYPE. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILURE. USE 'NEXT DATA' TO DISPLAY NEXT TIME STAMP.			TEST 2: TEST THE DIAGNOSTIC PROCESSOR COMPLEX AND DISPLAY THE FAILURE CODE IN FIELD 9. USE 'NEXT UNIT' TO DISPLAY NEXT UNIT TYPE. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILURE.			TEST 3: TEST THE DIAGNOSTIC PROCESSOR COMPLEX CONTINUOUSLY AND DISPLAY THE FAILURE CODE IN FIELD 9. USE 'STOP' TO HALT THE TEST. USE 'NEXT UNIT' TO DISPLAY THE NEXT UNIT TYPE. USE 'NEXT CIRCUIT' TO DISPLAY THE NEXT FAILURE.			TEST 4: MAKE A TEST CALL TO RMATS AND DISPLAY THE TEST RESULT. TEST 5: DISPLAY RESULT OF TEST 4. (FIELD DEFINITIONS CONT. ON WORD 0)			SPECIAL ERROR CODE: 80-THERE IS REDUCED TESTING FUNCTIONALITY 81-DMDS OVERFLOW 82-MODEM 0 BUSY 83-MODEM 1 BUSY 84-MODEMS 0 AND 1 BUSY 85-TEST CAN NOT RUN IN			OFF-LINE PROCESSOR 86-PROCEDURE CANNOT BE RUN FROM THIS PORT 87-PROCEDURE CANNOT BE MOVED TO PSEUDO PORT TO ALLOW TEST CALL 88-I/O TO DIAGNOSTIC PROCESSOR FAILED		
TEST NO	UNIT TYPE	TESTS 1-3				T1	TESTS 1-3	TESTS 1-3 SPECIFIC FAULT CODE	TEST 3		TEST 3				COMMON CONTROL TESTS		
		EQUIPMENT LOCATION							FAULT 10 OCCUR.	TIMES TESTED 13	TIMES FAILED 14						
		MOD	CAB	CAR	SLOT												
1	2	3	4	5	6	7	8	9	TIMES FAILED 10	STAMP INDEX 11	DAY 12	HOUR 13	MINUTE 14	618			

Purpose

PROC 618 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS**, **EXT PROC**, and **EXT EQPT** fault indicator resulting from a diagnostic processor complex failure.

PROC 618 reports the status and performs demand testing of the diagnostic processor complex. In addition, external alarms originated by the external processor, external equipment, and auxiliary equipment are also reported.

The diagnostic processor complex consists of:

1. The diagnostic processor.
2. The alarm interface.
3. The remote interface.
4. 1200 baud modem serving RMATS.
5. Maintenance bus.

Field Definitions and Codes

Each field of **PROC 618** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AA, PROC 618 - Field Definitions and Codes.

PROC 618

There are no optional input fields for **PROC 618**.

Operation of Procedure

Overview

PROC 618 is used to determine the cause of the **OTHER FAILS**, **EXT PROC**, and **EXT EQPT** fault indicator being lighted resulting from a diagnostic processor complex failure.

To call in **PROC 618**, perform the following:

1. Depress **PROC NO; 618; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Five tests are available:

1. Test 1 - Displays the failure history for unit type 60 (Diagnostic Processor/Remote Interface/Alarm Interface), unit type 63 (External Equipment), and unit type 64 (External Processor).
2. Test 2 - Executes a single test cycle on the diagnostic processor complex.
3. Test 3 - Executes a continuous test cycle on the diagnostic processor complex.
4. Test 4 - Makes a test call to RMATS and displays the current state of the test.
5. Test 5 - Displays the results of the last test call executed by Test 4.

Note: Test 5 allows RMATS to execute **PROC 618**, Test 4 remotely and then later call back to get the results of the test call.

There is reduced functionality if **PROC 618** is executed in the off-line side of a duplicated common control.

1. Test 1 executes the same way as it does in the on-line side of a duplicated common control.
2. The analog loop-around test capability for the modems is not performed in Tests 2 and 3.
3. Test 4 cannot be performed in the off-line side of the common control.

Note: If Test 4 is attempted in the off-line side of the common control, special error code 85 (test can not run in off-line processor) is displayed in the **MAAP** error code field.

4. Test 5 executes the same way as it does in the on-line side of a duplicated common control.

Note: Test 5 displays the results of the last test call executed by Test 4 when the off-line common control was on-line.

TABLE AA.

PROC 618 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-5	Test number.	4 (Contd)		Equipment location for unit type 63 (Contd).
2	60, 63 and 64	Unit type: Number designation of the functional unit of equipment which is being displayed.		4	Auxiliary cabinet circuit breaker.
	60	Diagnostic processor/remote interface.		5	Auxiliary cabinet frequency generator.
	63	External equipment.		6	Auxiliary cabinet rectifier.
	64	External processor.		7	Multiple external and/or auxiliary equipment failures.
3-6		Equipment location for unit type 60 displayed in Field 2.		8	Type unknown (multiple errors).
3	0-30	Module number.		Dashed	Not applicable for unit type 63.
4	0-7	Cabinet number.			
5	0-3	Carrier number.	3-6		Equipment location for unit type 64 displayed in Field 2.
6	22, 31, or 32	Slot number.	3	1-32	Unit number of external processor.
3-6		Equipment location for unit type 63 displayed in Field 2.	4-6	Dashed	Not applicable for unit type 64.
3	1-32	Unit number of external equipment.	7	1-5	Alarm status of displayed failure.
4	1-8	External equipment encode.		1	Major.
	1	Auxiliary cabinet battery holdover.		2	Minor.
	2	Auxiliary cabinet temperature.		3	Warning.
				4	Errors recorded.
3		Auxiliary cabinet fan.		5	Alarm resolved.

TABLE AA. Contd

PROC 618 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
8	0-99	Failure index.	9 (Contd)		Call state (Contd)
9	1-972	Specific fault code (Test 1, 2, and 3). See documentation.		12	Test call failed, modem 1 busy.
				13	Test call failed, modems 0 and 1 busy.
9	0-13	Call state (Test 4 and Test 5).	10	1-99	Number of times the displayed circuit failed (Test 1 only).
	0	Test call not run.			
	1	Dialing in progress.	10	1-99	Number of times the specific fault code displayed in Field 9 occurred (Test 3 only).
	2	Remote modem connected.			
	3	Test data received.	11	1-3	Stamp Index (Time Stamp Index).
	4	Test call passed, modem 0 idle, AAOF disabled.			
	5	Test call passed, modem 0 idle, AAOF enabled.	12-14		Time Stamp: A time stamp showing the day of the month, hour, and minute when the error began, or of the most recent error; or when the error was alarmed or resolved (Test 1 only).
	6	Test call failed, I/O to diagnostic processor failed.			
	7	Test call failed, calling out failed.	12	1-31	Day of the month.
	8	Test call failed, test data not received.	13	0-23	Hour of the day.
	9	Test data failed, test call not terminated.	14	0-59	Minute.
	10	Test call failed, test call aborted.	13	1-99	Number of times the diagnostic processor complex was continuously tested (Test 3 only).
	11	Test call failed, modem 0 busy.	14	1-99	Number of times the diagnostic processor complex failed Test 3.

Test 1

Test 1 displays the failure history for unit type 60 (diagnostic process/remote interface/alarm interface), unit type 63 (external equipment), and unit type 64 (external processor).

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 618** or is selected by use of **NEXT TEST**.
2. To start Test 1, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on as the PMIDS failure history is sorted.

3. If the on-line program has not detected any unit type 60, unit type 63, or unit type 64 failures, a 0 is displayed in Field 8 (failure index).
4. If failures are recorded, the following summary is displayed:

Field 1 - 1.

Fields 2 through 7 - Dashed.

Field 8 - Total number of failures.

Fields 9 through 14 - Dashed.

5. Depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the first PMIDS entry with recorded errors.

NEXT CIRCUIT is used to step through all individual circuit entries or all entries within a unit type.

NEXT UNIT is used to step to the first entry of the next unit type in numerical sequence.

6. The first entry with recorded errors is displayed as follows:

Field 1 - 1.

Field 2 - Unit type.

Field 3 - Unit number of external equipment/processor, or module number of displayed entry.

Field 4 - Dashed, external equipment encode, or cabinet number of displayed entry.

Field 5 - Dashed or carrier number of displayed entry.

Field 6 - Dashed or slot number of displayed entry.

Field 7 - Alarm status.

Field 8 - Failure index.

Field 9 - Specific fault code.

Field 10 - Total number of times the displayed entry failed.

Field 11 - 1 (indicating that Fields 12 through 14 display the time when the most recent error was recorded for the displayed entry).

Fields 12 through 14 - Day, hour, and minute of the most recent error recorded for the displayed entry.

7. Depressing **NEXT DATA** changes the stamp index and time stamp. Field 11 (stamp index) displays a 2 indicating that the time displayed in Fields 12 through 14 is the time when the error began for the entry displayed in Fields 2 through 6.

PROC 618, Test 1 and Test 2

8. If the displayed entry is an alarmed PMIDS entry (indicated by a 1, 2, or 3 displayed in Field 7), depressing **NEXT DATA** once more changes the stamp index and time stamp. Field 11 (stamp index) displays a 3 indicating that the time displayed in Fields 12 through 14 is the time the entry was alarmed.

If the displayed entry is not an alarmed PMIDS entry (or after displaying the time the entry was alarmed), depressing **NEXT DATA** cycles back to the initial display providing a stamp index of 1 in Field 11 and the time of the most recent error for the entry in Fields 12 through 14.

9. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures.
 - a. Each time **NEXT CIRCUIT** is depressed, Field 8 is decremented by 1 to show the number of remaining entries to be displayed.

When all failures are displayed, Fields 2 through 14 are dashed.
 - b. Depressing **NEXT CIRCUIT** once more starts the sequence over displaying the failure summary.

10. Depressing **NEXT UNIT** when the summary is displayed or after displaying the first unit type displays the next unit type with failures (if any).

NEXT CIRCUIT is used to display the failures within the unit type.

11. Depressing **NEXT UNIT** when the summary is displayed decrements Field 8 corresponding to the number of entries within a unit type passed over (if any).
12. The **CLEAR DATA; EXECUTE** sequence can be used to resolve individual alarmed entries after **EXECUTE** is used to initiate Test 1.
13. To resolve individual alarmed entries (turn off its associated fault indicator - when no other alarmed entries affect the same fault indicator), perform the following:
 - a. Use **NEXT UNIT** and/or **NEXT CIRCUIT** to display the alarmed entry (1, 2, or 3 displayed in Field 7) on the **MAAP**.

Requirement: The alarmed entry cannot be resolved or the fault indicator turned off unless the alarmed entry is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.
14. Field 7 (alarm status) displays a 5 indicating the alarmed entry in PMIDS is resolved.

The **OTHER FAILS**, **EXT PROC**, or **EXT EQPT** fault indicator associated with the alarmed entry is turned off if no other alarmed entries affecting the same fault indicator exist.

Test 2

Test 2 performs a single test cycle on the diagnostic processor complex.

When all tests for circuits of a given unit type pass, all alarmed entries in that unit type are resolved in PMIDS.

Test 2 performs the following tests:

1. An ID-chip test on the diagnostic processor (DP).

2. A parity checker test on the DP.
3. 501CC to DP interface RAM test.
4. An analog loop-around test on modem 0 the 1200 baud modem serving RMATS.
5. A retrieval of the error status bytes which reflect the results of the DP tests.
6. An ID-chip test on the remote interface (RI).
7. An ID-chip test on the alarm interface (AI).

If there is modem activity on either modem, the interface RAM testing, the error status bytes testing, and the analog loop-around testing are not performed.

Note: Special error code 80 (there is reduced testing functionality) is displayed in the **MAAP** error code field when these tests cannot be performed because of modem activity.

Test 2 automatically turns off the **OTHER FAILS** fault indicator when the diagnostic processor complex is tested successfully.

1. Test 2 is selected by use of **NEXT TEST**.
2. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

Note: If special error code 82 (modem 0 busy), special error code 83 (modem 1 busy), or special error code 84 (modems 0 and 1 busy) is displayed alternately on and off, or steadily on in the **MAAP** error code field while Test 2 is executing, the special error code indicates that all tests are not being performed because RMATS is using modem 0 modem 1, or both modems.

3. The failure information returned in Test 2 is stored in the Demand Information Data Structure (DMIDS).
 - a. If DMIDS becomes full at any time during the test, special error code 81 (DMIDS overflow) is displayed in the **MAAP** error code field.
 - b. Testing is **not** stopped when the DMIDS buffer becomes full.

Note: A maximum of 254 failure entries are frozen in DMIDS although Field 8 (failure index) may only indicate 99.

4. When Test 2 is completed, the **WAIT** indicator turns off and a summary is displayed.
5. If no failures occur, a 2 is displayed in Field 1 and a 0 is displayed in Field 8 (failure index).
6. If failures occurred, the following summary is displayed:

Field 1 - 2.

Fields 2 through 7 - Dashed.

Field 8 - Total number of failures.

Fields 9 through 14 - Dashed.

PROC 618, Test 2 and Test 3

7. Depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the first failure.
NEXT CIRCUIT is used to step through all individual circuit failures within a unit type.
NEXT UNIT is used to step to the first entry of the next unit type in numerical sequence.
8. The first failure is displayed as follows:
Field 1 - 2.
Field 2 - Unit type.
Field 3 - Unit number of external equipment/processor, or module number of displayed entry.
Field 4 - Dashed, external equipment encode, or cabinet number of displayed entry.
Field 5 - Dashed or carrier number of displayed entry.
Field 6 - Dashed or slot number of displayed entry.
Field 7 - Dashed.
Field 8 - Failure index.
Field 9 - Specific fault code.
Fields 10 through 14 - Dashed.

Note: If there are failures for unit type 60 (diagnostic processor/remote interface), the **RED** LEDs on the indicted circuit packs are turned on. No circuit packs are indicted for unit type 63 (external equipment) and unit type 64 (external processor).
9. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures.
 - a. Each time **NEXT CIRCUIT** is depressed, Field 8 is decremented by 1 to show the number of remaining entires to be displayed.
When all failures are displayed, Fields 2 through 14 are dashed.
 - b. Depressing **NEXT CIRCUIT** once more starts the sequence over displaying the failure summary.
10. Depressing **NEXT UNIT** when the summary is displayed or after displaying the first unit type displays the next unit type with failures (if any).
NEXT CIRCUIT is used to display the failures within the unit type.
11. Depressing **NEXT UNIT** when the summary is displayed decrements Field 8 corresponding to the number of entries within a unit type passed over (if any).
12. The **OTHER FAILS**, **EXT PROC**, and/or **EXT EQPT** fault indicator is automatically turned off when Test 2 completes with no failures detected if no other alarmed entries affecting the same fault indicator exist.

Test 3

Test 3 performs a continuous test cycle on the diagnostic processor complex, performing the same tests as in Test 2.

If there is modem activity on either modem, the interface RAM testing, the error status bytes testing, and the analog loop-around testing are not performed.

Note: Special error code 80 (there is reduced testing functionality) is displayed in the **MAAP** error code field when these tests cannot be performed because of modem activity.

1. Test 3 is selected by use of **NEXT TEST**.
2. To start Test 3, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is **not** turned on.

Note: If special error code 82 (modem 0 busy), special error code 83 (modem 1 busy), or special error code 84 (modems 0 and 1 busy) is displayed alternately on and off, or steadily on in the **MAAP** error code field while Test 3 is executing, the special error code indicates that all tests are not being performed because RMATS is using modem 0, modem 1, or both modems.

3. While Test 3 is executing, a blinking 0 is displayed in Field 9 (specific fault code).
Field 13 (times tested) and Field 14 (times failed) are updated as Test 3 is executing.
4. If a failure is detected, a blinking specific fault code is displayed in Field 9 as soon as the failure occurs and blinks until the end of the current test cycle.
A blinking 0 is displayed in Field 9 at the start of the next test cycle.
5. The **GREEN** LEDs on the DP, RI, and AI circuit packs are turned on at the end of one Test 3 cycle if no circuit packs failed.
6. If there is a failure for unit type 60 (diagnostic processor/remote interface), the **RED** LED on the indicted circuit pack is turned on.

RED LEDs are turned on at the time a failure is detected and stay on until an entire cycle of Test 3 executes failure free for that circuit pack.

7. The failure information returned in Test 3 is stored in the Demand Information Data Structure (DMIDS).
 - a. If DMIDS becomes full at any time during the test, special error code 81 (DMIDS overflow) is displayed in the **MAAP** error code field.
 - b. If DMIDS becomes full at any time during the test, **STOP** can be depressed and the results of the test can be examined.

Note: A maximum of 254 failure entries are frozen in DMIDS although Field 8 (failure index) may only indicate 99.

8. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
9. If no failures occur, a 3 is displayed in Field 1 and a 0 is displayed in Field 14 (times failed).
10. If failures occurred, the following summary is displayed:

Field 1 - 3.

Fields 2 through 7 - Dashed.

Field 8 - Total number of failures.

Fields 9 through 12 - Dashed.

Field 13 - Total number of times the diagnostic processor complex was tested.

Field 14 - Total number of times the diagnostic processor complex failed Test 3.

11. Depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the first failure.

NEXT CIRCUIT is used to step through all individual circuit failures within a unit type.

NEXT UNIT is used to step to the first entry of the next unit type in numerical sequence.

12. The first failure is displayed as follows:

Field 1 - 3.

Field 2 - Unit type.

Field 3 - Unit number of external equipment/processor, or module number of displayed entry.

Field 4 - Dashed, external equipment encode, or cabinet number of displayed entry.

Field 5 - Dashed or carrier number of displayed entry.

Field 6 - Dashed or slot number of displayed entry.

Field 7 - Dashed.

Field 8 - Failure index.

Field 9 - Specific fault code.

Field 10 - Number of times the specific fault code displayed in Field 9 occurred.

Fields 11 and 12 - Dashed.

Field 13 - Total number of times the diagnostic processor complex was tested.

Field 14 - Total number of times the diagnostic processor complex failed Test 3.

Note: If there are failures for unit type 60 (diagnostic processor/remote interface, the **RED** LEDs on the indicted circuit packs are turned on. No circuit packs are indicted for unit type 63 (external equipment) and unit type 64 (external processor).

13. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures.

- a. Each time **NEXT CIRCUIT** is depressed, Field 8 is decremented by 1 to show the number of remaining entires to be displayed. Fields 9 and 10 are updated as appropriate.

When all failures are displayed, Fields 2 through 14 are dashed.

- b. Depressing **NEXT CIRCUIT** once more starts the sequence over displaying the failure summary.

14. Depressing **NEXT UNIT** when the summary is displayed or after displaying the first unit type displays the next unit type with failures (if any).

NEXT CIRCUIT is used to display the failures within the unit type.

15. Depressing **NEXT UNIT** when the summary is displayed decrements Field 8 corresponding to the number of entries within a unit type passed over (if any).

16. If **STOP** is depressed to halt Test 3, **EXECUTE** must be depressed to restart Test 3. Test 3 will start from the beginning of the diagnostic processor complex test after the **STOP**, **EXECUTE** sequence is used.

Test 4

Test 4 is used to make a test call to RMATS and display the current call state as the test progresses.

Test 4 performs the following tests:

1. Checks translation for the presence of a phone number indicating that AAOF is allowed.

Note: Error code 74 (equipment not part of system) is displayed in the **MAAP** error code field indicating that AAOF is not assigned if there is no phone number in translation.

2. Send an order to the diagnostic processor to enable AAOF.
3. Extinguish the **RED** and **GREEN** LEDs on the RI.

Note: The LEDs must be extinguished in order to discern RMATS' turning on and off the **GREEN** LED.

4. Wait for modem 0 to become idle.

Note: RMATS may be calling in on modem 0 or modem 1 and executing **PROC 618**. The wait for modem 0 to become idle allows RMATS time to hang up (regardless of which modem RMATS is using) to allow the test call to be executed as the test call goes out on modem 0. RMATS must hang up prior to the test call being executed. The AAOF automatically tries to call out on modem 0.

5. Send a test call request to the DP. The DP then sends a test call to the RMATS center.
6. Monitor the RI **GREEN** LED when modem 0 becomes active.

Note: The RI **GREEN** LED turning on signifies that RMATS received the call and recognizes it as a test call.

7. After the RI **GREEN** LED becomes active, wait for it to be extinguished.
8. The RMATS center waits for one second and then extinguishes the RI **GREEN** LED.

Note: The extinguishing of the **GREEN** LED signifies the end of the test data.

9. After the RI **GREEN** LED is extinguished, Test 4 waits for modem 0 carrier to drop.

Note: When the modem 0 carrier drops, RMATS has terminated its response to the test call.

Test 4 is performed as follows.

1. Test 4 is selected by use of **NEXT TEST**.
2. To start Test 4, depress **EXECUTE**.

Note: Special error code 87 (procedure cannot be moved to pseudo port to allow test call) is displayed in the **MAAP** error code field when port contention will not allow the procedure access to call out.

PROC 618, Test 4 and Test 5

3. While Test 4 is executing, the following is displayed:

Field 1 - 4.

Fields 2 through 8 - Dashed.

Field 9 - Current call state of test.

Fields 10 through 14 - Dashed.

Note: Special error code 85 (test can not run in off-line processor) is displayed in the **MAAP** error code field if Test 4 is executed in the off-line common control.

4. Test 4 is terminated when it reaches one of the final call states. The following is displayed:

Field 1 - 4.

Fields 2 through 8 - Dashed.

Field 9 - Completion call state of Test 4.

Fields 10 through 14 - Dashed.

Note: If special error code 88 (I/O to diagnostic processor failed) is displayed in the **MAAP** error code field, perform Test 2 or 3 of **PROC 618** to determine the status of the diagnostic processor complex.

5. Depressing **STOP** causes the test to abort and results in a final state indicating a failure.

Call state 10 (test call failed, test call aborted) is displayed in Field 9.

Test 5

Test 5 displays the results of the last test call executed by Test 4 while on-line.

Test 5 allows RMATS or local maintenance personnel to execute **PROC 618**, Test 4 remotely (or locally) and then later call back to display the results of the test call executed by Test 4.

Test 5 returns the result of the last test call whether or not Test 4 is executed remotely. That is, Test 4 may be executed locally from the MAAP. RMATS or local maintenance personnel may call in at a later time and get the results of that test.

In order to remotely execute Test 4 from modem 0 or modem 1, RMATS must initiate the test and then hang up. Test 4 continues to execute the test and stores the final call state of Test 4 in memory.

After the test call is completed, RMATS or local maintenance personnel may invoke Test 5 of **PROC 618** to obtain the final call state of the previous test call.

1. Test 5 is selected by use of **NEXT TEST**.
2. To start Test 5, depress **EXECUTE**.
3. The following is displayed:

Field 1 - 5.

Fields 2 through 8 - Dashed.

Field 9 - Final call state of last test call executed by Test 4.

Note: Refer to Table AA, PROC 618 - Field Definitions and Codes for definition of the call state displayed in Field 9.

Fields 10 through 14 - Dashed.

Repair Guide

When unit type 60 (diagnostic processor), unit type 63 (external equipment), or unit type 64 (external processor) failure is indicated, **PROC 618** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted, perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and manually record the unit type, equipment location, and specific fault code displayed in Fields 2 through 6.
2. Perform the steps listed under **Unit type 60 (diagnostic processor), Unit type 63 (external equipment), or Unit type 64 (external) processor** as appropriate for the unit type(s) with failures recorded in Step 1.

Unit type 60 (diagnostic processor):

1. If the specific fault code displayed in Field 9 is **914, 916, 917, or 972**, check the configuration settings on the 1200 baud modem associated with the TN492 circuit pack at the equipment location displayed in slot 32.
2. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
3. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, proceed to Step 4.
4. Replace the 1200 baud modem.
5. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
6. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, proceed to Step 7.
7. Replace the cabling to the 1200 baud modem.
8. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
9. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, proceed to Step 10.
10. Replace circuit pack TN492 at the equipment location displayed in slot 32.

Note: Prior to replacement of circuit pack TN492, insure that the battery (comcode 844665836) is connected (or connect) to the back side of the circuit pack.

- a. Mark the date of the next battery replacement (month and year) on the **Date Label** that is attached to the battery.

Note: The battery replacement date is established by adding 5 years to the date of installation of the TN492 circuit pack and associated battery. Example: TN492 circuit pack replaced July 1987; date to be written on the label is July 1992.

- b. Affix the **Date Label** to the faceplate of the TN492 circuit pack.

Note: If the YELLOW LED is lighted, after the circuit pack is replaced, the battery is **not** connected or wired correctly.

11. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
12. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, proceed to Step 13.
13. Replace circuit pack TN491.
14. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
15. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.
16. If the specific fault code is **not 914, 916, 917, or 972**, replace the circuit pack at the equipment location displayed in Fields 3 through 6.
17. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
18. If the same entry is not displayed, corrective action is complete.
If the same entry is displayed, determine if slot 22, or 32 is displayed in Field 6.
19. If slot 22 or 32 is not displayed, proceed to Step 22.
If slot 22 or 32 is displayed, replace TN491 in slot 31 at the equipment location displayed in Fields 3 through 6.
20. Execute Test 3 to verify that the problem is corrected.
Determine if the same entry for unit type 60 is displayed.
21. If the same entry is not displayed, corrective action is complete.
22. If the same entry is displayed, check the UART cable E26 - E26 and the wiring associated with the circuit pack(s) replaced or perform microdiagnostic test 0 in the off-line side of a duplicated common control switch. If the switch is unduplicated, perform microdiagnostic testing only when traffic permits as microdiagnostic testing takes the switch down.
23. Repeat Steps 1 through 22 for each diagnostic processor entry (unit type 60) displayed in Test 1.

Unit type 63 (external equipment):

1. Record the unit number of the external equipment and the external equipment encode displayed in Fields 3 and 4 of each unit type 63 entry displayed in Test 1.
2. Determine from local records if you are at the customer's premises associated with the unit number displayed in Field 3.
3. If you are at the customer's premises, determine what corrective action to take depending on the external equipment encode displayed in Field 4.
4. External equipment encodes displayed in Field 4 are defined as follows:
 - 1 = The auxiliary cabinet battery holdover circuit alarm is active.
 - 2 = The auxiliary cabinet temperature limit sensor alarm is active.
 - 3 = The auxiliary cabinet fan power alarm is active.
 - 4 = The auxiliary cabinet circuit breaker/fuse alarm is active.
 - 5 = The auxiliary cabinet frequency generator alarm is active.
 - 6 = The auxiliary cabinet rectifier alarm is active.
 - 7 = Multiple external and/or auxiliary equipment failures.
 - 8 = Type of trouble is unknown, unit number(s) are known (multiple errors).

Isolation techniques for the encodes displayed in **PROC 618** are detailed in the following paragraphs.

Encode 1 - Battery Holdover

Extended holdover or extended power reserve is provided by the DC filter.

If encode 1 is displayed in Field 4 of **PROC 618**, Test 1 replace the DC filter.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the DC filter.

Encode 2 - Temperature Limit Sensor

An overtemperature alarm cause signifies that a predetermined cabinet temperature is exceeded.

1. Determine if fans are provided in the auxiliary cabinet.
 If no fans are provided, proceed to Step 8.
 If fans are provided, proceed to Step 2.
2. Determine if the fans are running.
 If no fans are running, proceed to Step 4.
 If fans are running, proceed to Step 3.
3. Determine if all fans are operating properly.
 - a. If all fans are operating properly, refer to isolation and repair step **Other Repair Steps**.

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- b. Replace any defective fan, allow sufficient time for cabinet interior to cool and proceed to Step 9.

Note: Refer to AUXILIARY CABINET COMPONENT REPLACEMENT for steps on replacement of fans.

4. Check the fuse (F1 or F2) associated with the fans. (F1 controls the upper fan assembly and F2 controls the lower fan assembly.)

If the fuse is blown, proceed to Step 5.

If the fuse is not blown, it may be possible for excessive heat in the room to cause the temperature alarm. Proceed to Step 8.

5. Replace the blown fuse.

If the fuse does not blow again, allow sufficient time for cabinet interior to cool and proceed to Step 9.

6. If the fuse blows again, replace the fan assembly associated with the blown fuse.

Note: Refer to AUXILIARY CABINET COMPONENT REPLACEMENT for steps on replacement of the fan assembly.

7. Replace the blown fuse, allow sufficient time for cabinet interior to cool and proceed to Step 9.

8. When no fans are provided, or excessive heat in the room is suspected, determine if environmental temperature is above maximum for the auxiliary cabinet.

- a. If the environmental temperature is above the maximum, leave the cabinet open to allow cooling, and refer the problem to local engineering.
- b. If the environmental temperature is not above the maximum, refer to isolation and repair step **Other Repair Steps**.

9. Enter **PROC 618**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

10. Enter **PROC 618**, Test 1 and depress **EXECUTE**.

Determine if the same entry for unit type 63 is displayed.

11. If the same entry is not displayed, corrective action is complete.
12. If the same entry is displayed, check the wiring associated with the fuse and fan assembly.

Encode 3 - Fan Power

Encode 3 (fan power) indicates that a fan may be malfunctioning.

1. Determine if the fans are running.

If no fans are running, proceed to Step 3.

If fans are running, proceed to Step 2.

2. Determine if all fans are operating properly.

- a. If all fans are operating properly, refer to isolation and repair step **Other Repair Steps**.

- b. Replace any defective fan, allow sufficient time for cabinet interior to cool and proceed to Step 7.

Note: Refer to AUXILIARY CABINET COMPONENT REPLACEMENT for steps on replacement of fans.

3. Check the fuse (F1 or F2) associated with the fans. (F1 controls the upper fan assembly and F2 controls the lower fan assembly.)

If the fuse is blown, proceed to Step 4.

If the fuse is not blown, refer to isolation and repair step **Other Repair Steps**.

4. Replace the blown fuse.

If the fuse does not blow again, allow sufficient time for cabinet interior to cool and proceed to Step 7.

5. If the fuse blows again, replace the fan assembly associated with the blown fuse.

Note: Refer to AUXILIARY CABINET COMPONENT REPLACEMENT for steps on replacement of the fan assembly.

6. Replace the blown fuse, allow sufficient time for cabinet interior to cool and proceed to Step 7.

7. Enter **PROC 618**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

8. Enter **PROC 618**, Test 1 and depress **EXECUTE**.

Determine if the same entry for unit type 63 is displayed.

9. If the same entry is not displayed, corrective action is complete.
10. If the same entry is displayed, check the wiring associated with the fan and circuit breaker.

Encode 4 - Circuit Breaker/Fuse

Fuses and circuit breakers provide visual indications when they operate.

1. Determine if any fuses are blown or circuit breakers tripped.

If no fuses are blown or circuit breakers tripped, refer to isolation and repair step **Other Repair Steps**.

If any fuse is blown or circuit breaker tripped, proceed to Step 2.

2. Replace the blown fuse, or reset the circuit breaker.

If the fuse does not blow again or circuit breaker does not trip, proceed to Step 4.

If the fuse blows again or circuit breaker trips, proceed to Step 3.

3. The corrective action to be taken depends on the blown fuse or tripped circuit breaker.

- a. Replacement of components associated with the blown fuse or circuit breaker may be required.
- b. Wiring or cabling associated with the fuse or circuit breaker should be checked.

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4. Enter **PROC 618**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
5. Enter **PROC 618**, Test 1 and depress **EXECUTE**.
Determine if the same entry for unit type 63 is displayed.
6. If the same entry is not displayed, corrective action is complete.
7. If the same entry is displayed, check the wiring associated with the fuse or circuit breaker.

Encode 5 - Frequency Generator

1. Determine the type of frequency generator installed in the auxiliary cabinet.
If the frequency generator is a 124B, proceed to Step 4.
If the frequency generator is a 124B1 or 124B2, proceed to Step 2.
2. Check the reset button (1 amp) at the front of the frequency generator.
If the reset button is flush (not popped out), proceed to Step 4.
If the reset button has popped out, proceed to Step 3.
3. Push the reset button in.
If the reset button pops out again, check the wiring to the output load(s) to determine the cause of the trouble.
If the reset button does not pop out, proceed to Step 7.
4. Check the fuse (2 amp) on the fuse panel associated with the frequency generator.
If the fuse is blown, proceed to Step 5.
If the fuse is not blown, proceed to Step 6.
5. Replace the blown fuse.
If the fuse does not blow, proceed to Step 7.
If the fuse blows again, check the wiring between the fuse and the frequency generator.
6. Replace the frequency generator.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacement of the frequency generator.

7. Enter **PROC 618**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
8. Enter **PROC 618**, Test 1 and depress **EXECUTE**.
Determine if the same entry for unit type 63 is displayed.
9. If the same entry is not displayed, corrective action is complete.
10. If the same entry is displayed, check the wiring associated with the frequency generator.

Encode 6 - Rectifier

A green pilot LED located on the front panel of the rectifier is on when the rectifier is producing -48 volts on its output.

The green pilot LED does not indicate that the output voltage is within regulation limits.

Appropriate test points are available on the front panel of the rectifier for measuring the output voltage and determining the rectifier performance.

1. At the rectifier, determine if the green pilot LED is on.
If the green pilot LED is not on, proceed to Step 2.
If the green pilot LED is on, proceed to Step 9.
2. Determine if the circuit breaker associated with the rectifier is tripped.
If the circuit breaker is tripped, proceed to Step 3.
If the circuit breaker is not tripped, proceed to Step 5.
3. Reset the circuit breaker.
If the circuit breaker does not trip, proceed to Step 12.
If the circuit breaker trips again, replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

4. If the circuit breaker does not trip again after replacing the rectifier, proceed to Step 12.
If the circuit breaker trips again after replacing the rectifier, check the wiring associated with the rectifier.
5. Measure the rectifier output voltages at the test points using a digital multimeter.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

If all voltages are within tolerance, refer to isolation and repair step **Other Repair Steps**.

If the voltages are not within tolerance, proceed to Step 6.

6. Replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

7. Measure the output voltages.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

8. If all voltages are within tolerance, proceed to Step 12.
If voltages are not within tolerance, check the wiring associated with the rectifier.

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9. Determine if marginal or fluctuating voltages exist at the rectifier test points by measuring the output voltages using a digital multimeter.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

If all voltages are within tolerance without fluctuation, refer to isolation and repair step **Other Repair Steps**.

If the voltages are marginal or fluctuating, proceed to Step 10.

10. Replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

11. Measure the output voltages.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

If all voltages are within tolerance and do not fluctuate, proceed to Step 12.

If voltages are not within tolerance or fluctuate, check the wiring associated with the rectifier.

12. Enter **PROC 618**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

13. Enter **PROC 618**, Test 1 and depress **EXECUTE**.

Determine if the same entry for unit type 63 is displayed.

14. If the same entry is not displayed, corrective action is complete.

15. If the same entry is displayed, check the wiring associated with the rectifier.

Other Repair Steps

1. In the event an alarm encode is present but the equipment associated with the alarm encode is functioning properly (or unable to function because of a suspected sensor or detector malfunction), the sensor, detector or alarm board corresponding to the auxiliary cabinet encode is probably faulty.
2. Replace the auxiliary cabinet alarm unit.
3. Enter **PROC 618**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
4. Enter **PROC 618**, Test 1 and depress **EXECUTE**.
Determine if the same entry for unit type 63 is displayed.
5. If the same entry is not displayed, corrective action is complete.
6. If the same entry is displayed, proceed to Step 7.

7. Check the sensor or detector and replace as appropriate.
8. Enter **PROC 618**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
9. Enter **PROC 618**, Test 1 and depress **EXECUTE**.
Determine if the same entry for unit type 63 is displayed.
10. If the same entry is not displayed, corrective action is complete.
11. If the same entry is displayed, proceed to Step 12.
12. If the sensor or detector is functioning correctly or after replacement of the sensor or detector the failure still exists, the wiring between the sensor or detector and the module control channel may be at fault.

Encode 7 (multiple external and/or auxiliary equipment failures) and encode 8 (type of trouble is unknown) requires investigation of the entire auxiliary cabinet to determine the location of the trouble.

Unit type 64 (external processor):

1. Record the unit number of the external processor displayed in Field 3 of each unit type 64 entry displayed in Test 1.
2. Determine from local records if you are at the customer's premises associated with the unit number displayed in Field 3.
3. If you are at the customer's premises, perform corrective action on the external processor or refer the problem to the appropriate personnel.

Specific Fault Codes

Further isolation of a failure may be accomplished by analyzing the specific fault codes recorded from Test 1 (PMIDS) and Test 3 (DMIDS).

Determine from Table AB, PROC 618 - Specific Fault Code Definitions, if any additional corrective action can be performed (i.e., cabling, connectors, etc.).

Check the wiring and cabling associated with the circuit pack(s) or components replaced (point to point) depending upon the specific fault code(s) recorded.

TABLE AB.

PROC 618 SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
821	THE DIAGNOSTIC PROCESSOR INTERFACE RAM OUTPUT IS ALWAYS BUSY
823	THE DIAGNOSTIC PROCESSOR INTERFACE RAM TEST FAILED FOR TEST REQUEST COMMAND
824	THE DIAGNOSTIC PROCESSOR INTERFACE RAM COMPLEMENT TEST FAILED FOR THE COMPLEMENT TEST REQUEST COMMAND
825	THE AUTOMATIC ALARM ORIGATION FUNCTION CANNOT BE ENABLED
870	THE DIAGNOSTIC PROCESSOR INTERFACE RAM INPUT BUFFER IS UNAVAILABLE
871	THE COMMAND IN THE DIAGNOSTIC PROCESSOR INTERFACE RAM INPUT BUFFER WAS NOT ACCEPTED BY THE DP
872	THE DIAGNOSTIC PROCESSOR INTERFACE RAM OUTPUT BUFFER GIVES NO RESPONSE
873	THE DIAGNOSTIC PROCESSOR INTERFACE RAM OUTPUT BUFFER CONTAINS IMPROPER COMMAND RESPONSE
874	THE EXTERNAL PROCESSOR MINOR ALARM IS ACTIVE
875	THE EXTERNAL PROCESSOR MAJOR ALARM IS ACTIVE
876	THE EXTERNAL EQUIPMENT MINOR ALARM IS ACTIVE
877	THE EXTERNAL EQUIPMENT MAJOR ALARM IS ACTIVE
878	THE AUXILIARY CABINET BATTERY HOLDOVER CIRCUIT ALARM IS ACTIVE
879	THE AUXILIARY CABINET TEMPERATURE LIMIT SENSOR ALARM IS ACTIVE
880	THE AUXILIARY CABINET FAN POWER ALARM IS ACTIVE
881	THE AUXILIARY CABINET CIRCUIT BREAKER/FUSE ALARM IS ACTIVE
882	THE AUXILIARY CABINET FREQUENCY GENERATOR ALARM IS ACTIVE
883	THE AUXILIARY CABINET RECTIFIER ALARM IS ACTIVE
884	AT LEAST ONE BACKGROUND TEST OF THE DIAGNOSTIC PROCESSOR'S ROM CRC TEST OR INTERNAL RAM TEST HAS FAILED
885	ONE ID-CHIP TEST ON THE MAINTENANCE BUS HAS FAILED
886	MORE THAN ONE ID-CHIP TEST ON THE MAINTENANCE BUS HAS FAILED
887	AT LEAST ONE BACKGROUND TEST OF THE INTEGRATED MODEMS HAS FAILED

TABLE AB. (Contd)

PROC 618 SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
888	AT LEAST ONE BACKGROUND TEST OF THE ALARM INTERFACE CIRCUIT HAS FAILED
889	VALIDATED AND REWRITTEN INFORMATION RAM CRC CHECK FAILURE
890	TWO OR MORE INVALID MESSAGES THAT THE DIAGNOSTIC PROCESSOR DETECTED ON PORT 0 WHILE IN DIRECT MODE
891	TWO OR MORE INVALID MESSAGES THAT THE DIAGNOSTIC PROCESSOR DETECTED ON PORT 1 WHILE IN DIRECT MODE
892	THE DIAGNOSTIC PROCESSOR ORIGINATED A CALL TO RMATS BUT WAS NOT SUCCESSFUL IN REPORTING THE ALARM
893	THERE WAS AN UNSUCCESSFUL INITIAL DATA EXCHANGE ON A CALL INTO THE CS500 REMOTE INTERFACE CIRCUIT
894	AN ATTEMPT WAS MADE TO RUN THE ID-CHIP TEST ON A BOARD WHOSE PRESENCE CANNOT BE DETECTED
895	ONLY THE EXTERNAL ALARM UNIT NUMBER IS DISCERNIBLE
896	ONLY THE EXTERNAL ALARM ERROR TYPE IS DISCERNIBLE
897	AN EXTERNAL ALARM HAS OCCURRED, HOWEVER, THE TYPE AND UNIT NUMBER ARE NOT DISCERNIBLE BECAUSE SEVERAL ALARMS EXIST AT ONCE
913	THE DIAGNOSTIC PROCESSOR INTERFACE RAM INPUT BUFFER FLAG IS NOT SETTABLE
914	MODEM 0 TWICE FAILED THE ANALOG LOOP-AROUND TEST RUN BY THE DIAGNOSTIC PROCESSOR
916	MODEM 1 TWICE FAILED THE ANALOG LOOP-AROUND TEST RUN BY THE DIAGNOSTIC PROCESSOR
917	ANALOG LOOP-AROUND TEST COULD NOT BE RUN ON MODEM 0
972	ANALOG LOOP-AROUND TEST COULD NOT BE RUN ON MODEM 1

PROC 620

PROC 620 - NETWORK PROCEDURE

FLIPCHART ISSUE 3		+	+	NETWORK PROCEDURE				+	+	845552223	
UNIT TYPE (FIELD 2): 6 = MODULE CONTROL CHANNEL 7 = TMS/MODULE PROCESSOR 8 = MAINT INTERFACE 9 = MODULE CLOCK 10 TSI ALU 11 TSI PSTORE 12 = I/O BUS INTERFACE		13 = PDS 14 = PCI 15 = PDI 16 = TONE PLANT 23 = TMS/NET DUPLICATION 24 = TT SENDER 25 = TT RECEIVER 26 = NETWORK I/O	27 = GPP 28 = MFET 29 = LINE CIRCUIT 31 = AUX TONE PLANT 32 = CO TRUNK 33 = DID TRUNK 34 = TIE TRK/DATA PORT 44 = ATND CNSL INTF	45 = AUXILIARY TRUNK 46 = ATTENDANT CONFERENCE 50 = TMS CLOCK OSCILLATOR 51 = LOCAL CLOCK TERMINATION 52 = SCS 53 = MULTIPLEXOR 54 = FAN OUT 55 = MODULE INTERFACE	56 = INTERMODULE DATA STORE 57 = LIGHT GUIDE INTERFACE 58 = FAN IN 59 = TMS MAINT INTER. 62 = ADFTC 66 = TONE DETECTOR 2	68 = DS1 69 = MFAT 71 = RMI 72 = EIA 74 = RCG 75 = PRI 98 = TMSF 99 = TSI	SPECIAL ERROR CODES: 80-BUSY/RELEASE BUSY NOT ALLOWED FOR THIS UNIT 81-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED 82-TEST OF RANGE NOT COMPLETED 83-SWITCH RESOURCES NOT AVAILABLE 84-DMIDS OVERFLOW				
WIND 0	REMOTE STATUS (FIELD 8): 0 = LOCAL 1 = REMOTE TI 2 = REMOTE FIBER		ALARM STATUS (FIELD 9): 0 = NO ERRORS RECORDED 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED		CIRCUIT STATUS (FIELD 10): 0 = IDLE 1 = ON-LINE & IN USE 2 = OFF-LINE 3 = MAINT BUSY 4 = NOT PLUGGED IN OR UNABLE TO COMMUNICATE 5 = BOARD IDLE WITH SOME PORTS MAINTENANCE BUSY		FAULT CODE INDEX (FIELD 11): 1 = SPECIFIC FAULT CODE FAULT CODE (FIELD 12): 9999 = FAILURE DETECTED ON OTHER THAN TESTED CIRCUIT (TEST 5) SEE DOCUMENTATION		85-NON-NETWORK EQUIP SPECIFICATION 86-NO CIRCUIT OF THIS TYPE IN THE SPECIFIED RANGE 87-MODULE CONTROL SWITCHED DURING TEST 88-SEE DOCUMENTATION FOR REPLACEMENT OF CIRCUIT PACKS 90-TEST PASSED, SEE DOCUMENTATION		NETWORK 620

FLIPCHART ISSUE 4		+		+		NETWORK PROCEDURE		+		+		845552223			
TEST 1: PMIDS FAILURE HISTORY DISPLAY. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARMS.				TEST 2: ONE ITERATION TESTING OF ONE OR MORE CIRCUITS. USE 'STOP' TO STOP THE TEST (TESTS 2 AND 3). USE 'NEXT DATA' TO DISPLAY FAILURE INFORMATION LISTS.				TEST 3: CONTINUOUS TESTING OF ONE OR MORE CIRCUITS.				TEST 4: DIAGNOSTIC ANALYSIS AND VERIFICATION.		TEST 5: CIRCUIT PACK VERIFICATION.	
								CAUTION: TEST 4 (VERIFICATION) AND TEST 5 WILL DISRUPT CALLS IN PROGRESS FOR ALL PORTS ON THE BOARD UNDER TEST.							
USE 'NEXT FAULT' TO DISPLAY MULTIPLE FAULTS FOR ONE CIRCUIT (TESTS 3, 4 & 5).															

Purpose

PROC 620 is used when referenced from **PROC 600** (alarm causes/error log) or when the **NETWORK SWITCH** and/or **PORT** and **MAJOR**, and/or **MINOR** alarm indicators on the alarm panel are lighted.

The hardware tested by **PROC 620** includes all of the digital network below the 4-MHz data channel down to and including the ports and the TMS.

PROC 620 is used to:

1. Display failure history for any circuit in the digital network.
2. Provide the capability to manually turn off the fault indicator(s) activated because of digital network failures.

Note: Network alarmed circuit failures in PMIDS are marked as resolved.

3. Test one or more circuits once and display the test results.
4. Test one or more circuits in a continuous cycle and display the test results.
5. Start with a specific equipment location and diagnose a problem to determine the true location of the fault.

6. Perform a verification test on a specific equipment location and turn the circuit pack's RED or GREEN LED on to indicate whether or not the problem is corrected.
7. Automatically turn off the fault indicator(s) when all circuits that raised an alarm are tested as good.

Note: Network alarmed circuit failures in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 620** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AC, PROC 620 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Field 2 - Select unit type (number designation of the functional unit of equipment) to be tested or displayed.
3. Fields 3 through 7 - Select equipment location of a specific circuit, range of circuits, or all circuits in a unit type to be tested (Tests 2 through 5 only).

Operation of Procedure

Overview

PROC 620 is used to determine the cause of the **NETWORK SWITCH** and/or **PORT** and **MAJOR** or **MINOR** alarm indicators being lighted resulting from a digital network failure.

To call in **PROC 620**, perform the following:

1. Depress **PROC NO; 620; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Five tests are available:

1. Test 1 - Displays failure history by severity of alarm, then within alarm level by unit type, and within unit type by circuit location.
Test 1 is also used to manually resolve individual digital network alarmed failures or all digital network alarmed failures which turns off the associated fault indicator(s).
2. Test 2 - Tests one or more circuits, an individual unit type, or a range of circuits one time.
3. Test 3 - Tests one or more circuits, an individual unit type, or a range of circuits continuously.
4. Test 4 - Performs a diagnostic analysis and verification test on a specific equipment location.
5. Test 5 - Performs a verification test on a specific equipment location.

TABLE AC.

PROC 620 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-5	Test number.	2 (Contd)	27	General purpose port (GPP).
2	6-99	Unit Type: Number designation of the functional unit of equipment to be tested, or which is being displayed.		28	Multifunctional Electronic Telephone (MFET) port.
	6	TMS or module control channel.		29	Line circuit.
	7	TMS or module processor (scanner).		31	Auxiliary tone plant.
	8	Maintenance interface.		32	CO trunk (hardware).
	9	Module clock.		33	DID trunk (hardware).
	10	Time slot interchanger (TSI) - ALU.		34	TIE trunk/data port (hardware).
	11	Time slot interchanger (TSI) - PSTORE.		44	Attendant console interface.
	12	I/O bus interface (IOBI).		45	Auxiliary trunk.
	13	Port data store (PDS).		46	Attendant conference.
	14	Port control interface (PCI).		50	TMS clock oscillator (TCO).
	15	Port data interface (PDI).		51	Local clock termination (LCT).
	16	Tone plant.		52	System clock synchronizer (SCS).
	23	TMS or network duplication channel.		53	Multiplexer (MPX).
	24	Touch-tone dialing sender.		54	Fan out (FO).
	25	Touch-tone dialing receiver.		55	Module interface (MI).
	26	Network I/O.		56	Intermodule data store (IDS).
				57	Light guide interface (LGI).

TABLE AC. (Contd)

PROC 620					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
2 (Contd)	58	Fan in (FI).	8 (Contd)	1	Remote port or RCC via T1 carrier.
	59	TMS maintenance interface (TMIF).		2	Remote port or RCC via fiber.
	62	Analog/Digital Facility Test Circuit (ADFTC).	9	0-5	Alarm status of circuit being displayed.
	66	Tone detector 2.		0	No errors recorded.
	68	DS-1 trunk interface.		1	Major.
	69	Multifunction analog terminal (MFAT).		2	Minor.
	71	Remote module interface (RMI).		3	Warning.
	72	EIA interface.		4	Errors recorded.
	74	Remote carrier group (RCG).		5	Alarm resolved.
	75	Primary rate interface.	10	0-5	Circuit status of circuit being displayed.
	96	TMS fabric (TMSF).		0	Idle.
	99	Time slot interchanger (TSI).		1	On-line and in-use.
3-7		Equipment location of displayed circuit.		2	Off-line.
				3	Maintenance busy.
				4	Not plugged in or unable to communicate.
				5	Board idle with some ports maintenance busy.
			11		Fault code index:
				1	Specific fault code.
3	0-30	Module number.			
4	0-7	Cabinet number.			
5	0-3	Carrier number.			
6	0-27	Slot number.			
7	0-7	Circuit number (if any).			
8	0-2	Remote status:			
	0	Local port or RCL.			

TABLE AC. (Contd)

PROC 620 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
12	0-2007	Specific fault code.	14	0-99	Number of circuits failed in a multicircuit test OR Number of times that an individual circuit has failed a test OR Fault list index for an individual circuit during continuous testing.
	9999	Failure detected on other than the tested circuit (Test 5).			
13	0-9999	Number of circuits tested or number of times single circuit has been tested.			

Test 1**Overview**

Test 1 provides a failure history of the digital network failures detected by on-line software.

Failures are displayed in alarm order severity. Alarmed failures are displayed in descending order with major alarmed failures displayed first, entries with minor alarms second, and failures with warning alarms last. Entries in the failure history with errors recorded are displayed after all alarmed failures.

1. Within each alarm category failures are displayed by unit type priority.

Note: Entries with errors recorded are also displayed by unit type priority.

2. Unit type priority is assigned according to the order of their importance to service to the customer (most important to least important functional area) and are **not** in numerical order.

Test 1 is also used to manually turn off the **NETWORK SWITCH** and/or **PORT** fault indicator(s).

Test 1 Execution

1. Test 1 is the default test when entering **PROC 620** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. The PMIDS error log is sorted and a summary of the failures and/or entries with errors recorded are displayed.

4. If no failures and/or entries with errors recorded exist, the following summary is displayed:
 Field 1 - 1.
 Field 13 - 0 (Indicating no failures and/or entries with errors recorded).
5. If any failures and/or entries with errors recorded exist, the summary displays a 1 in Field 1 and the total number of failures and/or entries with errors recorded in Field 13.
6. Depressing **NEXT CIRCUIT** displays the first failure or entry with errors recorded as follows:
 Field 1 - 1.
 Field 2 - Unit type of displayed circuit.
 Fields 3 through 7 - Equipment location of displayed circuit.
 Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).
 Field 9 - Alarm status of displayed circuit (1 = major, 2 = minor, 3 = warning, 4 = errors recorded).
 Fields 10 and 11 - Dashed.
 Field 12 - Specific fault code.
 Field 13 - Total number of failures and/or entries with errors recorded.
 Field 14 - Total number of times the circuit in Fields 2 through 7 failed or had errors recorded.

Note: Field 13 includes in its count the entry currently being displayed.

7. Failures for unit type 26 (Network I/O) are logged in PMIDS by ORing the current fault code with the one, if any, already logged for the specific location.

Table AD, PROC 620 - Unit Type 26 (Network I/O) Specific Fault Code Definitions, defines the meaning of the current fault code, or the ORed fault code logged in PMIDS for unit type 26.

Note: The specific fault code displayed in Field 12 for unit type 26 (Network I/O) is **not** passed to Tests 2, 3, 4, or 5.

8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining digital network failures and/or entries with errors recorded in the PMIDS error log.
 - a. Each time **NEXT CIRCUIT** is depressed, Field 13 is decremented by 1 to show the number of remaining failures and/or entries with errors recorded to be displayed.
 - b. Field 13 includes in its count the failure and/or entry with errors recorded being displayed.
9. Depressing **NEXT CIRCUIT** after all failures and/or entries with errors recorded are displayed dashes Fields 2 through 14.

Depressing **NEXT CIRCUIT** again causes the display sequence to start over beginning with the summary.

TABLE AD.

PROC 620 UNIT TYPE 26—NETWORK I/O SPECIFIC FAULT CODE DEFINITIONS (SFC)		
SFC	DEFINITION	
3	SCAN_TSK_ERR	Scan task error
129	CALL_PROC_ERR	Call Processing error
131	SCAN_TSK_ERR; CALL_PROC_ERR	Scan task error and call processing error
257	NACK_RESPONSE	Negative acknowledgment response
259	SCAN_TSK_ERR; NACK_RESPONSE	Scan task error and negative acknowledgment response
385	CALL_PROC_ERR; NACK_RESPONSE	Call processing error and negative acknowledgment response
387	SCAN_TSK_ERR; CALL_PROC_ERR; NACK_RESPONSE	Scan task error, call processing error, and negative acknowledgment response

10. The **CLEAR DATA; EXECUTE** sequence is used to manually resolve individual alarmed digital network failures or all alarmed digital network failures after **EXECUTE** is used to initiate Test 1.

Note: When alarmed failures are resolved the circuits' failure history is not deleted from the PMIDS error log. The failure history is updated to show that the alarm status now equals 5 (alarm resolved).

The digital network failures which are resolved are those failures with an alarm status of 1, 2, or 3 displayed in Field 9.

11. To resolve individual digital network failures with an alarm status of 1, 2, or 3, perform the following:

- a. Use **NEXT CIRCUIT** to display the alarmed failure on the **MAAP**.

Requirement: Individual digital network failures cannot be resolved unless the failing digital network circuit is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.

12. Field 9 (alarm status) displays a 5 indicating that the failing digital network circuit in PMIDS is marked as resolved.

The **NETWORK SWITCH** or **PORT** fault indicator associated with the failing digital network circuit is turned off if no other sources affecting the same fault indicator exist.

13. All digital network failures with an alarm status of 1, 2, or 3 can be resolved when the summary is initially displayed, i.e., upon entry to **PROC 620**, Test 1 and after displaying and recording all alarmed digital network failures and then using **NEXT CIRCUIT** to display the summary.

Caution: The alarmed digital network failures should be displayed and recorded prior to resolving the alarmed failures and turning off their associated alarm and fault indicators in order that a record of the causes of the alarmed failures are available for maintenance personnel.

14. After entering Test 1 and depressing **EXECUTE**, the summary is displayed.
Depress **CLEAR DATA; EXECUTE**.
15. Field 13 (total number of failures and/or entries with errors recorded) changes to indicate the number of digital network failures with an alarm status of 1, 2, or 3 which are resolved.
Alarmed digital network failures are marked as resolved in PMIDS and the **NETWORK SWITCH** and/or **PORT** fault indicator(s) is turned off.
16. After displaying and recording all digital network failures, depress **NEXT CIRCUIT** until the summary is displayed.
Then, depress **CLEAR DATA; EXECUTE**.
17. Field 13 (total number of failures and/or entries with errors recorded) changes to indicate the number of digital network failures with an alarm status of 1, 2, or 3 which are resolved.
Alarmed digital network failures are marked as resolved in PMIDS and the **NETWORK SWITCH** and/or **PORT** fault indicator(s) is turned off.
18. The **MAJOR** and/or **MINOR** alarm indicator(s) is also turned off when no other sources affecting the **MAJOR** and/or **MINOR** alarm indicator(s) is present.

Test 2

Overview

Test 2 is used to test one or more circuits in the digital network once and display the results of the test.

Circuits can be selected for testing by unit type, a range of equipment locations, or on a single circuit basis.

Test 2 automatically turns off the **NETWORK SWITCH** and/or **PORT** fault indicator(s) when all circuits that raised an alarm pass Test 2. Network circuit alarmed failures in PMIDS are marked as resolved.

Test 2 Data Entry

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.

PROC 620, Test 2

2. When Test 2 is initially called in, a default equipment location and unit type may be displayed in Fields 2 through 7.

The alarm status, circuit status, and specific fault code associated with the default equipment location are displayed in Fields 9, 10, and 12.

Field 2 (unit type) is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Tests 1, or 3 through 5 of **PROC 620** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

The default equipment location can also be passed from other maintenance procedures; i.e.: **PROC 621, PROC 622, PROC 625, PROC 646, PROC 647, and PROC 648** as long as the equipment location is a network digital circuit and is still displayed in **PROC 621, PROC 622, PROC 625, PROC 646, PROC 647, or PROC 648** when it is passed.

4. All digital network circuits, a range of circuits, all circuits within a unit type, a combination of unit type and range (i.e., all circuit locations of a unit type in the range specified), a specific digital network circuit, or the default equipment location can be tested.
5. When unit type 27 (GPP) is selected during range testing, all translated peripherals should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when peripherals are disconnected or do not have power on when required.

Proceed to Step 9.

6. When attendant console interface circuits (unit type 44) are selected during range testing, the associated headset(s) or handset(s) **must** be unplugged or the circuits fail.

Proceed to Step 9.

7. When unit type 45 (auxiliary trunks) is selected during range testing, one-way incoming and one-way outgoing auxiliary trunks **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).

Proceed to Step 9.

8. Unit type 68 (DS-1), unit type 74 (RCG), and unit type 75 (PRI) can be selected for range testing.

Note: Any unit type 68, unit type 74, unit type 75 circuit packs not busied out and **in use** can be tested in Test 2 without busying out the unit type 68 (DS-1), unit type 74 (RCG), and unit type 75 (PRI) circuit packs as the test executed is **not** service affecting.

Proceed to Step 9.

9. To select the entire switch to be tested, Fields 2 through 7 must be dashed.
 - a. If no default equipment location is displayed, depress **ENTER**.
 - b. If a default equipment location is displayed, depress **CHANGE FIELD; 2; ENTER; ENTER**.

Test 2 starts with the first module, first cabinet and carrier and runs until all digital network circuits in the switch are tested.

Proceed to Step 1 of Test 2 Execution.

10. In addition to testing all network circuits in the entire switch, a range of digital network circuits (all network circuits in a module, cabinet, carrier, or slot) can also be selected for testing.
11. Selection of a range of circuits to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed, **ENTER** or the **CHANGE FIELD** sequence is performed to select the range of circuits to be tested.
12. To select all network circuits in a module for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number to be tested); ENTER.**

Test 2 starts with the first network circuit in the module selected and runs until all digital network circuits in the module are tested.

Proceed to Step 1 of Test 2 Execution.

13. To select all network circuits in a cabinet for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER, (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

Test 2 starts with the first network circuit in the cabinet selected and runs until all digital network circuits in the cabinet are tested.

Proceed to Step 1 of Test 2 Execution.

14. To select all network circuits in a carrier for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**

Test 2 starts with the first network circuit in the carrier selected and runs until all digital network circuits in the carrier are tested.

Proceed to Step 1 of Test 2 Execution.

15. To select all network circuits in a slot for testing, perform one of the following depending on whether or not a default equipment location is displayed.

PROC 620, Test 2

- a. ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.
- b. CHANGE FIELD; 2; ENTER; ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.

Note: When a slot is specified to be tested, either all circuits on the circuit pack are tested, or if the circuit pack has no circuits, then the circuit pack is tested.

Test 2 starts with the first network circuit on the circuit pack selected and runs until all digital network circuits on the circuit pack are tested.

Proceed to Step 1 of Test 2 Execution.

16. To select all circuits within a unit type to be tested, the appropriate unit type must be entered in Field 2.

Note: Refer to Table AE, PROC 620 - Unit Type to Circuit Pack Identification, to determine which circuit pack(s) is tested for a particular unit type.

17. A unit type can be selected in several ways: i.e., by depressing **NEXT UNIT** until the correct unit type is displayed, or by entering the unit type and depressing **ENTER**.
18. When unit type 27 (GPP) is selected during range testing, all translated peripherals should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when peripherals are disconnected or do not have power on when required.

Proceed to Step 22.

19. When unit type 44 (attendant console interface) is selected during range testing, the associated headset(s) or handset(s) **must** be unplugged or the circuits fail.

Proceed to Step 22.

20. When unit type 45 (auxiliary trunks) is selected during range testing, one-way incoming and one-way outgoing auxiliary trunks **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).

Proceed to Step 22.

21. Unit type 68 (DS-1), unit type 74 (RCG), and unit type 75 (PRI) can be selected for range testing.

Note: Any unit type 68, unit type 74, or unit type 75 circuit packs not busied out and **in use** can be tested in Test 2 without busying out the unit type 68 (DS-1), unit type 74 (RCG), and unit type 75 (PRI) circuit packs as the test executed is **not** service affecting.

Proceed to Step 22.

TABLE AE.

PROC 620 UNIT TYPE TO CIRCUIT PACK IDENTIFICATION		
UNIT TYPE	DEFINITION	CIRCUIT PACK
6	TMS or module control channel (MCC)	TN401
7	TMS or module processor	TN381 or TN380
8	Maintenance interface (MIF)	TN444
9	Module clock	TN460
10	Time slot interchanger (TSI)—ALU	TN446
11	Time slot interchanger (TSI)—PSTORE	TN445
12	I/O bus interface (IOBI)	TN400
13	Port data store (PDS)	TN440
14	Port control interface (PCI)	TN452
15	Port data interface (PDI)	TN454
16	Tone plant	SN250
23	TMS or network duplication/update channel	TN530
24	Touch-tone dialing sender	SN252
25	Touch-tone dialing receiver	SN251
26	Network I/O	Not applicable
27	General purpose port (GPP) or off-premises general purpose port (OPGPP)	SN270 or SN271
28	Multifunctional electronic telephone (MFET) port	SN224
29	Line circuit	SN228 or SN229
31	Auxiliary tone plant	SN253
32	CO trunk (hardware)	SN230
33	DID trunk (hardware)	SN232
34	TIE trunk/data port (hardware)	SN233 or SN243
44	Attendant console interface	SN233
45	Auxiliary trunk (hardware)	SN231
46	Attendant conference	SN254
50	TMS clock oscillator (TCO)	TN461
51	Local clock termination (LCT)	TN462
52	System clock synchronizer (SCS)	TN463
53	Multiplexer (MPX)	TN470
54	Fan out (FO)	TN473
55	Module interface	TN480
56	Intermodule data store	TN441
57	Light guide interface (LGI)	TN481
58	Fan in (FI)	UN150
59	TMS maintenance interface (TMIF)	TN482

TABLE AE. (Contd)

PROC 620 UNIT TYPE TO CIRCUIT PACK IDENTIFICATION		
UNIT TYPE	DEFINITION	CIRCUIT PACK
62	Analog/digital facility test circuit (ADFTC)	SN261
66	Tone detector 2	SN255
68	DS-1	ANN11
69	Multifunction analog terminal (MFAT)	ANN17
71	Remote module interface (RMI)	TN456
72	EIA	SN238
74	Remote carrier group	ANN15/ANN16
75	Primary rate interface (PRI)	ANN35

22. If no default equipment location is displayed, enter the unit type to be tested in Field 2 and depress **ENTER** or use **NEXT UNIT** to step through the unit types in numerical sequence until the unit type to be tested is displayed in Field 2.

If a default equipment location is displayed, enter the unit type to be tested in Field 2 and depress **ENTER**.

Test 2 starts with the first module, first cabinet and carrier, and runs until all digital network circuits of the unit type selected are tested.

Proceed to Step 1 of Test 2 Execution.

23. In addition to testing all network circuits in a specified unit type, a range of circuits for the unit type (all circuits for a unit type in a module, cabinet, carrier, or slot) can also be selected for testing.
24. To select all network circuits for a unit type in a module for testing, perform one of the following depending on whether or not a default equipment location is displayed.
- (Unit type to be tested); ENTER; (Module number to be tested); ENTER.**
 - CHANGE FIELD; 2; ENTER; (Unit type to be tested); ENTER; (Module number to be tested); ENTER.**

Test 2 starts with the first network circuit of the unit type specified, in the module selected, and runs until all digital network circuits of the unit type in the module are tested.

Proceed to Step 1 of Test 2 Execution.

25. To select all network circuits for a unit type in a cabinet for testing, perform one of the following depending on whether or not a default equipment location is displayed.
- (Unit type to be tested); ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

- b. **CHANGE FIELD; 2; ENTER; (Unit type to be tested); ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

Test 2 starts with the first network circuit of the unit type specified, in the cabinet selected, and runs until all digital network circuits of the unit type in the cabinet are tested.

Proceed to Step 1 of Test 2 Execution.

- 26. To select all network circuits for a unit type in a carrier for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Unit type to be tested); ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Unit type to be tested); ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**

Test 2 starts with the first network circuit of the unit type specified, in the carrier selected, and runs until all digital network circuits of the unit type in the carrier are tested.

Proceed to Step 1 of Test 2 Execution.

- 27. To select all network circuits for a unit type in a slot for testing, perform one of the following depending on whether or not a default equipment location is displayed.

Note: When a slot is specified to be tested, either all circuits on the circuit pack are tested, or if the circuit pack has no circuits, then the circuit pack is tested.

- a. **(Unit type to be tested); ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**
- b. **CHANGE FIELD; 2; ENTER; (Unit type to be tested); ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**

Test 2 starts with the first network circuit of the unit type specified, in the slot selected, and runs until all digital network circuits of the unit type in the slot are tested.

Proceed to Step 1 of Test 2 Execution.

- 28. A specific network circuit can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER (Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**

Proceed to Step 35.

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29. When a specific circuit in unit type 27 (GPP) is selected for testing, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

Proceed to Step 35.

30. When a specific circuit in unit type 44 (attendant console interface) is selected for testing, the associated headset or handset **must** be unplugged or the circuit fails.

Proceed to Step 35.

31. When a specific circuit in unit type 45 (auxiliary trunks) is selected for testing, one-way incoming and one-way outgoing auxiliary trunks **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).

Proceed to Step 35.

32. The unit type field is an optional input field to test a specific network circuit.

If the unit type is unknown, **CLEAR ENTRY; ENTER** is used to clear any unit type displayed in Field 2, or **ENTER** is depressed when no unit type is displayed.

33. A specific network circuit can also be selected for testing whether or not a default equipment location is displayed by use of **NEXT UNIT** and **NEXT CIRCUIT**.

- a. Depress **NEXT UNIT** until the unit type of the circuit to be tested is displayed in Field 2.
- b. Depress **NEXT UNIT** until the unit type of the circuit to be tested is displayed in 7.

Proceed to Step 35.

34. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 35.
35. When a specific network circuit or default equipment location is to be tested, check the circuit status in Field 10.

Note: Individual DS-1, RCG, or PRI circuit packs do not have to be busied out as testing of DS-1, RCG, or PRI circuit packs is non-destructive in Test 2 (i.e., does not affect customer calls).

36. If Field 10 equals 1 (on-line and in-use), Test 2 cannot be performed for port circuits without busying them out. Wait until the circuit is not in-use or perform tests on other circuits.

Note: Port circuits that cannot be tested while in-use without being busied out are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.

If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 37.

If Field 10 does not equal 4, proceed to Step 38.

37. If Test 2 is being performed remotely, proceed to Step 38.

- a. If Test 2 is being run locally (or with maintenance personnel on the customer's premises or at the remote carrier group), determine if the circuit pack being tested is plugged in.
 - b. If the circuit pack is not plugged in or the slot is empty, reseal or install the circuit pack, then proceed to Step 38.
 - c. If the circuit pack is firmly seated, proceed to Step 38.
38. Individual port circuits, DS-1, RCG, or PRI circuit packs can be placed in maintenance busy out status for testing by checking the circuit status in Field 10.
39. Busy out of an PRI circuit pack (ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
- a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that all ISDN trunks are busied out by checking the circuit status of the ISDN trunks. The circuit status of the ISDN trunks are independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *Busying out a port circuit results in loss of customer calls when the port circuit is in use. Busying out a DS-1, RCG, or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1, RCG, or PRI circuit pack.*

40. If Field 10 equals 1, individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.

41. If the circuit status = 3, proceed to Step 1 of Test 2 Execution.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 1 of Test 2 Execution.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

Test 2 Execution

1. To start Test 2 after selecting the circuit(s) to be tested, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

2. Test 2 operation and display of test results is different when a specific network circuit, a default equipment location, a DS-1, RCG, or PRI circuit pack is tested and when the entire switch or a range of circuits are tested.
3. For test operation and display of test results for a default equipment location, a specific network circuit, a DS-1, RCG, or PRI circuit pack, proceed to Step 1 of Test 2 Execution and Test Result Display for a Single Circuit.
4. For test operation and display of test results for the entire switch or a range of circuits, proceed to Step 1 of Test 2 Execution and Test Result Display for a Range of Circuits.

Test 2 Execution and Test Result Display for a Single Circuit

1. Special error codes 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the default equipment location or the specific network digital circuit cannot be tested.
2. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 2. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7.
3. When special error code 83 (switch resources not available) is displayed, repeat Test 2 until the test is executed or wait until switch resources become available before testing.
4. If special error code 81 or 83 is not displayed, proceed to Step 5.
5. When the test is completed for a default equipment location, a specific circuit, a DS-1, RCG, or PRI circuit pack, the **WAIT** indicator is turned off and the following is displayed:
Field 1 - 2.
Fields 2 through 7 - Unit type and equipment location of circuit tested.
Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).
Field 9 - Alarm status of displayed circuit.
Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).
Fields 11 and 12 - Dashed.
Field 13 - 1 (Indicating one circuit tested).
Field 14 - 0 (Indicating no failures were found for the circuit tested) or 1 (Indicating that the circuit failed the test).
6. When a specific circuit, a default equipment location, a DS-1, RCG, or PRI circuit pack fails Test 2 (indicated by a 1 in Field 14), depressing **NEXT CIRCUIT** displays the index and specific fault code recorded for the circuit tested in Fields 11 and 12.
7. When the default equipment location, specific circuit, DS-1, RCG, or PRI circuit pack previously tested was busied out and the test passed, or the problem was corrected, the circuit, or circuit pack should be released from busy using **RLS BUSY OUT**.
8. Releasing ISDN trunks (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
9. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks. The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.
10. When another specific circuit is to be tested, the **CHANGE FIELD** sequence must be used to select the specific circuit.

CHANGE FIELD; 2; ENTER; (Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

11. **EXECUTE** must be depressed to test the specific circuit selected.

Test 2 Execution and Test Result Display for a Range of Circuits

1. When the entire switch or a range of circuits is being tested for digital network failures, the **WAIT** indicator is turned on and the following fields are incremented as a circuit is tested:

Field 2 - Unit type of circuit being tested.

Fields 3 through 7 - Equipment location of circuit being tested.

Note: When a range of circuits for a particular unit type is being tested and the unit type contains only one circuit pack, the display in Fields 2 through 7 may not be changing.

Field 11 - Index (if any).

Field 12 - Specific fault code (if any).

Field 13 - Number of circuits tested.

Field 14 - Number of circuits failed (if any).

2. The failure information returned in Test 2 is stored in the Demand Maintenance Information Data Structure (DMIDS).

If DMIDS becomes full at any time during the test, Test 2 is stopped and the **WAIT** indicator is turned off.

The last equipment location tested is displayed in Fields 2 through 7, and special error code 84 (DMIDS overflow) is displayed in the **MAAP** error code field.

3. Results of the test can be examined at this time (See Steps 14 through 20 below) and Test 2 can be continued from where it was stopped; i.e., from the equipment location displayed in Fields 3 through 7.

Caution: *If Test 2 is continued from where it was stopped by a DMIDS overflow, any test results gathered to that point are lost and only new failure data is retained.*

Note: Before depressing **EXECUTE** to continue Test 2 from where it was stopped because of a DMIDS overflow, the failure data should be examined and recorded.

4. If the test is halted because of a DMIDS overflow, a new range of circuits to be tested can be entered instead of continuing Test 2 from where it was stopped.
 - a. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested.
 - b. Refer to Steps 5 through 15 of Test 2 Data Entry above to select a range of digital network circuits to be tested in a module, cabinet, carrier, or slot.

- c. Refer to Steps 19 through 27 of Test 2 Data Entry above to select a range of digital network circuits within a unit type to be tested in a module, cabinet, carrier, or slot.

- 5. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits entered or from where Test 2 was stopped.
- 6. When more than one circuit is being tested and the test of the circuit cannot be completed because switch resources are not available, special error code 83 (switch resources not available) is displayed in the **MAAP** error code field.

A fault code indicating resources were not available is stored in DMIDS and the next circuit is tested.
- 7. When a range of circuits is being tested and a circuit is encountered which is being used by call processing, the **IN USE** indicator on the **MAAP** is turned on momentarily when the display is updated and the in-use circuit is stored for a later retry.

Note: The **IN USE** indicator on the **MAAP** is also turned on momentarily when a DS-1, RCG, or PRI circuit pack is being tested and one of the circuits is in-use.

- 8. When the range of circuits specified is tested once, the stored in-use circuit locations are tried again following the same testing sequence as the first pass through the range of circuits.

The in-use list may be reduced to a few circuits or circuit packs which remain in-use by call processing. This condition can be recognized by the **IN USE** indicator on the **MAAP** remaining on and the display fields not changing or changing very slowly.

The test of in-use circuits or circuit packs continues until all circuits or circuit packs in the range specified are tested or until maintenance personnel halt Test 2 by depressing **STOP**.

- 9. When Test 2 is halted by depressing **STOP** and in-use circuits still exist, the list of in-use circuits or circuit packs are merged into the failed circuits list and the circuits or circuit packs are marked with a specific fault code of 13 indicating they were in-use.

The **WAIT** indicator is turned off and the results of the test can be examined at this time. (See Steps 14 through 21 below.)

- 10. **STOP** can be depressed when the entire switch or a range of circuits is being tested.

If Test 2 is stopped before one complete testing pass through the range of circuits specified is made, the total number of circuits tested and the total number of circuits failed are displayed in Fields 13 and 14.

The last equipment location tested is displayed in Fields 3 through 7 and special error code 82 (test of range not completed) is displayed in the **MAAP** error code field.

- 11. When Test 2 is halted by depressing **STOP** before the range of circuits is tested at least once, the in-use circuit list (if any) is merged into the failure list.

When Test 2 is continued, the in-use circuit list is added to as necessary and the circuits are retried as described in Step 8.

- 12. Test result information can be stepped through (as described in Steps 14 through 20 below) when Test 2 is halted using **STOP** even though the entire range is not tested.

13. To restart the test when Test 2 is halted by use of **STOP** before the range of circuits is tested at least once, **EXECUTE** is depressed and Test 2 starts at the equipment location following the last equipment location tested.

Test results gathered after restarting Test 2 are added to the test results previously stored in DMIDS.
14. When the entire switch or a range of circuits is tested, the **WAIT** indicator is turned off and a summary is displayed.
15. If no digital network circuits failed, the following summary is displayed.
Field 1 - 2.
Fields 2 through 6 - Equipment location of the range of circuits tested.
Field 13 - Number of circuits tested.
Field 14 - 0 (Indicating no failures).
16. If any digital network circuits failed, the summary displays a 2 in Field 1, the equipment location of the range of circuits tested in Fields 2 through 6, the total number of circuits tested in Field 13, and the total number of failures in Field 14.
17. Depressing **NEXT CIRCUIT** displays the first failure, as follows:
Field 1 - 2.
Field 2 - Unit type of failed circuit.
Fields 3 through 7 - Equipment location of failed circuit.
Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).
Field 9 - Alarm status of failed circuit.
Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).
Field 11 - Index (1).
Field 12 - Specific fault code.
Field 13 - Number of circuits tested.
Field 14 - Number of circuits failed.
18. When one-way incoming and one-way outgoing auxiliary trunks (unit type 45) are tested during range testing, they **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).
19. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing digital network circuits.
 - a. When more than one unit type is tested, depressing **NEXT UNIT** causes the first circuit of the next unit type with failures to be displayed.

Field 14 decrements, corresponding to the number of failures passed over (if any), when stepping from unit to unit.

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- b. **NEXT CIRCUIT** is used to step through the failures of the displayed unit type.
20. When all failing circuits are displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** dashes Fields 2 through 14.
- Depressing **NEXT CIRCUIT** or **NEXT UNIT** once more causes the summary to be displayed, and the failing circuits can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.
21. To select another range of digital network circuits to test, the **CHANGE FIELD** sequence must be used.
- a. Refer to Steps 5 through 15 of Test 2 Data Entry above to select a range of digital network circuits to be tested in a module, cabinet, carrier, or slot.
- b. Refer to Steps 19 through 27 of Test 2 Data Entry above to select a range of digital network circuits within a unit type to be tested in a module, cabinet, carrier, or slot.
22. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits selected.
23. The **NETWORK SWITCH** and/or **PORT** fault indicator(s) is automatically turned off when Test 2 completes with no failures detected for all network digital circuits that raised an alarm.
- Note:** Network circuit alarmed entries in PMIDS are marked as resolved.
24. The **MAJOR** and/or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Test 3

Overview

Test 3 is used to test one or more circuits in the digital network in a continuous cycle.

Test 3 is mainly used when an intermittent fault is suspected, when using test equipment to further isolate a problem, or to trace wiring problems.

Circuits can be selected for testing by unit type, a range of equipment locations, or on a single circuit basis.

Test 3 Data Entry

- Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
- When Test 3 is initially called in, a default equipment location and unit type may be displayed in Fields 2 through 7.

The alarm status, circuit status, and specific fault code associated with the default equipment location are displayed in Fields 9, 10, and 12.

Field 2 (unit type) is blinking, indicating an optional entry field.

3. Normally, a specific digital network circuit or the default equipment location is tested in Test 3. However, circuit selection for testing in Test 3 is identical to Test 2.

All digital network circuits, a range of circuits, all circuits within a unit type, a combination of unit type and range (i.e., all circuit locations of a unit type in the range specified), a specific digital network circuit, or the default equipment location can be tested continuously in Test 3.

4. When unit type 27 (GPP) is selected during range testing, all translated peripherals should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when peripherals are disconnected or do not have power on when required.

Proceed to Step 8.

5. When attendant console interface circuits (unit type 44) are selected during range testing, the associated headset(s) or handset(s) **must** be unplugged or the circuits fail.

Proceed to Step 8.

6. When unit type 45 (auxiliary trunks) is selected during range testing, one-way incoming and one-way outgoing auxiliary trunks **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).

Proceed to Step 8.

7. Unit type 68 (DS-1), unit type 74 (RCG), or unit type 75 (PRI) can be selected for range testing.

Note: Any unit type 68, unit type 74, or unit type 75 circuit packs not busied out and **in use** can be tested in Test 3 without busying out the unit type 68 (DS-1), unit type 74 (RCG), and unit type 75 (PRI) circuit packs as the test executed is **not** service affecting.

Proceed to Step 8.

8. When all circuits in the switch are to be tested continuously, refer to Test 2 Data Entry, Step 9 for circuit selection.
 - a. To select all circuits in a specific module to be tested continuously, refer to Test 2 Data Entry, Step 12.
 - b. To select all circuits in a specific cabinet to be tested continuously, refer to Test 2 Data Entry, Step 13.
 - c. To select all circuits in a specific carrier to be tested continuously, refer to Test 2 Data Entry, Step 14.
 - d. To select all circuits in a specific slot to be tested continuously, refer to Test 2 Data Entry, Step 15.

Proceed to Step 1 of Test 3 Execution.

9. When all circuits in a unit type are to be tested continuously, refer to Test 2 Data Entry, Steps 16 through 22 for unit type selection.

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- a. To select all circuits of a unit type in a specific module to be tested continuously, refer to Test 2 Data Entry, Step 24.
- b. To select all circuits of a unit type in a specific cabinet to be tested continuously, refer to Test 2 Data Entry, Step 25.
- c. To select all circuits of a unit type in a specific carrier to be tested continuously, refer to Test 2 Data Entry, Step 26.
- d. To select all circuits of a unit type in a specific slot to be tested continuously, refer to Test 2 Data Entry, Step 27.

Proceed to Step 1 of Test 3 Execution.

10. A specific network circuit can be selected for testing by entering the unit type (optional) and equipment location in Fields 2 through 7 whether or not a default equipment location is displayed:

(Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

Proceed to Step 17.

11. When a specific circuit in unit type 27 (GPP) is selected for testing, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

Proceed to Step 17.

12. When a specific circuit in unit type 44 (attendant console interface) is selected for testing, the associated headset or handset **must** be unplugged or the circuit fails.

Proceed to Step 17.

13. When a specific circuit in unit type 45 (auxiliary trunks) is selected for testing, one-way incoming and one-way outgoing auxiliary trunks **will** fail with a specific fault code of 316 (insufficient 600 ohm termination reflection possibly caused by an open transmission option switch).

Proceed to Step 17.

14. The unit type field is an optional input field to test a specific network circuit.

If the unit type is unknown, **CLEAR ENTRY; ENTER** is used to clear any unit type displayed in Field 2, or **ENTER** is depressed when no unit type is displayed.

15. A specific network circuit can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.

- a. Depress **NEXT UNIT** until the unit type of the circuit to be tested is displayed in Field 2.
- b. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 3 through 7.

Proceed to Step 17.

16. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 17.
17. When a specific network circuit or default equipment location is to be tested, check the circuit status in Field 10.

Note: Individual DS-1, RCG, or PRI circuit packs do not have to be busied out as testing of DS-1, RCG, or PRI circuit packs is non-destructive in Test 3 (i.e., does not affect customer calls).

18. If Field 10 equals 1 (on-line and in-use), Test 3 cannot be performed for port circuits without busying them out. Wait until the circuit is not in-use or perform tests on other circuits.

Note: Port circuits that cannot be tested while in-use without being busied out are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.

If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 19.

If Field 10 does not equal 4, proceed to Step 20.

19. If Test 3 is being performed remotely, proceed to Step 20.

If Test 3 is being run locally (or with maintenance personnel on the customer's premises or at the remote carrier group), determine if the circuit pack being tested is plugged in.

If the circuit pack is not plugged in or the slot is empty, reseal or install the circuit pack, then proceed to Step 20.

If the circuit pack is firmly seated, proceed to Step 20.

20. Individual port circuits, DS-1, RCG, or PRI circuit packs can be placed in maintenance busy out status for testing by checking the circuit status in Field 10.
21. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.

- a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *Busying out a port circuit results in loss of customer calls when the port circuit is in use. Busying out a DS-1, RCG, or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1, RCG, or PRI circuit pack.*

22. If Field 10 equals 1, individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.

23. If the circuit status equals 3, proceed to Step 1 of Test 3 Execution.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 1 of Test 3 Execution.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

Test 3 Execution

1. To start Test 3 after selecting the circuit(s) to be tested, depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

2. When an in-use circuit or circuit pack is encountered during Test 3 execution (for a range of circuits, a circuit pack, or for a single circuit), the **IN USE** indicators lighted on the **MAAP** momentarily and the circuit or circuit pack is passed over for that iteration of the test.

The in-use circuit or circuit pack is not stored for a later retry as Test 3 is executed continuously, testing all circuits or circuit packs specified in physical order.

Circuits or circuit packs that are in-use are not merged into the failed circuits list when Test 3 is stopped.

3. When no switch resources are available to test a circuit during execution of Test 3, special error code 83 (switch resources not available) is displayed in the **MAAP** error code field.

If a single circuit is being tested, a fault code indicating no resources were available is stored in DMIDS and the single circuit is tested again.

If more than one circuit is being tested, a fault code indicating no resources were available is stored in DMIDS and the next circuit is tested.

4. If the DMIDS storage buffer becomes full either during testing of a range of circuits or a single circuit, special error code 84 (DMIDS overflow) is displayed in the **MAAP** error code field.

Note: Testing is not stopped when the DMIDS buffer becomes full.

5. When multiple circuits are being tested, new errors found are discarded. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed. (See Steps 1 through 8 of Test 3 Result Display for a Range of Circuits).

6. When testing a single circuit new errors found are added to the failure list and the oldest errors are deleted. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed. (See Steps 5 through 11 of Test 3 Result Display for a Single Circuit.)

Note: Only 40 errors are displayed when the DMIDS buffer becomes full. When multiple circuits are being tested the 40 errors are the oldest errors recorded. When a single circuit is tested the 40 errors are the newest errors recorded.

7. When a default equipment location, a specific circuit, a DS-1, RCG, or PRI circuit pack is being tested continuously in Test 3, Field 12 is dashed for 3 seconds and blanked for 3 seconds.
8. When the entire switch or a range of circuits is being tested continuously in Test 3, the following fields are incremented as a circuit is tested:

Field 2 - Unit type of circuit being tested.

Fields 3 through 7 - Equipment location of circuit being tested.

Note: When a range of circuits for a particular unit type is being tested and the unit type contains only one circuit pack, the display in Fields 2 through 7 may not be changing.

Field 11 - Index (if any).

Field 12 - Specific fault code (if any) for circuit displayed.

Note: While testing of a circuit displayed in Fields 2 through 7 is being conducted, Field 12 will be dashed for 3 seconds and blanked for 3 seconds.

9. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
10. Display of test results is different when a specific network circuit, a default equipment location, a DS-1, RCG, or PRI circuit pack is tested and when the entire switch or a range of circuits are tested.
11. For display of test results when testing a default equipment location, a specific network circuit, a DS-1, RCG, or PRI circuit pack proceed to Step 1 of Test 3 Result Display for a Single Circuit.
12. For display of test results when testing the entire switch or a range of circuits, proceed to Step 1 of Test 3 Result Display for a Range of Circuits.

Test 3 Result Display for a Single Circuit

1. Special error codes 81 or 83 may be displayed in the **MAAP** error code field when the default equipment location or the specific network digital circuit cannot be tested.
2. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 3. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7.
3. When special error code 83 (switch resources not available) is displayed, repeat Test 3 until the test is executed or wait until switch resources become available before testing.
4. If special error code 81 or 83 is not displayed, proceed to Step 5.
5. When Test 3 is stopped while testing a default equipment location, a specific circuit, a DS-1, RCG, or PRI circuit pack, the following is displayed:

Field 1 - 3.

Field 2 - Unit type of displayed circuit.

Fields 3 through 7 - Equipment location of circuit tested.

Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).

Field 9 - Alarm status of displayed circuit.

Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).

Fields 11 and 12 - Dashed.

Field 13 - Number of times the circuit was tested.

Field 14 - 0 (indicating no failures were found for the circuit tested) or number of fault information lists for the failing circuit.

6. When a specific circuit, a default equipment location, a DS-1, RCG, or PRI circuit pack failed Test 3 (indicated by Field 14), depressing **NEXT CIRCUIT** displays the index and the specific fault code for the circuit tested in Fields 11 and 12.
7. When more than one fault information list is recorded for a single circuit location that is tested, indicated by Field 14 displaying more than 1 (which is an index to fault information lists when testing single circuits), **NEXT FAULT** is depressed to step to the next fault information list.

Note: When **NEXT FAULT** is depressed, Fields 2 through 14 may be dashed. This indicates that all remaining fault information lists contained the same type of data.

Dashing of Fields 2 through 14 can happen at any time when **NEXT FAULT** is depressed, no matter what number was displayed in Field 14 before **NEXT FAULT** was depressed.

8. Depressing **NEXT FAULT** may display a different specific fault code in Field 12 when a new fault information list exists.
9. **NEXT FAULT** is depressed once more to determine if other fault information lists exist for the circuit tested.

When no new fault information lists exist, Fields 2 through 14 are dashed when **NEXT FAULT** is depressed.

10. Depressing **NEXT FAULT** again displays the summary (Fields 11 and 12 are dashed).
11. When the default equipment location, specific circuit, DS-1, RCG, or PRI circuit pack previously tested was busied out and the test passed, or the problem was corrected, the circuit or circuit pack should be released from busy using **RLS BUSY OUT**.
12. Releasing ISDN trunks (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

13. When another specific circuit is to be continuously tested, the **CHANGE FIELD** sequence must be used to select the specific circuit:

CHANGE FIELD; 2; ENTER; (Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

14. **EXECUTE** must be depressed to test the specific circuit selected.

Test 3 Result Display for a Range of Circuits

1. When Test 3 is stopped while testing the entire switch or a range of circuits, a summary is displayed.
2. If no digital network circuits failed, the following summary is displayed:
 Field 1 - 3.
 Fields 2 through 6 - Equipment location of the range of circuits tested.
 Field 13 - Number of circuits tested.
 Field 14 - 0 (Indicating no failures).
3. If any digital network circuits failed, the summary displays a 3 in Field 1, the equipment location of the range of circuits tested in Fields 2 through 6, the total number of circuits tested in Field 13, and the total number of circuits failed in Field 14.
4. Depressing **NEXT CIRCUIT** displays the first failure, as follows:
 Field 1 - 3.
 Field 2 - Unit type of failed circuit.
 Fields 3 through 7 - Equipment location of failed circuit.
 Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).
 Field 9 - Alarm status of failed circuit.
 Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).
 Field 11 - Index (1).
 Field 12 - Specific fault code.
 Field 13 - Number of circuits tested.
 Field 14 - Number of circuits failed.

Note: Only one fault information list exists for each failing circuit when multiple circuits are tested.
5. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing digital network circuits.
6. When more than one unit type is tested, depressing **NEXT UNIT** causes the first circuit of the next unit type with failures to be displayed.
7. When **NEXT UNIT** is used to step from unit to unit, without examining the circuits within the unit, Field 14 is decremented by the number of failures passed over (if any).
NEXT CIRCUIT is used to step through the failures of the displayed unit type.
8. When all failing circuits are displayed, depressing **NEXT CIRCUIT** dashes Fields 2 through 14.
 Depressing **NEXT CIRCUIT** once more causes the summary to be displayed, and the failing circuits can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.

PROC 620, Test 3 and Test 4

9. Test 3 can be restarted without changing the equipment location originally entered for testing by depressing **EXECUTE**.

The same equipment location or range of circuits is used as the basis for the new execution of Test 3.

Any data gathered in the last execution of Test 3 is lost when **EXECUTE** is depressed.

10. To select another range of digital network circuits to be continuously tested, the **CHANGE FIELD** sequence must be used.
 - a. Refer to Steps 5 through 15 of Test 2 Data Entry to select a range of digital network circuits to be tested in a module, cabinet, carrier, or slot.
 - b. Refer to Steps 19 through 27 of Test 2 Data Entry to select a range of digital network circuits within a unit type to be tested in a module, cabinet, carrier, or slot.
11. **EXECUTE** must be depressed to begin Test 3 from the new range of circuits selected.

Test 4

Overview

Test 4 provides a diagnostic analysis on a single circuit or circuit pack, beginning with the specific equipment location of the circuit or circuit pack, to determine where a fault actually is located in the digital network.

Test 4 automatically runs a verification test on any circuit pack that is reseated or replaced (without any **MAAP** operations by maintenance personnel) to ensure that the problem is corrected.

Verification tests are destructive tests in that they automatically busy out all circuits on a port circuit pack (except DS-1, RCG, and PRI port circuit packs). After the port circuit pack is tested, all circuits on the port circuit pack are released from busy by the verification test whether or not the circuits had been previously busied out by other software routines.

Test 4 provides alternate circuit pack replacements (if any) when the first circuit pack replaced does not correct the problem.

When alternate circuit packs are replaced, Test 4 runs a verification test on the alternate circuit pack. If the alternate circuit pack passes the test, the first circuit pack replaced is also verified to be sure that it now passes, and the original failing test is executed to ensure that the problem is corrected.

Test 4 provides visual feedback to maintenance personnel on whether a problem is corrected by the use of RED and GREEN LEDs on the faceplate of the circuit pack that was reseated or replaced.

Test 4 Data Entry

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 4; ENTER.

2. When Test 4 is initially called in, a default equipment location and unit type may be displayed in Fields 2 through 7.

The alarm status, circuit status, and specific fault code associated with the default equipment location are displayed in Fields 9, 10, and 12.

Field 2 (unit type) is blinking, indicating an optional entry field.

3. Either the default equipment location can be tested or another digital network circuit can be selected for testing.

Caution: *Diagnosis of specific fault codes 607, 612, 630, or 638 displayed in Field 12 against unit type 57 (light guide interface) may affect service for approximately the last 6 seconds of Test 4 when unit type 57 is tested.*

Note: A normal passing test for unit type 57 lasts approximately 2 to 3 minutes.

4. A specific digital network circuit can be selected for testing by entering the equipment location and unit type (optional) in Fields 2 through 7 whether or not a default equipment location is displayed:

(Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

Note: No entry is required for the circuit number field if there are no circuits on the circuit pack.

Proceed to Step 8.

5. The unit type field is an optional input field to test a specific network circuit.

If the unit type is unknown, **CLEAR ENTRY; ENTER** is used to clear any unit type displayed in Field 2, or **ENTER** is depressed when no unit type is displayed.

6. A specific network circuit can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.
 - a. Depress **NEXT UNIT** until the unit type of the circuit to be tested is displayed in Field 2.
 - b. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 3 through 7.

Proceed to Step 8.

7. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 8.

8. When a specific circuit in unit type 27 (GPP) is selected for testing, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

Proceed to Step 13.

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9. When an attendant console interface circuit (unit type 44) is selected for testing, the associated headset or handset **must** be unplugged or the circuit fails the diagnostic test.

Proceed to Step 13.

10. When a 1-way incoming or 1-way outgoing auxiliary trunk circuit (unit type 45) is selected for testing, the option settings **must** be set for 2-way transmission or the circuit fails the diagnostic test.
11. To test an auxiliary trunk circuit, perform the following:
 - a. Remove the auxiliary trunk circuit pack (SN231) and check the option settings on the circuit to be tested.
 - b. If the auxiliary trunk circuit is 2-way transmission (option Q - switches 2 and 3 in the up position), proceed to Step 13.
 - c. If the auxiliary trunk circuit is a 1-way incoming (option S - switch 2 up and switch 3 down) or a 1-way outgoing (option R - switch 2 down and switch 3 up) record the switch settings and set both switches (2 and 3) to the up position, then proceed to Step 13.

Note: After the test has passed (corrective action taken if necessary), ensure the switch settings are correctly positioned (recorded above) for the type of transmission required (1-way incoming or 1-way outgoing) on the auxiliary trunk circuit tested.

12. A specific circuit in unit type 68 (DS-1), unit type 74 (RCG), or unit type 75 (PRI) can be selected for testing in two ways.
 - a. To test unit type 68 (DS-1), unit type 74 (RCG), or unit type 75 (PRI) circuits without manually busying out the circuit pack to be tested, proceed to Step 1 of Test 4 Execution. Test 4 automatically busies out circuits on unit type 68 (DS-1), unit type 74 (RCG), or unit type 75 (PRI) circuit packs if the circuits are not in use.

Note: Any unit type 68, unit type 74, or unit type 75 circuit not busied out and **in use** is not tested. Test 4 returns specific fault code 13 (circuit in use) for any unit type 68, unit type 74, or unit type 75 circuit that is not busied out and in use when the test is attempted.

- b. To test unit type 68 (DS-1), unit type 74 (RCG), or unit type 75 (PRI) circuits by busying out the circuit pack to be tested, proceed to Step 13.
13. When a specific network circuit, default equipment location, DS-1, RCG, or PRI circuit pack is to be tested, check the circuit status in Field 10.
14. If Field 10 equals 1 (on-line and in-use), Test 4 cannot be performed for port circuits without busying them out. Wait until the circuit is not in-use or perform tests on other circuits.

Note: Port circuits that cannot be tested while in-use without being busied out are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 68, 69, 71, 72, 74, and 75.

15. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 16.
If Field 10 does not equal 4, proceed to Step 17.

16. If Test 4 is being performed remotely, proceed to Step 17.

If Test 4 is being run locally (or with maintenance personnel on the customer's premises or at the remote carrier group), determine if the circuit pack being tested is plugged in.

If the circuit pack is not plugged in or the slot is empty, reseal or install the circuit pack, then proceed to Step 17.

If the circuit pack is firmly seated, proceed to Step 17.

17. Individual port circuits, DS-1, RCG, or PRI circuit packs can be placed in maintenance busy out status for testing by checking the circuit status in Field 10.
18. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
- Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *Busying out a port circuit results in loss of customer calls when the port circuit is in use. Busying out a DS-1, RCG, or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1, RCG, or PRI circuit pack.*

19. If Field 10 equals 1 individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 68, 69, 71, 72, 74, and 75.

20. If the circuit status = 3, proceed to Step 1 of Test 4 Execution.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 1 of Test 4 Execution.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

Test 4 Execution

- To start Test 4 after selecting the circuit to be tested, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

- Special error codes 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the default equipment location or the specific network digital circuit cannot be tested.
- When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7.

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4. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.
5. If special error code 81 or 83 is not displayed, proceed to Step 6.
6. During execution of Test 4, Fields 2 through 7 display the unit type and equipment location of the circuit being tested. Field 1 displays a 4, and another fields are dashed.
7. If **STOP** is depressed while Test 4 is executing, the test is returned to its configuration just before **EXECUTE** was depressed; i.e., circuit selected for testing is displayed in Fields 2 through 7.

Any data gathered during testing prior to **STOP** being depressed is lost.

Test 4 Result Display

1. When Test 4 is completed for a default equipment location, a specific circuit, a DS-1, RCG, or PRI circuit pack the **WAIT** indicator is turned off.
2. When the specific circuit, default equipment, DS-1, RCG, or PRI circuit pack passes Test 4, the following is displayed:

Field 1 - 4.

Field 2 - Unit type of circuit tested.

Fields 3 through 7 - Equipment location of circuit tested.

Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).

Field 9 - Alarm status of circuit tested.

Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).

Fields 11 through 14 - Dashed.

Note: The **GREEN** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack passed Test 4.

3. When the specific circuit, default equipment location, DS-1 RCG, or PRI circuit pack fails Test 4, the following is displayed:

Field 1 - 4.

Field 2 - Unit type of failing circuit pack.

Fields 3 through 7 - Equipment location of failing circuit pack.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. The diagnostic analysis may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).

Field 9 - Alarm status of failing circuit.

Field 10 - Current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).

Field 11 - Index (1).

Field 12 - Specific fault code.

Fields 13 and 14 - Dashed.

Note: The **RED** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack failed Test 4.

4. When Test 4 is performing the diagnostic test, upon depressing **EXECUTE** only one fault information list is recorded.

Note: Depressing **NEXT FAULT** displays special error code 00 (key not allowed at this time) in the **MAAP** error code field.

5. When a circuit pack is reseated or replaced, an automatic verification test is performed.
6. If the DMIDS storage buffer becomes full during the verification test, special error code 84, (DMIDS overflow) is displayed in the **MAAP** error code field.

Note: Testing is not stopped when the DMIDS buffer becomes full.

New errors found are added to the failure list, and the oldest errors are deleted.

Note: Only 40 errors are displayed when the DMIDS buffer becomes full.

7. During the verification test, more than one fault information list may be recorded (if the circuit pack fails the verification test) for the circuit pack being tested (indicated by Field 14 displaying more than 1).

Note: The circuit (displayed in Field 7) on the circuit pack being tested may **not** be the circuit failing the verification test.

8. Depressing **NEXT FAULT** steps to the next fault information list.

Note: When **NEXT FAULT** is depressed, Fields 2 through 14 may be dashed. This indicates that all remaining fault information lists contained the same type of data.

9. Dashing of Fields 2 through 14 can happen at anytime when **NEXT FAULT** is depressed no matter what number was displayed in Field 14 before **NEXT FAULT** was depressed.
10. Depressing **NEXT FAULT** may display a different specific fault code in Field 12 when a new fault information list exists.
 - a. **NEXT FAULT** is depressed once more to determine if other fault information lists exist for the circuit tested.

When no new fault information lists exist, Fields 2 through 14 are dashed when **NEXT FAULT** is depressed.

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Depressing **NEXT FAULT** again displays the original fault information list.

11. Depressing **NEXT CIRCUIT** displays an alternate circuit pack (if any) to be replaced.

The **RED** LED on the original circuit pack is turned off and the **RED** LED on the displayed circuit pack in Fields 2 through 6 is turned on.

12. Depressing **NEXT CIRCUIT** again displays the last alternate circuit pack (if any) to be replaced.

The **RED** LED on the first alternate circuit pack is turned off and the **RED** LED on the displayed circuit pack in Fields 2 through 6 is turned on.

13. When all alternate circuit packs are displayed, depressing **NEXT CIRCUIT** once more dashes Fields 2 through 14.

Depressing **NEXT CIRCUIT** again displays the first circuit pack in the replacement sequence.

14. When the default equipment location, specific circuit, DS-1, RCG, or PRI circuit pack previously tested was busied out and the test passed, or the problem was corrected, and the circuit status in Field 10 = 3 the circuit should be released from busy using **RLS BUSY OUT**.

15. Releasing ISDN trunks (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trucks.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

16. When another specific circuit is to be tested, the **CHANGE FIELD** sequence must be used to select the specific circuit

CHANGE FIELD; 2; ENTER; (Unit type of circuit to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

Note: No entry is required for the circuit number field if there are no circuits on the circuit pack.

17. **EXECUTE** must be depressed to test the circuit selected.
18. The **NETWORK SWITCH** and/or **PORT** fault indicator is turned off when Test 4 completes with no failures detected for all network digital circuits that raised an alarm.

Note: Network circuit alarmed entries in PMIDS are marked as resolved.

19. Test 4 must be repeated for each network digital circuit alarmed entry in **PROC 600**, Test 1 or **PROC 620**, Test 1 before the fault indicator can be turned off.

20. The **MAJOR** and/or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Test 5

Overview

Test 5 runs a verification test sequence on a circuit pack, testing all circuits (if any). The verification sequence indicates the status of the circuit pack; i.e., the circuit pack passed, the circuit pack is good but that another circuit pack is faulty, or the circuit pack failed.

Verification tests are destructive tests in that they automatically busy out all circuits on a port circuit pack (except DS-1, RCG, and PRI port circuit packs). After the port circuit pack is tested, all circuits on the port circuit pack are released from busy by the verification test whether or not the circuits had been previously busied out by other software routines.

Test 5 provides visual feedback to maintenance personnel on whether a problem is corrected by the use of **RED** and **GREEN** LEDs on the faceplate of the circuit pack that is reseated or replaced.

Test 5 Data Entry

1. Test 5 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 5; ENTER.
2. When Test 5 is initially called in, a default equipment location and unit type may be displayed in Fields 2 through 7.
3. The alarm status, circuit status, and specific fault code associated with the default equipment location are displayed in Fields 9, 10, and 12.
Field 2 (unit type) is blinking, indicating an optional entry field.
4. Either the default equipment location can be tested, or another digital network circuit pack can be selected for testing.
5. A specific digital network circuit pack can be selected for testing by entering the equipment location and unit type (optional) in Fields 2 through 6 whether or not a default equipment location is displayed:
(Unit type of circuit pack to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.

Note: All circuits (if any) on a circuit pack are tested in Test 5.

Proceed to Step 9.

6. The unit type field is an optional input field to test a specific network circuit pack.
If the unit type is unknown, **CLEAR ENTRY; ENTER** is used to clear any unit type displayed in Field 2, or **ENTER** is depressed when no unit type is displayed.
7. A specific network circuit pack can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.

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- a. Depress **NEXT UNIT** until the unit type of the circuit pack to be tested is displayed in Field 2.
- b. Depress **NEXT CIRCUIT** until the circuit pack to be tested is displayed in Fields 3 through 6.

Note: All circuits (if any) on a circuit pack are tested in Test 5.

Proceed to Step 9.

8. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 9.
9. When a specific circuit in unit type 27 (GPP) is selected for testing, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

Proceed to Step 1 of Test 5 Execution.

10. When a specific circuit in unit type 44 (attendant console interface) is selected for testing, the associated headset or handset **must** be unplugged or the circuit fails.

Proceed to Step 1 of Test 5 Execution.

11. When a specific auxiliary trunk circuit pack (unit type 45) is selected for testing, the option settings **must** be set for 2-way transmission on **all** circuits or the circuit pack fails.
12. To test an auxiliary circuit pack, perform the following:
 - a. Remove the auxiliary trunk circuit pack (SN231) and check the option settings on all four circuits.
 - b. If the auxiliary trunk circuits are 2-way transmissions (option Q - switches 2 and 3 in the up position), proceed to Step 1 of Test 5 Execution.
 - c. If any of the auxiliary trunk circuits are 1-way incoming (option S - switch 2 up and switch 3 down) or 1-way outgoing (option R - switch 2 down and switch 3 up), record the switch settings for each circuit and set the switches (2 and 3) to the up position for each circuit as required, then proceed to Step 1 of Test 5 Execution.

Note: After the test has passed (corrective action taken if necessary), ensure the switch settings for each circuit are correctly positioned (recorded above) for the type of transmission required (1-way incoming or 1-way outgoing) on the auxiliary trunk circuit pack tested.

Proceed to Step 1 of Test 5 Execution.

13. When a DS-1, RCG, or PRI circuit pack is to be tested, check the circuit status in Field 10.
 - a. If Field 10 equals 1 (on-line and in-use), Test 5 cannot be performed for DS-1, RCG, or PRI circuit packs without busying them out and **disrupting calls in progress on all 24 ports of the DS-1, RCG, or PRI circuit pack**. Wait until the circuit pack is not in-use or perform tests on other circuit packs.

- b. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 14.
If Field 10 does not equal 4, proceed to Step 15.
14. If Test 5 is being performed remotely, proceed to Step 15.
If Test 5 is being run locally (or with maintenance personnel on the customer's premises or at the remote carrier group), determine if the DS-1, RCG, or PRI circuit pack being tested is plugged in.
If the DS-1, RCG, or PRI circuit pack is not plugged in or the slot is empty, reseal or install the circuit pack, then proceed to Step 15.
If the DS-1, RCG, or PRI circuit pack is firmly seated, proceed to Step 15.
15. Individual DS-1, RCG, or PRI circuit packs can be placed in maintenance busy out status for testing by checking the circuit status in Field 10.
16. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.
The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *Busying out a DS-1, RCG, or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1, RCG, or PRI circuit pack.*
17. If the circuit status equals 3, proceed to Step 1 of Test 5 execution.
If the circuit status does not equal 3 and you wish to test the circuit pack, depress **BUSY OUT** and proceed to Step 1 of Test 5 Execution.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

Test 5 Execution

Caution: *All port circuits are automatically busied out when verification tests are performed. Established calls and data transmission for all port circuits on the port circuit pack being tested are aborted.*

1. To start Test 5 after selecting the circuit pack to be tested, depress **EXECUTE**.
The **WAIT** indicator on the **MAAP** is turned on.
2. Special error codes 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the default equipment location or the specific network digital circuit pack cannot be tested.

PROC 620, Test 5

3. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 5. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7.
4. When special error code 83 (switch resources not available) is displayed, repeat Test 5 until the test is executed or wait until switch resources become available before testing.
5. If special error code 81 or 83 is not displayed, proceed to Step 6.
6. During execution of Test 5, Field 12 (specific fault code) is updated with the latest value received from the test.
7. If **STOP** is depressed while Test 5 is executing, the test is returned to its configuration just before **EXECUTE** was depressed; i.e., circuit or circuit pack selected for testing is displayed in Fields 2 through 7.

Any data gathered during testing prior to **STOP** being depressed is lost.

8. If the DMIDS storage buffer becomes full, special error code 84 (DMIDS overflow), is displayed in the **MAAP** error code field.

Note: Testing is not stopped when the DMIDS buffer becomes full.

New errors found are added to the failure list, and the oldest errors are deleted.

Note: Only 40 errors can be displayed when the DMIDS buffer becomes full.

Test 5 Result Display

1. When Test 5 is completed for a default equipment location, a specific circuit pack, a DS-1, RCG, or PRI circuit pack, the **WAIT** indicator is turned off.
2. When the specific circuit pack, default equipment location, DS-1, RCG, or PRI circuit pack passes Test 5, the following is displayed:

Field 1 - 5.

Field 2 - Unit type of circuit pack tested.

Fields 3 through 7 - Equipment location of circuit pack tested.

Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).

Field 9 - Dashed or alarm status of circuit tested.

Field 10 - Dashed occurrent status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).

Field 11 - Dashed.

Field 12 - 0 (circuit pack passed the test) or 9999 (failure is detected on other than tested circuit pack).

Fields 13 and 14 - Dashed.

Note: The **GREEN** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack passed Test 5.

3. When 9999 is displayed in Field 12, the circuit pack tested passed Test 5 and the **GREEN** LED is lighted on the circuit pack. However, a failure has been detected on another circuit pack that interfaces with the circuit pack tested.

Note: Test 4 should be executed on the circuit pack displaying 9999 to find the failing circuit pack that interfaces with the circuit pack tested.

- a. Field 11 (index) and Field 14 (fault list index) display dashes.
- b. Depressing **NEXT FAULT** displays a 1 in Field 11, the specific fault code in Field 12, and the number of fault information lists that are recorded in Field 14.

Proceed to Step 5.

4. When the specific circuit pack, default equipment location, DS-1, RCG, or PRI circuit pack fails Test 5, the following is displayed:

Field 1 - 5.

Field 2 - Unit type of circuit pack tested.

Fields 3 through 7 - Equipment location of circuit pack tested.

Note: The circuit (displayed in Field 7) on the circuit pack being tested may **not** be the circuit failing the verification test.

Field 8 - Remote status of displayed circuit (dashed if non-port circuit; 0, 1, or 2 if port circuit).

Field 9 - Dashed or alarm status of circuit tested.

Field 10 - Dashed or current status of displayed circuit (0 = idle, 1 = on-line and in-use, 2 = off-line, 3 = maintenance busy, 4 = not plugged in or unable to communicate, 5 = board idle with some ports maintenance busy - DS-1 applications only).

Field 11 - Index (1).

Field 12 - Specific fault code.

Field 13 - Dashed.

Field 14 - Index to the fault information lists recorded.

Note: The **RED** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack failed Test 5.

5. When more than one fault information list is recorded, indicated by Field 14 displaying more than 1 (which is an index to fault information lists), **NEXT FAULT** is depressed to step to the next fault information list.

Note: When **NEXT FAULT** is depressed, Fields 2 through 14 may be dashed. This indicates that all remaining fault information lists contained the same type of data.

PROC 620, Test 5

Dashing of Fields 2 through 14 can happen at any time when **NEXT FAULT** is depressed, no matter what number was displayed in Field 14 before **NEXT FAULT** was depressed.

6. Depressing **NEXT FAULT** may display a different specific fault code in Field 12 when a new fault information list exists.

- a. **NEXT FAULT** is depressed once more to determine if other fault information lists exist for the circuit tested.

When no new fault information lists exist, Fields 2 through 14 are dashed when **NEXT FAULT** is depressed.

- b. Depressing **NEXT FAULT** again displays the original fault information list (last list recorded).
7. When a DS-1, RCG, or PRI circuit pack previously tested was busied out and the test passed or the problem was corrected, the DS-1, RCG, or PRI circuit pack should be released from busy using **RLS BUSY OUT**.
8. Releasing ISDN trunks (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

9. When another specific circuit pack is to be tested, the **CHANGE FIELD** sequence must be used to select the specific circuit pack:

CHANGE FIELD; 2; ENTER; (Unit type of circuit pack to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.

10. **EXECUTE** must be depressed to test the circuit pack selected.
11. Test 5 must be repeated for each network digital circuit pack alarmed entry in **PROC 600**, Test 1 or **PROC 620**, Test 1 before the fault indicator can be turned off.

All alarmed entries for a circuit pack do not have to be tested in Test 5 if the circuit pack passes Test 5. All alarmed entries for the circuit pack are resolved when the circuit pack passes Test 5.

12. The **NETWORK SWITCH** and/or **PORT** fault indicator is turned off when Test 5 completes with no failures detected for all network digital circuits that raised an alarm.

Note: Network circuit alarmed entries in PMIDS are marked as resolved.

13. The **MAJOR** and/or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Repair Guide

Overview

When the **NETWORK SWITCH** and/or **PORT** and **MAJOR** and/or **MINOR** alarm indicators on the alarm panel are lighted (indicating a digital network failure) or when **PROC 620** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

The starting point for isolation and repair of digital network circuit failures is Test 1 of **PROC 620**.

To isolate a digital network failure displayed in Test 1 of **PROC 620**, Test 4 of **PROC 620** is executed to determine where a fault actually is located in the digital network.

Test 4 of **PROC 620** performs a diagnostic analysis on the failing digital network circuit beginning at the specified circuit location.

If the circuit fails, other tests may be executed on the circuit pack and the paths leading into the circuit pack (i.e., data, I/O, maintenance interface, etc.) to determine if a fault lies inside the circuit pack or along one of the interface paths.

If the fault lies outside of the circuit pack, Test 4 continues testing until the fault is isolated. If the failure is found to be on another circuit pack than the one originally specified, this circuit pack is indicated as the failure.

Test 4 of **PROC 620** also provides alternate circuit pack replacements (if any).

The alternate circuit packs are replaced in order of decreasing probability until the possibilities (maximum of three - 2 alternate circuit packs) are replaced or the failure is corrected.

Isolation of Failure

1. Execute Test 1 of **PROC 620** to determine which digital network circuits are alarmed, indicated by a 1, 2, or 3 (major, minor, or warning) displayed in Field 9; the severity of the alarms; and the order in which the digital network unit types (functional areas) are displayed. Record the unit types, equipment locations, and the remote status of the failing digital network circuits displayed in Fields 2 through 8 of **PROC 620**, Test 1.
2. Determine from the failing digital network circuits recorded if a pattern exists that would assist in determining the type of corrective action required.
3. Isolation and repair steps for digital network circuit failures are detailed in:

One digital network circuit failure.

Digital network circuit failures in different unit types.

Multiple digital network circuit failures in the same unit type.

Multi-module switch alarms with more than one unit type 13 (port data store) with specific fault code 70 and more than one unit type 53 (multiplexer) with specific fault code 611 failure caused by network test flag faults.

PROC 620

DS-1 (unit type 68) or PRI (unit type 75) failures.

Remote carrier group (unit type 74) failures.

Remote module interface (unit type 71) failures.

Time Slot Interchanger (TSI) demand test (if applicable).

Special error code 88.

Special error code 90.

Specific fault codes.

One Digital Network Circuit Failure

Overview

Assumption: Test 1 of **PROC 620** displays only one alarmed digital network circuit failure.

Fault Isolation

1. Display the failing circuit in Test 1 of **PROC 620**.
2. If the failing circuit is a DS-1 circuit pack (unit type 68) or a PRI circuit pack (unit type 75), refer to isolation and repair step **DS-1 (unit type 68) or PRI (unit type 75) Failures** for further diagnosis of the trouble.
3. If the failing circuit is a remote module interface (unit type 71), refer to isolation and repair step **Remote Module Interface (unit type 71) Failures** for further diagnosis of the trouble.
4. If the failing circuit is a RCG circuit pack (unit type 74), refer to isolation and repair step **Remote Carrier Group (unit type 74) Failures** for further diagnosis of the trouble.
5. If the failing circuit is not a unit type 68, unit type 71, unit type 74, or unit type 75 trouble, proceed to Step 6.
6. Enter **PROC 620**, Test 4.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 620** is the default equipment location displayed in Test 4 of **PROC 620**.

7. Record the specific fault code displayed in Field 12 which was detected by on-line periodic software tests and logged in PMIDS.

Caution: *Diagnosis of specific fault codes 607, 612, 630, or 638 displayed in Field 12 against unit type 57 (light guide interface) may affect service for approximately the last 6 seconds of Test 4 when unit type 57 is tested in an unduplicated TMS/network module complex.*

Note: A normal passing test for unit type 57 lasts approximately 2 to 3 minutes.

8. If a unit type 27 (GPP), unit type 29 (line circuit), unit type 69 (MFAT), or unit type 72 (EIA) circuit is displayed in Fields 2 through 7, determine the remote status of the circuit displayed in Field 8.
 - a. If the remote status displayed in Field 8 = 0 (local), proceed to Step 9.
 - b. If the remote status displayed in Field 8 = 1 (remote T1) or 2 (remote fiber), refer to isolation and repair step **Remote Carrier Group (unit type 74) Failures** for further diagnosis of the trouble.
9. When a GPP circuit (unit type 27) is the failing circuit, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

Proceed to Step 13.

10. When an attendant console interface circuit (unit type 44) is the failing circuit, the associated headset or handset **must** be unplugged or the circuit fails the diagnostic test.

Proceed to Step 13.

11. When a 1-way incoming or 1-way outgoing auxiliary trunk circuit (unit type 45) is the failing circuit, the option settings **must** be set for 2-way transmission or the circuit fails the diagnostic test.
12. To test an auxiliary trunk circuit, perform the following:
 - a. Remove the auxiliary trunk circuit pack (SN231) and check the option settings on the circuit to be tested.
 - b. If the auxiliary trunk circuit is a 2-way transmission (option Q - switches 2 and 3 in the up position), proceed to Step 13.
 - c. If the auxiliary trunk circuit is a 1-way incoming (option S - switch 2 up and switch 3 down) or a 1-way outgoing (option R - switch 2 down and switch 3 up), record the switch settings and set both switches (2

Note: After the test passes (corrective action taken if necessary), ensure the switch settings are correctly positioned (recorded above) for the type of transmission required (1-way incoming or 1-way outgoing) on the auxiliary trunk circuit tested.

13. Check the circuit status displayed in Field 10.
 - a. If Field 10 equals 1 (on-line and in-use), Test 4 cannot be performed for port circuits without busying them out. Wait until the circuit is not in-use or perform tests on other circuits.

Note: Port circuits that cannot be tested while in-use without being busied out are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.
 - b. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 14.

Note: A possibility exists that the circuit pack is not plugged in or that a faulty ID chip on the circuit pack exists when a circuit status of 4 is displayed in Field 10 before Test 4 is executed.

If Field 10 does not equal 4, proceed to Step 15.

14. If Test 4 is being run remotely, proceed to Step 15.

If Test 4 is being run locally (or maintenance personnel are on the customer's premises), determine if the circuit pack is plugged in.

If the circuit pack is not plugged in, or the slot is empty, reseal or replace the circuit pack, then proceed to Step 15.

If the circuit pack is firmly seated, proceed to Step 15.

15. Individual port circuits can be placed in maintenance busy out status for testing by checking the circuit status displayed in Field 10.

Caution: *Busying out a port circuit results in loss of customer calls when the port circuit is in use.*

16. If Field 10 equals 1, individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 69, 71, and 72.

17. If the circuit status equals 3, proceed to Step 18.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 18.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

18. Depress **EXECUTE**.

19. Special error codes 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the network digital circuit cannot be tested.

If special error code 81 or 83 is not displayed, proceed to Step 22.

20. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4.

- a. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7 and depressing **EXECUTE**.

- b. If TN380 or TN381 fails, perform Steps 31 through 50 below (as appropriate).

If TN380 or TN381 passes, check the wiring associated with the circuit pack that displayed special error code 81.

21. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.

22. If special error code 88 (see documentation for replacement of circuit packs) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 88** for further diagnosis of the trouble.
23. If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.
24. If unit type 6 (module control channel) is being tested, check the specific fault code displayed in Field 12.
 If specific fault code 23 is displayed in Field 12, proceed to Step 25.
 If specific fault code 23 is not displayed in Field 12, proceed to Step 28.
25. Check the translation for TN530 (duplication/update channel).
 If TN530 is not translated, either remove TN530 or translate the circuit and repeat Test 4.
 If TN530 is translated, proceed to Step 28.
26. If unit type 27 (GPP) is being tested, check the specific fault code displayed in Field 12.
 - a. If specific fault code 351 is displayed in Field 12, it is probably the result of a disconnected or powered down peripheral. Proceed to Step 27.
 - b. If specific fault code 350, 352, 354, or 356 is displayed in Field 12, it may be the result of excessive backplane noise or noise coupled into the conductors to the peripheral. Proceed to Step 27.
 - c. If specific fault code 350, 351, 352, 354, or 356 is not displayed in Field 12, proceed to Step 28.
27. Verify that the peripheral is connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.
 If the peripheral is not connected and/or powered up when required, connect or turn on the peripheral and repeat the test from Step 18.
 If the peripheral is connected and has power on when required, proceed to Step 28.
28. Determine the status of the circuitry observing the LEDs on the faceplate of the circuit pack displayed in Fields 3 through 6.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.
29. If the circuit passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status = 4 (unable to communicate or not plugged in) a faulty ID chip on the circuit pack is the problem. Proceed to Step 65.
 If the circuit status does not equal 4, proceed to Step 56.

Note: When the circuit was alarmed in Test 1 of **PROC 620** and passes the diagnostic analysis test in Test 4 of **PROC 620**, further analysis of the problem should be performed by running a continuous test of the circuit in Test 3 of **PROC 620** to ensure that the failure is not intermittent.

30. If the circuit fails, indicated by a specific fault code displayed in Field 12 and the **RED** LED lighted on the faceplate of the circuit pack, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

31. At the equipment location displayed in Fields 3 through 6, reseal the circuit pack.

Note: When a circuit in unit type 33 - Direct Inward Dialing (DID) trunk - is being tested, check the dip switch settings on SN232 prior to reseating the circuit pack. Each pair of switches for each circuit **must** be positioned one up and one down or the test fails.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

32. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

Note: A verification test is automatically performed by Test 4 on the circuit pack reseated or replaced without any steps performed by maintenance personnel, other than reseating or replacing the circuit pack.

33. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

34. Check the circuit status displayed in Field 10. If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 65.

If the circuit status does not equal 4, proceed to Step 66.

35. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.

At the equipment location displayed in Fields 2 through 6, replace the circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

36. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

Proceed to Step 66.

37. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.
 - a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
 - b. If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.
Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.
38. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.

39. At the equipment location displayed in Fields 3 through 6, reseal the alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

40. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

Proceed to Step 66.

41. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

At the equipment location displayed in Fields 3 through 6, replace the alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

42. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

Proceed to Step 66.

43. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.
 - a. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.

- b. If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.

Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

- 44. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.

- 45. At the equipment location displayed in Fields 3 through 6, reseal the second alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

- 46. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

Proceed to Step 66.

- 47. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

At the equipment location displayed in Fields 3 through 6, replace the second alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

- 48. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Note: If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code field, refer to isolation and repair step **Special Error Code 90** for further diagnosis of the trouble.

Proceed to Step 66.

- 49. If the circuit pack fails again the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

- 50. Determine if unit type 53 (multiplexer) is being tested.

- a. If unit type 53 is being tested **and** specific fault code 636 is displayed in Field 12, proceed to Step 51.

- b. If unit type 53 is not being tested, or specific fault code 636 is **not** displayed in Field 12 for unit type 53, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

51. Use **NEXT TEST** to step to Test 3 of **PROC 620**.

Note: The multiplexer circuit that was displayed in Test 4 is the default equipment location displayed in Test 3.

At Slot 23 of the TMS carrier, reseal TN530.

52. Depress **EXECUTE**.

- a. Allow Test 3 to execute for a period of time (or until a specific fault code is indicated in Field 12) and depress **STOP**.
- b. If the multiplexer circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
If the multiplexer circuit fails Test 3 (indicated by a 1 displayed in Field 14), replace TN530 in Slot 23 of the TMS carrier.

53. Depress **EXECUTE**.

- a. Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.
- b. If the multiplexer circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
If the multiplexer circuit fails Test 3 (indicated by a 1 displayed in Field 14), reseal TN462 at Slot 11 of the TMS carrier.

54. Depress **EXECUTE**.

- a. Allow Test 3 to execute for a period of time (or until a specific fault code is indicated in Field 12) and depress **STOP**.
- b. If the multiplexer circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
If the multiplexer circuit fails Test 3 (indicated by a 1 displayed in Field 14), replace TN462 in Slot 11 of the TMS carrier.

55. Depress **EXECUTE**.

- a. Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.
- b. If the multiplexer circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
If the multiplexer circuit fails Test 3 (indicated by a 1 displayed in Field 14), refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

56. Use **NEXT TEST** to step to Test 3 of **PROC 620**.

Note: The circuit that was displayed in Test 4 is the default equipment location displayed in Test 3.

57. Depress **EXECUTE**.

Allow Test 3 to execute for a period of time (or until a specific fault code is indicated in Field 12) and depress **STOP**.

If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.

58. If the circuit fails Test 3, reseal the circuit pack at the equipment location displayed in Fields 3 through 6.

59. Depress **EXECUTE**.

Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.

60. If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.

61. If the circuit fails Test 3, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

62. At the equipment location displayed in Fields 3 through 6, replace the circuit pack.

63. Depress **EXECUTE**.

Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.

64. If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.

If the circuit fails Test 3, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

65. When a circuit status of 4 indicates a faulty ID chip, perform the following:

- a. At the equipment location displayed in Fields 2 through 6, replace the circuit pack.
- b. Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
- c. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.
- d. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack. Proceed to Step 66.

If the circuit pack fails, the **RED** LED is lighted on the faceplate of the circuit pack. Check the wiring associated with the circuit pack replaced.

66. When any circuit packs for the following unit types are replaced, isolation and repair step **TSI Demand Test** should be run before leaving the customer's premises.

Unit type 8 - Maintenance Interface (MIF).

Unit type 9 - Module clock.

Unit type 10 - TSI ALU.

Unit type 11 - TSI PSTORE.

Unit type 13 - PDS.

Unit type 15 - PDI.

67. The **NETWORK SWITCH** or **PORT** fault indicator is turned off when the circuit passes Test 4.

The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Digital Network Circuit Failures in Different Unit Types

Overview

Assumption: Test 1 of **PROC 620** displays network circuit failures in different unit types.

In Test 1 of **PROC 620** alarmed failures are displayed in order of severity; i.e., major alarm failures first, followed by minor alarm failures, with warning alarm failures displayed last.

Within each alarm category, (i.e., major, minor, or warning), alarmed failures are displayed by unit types (functional areas) corresponding to the most important functional area to the least important functional area of the switch.

Fault Isolation

1. Record all alarmed failures in Test 1 of **PROC 620**.
2. Display the first failing circuit in Test 1 of **PROC 620**.

Note: The first failing circuit is the highest alarmed failure (i.e., major, minor, or warning) recorded in the most important functional area (unit type).

3. If the failing circuit is a DS-1 circuit pack (unit type 68) or a PRI circuit pack (unit type 75), refer to isolation and repair step **DS-1 (unit type 68) or PRI (unit type 75) Failures** for further diagnosis of the trouble.
4. If the failing circuit is a remote module interface (unit type 71), refer to isolation and repair step **Remote Module Interface (unit type 71) Failures** for further diagnosis of the trouble.
5. If the failing circuit is a RCG circuit pack (unit type 74), refer to isolation and repair step **Remote Carrier Group (unit type 74) Failures** for further diagnosis of the trouble.
6. If the failing circuit is not a unit type 68, unit type 71, unit type 74, or unit type 75 trouble, proceed to Step 7.
7. When a GPP circuit (unit type 27) is selected for testing, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

8. When an attendant console interface circuit (unit type 44) is selected for testing, the associated headset or handset **must** be unplugged or the circuit fails the diagnostic test.

PROC 620

9. When a 1-way incoming or 1-way outgoing auxiliary trunk circuit (unit type 45) is selected for testing, the option settings **must** be set for 2-way transmission or the circuit fails the diagnostic test.
10. To test an auxiliary trunk circuit, perform the following:
 - a. Remove the auxiliary trunk circuit pack (SN231) and check the option settings on the circuit to be tested.
 - b. Record the positions of switches 2 and 3.
 - c. Set both switches (2 and 3) to the up position (2-way transmission) to test the auxiliary trunk circuit.

Note: After the test passes (corrective action taken if necessary), ensure the switch settings on the auxiliary trunk circuit tested are correctly positioned as recorded above.

11. Perform Steps 6 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** for the first failure displayed in Test 1 of **PROC 620**.
12. When the first failure displayed is repaired and/or passes, analyze the remaining alarmed failures to determine if the first failure could have affected the remaining failures.

Example: A failure in a PCI or PDI can have some bearing on port failures.

Perform one of the following steps (13 through 15) depending on what is determined by the analysis.
13. Enter Test 1 of **PROC 620** and display the next alarmed failure in order of severity, then step to Test 4 of **PROC 620** and perform Steps 2 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure**.
14. Enter the next recorded failure (in alarm severity order) in Fields 2 through 7 of Test 4 using the **CHANGE FIELD** sequence and perform Steps 2 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure**.
15. Perform Test 2 of **PROC 620** for each alarmed failure recorded in Test 1 of **PROC 620** to test the alarmed circuit or to turn off the fault indicator.
16. When Test 2 of **PROC 620** indicates a failure for the circuit entered (indicated by a 1 displayed in Field 13), Steps 2 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** must be performed to correct the problem.
17. When all alarmed circuits displayed in Test 1 of **PROC 620** are repaired and/or pass, the **NETWORK SWITCH** and/or **PORT** fault indicator is turned off.

The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Multiple Digital Network Circuit Failures In Same Unit Type

Overview

Assumption: Test 1 of **PROC 620** displays multiple alarmed digital network circuit failures within the same unit type and that no other failures in other unit types are alarmed.

Fault Isolation

1. When Test 1 of **PROC 620** displays more than one digital network circuit of the same unit type with failures, execute Test 2 of **PROC 600** for the same unit type to determine if other digital network circuits within the same unit type have errors recorded against them.

Record the unit type and digital network circuits with errors recorded against them displayed in Test 1 of **PROC 620** and Test 2 of **PROC 600**.

2. Analyze the failures recorded in Test 1 of **PROC 620** and Test 2 of **PROC 600** to determine if the failures could have been caused by a common interface.

Example: A failure in an Input/Output Bus Interface (IOBI) circuit pack can affect several PCIs, a failure in a Port Data Store (PDS) can affect several PDIs, etc.

Depending upon what is determined from the analysis of the circuits recorded in Test 1 of **PROC 620** and Test 2 of **PROC 600**, perform Step 3 or 4.

3. When the analysis does not indicate a common interface, perform Steps 1 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** starting with the first failing circuit displayed in Test 1 of **PROC 620**.
 - a. After the first failing circuit is repaired and/or passes, repeat Steps 1 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** for each alarmed failure recorded in Test 1 of **PROC 620**.
 - b. When all alarmed failures recorded in Test 1 of **PROC 620** pass Test 4 of **PROC 620**, the **NETWORK** or **PORT** fault indicator is turned off.

The **MAJOR** and/or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

4. When the analysis indicates a common interface as the potential problem, enter the common interface equipment location in Fields 2 through 7 of **PROC 620**, Test 4 using the **CHANGE FIELD** sequence.

Perform Steps 6 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure**.

5. When the common interface circuit is repaired and/or passes, perform Test 2 of **PROC 620** for the unit type recorded in Test 1 of **PROC 620** with alarmed failures in order to turn off the fault indicator and resolve the alarmed entries.
6. When Test 2 of **PROC 620** indicates a failure for the unit type tested, Steps 2 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** must be performed for each failure displayed in Test 2 of **PROC 620**.
7. When all alarmed failures recorded in Test 1 of **PROC 620** pass Test 2 or 4 of **PROC 620**, the **NETWORK** or **PORT** fault indicator is turned off.

The **MAJOR** and/or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Multi-Module Switch Alarms With More Than One Unit Type 13 (Port Data Store) With Specific Fault Code 70 and More Than One Unit Type 53 (Multiplexer) With Specific Fault Code 611 Failures Caused By Network Test Flag Faults

PROC 620

Overview

Assumption: Test 1 of **PROC 620** displays more than one unit type 13 (Port Data Store) alarmed failure with specific fault code 70 **and** more than one unit type 53 (Multiplexer) alarmed failure with specific fault code 611.

If either of these conditions is not true, the failures should be analyzed using other isolation and repair steps.

Under some failure conditions, these alarmed failures only appear while the switch is running traffic. The switch runs alarm free and passes all demand tests out of hours.

Note: This is a strong indication that the fault is in a port carrier.

Fault Isolation

If both conditions are true (more than one unit type 13 alarmed failure with specific fault code 70 and more than one unit type 53 alarmed failure with specific fault code 611), perform the following steps to determine the module that is the true source of the alarms.

1. Use Test 2 of **PROC 620** to test all unit type 57 (LGI) circuits in the switch.
2. Expect many unit type 57 circuits to fail with specific fault code 611.

Unit type 57 (LGI) circuits that fail with a fault code other than 611 indicate the source of the network test flags.

3. Display a unit type 57 circuit (LGI) with a fault code other than 611 in Test 2.

Step to Test 4 of **PROC 620**.

Note: The circuit displayed in Test 2 is now displayed in Test 4 of **PROC 620**.

4. Depress **EXECUTE**.
5. If a unit type 54 (fan out) TN473 circuit pack, unit type 55 (module interface) TN480 circuit pack, unit type 58 (fan in) UN150 circuit pack, or the unit type 57 (light guide interface) TN481 circuit pack is displayed in Fields 2 through 7, it is the failing circuit pack.

Perform Steps 31 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** to correct the problem.

6. If a unit type 54, unit type 55, unit type 58, or the unit type 57 circuit pack is **not** indicted, the failure is coming from within the same module as the LGI being tested.
7. Failures in a module control are generally diagnosed correctly and there should be few alarms in the failing module. If there are many alarms in the failing module, the fault is probably in a port carrier.

Port carrier failures cause alarms no matter which module control is on-line. Failures in the port carrier often require the presence of traffic to raise alarms. Demand tests on port carriers executed out of hours often pass.

Refer the problem to appropriate third tier maintenance personnel.

DS-1 (Unit Type 68) or PRI (Unit Type 75) Failures

Overview

System level fault isolation for DS-1 (unit type 68) or primary rate interface (PRI) (unit type 75) alarmed failures is defined as the isolation of faults among the various subsystems:

- a. System 85 DS-1 or PRI circuit packs.
- b. Channel Division Multiplexer (CDM).
- c. Channel Expansion Multiplexer (CEM).
- d. Network Channel Terminating Equipment (NCTE).
- e. Other associated equipment (i.e., on-site wiring, facility, and any special service equipment).

In isolating DS-1 or PRI alarmed failures, maintenance personnel should start by checking the current health and status of the circuit pack in question by using Test 1 of **PROC 625**.

If the health code is four or higher, maintenance personnel should attempt a call across the facility. If the call completes and is of acceptable quality, then additional maintenance (clearing of the alarmed failure) should be deferred until after hours.

However, if the facility is out of service, then **PROC 620** should be used to isolate the faulty hardware.

Note: **PROC 620**, Test 4 and Test 5 should not be used to check the status of the circuit pack. Tests 4 and 5 are destructive tests (service affecting to all 24 channels on the circuit pack) and should only be used when the facility is unavailable or out-of-hours.

When using **PROC 620** to test an DS-1 or PRI alarmed failure, the following should be understood.

1. **PROC 620**, Tests 2 and 3 are non-destructive and provide the same testing capability as scheduled tasks.
2. **PROC 620**, Tests 4 and 5 are destructive tests which start by checking the presence of any transmission facility faults.
If found, they are stored until the interface has been checked.
3. Facility faults are only displayed when no other failure is found on the circuit pack (Test 4).

For a more detailed explanation of how DS-1 and to some degree PRI applies to System 85, refer to document 555-025-101 Issue 2, July 1987 entitled "AT&T System 75 and System 85 DS1/DMI Interface".

When DS-1 and PRI circuit packs fail, specific fault codes can be logged against the interface or facility. Interface specific fault codes are logged against the circuit pack and facility specific fault codes are logged against the network (link). The specific fault code has to be analyzed when the DS-1 or PRI circuit pack fails in order to determine the type of fault isolation to be performed in correcting alarmed failures for DS-1 and PRI circuit packs. **PROC 620**, Test 2 should be performed for the alarmed DS-1 or PRI failure to determine (if any) the type of specific fault code logged.

PROC 620

Fault isolation for DS-1 or PRI alarmed failures consist of

- a. Fault isolation when the alarmed DS-1 or PRI failure is caused by an associated alarmed CEM failure.
- b. Fault isolation for DS-1 or PRI alarmed failures when the failure is not caused by an associated CEM alarmed failure.
- c. Fault isolation techniques for CEM, CDM, and NCTE type equipment.

Fault Isolation for associated alarmed CEM failure

1. Enter **PROC 618**, Test 1 and examine unit type 63 (external equipment) to determine if a CEM alarm associated with the DS-1 or PRI failure exists.

Note: Local records must be used to determine the external equipment encode for CEMs and the associated DS-1 or PRI equipment location.

2. Enter **PROC 620**, Test 1 and display the original DS-1 or PRI failure.
3. If a CEM alarm does not exist for the associated DS-1 or PRI interface failure, proceed to isolation and repair step **Fault Isolation for DS-1 or PRI Alarmed Failures Not Caused by Associated CEM Alarmed Failures** for further diagnosis of the trouble.
4. If a CEM alarm is present, there is a problem in the CEM.
 - a. On-site repair actions on the CEM must be taken.
 - b. The CEM maintenance procedures are specified in AT&T Practice 365-287-100.
 - c. In general, the CEM circuit pack with the RED LED lighted is the first choice.
If none are lighted, power should be checked at the test points on the power unit.
 - d. Following the repair the CEM reset button must be depressed to clear the alarm condition.
5. Enter **PROC 620**, Test 2 and test the original DS-1 or PRI failure.
6. If Test 2 passes, the DS-1 or PRI facility is presently operational and no destructive testing of the DS-1 or PRI will be performed using **PROC 620**, Tests 4 or 5.
7. If Test 2 fails, indicating that the DS-1 or PRI facility is not healthy or **if you desire to verify that the DS-1 or PRI facility is functioning**, use one of the following test calls prior to testing the DS-1 or PRI using **PROC 620** Test 4 or Test 5.
 - a. Make an ATMS supervision call using **PROC 647**, Test 3 on the DS-1 or PRI.
 - b. Make a TVS call using the DS-1 or PRI.
 - c. Make a terminal-to-trunk test call using **PROC 642** on the DS-1 or PRI.

Caution: The DS-1 or PRI tests executed by PROC 620, Tests 4 and 5 are service affecting and should only be executed during periods of low traffic, during out-of-hours, or after a service outage has already occurred and is verified using one of the above tests. PROC 620, Test 2 or PROC 625, Test 1 should always be used when the current health of a DS-1 or PRI digital service is in question.

8. After repair of the CEM, the DS-1 or PRI circuit pack must be tested to clear the alarmed entry in PMIDS.

Caution: *Busying out a DS-1 or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1 or PRI circuit pack.*

9. Busy out the DS-1 or PRI circuit by depressing **BUSY OUT** in **PROC 620**, Test 4. One circuit cannot be busied out by **PROC 620**. If all 24 circuits on the DS-1 or PRI circuit pack are busied out in any busy out procedure, testing can be performed.

Note: If the DS-1 or PRI circuit pack is not busied out, the test **will** fail with a specific fault code of 13 (DS-1 or PRI in-use) if any channel on the DS-1 or PRI is in-use when the test is performed.

10. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.
11. Perform Steps 1 through 67 (as required) of isolation and repair step **One Digital Network Circuit Failure** to retire the alarm cause.

Fault Isolation for DS-1 or PRI Alarmed Failures Not Caused by Associated CEM Alarmed Failures

The DS-1 or PRI alarms represent conditions that could result from either on or off-site faults.

A **RED** alarm (specific fault code 1862) is initiated by a digital switch or digital transmission equipment when the incoming DS-1 or PRI transmission bit stream on a particular facility is lost or framing for the incoming bit stream is lost. Upon initiation of a **RED** alarm, the switch or digital transmission equipment sends a **YELLOW** alarm code on the outgoing DS-1 or PRI transmission bit stream for that particular facility.

A **YELLOW** alarm (specific fault code 1858) is transmitted to an "other end" switch or digital transmission equipment to indicate that the DS-1 or PRI transmission bit stream incoming from the "other end" has been lost or framing on the incoming bit stream from the "other end" is lost. The **YELLOW** alarm code employed is dependent on the type of framing (D4 or Fe) and signaling (Rob Bit or 24th Channel) employed. For D4 framing with Rob Bit signaling, the **YELLOW** alarm code is recognized as a zero for bit 2 in each time slot (channel) for at least two full frames (48 consecutive time slots).

A **BLUE** alarm (specific fault code 1865) is transmitted to an "other end" switch or digital transmission equipment to indicate that testing is being done locally which interrupts communication with the "other end". One example is running a maintenance **PROC** on System 85 which executes a looparound test on the DS-1 or PRI circuit pack itself. While this test is being performed, the **BLUE** alarm code is sent to the "other end". The **BLUE** alarm is recognized as a continuous stream of ones with no provisions for framing or signaling.

PROC 620

1. Check the specific fault code displayed in Field 12 of **PROC 620**, Test 1 for the original DS-1 or PRI alarmed failure.
 - a. If specific fault code 729, 730, 734, 762, 773, 1601, 1602, 1853, 1855 through 1858, 1860 through 1865, 1924, 1925, 1934, or 1935 is displayed in Field 12, you have a facility problem. Proceed to Step 5.
 - b. If any other specific fault code is displayed in Field 12, proceed to Step 2.

Caution: *If this DS-1 or PRI is a primary or secondary reference, then busying out the DS-1 or PRI circuit pack and testing it may be service affecting to other digital facilities because the capability to communicate at a digital rate would be lost for the duration of the test.*

2. Busy out the DS-1 or PRI circuit by depressing **BUSY OUT** in **PROC 620**, Test 4. One circuit cannot be busied out. The entire DS-1 or PRI circuit pack is busied out by depressing **BUSY OUT**.

Caution: *Busying out a DS-1 or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1 or PRI circuit pack.*

Note: If the DS-1 or PRI circuit pack is not busied out the test **will** fail with a specific fault code of 13 (DS-1 or PRI in-use) if any channel on the DS-1 or PRI is in-use when the test is performed.

3. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

4. Perform Steps 1 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** for the failing DS-1 or PRI circuit pack.
5. Enter **PROC 620**, Test 2 and test the original DS-1 or PRI failure.
6. If Test 2 passes, the DS-1 or PRI facility is presently operational and no destructive testing of the DS-1 or PRI will be performed using **PROC 620**, Tests 4 or 5.
7. If Test 2 fails, indicating that the DS-1 or PRI facility is not healthy or **if you desire to verify that the DS-1 or PRI facility is functioning**, use one of the following test calls **prior** to testing the DS-1 or PRI using **PROC 620** Test 4 or Test 5.
 - a. Make an ATMS supervision call using **PROC 647**, Test 3 on the DS-1 or PRI.
 - b. Make a TVS call using the DS-1 or PRI.
 - c. Make a terminal-to-trunk test call using **PROC 642** on the DS-1 or PRI.

Caution: The DS-1 or PRI tests executed by PROC 620, Tests 4 and 5 are service affecting and should only be executed during periods of low traffic, during out-of-hours, or after a service outage has already occurred and is verified using one of the above tests. PROC 620, Test 2 or PROC 625, Test 1 should always be used when the current health of a DS-1 or PRI digital service is in question.

8. Specific fault codes 729, 730, 734, 762, 773, 1601, 1602, 1853, 1855 through 1858, 1860 through 1865, 1924, 1925, 1934, or 1935 displayed in Field 12 indicate a red, blue, or yellow alarm indicting the facility.

The DS-1 or PRI port, the CEMs and CDMs, the on-site wiring, the NCTE, or the facility could be the problem.

9. To isolate problems with the CEMs, CDMs, NCTE, the DS-1 or PRI port, refer to one of the following isolation and repair steps:

- a. **Fault Isolation Techniques for CEM, CDM, and NCTE.**

- b. Step 10 for DS-1 or PRI port test.

10. Enter **PROC 620**, Test 1 and display the original DS-1 or PRI failure.

11. Enter **PROC 620**, Test 4.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 620** is the default equipment location displayed in Test 4 of **PROC 620**.

12. Record the specific fault code displayed in Field 12 which was detected by on-line periodic software tests and logged in PMIDS.

13. Check the circuit status displayed in Field 10.

- a. If Field 10 equals 1 (on-line and in-use), Test 4 cannot be performed for the DS-1 or PRI port circuit. Wait until the circuit is not in use or perform tests on other circuits.

- b. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 14.

Note: A possibility exists that the circuit pack is not plugged in or that a faulty ID chip on the circuit pack exists when a circuit status of 4 is displayed in Field 10 before Test 4 is executed.

- c. If Field 10 does not equal 4, proceed to Step 15.

14. If Test 4 is being run remotely, proceed to Step 15.

If Test 4 is being run locally (or maintenance personnel are on the customer's premises), determine if the circuit pack is plugged in.

If the circuit pack is not plugged in, or the slot is empty, reseal or replace the circuit pack, then proceed to Step 15.

If the circuit pack is firmly seated proceed to Step 15.

Caution: Busying out a DS-1 or PRI circuit pack disrupts calls in progress on all 24 ports of the DS-1 or PRI circuit pack.

15. Busy out the DS-1 or PRI circuit by depressing **BUSY OUT**. One circuit cannot be busied out by **PROC 620**. If all 24 circuits on the DS-1 or PRI circuit pack are busied out in any busy out procedure, testing can be performed.

Note: If the DS-1 or PRI circuit pack is not busied out, the test **will** fail with a specific fault code of 13 (DS-1 or PRI in-use) if any channel on the DS-1 or PRI is in-use when the test is performed.

16. Busy out of a range of ISDN trunks (PRI circuit pack ANN35) takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

17. Depress **EXECUTE**.
18. Special error codes 81 or 83 may be displayed in the **MAAP** error code field, and the test is terminated when the network digital circuit cannot be tested.

If special error code 81 or 83 is not displayed, proceed to Step 21.

19. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4.
 - a. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7 and depressing **EXECUTE**.
 - b. If TN380 or TN381 fails, perform Steps 24 through 44 below (as required).

If TN380 or TN381 passes, check the wiring associated with the circuit pack that displayed special error code 81.

20. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.
21. Determine the status of the circuit by observing the LEDs on the faceplate of the circuit pack displayed in Fields 3 through 6.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

22. If the circuit passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
23. If the DS-1 or PRI circuit passes, facility vendor tests or on-site action is required to isolate the problem. Refer to isolation and repair step **Fault Isolation Techniques for CEM, CDM, and NCTE** for recommended procedures.
24. If the circuit fails, indicated by a specific fault code displayed in Field 12 and the **RED** LED lighted on the faceplate of the circuit pack, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Caution: If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)

25. At the equipment location displayed in Fields 3 through 6, reseal the circuit pack.

Caution: Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

26. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

Note: A verification test is automatically performed by Test 4 on the circuit pack reseated or replaced without any steps performed by maintenance personnel, other than reseating or replacing the circuit pack.

27. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Proceed to Step 45.

28. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.

Caution: If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)

At the equipment location displayed in Fields 3 through 6, replace the circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

29. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Proceed to Step 45.

30. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.

Caution: If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)

- a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
- b. If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.
Refer to DS-1 or PRI circuit pack LEDs described in Step 46 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

31. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.

32. At the equipment location displayed in Fields 3 through 6, reseal the alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

33. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Proceed to Step 45.

34. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

Caution: *If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)*

At the equipment location displayed in Fields 3 through 6, replace the alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

35. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Proceed to Step 45.

36. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

Caution: *If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)*

- a. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
- b. If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.

Refer to DS-1 or PRI circuit pack LEDs described in Step 46 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

37. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.

38. At the equipment location displayed in Fields 3 through 6, reseal the second alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

39. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 45.

40. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

Caution: *If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)*

At the equipment location displayed in Fields 3 through 6, replace the second alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

41. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 45.

42. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

Caution: *If the DS-1 circuit pack code is ANN11B, RED and YELLOW alarms will result from running a test. A minimum of 15 seconds is required for these alarms to clear. After waiting 15 seconds, rerun Test 4 to get valid results. (This problem does not occur on DS-1 circuit pack code ANN11C or on PRI circuit pack code ANN35.)*

Refer to DS-1 or PRI circuit pack LEDs described in Step 46 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

43. When the DS-1 or PRI circuit pack previously tested was busied out and the test passed, or the problem was corrected, and the circuit status in Field 10 = 3, the circuit should be released from busy by depressing **RLS BUSY OUT**.

44. Releasing ISDN trunks (PRI circuit pack ANN35) requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

45. The **NETWORK SWITCH** or **PORT** fault indicator is turned off when the circuit passes Test 4.

Note: The far end DS-1 or PRI will be in a **RED** alarm state following the termination of Test 4. Fifteen seconds must elapse before this alarm state clears and the DS-1 or PRI circuit packs resume normal operation. (With one exception, this alarm state is indicated by the **GREEN** LED in position 8 being off. The exception is when the circuit is optioned for D4 framing and 24th channel signaling.)

The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

46. The LEDS on the DS-1 or PRI circuit pack may assist in isolating problems with DS-1 or PRI alarms.
47. Examine the LEDs on the DS-1 or PRI circuit pack.

Under normal conditions, the two **GREEN** LEDs in positions 7 and 8 are lighted. This indicates the DS-1 or PRI link is up and framing is accomplished.

If the **GREEN** LED in position 7 is off (**not lighted**), a **RED** alarm is indicated. This implies that the incoming DS-1 or PRI bit stream is lost or that framing is lost on the incoming bit stream. Under these conditions, the **GREEN** LED in position 8 is a don't care state and may be on or off. On rare occasions, the position 7 LED flutters. This indicates that the ANN11 or ANN35 circuit pack is not able to frame on the incoming signal. The problem could be either the signal coming from the facility, the ANN11 or ANN35 circuit pack, or System 85 circuitry distributing control signals to the ANN11 or ANN35.

If the **GREEN** LED in position 7 is lighted and the **GREEN** LED in position 8 is off (**not lighted**), a **YELLOW** alarm has been received from the other end. This indicates that the "other end" has lost incoming framing or transmission and is in a **RED** alarm state. A **YELLOW** alarm condition may exist even though the **GREEN** LED is lighted. Use **PROC 600** to determine if a network alarm exists.

The **YELLOW** LED in position 9 is on (**lighted**) during initialization of the DS-1 or PRI circuit pack. It will turn off (**not lighted**) after approximately 4 seconds indicating initialization is complete. Thereafter, the **YELLOW** LED will be on (**lighted**) when at least one trunk channel on the DS-1 or PRI link is in use and serves as a busy indicator.

Fault Isolation Techniques for CEM, CDM and NCTE

1. On-site isolation among the units that are provided between the DS-1 or PRI port and the span line interface is performed by activating built-in tests on individual units and by using patch cords to provide external looparound and to bypass
2. On-site tests for the specific unit should be run as needed in accordance with the maintenance documentation (or other vendor documentation) provided for the specific unit.
3. External looparound should be performed by changing Field 12 of **PROC 260** to a 1 and executing **PROC 620**, Test 2 on the DS-1 or PRI circuit pack.

Test 2 performs external looparound on the DS-1 or PRI circuit pack to the first looparound on the DS-1 or PRI link outside the switch.

4. When CEMs are provided, a preferred looparound is on a patch field such as the ED-2C780 Jack Panel (X IN to X OUT or Y IN to Y OUT).

Note: The CEM switches looparound data back to the CEM on all three DS-1s or PRIs. The switches do not loop data back towards the switch.

5. If a CDM is also provided, the CDM should be bypassed by manually forcing it into looparound.
6. If Test 2 fails, the DS-1 or PRI circuit pack should be replaced and the tests repeated.
If Test 2 still fails, check the wiring between the DS-1 or PRI circuit pack and the associated units.
7. If Test 2 passes, activate the CEM loop switches and observed that no equipment alarm exists on the CEM.
If no alarms are observed, loop the data at the NCTE (X IN to X OUT patch cord) and remove the line Z loop on the CEM via the loop control switch.
8. Observe that the CEM runs alarm free after reset is depressed.

If the CEM displays alarms, trouble with the NCTE and the wiring to the NCTE probably exist.

If the CEM does not display alarms, trouble with the facility probably exists.

Additional DS-1 Troubleshooting Techniques

In some cases where extraordinary measures are needed for troubleshooting DS-1 failures, such as for infrequently occurring problems, or during facility transmission setting alignment and verification it may be desirable to connect stand-alone test equipment to the facility.

The following list of documents describe equipment which may be applicable depending upon circumstances encountered.

1. The AT&T 365 series of Practices include general information about DS-1 facilities and specific guidance on use of some of the test equipment.
2. AT&T Practice 103-245-100 - J1C140A Digital Access Time Slot Selector which is a unit that allows access to two of the voice channels multiplexed on the facility.

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3. AT&T Practice 103-488-105 - J68435AH equipment to measure errored seconds.
4. AT&T Practices 103-493-xxx through 103-494-xxx - a number of units including outside suppliers equipment with various capabilities.

In addition to the equipment included in the above list, other equipment with varying capabilities are available in the industry. TEKELEC model TE-820A and VENATOR model VENCAT-24 are two examples of these.

Remote Carrier Group (Unit Type 74) Failures

Overview

System level fault isolation for remote carrier group (unit type 74) failures is defined as the isolation of faults among the various subsystems:

- a. System 85 remote carrier local (RCL) ANN15 circuit packs.
- b. Remote carrier controller (RCC) ANN16 circuit packs located in the remote carrier group.
- c. Port circuits located in the remote carrier group.
- d. Remote carrier group environmental failures.

Determine the type of remote carrier group failure.

1. If the failing circuit is a RCG circuit pack (unit type 74), determine the remote status displayed in Field 8.
If the remote status displayed in Field 8 equals 0 (local), proceed to isolation and repair step **Fault Isolation for RCL failures** for further diagnosis of the trouble.
2. If the remote status displayed in Field 8 equals 1 (remote T1) or 2 (remote fiber), check the specific fault code displayed in Field 12.
If the specific fault code displayed in Field 12 is 1625 (one or more environmental errors have been detected), proceed to isolation and repair step **Fault Isolation for RCG Environmental Failures** for further diagnosis of the trouble.
If the specific fault code displayed in Field 12 is **not** 1625, proceed to isolation and repair step **Fault Isolation for RCC and Remoted Port failures** for further diagnosis of the trouble.
3. If **Remote Carrier Group (unit type 74) failures** was referenced for a remoted unit type 27 (GPP), unit type 29 (line circuit), unit type 69 (MFAT), or unit type 72 (EIA) circuit, proceed to isolation and repair step **Fault Isolation for RCC and Remoted Port Failures** for further diagnosis of the trouble.

Fault Isolation for RCL Failures

1. Enter **PROC 620**, Test 1 and display the original RCG failure.
2. Enter **PROC 620**, Test 4.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 620** is the default equipment location displayed in Test 4 of **PROC 620**.

3. Record the specific fault code displayed in Field 12 which was detected by on-line periodic software tests and logged in PMIDS.
4. Check the circuit status displayed in Field 10.

If Field 10 equals 1 (on-line and in-use), Test 4 cannot be performed for port circuits without busying them out. Wait until the circuit is not in-use or perform tests on other circuits.

Note: Port circuits that cannot be tested while in use without being busied out are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 68, 69, 71, 72, 74, and 75.

5. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 6.

Note: A possibility exists that the circuit pack is not plugged in or that a faulty ID chip on the circuit pack exists when a circuit status of 4 is displayed in Field 10 before Test 4 is executed.

If Field 10 does not equal 4, proceed to Step 7.

6. If Test 4 is being run remotely, proceed to Step 7.

If Test 4 is being run locally (or maintenance personnel are on the customer's premises), determine if the circuit pack is plugged in.

If the circuit pack is not plugged in, or the slot is empty, reseal or replace the circuit pack, then proceed to Step 7.

If the circuit pack is firmly seated, proceed to Step 7.

7. Individual port circuits can be placed in maintenance busy out status for testing by checking the circuit status displayed in Field 10.

Caution: *Busying out an RCG circuit pack disrupts calls in progress on all 24 ports of the RCG circuit pack.*

8. If Field 10 equals 1, individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 68, 69, 71, 72, 74, and 75.

9. If the circuit status equals 3, proceed to Step 10.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 10.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

10. Depress **EXECUTE**.

11. Special error code 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the network digital circuit cannot be tested.

If special error code 81 or 83 is not displayed, proceed to Step 14.

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12. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4.
 - a. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7 and depressing **EXECUTE**.
 - b. If TN380 or TN381 fails, perform Steps 17 through 35 below (as appropriate).

If TN380 or TN381 passes, check the wiring associated with the circuit pack that displayed special error code 81.
13. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.
14. Determine the status of the circuit by observing the LEDs on the faceplate of the circuit pack displayed in Fields 3 through 6.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

15. If the circuit passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 45.

If the circuit status does not equal 4, proceed to Step 36.

Note: When the circuit was alarmed in Test 1 of **PROC 620** and passes the diagnostic analysis test in Test 4 of **PROC 620**, further analysis of the problem should be performed by running a continuous test of the circuit in Test 3 of **PROC 620** to ensure that the failure is not intermittent.

16. If the circuit fails, indicated by a specific fault code displayed in Field 12 and the **RED** LED lighted on the faceplate of the circuit pack, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

17. At the equipment location displayed in Fields 3 through 6, reseal the circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
18. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

Note: A verification test is automatically performed by Test 4 on the circuit pack reseated or replaced without any steps performed by maintenance personnel, other than reseating or replacing the circuit pack.

19. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
20. Check the circuit status displayed in Field 10. If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 45.
If the circuit status does not equal 4, proceed to Step 46.
21. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.
At the equipment location displayed in Fields 2 through 6, replace the circuit pack.
Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
22. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
Proceed to Step 46.
23. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.
 - a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
 - b. If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.
Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.
24. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.
The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.
25. At the equipment location displayed in Fields 3 through 6, reseal the alternate circuit pack.

Caution: Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
26. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.
Proceed to Step 46.
27. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.
At the equipment location displayed in Fields 3 through 6, replace the alternate circuit pack.
Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
28. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.
Proceed to Step 46.

29. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.
- Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
 - If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.

Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

30. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.

31. At the equipment location displayed in Fields 3 through 6, reseal the second alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

32. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 46.

33. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

At the equipment location displayed in Fields 3 through 6, replace the second alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

34. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 46.

35. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

36. Use **NEXT TEST** to step to Test 3 of **PROC 620**.

Note: The circuit that was displayed in Test 4 is the default equipment location displayed in Test 3.

37. Depress **EXECUTE**.

Allow Test 3 to execute for a period of time (or until a specific fault code is indicated in Field 12) and depress **STOP**.

If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.

38. If the circuit fails Test 3, reseal the circuit pack at the equipment location displayed in Fields 3 through 6.
39. Depress **EXECUTE**.

Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.

40. If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
41. If the circuit fails Test 3, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.
42. At the equipment location displayed in Fields 3 through 6, replace the circuit pack.
43. Depress **EXECUTE**.

Allow Test 3 to execute for the same period of time (or longer) and depress **STOP**.

44. If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.

If the circuit fails Test 3, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

45. When a circuit status of 4 indicates a faulty ID chip, perform the following:
 - a. At the equipment location displayed in Fields 2 through 6, replace the circuit pack.
 - b. Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
 - c. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.
 - d. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack. Proceed to Step 46.
 If the circuit pack fails, the **RED** LED is lighted on the faceplate of the circuit pack. Check the wiring associated with the circuit pack replaced.
46. The **NETWORK SWITCH** or **PORT** fault indicator is turned off when the circuit passes Test 4.

The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Fault Isolation for RCC and Remoted Port Failures

Fault isolation for RCC and remoted port failures is divided into two parts.

1. Part one is performed at the customer's premises using the **MAAP** to verify the existence of a failure and to determine the alternate circuit packs (if any) required to correct the trouble.

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2. Part two is performed at the remote carrier group using the remote carrier group circuit pack insertion test by reseating or replacing circuit packs in the remote carrier group to correct the trouble.

Part One - Verifying Failure

1. Display the failing unit type 74 (RCG), unit type 27 (GPP), unit type 29 (line circuit), unit type 69 (MFAT), or unit type 72 (EIA) circuit with a remote status of 1 (remote T1) or 2 (remote fiber) displayed in Field 8 in Test 1 of **PROC 620**.
2. Enter **PROC 620**, Test 4.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 620** is the default equipment location displayed in Test 4 of **PROC 620**.

3. Record the specific fault code displayed in Field 12 which was detected by on-line periodic software tests and logged in PMIDS.
4. When a GPP circuit (unit type 27) is the failing circuit, the translated peripheral should be connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.

Note: Tests may fail with a specific fault code other than the expected specific fault code 351 (GPP DTL idle bit set) failure when the peripheral is disconnected or does not have power on when required.

5. Individual port circuits can be placed in maintenance busy out status for testing by checking the circuit status displayed in Field 10.
6. If Field 10 equals 1, individual port circuits should not be busied out as they are on-line and in-use. Busying out in-use port circuits and performing tests results in loss of calls or data.

Note: Port circuits that should not be busied out while in-use are unit types 16, 24, 25, 27 through 29, 31 through 34, 44 through 46, 62, 66, 68, 69, 71, 72, 74, and 75.

Caution: *Busying out a port circuit results in loss of customer tails when the port circuit is in use. Busying out an RCG circuit pack disrupts calls in progress on all 24 ports of the RCG circuit pack.*

7. If the circuit status equals 3, proceed to Step 8.

If the circuit status does not equal 3 and you wish to test the circuit, depress **BUSY OUT** and proceed to Step 8.

Note: If the circuit within a unit type cannot be busied out, special error code 80 (busy/release busy not allowed for this unit) is displayed in the **MAAP** error code field.

8. Depress **EXECUTE**.
9. Special error code 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the network digital circuit cannot be tested.

If special error code 81 or 83 is not displayed, proceed to Step 12.

10. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4.
 - a. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7 and depressing **EXECUTE**.
 - b. If TN380 or TN381 fails, perform Steps 31 through 50 of **One Digital Network Circuit Failure** fault isolation (as appropriate).
 If TN380 or TN381 passes, check the wiring associated with the circuit pack that displayed special error code 81.
11. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.
12. If unit type 27 (GPP) is being tested, check the specific fault code displayed in Field 12.
 - a. If specific fault code 351 is displayed in Field 12, it is probably the result of a disconnected or powered down peripheral. Proceed to Step 13.
 - b. If specific fault code 350, 352, 354, or 356 is displayed in Field 12, it may be the result of excessive backplane noise or noise coupled into the conductors to the peripheral. Proceed to Step 13.
 - c. If specific fault code 350, 351, 352, 354, or 356 is **not** displayed in Field 12, proceed to Step 14.
13. Verify that the peripheral is connected. When the terminal is powered by external sources (i.e., commercial power), the power to the terminal **must** be turned on.
 If the peripheral is not connected and/or powered up when required, connect or turn on the peripheral and repeat the test from Step 8.
 If the peripheral is connected and has power on when required, proceed to Step 14.
14. Determine the status of the circuit by checking the specific fault code in Field 12.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

15. If the circuit passes, a specific fault code of 0 is displayed in Field 12.

Note: When the circuit was alarmed in Test 1 of **PROC 620** and passes the diagnostic analysis test in Test 4 of **PROC 620**, further analysis of the problem should be performed by running a continuous test of the circuit in Test 3 of **PROC 620** to ensure that the failure is not intermittent.

Proceed to Step 22.

16. If the circuit fails, indicated by a specific fault code other than 0 displayed in Field 12, record the specific fault code which is detected by the demand diagnostic test and logged in DMIDS.
 Record the unit type and equipment location of the failing circuit displayed in Fields 2 through 7.

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17. If specific fault code 1625 is displayed in Field 12 for unit type 74 (RCG), proceed to isolation and repair step **Fault Isolation for RCG Environmental Failures** for further diagnosis of the trouble.
18. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.
Proceed to Step 25.
19. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.
Record the unit type and equipment location of the alternate circuit pack displayed in Fields 2 through 6.
20. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.
Proceed to Step 25.
21. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.
Record the unit type and equipment location of the second alternate circuit pack displayed in Fields 2 through 6.
Proceed to Step 25.
22. Use **NEXT TEST** to step to Test 3 of **PROC 620**.

Note: The circuit that was displayed in Test 4 is the default equipment location displayed in Test 3.
23. Depress **EXECUTE**.
Allow Test 3 to execute for a period of time (or until a specific fault code is indicated in Field 12) and depress **STOP**.
24. If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 4 to turn off the **NETWORK SWITCH** or **PORT** fault indicator.
If the circuit fails Test 3, repeat the test from Step 1.
25. Dispatch maintenance personnel to the remote carrier group with the required circuit packs and the equipment location of the failing circuit pack(s) displayed in Fields 2 through 7.

Part Two - Remote Carrier Group Circuit Pack Replacement

Circuit pack replacement in the remote carrier group is dependent upon observation of the **RED** and **GREEN** LEDs on the circuit pack being reseated or replaced. There is **no MAAP** display to determine whether the circuit pack passes or fails the test.

The remote carrier group circuit pack insertion test consists of a hardware test and a software test. In order to perform the software test, the maintenance mode in the **MODE** display procedure **must not** be active.

Indications on the progress and results of the hardware and software tests are given by lighting LEDs on the circuit pack inserted.

The remote carrier group circuit pack insertion test LED indications depend on which circuit pack is inserted; i.e., Remote Carrier Controller (RCC) ANN16 circuit pack or a remote port circuit pack.

1. Each circuit pack and alternate circuit pack (as required) recorded in part one for the failing circuit should be reseated prior to being replaced. The circuit pack should be replaced if the test fails when the circuit pack is reseated.
2. The order of reseating and replacing circuit packs recorded as failing in part one is as follows:
 - a. Reseat the failing circuit pack.
 - b. Replace as required the failing circuit pack.
 - c. Reseat the first alternate circuit pack (if any).
 - d. Replace as required the first alternate circuit pack.
 - e. Reseat the second alternate circuit pack (if any).
 - f. Replace as required the second alternate circuit pack.

If all of the above steps (as appropriate) fail, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

3. The equipment location(s) recorded in part one for the failing circuit is not the true physical location in the remote carrier group of the circuit pack to be reseated or replaced.

The remote carrier group contains a label (refer to Figure 11) which shows the relationship of the **MAAP** display to the remote carrier group slot number to be replaced for the failing circuit pack.

4. When replacing unit type 74 (RCG) ANN16 circuit pack, refer to **RCC (ANN16) Circuit Pack Insertion** below for the results of the test.
5. When replacing unit type 27 (GPP), unit type 29 (line circuit), unit type 69 (MFAT), or unit type 72 (EIA) port circuits, refer to **Port Circuit Pack Insertion** below for the results of the test.

Note: When a unit type 27 (GPP) circuit pack is unseated or replaced in the remote carrier group, wait **at least 30 seconds** before reseating the SN270B or SN271 circuit pack. The auto reset may not take effect because of the circuit pack being horizontally mounted unless the circuit pack is unseated for at least 30 seconds.

RCC (ANN16) Circuit Pack Insertion

When the ANN16 (RCC) circuit pack is inserted in the remote carrier group, the following occurs.

Note: When a GPP circuit pack is tested, all translated peripherals should be connected. When the terminal(s) are powered by external sources (i.e., commercial power), the power to the terminal(s) **must** be turned on.

RGI-C (GROUP 1)	CENTRAL LOCATION	RGI-C (GROUP 2)
MODULE _____		MODULE _____
CABINET _____		CABINET _____
CARRIER _____		CARRIER _____
SLOT _____		SLOT _____

		REMOTE CARRIER SLOT			
MAAP	DISPLAY	GROUP 1		GROUP 2	
RGI-C	0,5,13 OR 18	→ —		—	
RGI-R	1,6,14 OR 19	→ 0		5	
PORT 1	0,5,13 OR 18	→ 1		4	
PORT 2	1,6,14 OR 19	→ 2		7	
PORT 3	2,7,15 OR 20	→ 3		8	

Figure 11. Remote Group Carrier Housing Unit Labels

1. The hardware test on the RCC (ANN16) is performed.
The **RED** LED on the RCC circuit pack is turned on, then off.
The **GREEN** LED on the RCC circuit pack is turned on, then off.
2. If the RCC hardware test passes, both LEDs remain off.
If the RCC hardware test fails, the **RED** LED is lighted on the RCC circuit pack.

Note: The RCC circuit pack's **GREEN heartbeat** LED indicates a fast heartbeat after the firmware test is performed.
3. Then the hardware test on all port boards is performed.

Note: The hardware test on the port boards is only performed if the hardware test on the RCC passed.

The **RED** LEDs are lighted on all port boards.
Then the **GREEN** LEDs are lighted on all port boards.

4. If the port board hardware test passes, both LEDs remain off.

If the port board hardware test fails, the **RED** LED is lighted on the failing port circuit pack(s).

5. After the hardware test on the RCC and all port boards is completed, communications with the switch is attempted.

Note: The hardware test on the RCC has to pass before communications with the switch is attempted.

The RCC circuit pack's **GREEN heartbeat** LED indicates a slow heartbeat and the RCC circuit pack's **YELLOW** LED is lighted indicating communication with the switch is established.

6. If the hardware test on the RCC passes, the software test is executed on the RCC circuit pack.

Note: No software test is executed for any port circuit packs.

7. The **GREEN** LED on the RCC circuit pack being tested is lighted during the software test.

8. If the **GREEN** LED is not lighted on the RCC circuit pack within five minutes after the hardware test is completed, the maintenance mode bit is probably activated by another facility.

Contact the local or remote maintenance facility and ask them to release the maintenance mode bit in the **MODE** display procedure.

9. When the RCC circuit pack being tested passes the software test, both LEDs are turned off.

The **RED** LED is lighted if the RCC circuit pack fails the software test.

10. If any of the circuit packs fail the hardware test or the RCC circuit pack fails the software test indicated by a **RED** LED being lighted, replace the circuit pack and repeat the circuit pack insertion test.

Note: If more than one of the circuit packs fail and one of the circuit packs is the RCC (ANN16), replace the RCC circuit pack first.

Port Circuit Pack Insertion

When a port circuit pack is inserted in the remote carrier group, the following occurs.

Note: When a GPP circuit pack is tested, all translated peripherals should be connected. When the terminal(s) are powered by external sources (i.e., commercial power), the power to the terminal(s) **must** be turned on.

1. The hardware test on the port circuit pack is performed.

The **RED** LED on the port circuit pack is turned on, then off.

The **GREEN** LED on the port circuit pack is turned on, then off.

2. If the port circuit pack hardware test passes, both LEDs remain off.

If the port circuit hardware test fails, the **RED** LED is lighted on the port circuit pack.

3. If the port circuit pack fails the hardware test indicated by a **RED** LED being lighted, replace the circuit pack and repeat the circuit pack insertion test.

Fault Isolation for RCG Environmental Failures

When specific fault code 1625 is displayed in Field 12 for unit type 74 (RCG), it indicates that the remote carrier group or the cabinet housing the remote carrier group has one or more environmental troubles.

1. Depress **NEXT DATA**.

Field 11 equals 2 and Field 12 displays a decimal value.

Record the decimal value displayed in Field 12.

2. Depress **NEXT DATA**.

Field 11 equals 3 and Field 12 displays a decimal value.

Record the decimal value displayed in Field 12.

3. Depressing **NEXT DATA** again dashes Fields 11 and 12.

Depressing **NEXT DATA** once more displays the original values in Fields 11 and 12. Field 11 equals 3; Field 12 equals 1625.

4. Refer to Table AF, PROC 620 - Remote Carrier Group Environmental Definitions, to determine the type of environmental failure requiring corrective action.

Note: When Field 11 display equals 3, there are 7 possible alarm conditions. When multiple alarm conditions exist, they are independent of each other. Table AF indicates in a note the priority of repair for multiple alarm conditions.

5. When the remote carrier group is **not** mounted in an auxiliary cabinet, some of the environmental encodes will not be displayed in Field 12. Only those environmental encodes applicable to the remote carrier group are displayed when the RCG is a stand-alone unit (not mounted in an auxiliary cabinet).
6. Dispatch maintenance personnel to the remote carrier group location to perform one or more (if required) of the following paragraphs listed below depending upon the type of environmental failure displayed in Field 12 and listed in Table AF, PROC 620 - Remote Carrier Group Environmental Definitions.

TABLE AF.

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
2	0	No environmental failures.
2	1	RCC power failure.
2	2	RCG converter alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
2	4	RCG low 48-volt alarm.
2	6	RCG converter alarm and RCG low 48-volt alarm.
3	0	No environmental failures.
3	1	Cabinet AC rectifier alarm.
3	2	Cabinet battery holdover alarm.
3	3	Cabinet AC rectifier alarm and Cabinet battery holdover alarm.
3	4	RCG fan alarm.
3	5	Cabinet AC rectifier alarm and RCG fan alarm.
3	6	Cabinet battery holdover alarm and RCG fan alarm.
3	7	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, and RCG fan alarm.
3	8	RCG over temp alarm.
3	9	Cabinet AC rectifier alarm and RCG over temp alarm.
3	10	Cabinet battery holdover alarm and RCG over temp alarm.
3	11	Cabinet AC rectifier alarm, Cabinet battery holdover alarm and RCG over temp alarm.
3	12	RCG fan alarm and RCG over temp alarm.
3	13	Cabinet AC rectifier alarm, RCG fan alarm, and RCG over temp alarm.
3	14	Cabinet battery holdover alarm, RCG fan alarm, and RCG over temp alarm.
3	15	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, and RCG over temp alarm.
3	16	RCG analog ringing generator alarm.
3	17	Cabinet AC rectifier alarm and RCG analog ringing generator alarm.
3	18	Cabinet battery holdover alarm and RCG analog ringing generator alarm.
3	19	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, and RCG analog ringing generator.
3	20	RCG fan alarm and RCG analog ringing generator alarm.
3	21	Cabinet AC rectifier alarm, RCG fan alarm, and RCG analog ringing generator alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	22	Cabinet battery holdover alarm, RCG fan alarm, and RCG analog ringing generator alarm.
3	23	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, and RCG analog ringing generator alarm.
3	24	RCG over temp alarm and RCG analog ringing generator alarm.
3	25	Cabinet AC rectifier alarm, RCG over temp alarm, and RCG analog ringing generator alarm
3	26	Cabinet battery holdover alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	27	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	28	RCG fan alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	29	Cabinet AC rectifier alarm, RCG ran alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	30	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	31	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and RCG analog ringing generator alarm.
3	32	CDM alarm.
3	33	Cabinet AC rectifier alarm and CDM alarm.
3	34	Cabinet battery holdover alarm and CDM alarm.
3	35	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, and CDM alarm.
3	36	RCG fan alarm and CDM alarm.
3	37	Cabinet AC rectifier alarm, RCG fan alarm, and CDM alarm.
3	38	Cabinet battery holdover alarm, RCG fan alarm, and CDM alarm
3	39	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, and CDM alarm.
3	40	RCG over temp alarm and CDM alarm.
3	41	Cabinet AC rectifier alarm, RCG over temp alarm, and CDM alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (Contd) (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	42	Cabinet battery holdover alarm, RCG over temp alarm, and CDM alarm.
3	43	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, and CDM alarm.
3	44	RCG fan alarm, RCG over temp alarm, and CDM alarm.
3	45	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, and CDM alarm.
3	46	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and CDM alarm.
3	47	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and CDM alarm.
3	48	RCG analog ringing generator alarm and CDM alarm.
3	49	Cabinet AC rectifier alarm, RCG analog ringing generator alarm, and CDM alarm.
3	50	Cabinet battery holdover alarm, RCG analog ringing generator alarm, and CDM alarm.
3	51	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG analog ringing generator alarm, and CDM alarm.
3	52	RCG fan alarm, RCG analog ringing generator alarm, and CDM alarm.
3	53	Cabinet AC rectifier alarm, RCG fan alarm, RCG analog ringing generator alarm, and CDM alarm.
3	54	Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, and CDM alarm.
3	55	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, and CDM alarm.
3	56	RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	57	Cabinet AC rectifier alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	58	Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	59	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (Contd) (See Note]		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	60	RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	61	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	62	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	63	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CDM alarm.
3	64	CEM alarm.
3	65	Cabinet AC rectifier alarm and CEM alarm.
3	66	Cabinet battery holdover alarm and CEM alarm.
3	67	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, and CEM alarm.
3	68	RCG fan alarm and CEM alarm
3	69	Cabinet AC rectifier alarm, RCG fan alarm, and CEM alarm.
3	70	Cabinet battery holdover alarm, RCG fan alarm, and CEM alarm.
3	71	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, and CEM alarm.
3	72	RCG over temp alarm and CEM alarm.
3	73	Cabinet AC rectifier alarm, RCG over temp alarm, and CEM alarm.
3	74	Cabinet battery holdover alarm, RCG over temp alarm, and CEM alarm.
3	75	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, and CEM alarm.
3	76	RCG fan alarm, RCG over temp alarm, and CEM alarm.
3	77	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, and CEM alarm.
3	78	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and CEM alarm.
3	79	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, and CEM alarm.
3	80	RCG analog ringing generator alarm and CEM alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (Contd) (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	81	Cabinet AC rectifier alarm, RCG analog ringing generator alarm, and CEM alarm.
3	82	Cabinet battery holdover alarm, RCG analog ringing generator alarm, and CEM alarm.
3	83	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG analog ringing generator alarm, and CEM alarm.
3	84	RCG fan alarm, RCG analog ringing generator alarm, and CEM alarm.
3	85	Cabinet AC rectifier alarm, RCG fan alarm, RCG analog ringing generator alarm, and CEM alarm.
3	86	Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, and CEM alarm.
3	87	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, and CEM alarm.
3	88	RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	89	Cabinet AC rectifier alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	90	Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	91	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	92	RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	93	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	94	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	95	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, and CEM alarm.
3	96	CDM alarm and CEM alarm.
3	97	Cabinet AC rectifier alarm, CDM alarm, and CEM alarm.
3	98	Cabinet battery holdover alarm, CDM alarm, and CEM alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (Contd) (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	99	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, CDM alarm, and CEM alarm.
3	100	RCG fan alarm, CDM alarm, and CEM alarm.
3	101	Cabinet AC rectifier alarm, RCG fan alarm, CDM alarm, and CEM alarm.
3	102	Cabinet battery holdover alarm, RCG fan alarm, CDM alarm, and CEM alarm.
3	103	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, CDM alarm, and CEM alarm.
3	104	RCG over temp alarm, CDM alarm, and CEM alarm.
3	105	Cabinet AC rectifier alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	106	Cabinet battery holdover alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	107	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	108	RCG fan alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	109	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	110	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	111	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, CDM alarm, and CEM alarm.
3	112	RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	113	Cabinet AC rectifier alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	114	Cabinet battery holdover alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	115	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	116	RCG fan alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.

TABLE AF. (Contd)

PROC 620 REMOTE CARRIER GROUP ENVIRONMENTAL DEFINITIONS (Contd) (See Note)		
FIELD 11 =	FIELD 12 =	ENVIRONMENTAL DEFINITION
3	117	Cabinet AC rectifier alarm, RCG fan alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	118	Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	119	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	120	RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	121	Cabinet AC rectifier alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	122	Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	123	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	124	RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	125	Cabinet AC rectifier alarm, RCG fan alarm, RCG over temp alarm, RCG analog generator alarm, CDM alarm, and CEM alarm.
3	126	Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
3	127	Cabinet AC rectifier alarm, Cabinet battery holdover alarm, RCG fan alarm, RCG over temp alarm, RCG analog ringing generator alarm, CDM alarm, and CEM alarm.
Note: When Field 11 display equals 3, there are 7 possible alarm conditions. When multiple alarm conditions exist, they are independent of each other. Each alarm condition has to be corrected separately. When multiple alarms exist, the priority of repair is: 1 = Cabinet AC rectifier. 2 = CDM. 3 = CEM. 4 = RCG analog ringing generator. 5 = RCG over temp. 6 = RCG fan. 7 = Cabinet battery holdover.		

PROC 620

RCC Power Failure Environmental Alarm

The RCC power failure alarm normally indicates that a circuit breaker is tripped, an AC cord is disconnected, or commercial power is not available.

1. At the remote carrier group location, determine if any circuit breakers are tripped.
If no circuit breakers are tripped, proceed to Step 4.
If any circuit breaker is tripped, proceed to Step 2.
2. Reset the circuit breaker.
If the circuit breaker does not trip again, proceed to Step 7.
If the circuit breaker trips again, proceed to Step 3.
3. The corrective action to be taken depends on the tripped circuit breaker.
Replacement of components associated with the circuit breaker may be required.
Wiring or cabling associated with the circuit breaker should be checked.
4. At the remote carrier group location, check the power cord to the AC outlet.
If the power cord is connected, proceed to Step 6.
If the power cord is not connected, proceed to Step 5.
5. Connect the power cord to the AC outlet and proceed to Step 7.
6. Determine if the commercial power at the remote carrier group is available.
If the commercial power is not available, report the problem to the customer.
If the commercial power is available, proceed to Step 7.
7. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
8. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.
Determine if the same entry and environmental cause for unit type 74 is displayed.
9. If the same entry and environmental cause is not displayed, corrective action is complete.
10. If the same entry and environmental cause is displayed, check the wiring and and cabling associated with the circuit breaker, power cord, and commercial power at the remote carrier group location.

RCG Converter Environmental Alarm

The faulty DC/DC converter or 634WAAB1 power unit is identified within the remote carrier group by its illuminated **RED** LED.

In the event of protective shutdown a reset toggle switch is located behind the front panel faceplate of the DC/DC converter or 634WAAB1 power unit.

1. At the remote carrier group location, check the circuit breaker associated with the DC/DC converter or 634WAAB1 power unit.
If the circuit breaker is tripped, proceed to Step 2.
If the circuit breaker is not tripped, proceed to Step 3.
2. Reset the circuit breaker.
If the circuit breaker does not trip, proceed to Step 9.
If the circuit breaker trips again, check the wiring between the circuit breaker and the DC/DC converter or 634WAAB1 power unit.
3. At the remote carrier group, measure the output voltage using a Digital Voltmeter (DVM) at the test points of the DC/DC converter or 634WAAB1 power unit.
If the voltage reading is greater than 0, proceed to Step 4.
If the voltage reading is 0, perform Steps 5 through 8.
4. Replace the DC/DC converter or 634WAAB1 power unit and proceed to Step 9.
5. Unseat all circuit packs in the remote carrier group associated with the DC/DC converter or 634WAAB1 power unit.

Caution: *Ensure that the toggle switch is in the up position before reseating the handle.*

Activate the reset toggle switch by pulling the DC/DC converter or 634WAAB1 power unit handle halfway out without unseating the DC/DC or 634WAAB1 circuit board, and then reseating the handle.

6. Measure the output voltage at the DC/DC converter or 634WAAB1 power unit.
7. If the voltage reading is 0, reseat all circuit packs, replace the DC/DC converter or 634WAAB1 power unit, and proceed to Step 9.
8. If the voltage reading is greater than 0, reseat the circuit packs one at a time.
The **RED** LED lights on the DC/DC converter or 634WAAB1 power unit when the faulty circuit pack is seated.
Replace the faulty circuit pack, reseat any disconnected circuit packs and proceed to Step 9.
9. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
10. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.
Determine if the same entry and environmental cause for unit type 74 is displayed.
11. If the same entry and environmental cause is not displayed, corrective action is complete.
12. If the same entry and environmental cause is displayed, check the backplane wiring for a short causing overcurrent shutdown and the wiring associated with the faulty circuit pack.

RCG Low 48-volt Environmental Alarm

1. Determine the type of power source installed in the remote carrier group.
2. If a DC/DC converter or 634WAAB1 power unit is the power source, proceed to isolation and repair step **RCG Converter Environmental Alarm** above and perform Steps 3 through 12 (as appropriate).
3. If an external rectifier is the power source, proceed to isolation and repair step **Cabinet AC Rectifier Environmental Alarm** below and perform Steps 5 through 14 (as appropriate).

Cabinet AC Rectifier Environmental Alarm

A green pilot LED located on the front panel of the rectifier is on when the rectifier is producing -48 volts on its output.

The green pilot LED does not indicate that the output voltage is within regulation limits.

Appropriate test points are available on the front panel of the rectifier for measuring the output voltage and determining the rectifier performance.

1. At the rectifier, determine if the green pilot LED is on.
If the green pilot LED is not on, proceed to Step 2.
If the green pilot LED is on, proceed to Step 8.
2. Determine if the circuit breaker associated with the rectifier is tripped.
If the circuit breaker is tripped, proceed to Step 3.
If the circuit breaker is not tripped, proceed to Step 5.
3. Reset the circuit breaker.
If the circuit breaker does not trip, proceed to Step 11.
If the circuit breaker trips again, replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

4. If the circuit breaker does not trip again after replacing the rectifier, proceed to Step 11.
If the circuit breaker trips again after replacing the rectifier, check the wiring associated with the rectifier.
5. Measure the rectifier output voltages at the test points using a digital multimeter.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

If all voltages are within tolerance, proceed to Step 11.
If the voltages are not within tolerance, proceed to Step 6.

6. Replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

7. Measure the output voltages.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and -52.6 volts, respectively.

If all voltages are within tolerance, proceed to Step 11.

If voltages are not within tolerance, check the wiring associated with the rectifier.

8. Determine if marginal or fluctuating voltages exist at the rectifier test points by measuring the output voltages using a digital multimeter.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -48 volts and -52.6 volts, respectively.

If all voltages are within tolerance without fluctuation, proceed to Step 11.

If the voltages are marginal or fluctuating, proceed to Step 9.

9. Replace the rectifier.

Note: Refer to AUXILIARY COMPONENT REPLACEMENT for steps on replacing the rectifier.

10. Measure the output voltages.

Note: At the auxiliary cabinet rectifier, minimum and maximum voltage readings should be between -46 volts and 52.6 volts, respectively.

If all voltages are within tolerance and do not fluctuate, proceed to Step 11.

If voltages are not within tolerance or fluctuate, check the wiring associated with the rectifier.

11. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

12. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.

Determine if the same entry and environmental cause for unit type 74 is displayed.

13. If the same entry and environmental cause is not displayed, corrective action is complete.

14. If the same entry is displayed, check the wiring associated with the rectifier.

CDM Environmental Alarm

Fault isolation techniques for CEM, CDM, and NCTE units are provided below.

1. On-site isolation among the units that are provided between the RCG port and the span line interface is performed by activating built-in tests on individual units and by using patch cords to provide external looparound and to bypass equipment external to the RCG port.
2. On-site tests for the specific unit should be run as needed in accordance with the maintenance documentation (or other vendor documentation) provided for the specific unit.
3. At the local **MAAP** or remote maintenance facility (if available), external looparound should be performed by changing Field 12 of **PROC 260** to a 1 and executing **PROC 620**, Test 2 on the RCG circuit pack.

Test 2 performs external looparound on the RCG circuit pack to the first looparound on the RCG link outside the switch.

4. When CEMs are provided, a preferred looparound is on a patch field such as the ED-2C780 Jack Panel (X IN to X OUT or Y IN to Y OUT).

Note: The CEM switches looparound data back to the CEM. The switches do not loop data back towards the switch.

5. If a CDM is also provided, the CDM should be bypassed by manually forcing it into looparound.
6. If Test 2 of **PROC 620** fails, the RCG circuit pack should be replaced and the tests repeated.
If Test 2 still fails, check the wiring between the RCG circuit pack and the associated units.
7. If Test 2 passes, activate the CEM loop switches and observed that no equipment alarm exists on the CEM.
If no alarms are observed, loop the data at the NCTE (X IN to X OUT patch cord) and remove the line Z loop on the CEM via the loop control switch.
8. Observe that the CEM runs alarm free after reset is depressed.

If the CEM displays alarms, trouble with the NCTE and the wiring to the NCTE probably exist.

If the CEM does not display alarms, trouble with the facility probably exists.

CEM Environmental Alarm

1. The CEM maintenance procedures are specified in AT&T Practice 365-287-100.
 - a. In general, the CEM circuit pack with the RED LED lighted is the first choice.
If none are lighted, power should be checked at the test points on the power unit
 - b. Following the repair the CEM reset button must be depressed to clear the alarm condition.
2. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 625**, Test 1 and check the health status of the RCG facility.

3. If the health status indicates that the RCG facility is presently operational, the alarms should be retired using **PROC 620**, Test 1 at the local MAAP or remote maintenance facility (if available), and no destructive testing of the RCG facility should be performed.
4. If the health status indicates that the RCG facility is not healthy or **if you desire to verify that the RCG facility is functioning**, use the following test call prior to testing the RCG using **PROC 620**.

Make a terminal-to-trunk test call using **PROC 642** on the RCG.

Caution: *The RCG tests executed by PROC 620, Tests 2 through 5 are service affecting and should only be executed during periods of low traffic, during out-of-hours, or after a service outage has already occurred and is verified using one of the above tests. PROC 625, Test 1 should always be used when the current health of a RCG digital service is in question.*

5. After repair of the CEM, the RCG circuit must be tested to clear the alarmed entry in PMIDS.

Caution: *Busying out a RCG circuit pack disrupts calls in progress on all 24 ports of the RCG circuit pack.*

- a. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 4 and busy out the RCG circuit by depressing **BUSY OUT**. One circuit cannot be busied out by **PROC 620**. If all 24 circuits on the RCG circuit pack are busied out in any busy out procedure, testing can be performed.

Note: If the RCG circuit pack is not busied out the test **will** fail with a specific fault code of 13 (RCG in-use) if any channel on the RCG is in-use when the test is performed.

- b. Perform Steps 1 through 67 (as required) of isolation and repair step **One Digital Network Circuit Failure** to retire the alarm cause.

RCG Analog Ringing Generator Environmental Alarm

1. At the remote carrier group location, replace circuit pack CAL1.

Note: Circuit pack CAL1 should only be replaced during low traffic if digital circuits are provided, and should be replaced immediately if analog circuits are provided.

2. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

3. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.

Determine if the same entry and environmental cause for unit type 74 is displayed.

4. If the same entry and environmental cause is not displayed, corrective action is complete.
5. If the same entry and environmental cause is displayed, check the wiring associated with the CAL1 circuit pack.

PROC 620

RCG Over Temp Environmental Alarm

An overtemperature alarm cause signifies that a predetermined remote carrier group temperature is exceeded.

1. Determine if the fan in the remote carrier group is running.
If the fan is running, proceed to Step 2.
If the fan is not running, proceed to Step 3.
2. Determine if the fan is operating properly.
If the fan is operating properly, proceed to Step 4.
If the fan is not operating properly, replace the fan, allow sufficient time for the remote carrier group interior to cool and proceed to Step 4.
3. Replace the fan, allow sufficient time for the remote carrier group interior to cool, and proceed to Step 4.
4. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
5. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.
Determine if the same entry and environmental cause for unit type 74 is displayed.
6. If the same entry and environmental cause is not displayed, corrective action is complete.
7. If the same entry and environmental cause is displayed, check the wiring associated with the fan.

RCG Fan Environmental Alarm

1. Determine if the fan in the remote carrier group is running.
If the fan is running, proceed to Step 2.
If the fan is not running, proceed to Step 3.
2. Determine if the fan is operating properly.
If the fan is operating properly, proceed to Step 4.
If the fan is not operating properly, replace the fan, allow sufficient time for the remote carrier group interior to cool and proceed to Step 4.
3. Replace the fan, allow sufficient time for the remote carrier group interior to cool, and proceed to Step 4.
4. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.

5. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.

Determine if the same entry and environmental cause for unit type 74 is displayed.

6. If the same entry and environmental cause is not displayed, corrective action is complete.
7. If the same entry and environmental cause is displayed, check the wiring associated with the fan.

Cabinet Battery Holdover Environmental Alarm

Nominal or extended holdover is provided by a 312 power unit, a J87462A power unit (consisting of a charger and battery system) or a DC filter.

Except for a DC filter, the holdover alarm is detected by software when **RSV FAIL** or **BTY ON LINE** on the 312 power unit or when **RSV ALM** or **BTY ON LINE** on the J87462A power unit is active.

Except for the DC filter, LEDs on the 312 power unit or J87462A power unit determine whether the switch failed or is drawing battery power because cabinet AC voltage is absent.

Appropriate test points are available on the 312 power unit or J87462A power unit for determining the power unit's performance.

1. Determine the type of holdover power unit installed in the cabinet housing the remote group carrier.
2. If a DC filter is the type of holdover power unit installed in the cabinet housing the remote carrier group, replace the DC filter.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of the DC filter.

If a DC filter is not the type of holdover power unit installed in the cabinet housing the remote carrier group, proceed to Step 7.

3. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.

Wait at least 5 to 10 minutes.

4. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.

Determine if the same entry and environmental cause for unit type 74 is displayed.

5. If the same entry and environmental cause is not displayed, corrective action is complete.
6. If the same entry and environmental cause is displayed, check the wiring associated with the DC filter.
7. At the cabinet housing the remote carrier group, determine the cause of the holdover alarm by checking the LEDs on the appropriate power unit (312 or J87462A).

PROC 620

8. If the **BTY ON LINE** LED is lighted, check the cabinet AC voltage (the cabinet is being powered from the battery system of the appropriate power unit, i.e., 312 or J87462A).
9. If the **RSV FAIL** or **RSV ALM** LED is lighted, use the test points on the appropriate power unit (312 or J87462A) to determine the cause of the problem.

Check for -48 volts using a digital voltmeter connected between test points **-48V** and **GRD**.

Check for BTY (-48 volts) using a digital voltmeter connected between test points **BTY** and **GRD**.

10. If -48 volts is present but BTY is not, proceed to Step 11.
If -48 volts is absent, check the wiring between the appropriate power unit and the voltage source.
11. Replace the CP1 circuit pack (charger and alarm board) in the 312 power unit or the AMC-1 circuit pack (power board) in the J87462A power unit.

Note: If the AMC-1 circuit pack in the J87462A power unit has a AMD-1 circuit pack (logic board) attached to it, replace both circuit packs as a set.

12. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
13. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.
Determine if the same entry and environmental cause for unit type 74 is displayed.
14. If the same entry and environmental cause is not displayed, corrective action is complete.
If the same entry and environmental cause is displayed, proceed to Step 15.
15. If the nominal or extended holdover is a 312B power unit or a J87462A List 5 power unit, proceed to Step 17.
16. If the nominal or extended holdover is a 312A or 312C power unit, or a J87462A List 6 or List 7 power unit, repeat Steps 10 through 15 for the other CP1 or AMC-1 circuit pack.
If both CP1 or AMC-1 circuit packs are replaced, proceed to Step 17.
17. At the cabinet housing the remote carrier group, replace the 312 power unit or J87462A power unit (as appropriate).
18. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and clear the alarmed entry.
Wait at least 5 to 10 minutes.
19. At the local **MAAP** or remote maintenance facility (if available), enter **PROC 620**, Test 1 and depress **EXECUTE**.
Determine if the same entry and environmental cause for unit type 74 is displayed.
20. If the same entry and environmental cause is not displayed, corrective action is complete.
21. If the same entry and environmental cause is displayed, check the wiring associated with the 312 power unit or J87462A power unit (as appropriate).

Remote Module Interface (Unit Type 71) Failures

Overview

Fault isolation of Remote Module Interface (RMI) circuit failures depends on whether the RMI is the central (switch end) or the remote RMI.

The equipment location displayed in Fields 2 through 6 (Field 7 is dashed) for the RMI (TN456) is **always** the central RMI equipment location.

Specific fault codes displayed in Field 12 assist in determining whether the TN456 to be replaced is a central or remote RMI. Reference to Unit Type 71 in Table AH, PROC 620 - Fault Code Definitions by Unit Type, lists the central or remote TN456 to replace, depending on whether it is the first, second, or third (as appropriate) circuit pack to replace.

Fault Isolation

Perform the following procedure to isolate RMI failures.

1. Enter **PROC 620**, Test 4.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 620** is the default equipment location displayed in Test 4 of **PROC 620**.

2. Record the specific fault code displayed in Field 12 which was detected by on-line periodic software tests and logged in PMIDS.
3. Check the circuit status displayed in Field 10.
 - a. If Field 10 equals 1 (on-line and in-use), Test 4 cannot be performed for the RMI circuit. Wait until the circuit is not in-use or perform tests on other circuits
 - b. If Field 10 equals 4 (unable to communicate or not plugged in), proceed to Step 4.

Note: A possibility exists that the circuit pack is not plugged in or that a faulty ID chip on the circuit pack exists when a circuit status of 4 is displayed in Field 10 before Test 4 is executed.

If Field 10 does not equal 4, proceed to Step 5.

4. If Test 4 is being run remotely, proceed to Step 5.

If Test 4 is being run locally (or maintenance personnel are on the customer's premises), determine if the circuit pack is plugged in.

If the circuit pack is not plugged in, or the slot is empty, reseal or replace the circuit pack, then proceed to Step 5.

If the circuit pack is firmly seated, proceed to Step 5.

5. Depress **EXECUTE**.
6. Special error codes 81 or 83 may be displayed in the **MAAP** error code field and the test is terminated when the network digital circuit cannot be tested.

If special error code 81 or 83 is not displayed, proceed to Step 9.

7. When special error code 81 (message transmission to TMS or module processor failed) is displayed, repeat Test 4.
 - a. If special error code 81 is displayed again, test TN380 (module processor) or TN381 (TMS processor) by entering unit type 7 and depressing **EXECUTE**.
 - b. If TN380 or TN381 fails, perform Steps 11 through 29 below (as required).

If TN380 or TN381 passes, check the wiring associated with the circuit pack that displayed special error code 81.
8. When special error code 83 (switch resources not available) is displayed, repeat Test 4 until the test is executed or wait until switch resources become available before testing.
9. Determine the status of the circuit by observing the LEDs on the faceplate of the circuit pack displayed in Fields 3 through 6.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

10. If the circuit passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 30.

If the circuit status does not equal 4, proceed to Step 35.
11. If the circuit fails, indicated by a specific fault code displayed in Field 12 and the **RED** LED lighted on the faceplate of the circuit pack, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

12. Check the specific fault code displayed in Field 12.
 - a. If the specific fault code displayed in Field 12 is 396, reseal the remote RMI circuit pack.
 - b. If the specific fault code displayed in Field 12 is **not** 396, reseal the circuit pack at the equipment location displayed in Fields 3 through 6.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

13. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

Note: A verification test is automatically performed by Test 4 on the circuit pack reseated or replaced without any steps performed by maintenance personnel, other than reseating or replacing the circuit pack.

14. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
 - a. Check the circuit status displayed in Field 10.

- b. If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 30.

If the circuit status does not equal 4, proceed to Step 35.

15. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.
 - a. Check the specific fault code displayed in Field 12.
 - b. If the specific fault code displayed in Field 12 is 396, replace the remote RMI circuit pack.
 - c. If the specific fault code displayed in Field 12 is **not** 396, replace the circuit pack at the equipment location displayed in Fields 2 through 6.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

16. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Proceed to Step 35.

17. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.
 - a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
 - b. If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.
Refer to RMI circuit pack LEDs described in Step 36 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

18. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.

19. Check the specific fault code displayed in Field 12.
 - a. If the specific fault code displayed in Field 12 is 393, 394, or 397, reseal the remote RMI circuit pack.
 - b. If the specific fault code displayed in Field 12 is **not** 393, 394, or 397, reseal the circuit pack at the equipment location displayed in Fields 3 through 6.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

20. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Proceed to Step 35.

21. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

- a. Check the specific fault code displayed in Field 12.
- b. If the specific fault code displayed in Field 12 is 393, 394, or 397, replace the remote RMI circuit pack.
- c. If the specific fault code displayed in Field 12 is **not** 393, 394, or 397, replace the circuit pack at the equipment location displayed in Fields 2 through 6.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

22. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Proceed to Step 35.

23. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

- a. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
- b. If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.

Refer to RMI circuit pack LEDs described in Step 36 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

24. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.

25. Check the specific fault code displayed in Field 12.

- a. If the specific fault code displayed in Field 12 is 395, reseal the remote RMI circuit pack.
- b. If the specific fault code displayed in Field 12 is **not** 395, reseal the circuit pack at the equipment location displayed in Fields 3 through 6.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

26. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 35.

27. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

- a. Check the specific fault code displayed in Field 12.

- b. If the specific fault code displayed in Field 12 is 395, replace the remote RMI circuit pack.
- c. If the specific fault code displayed in Field 12 is **not** 395, replace the circuit pack at the equipment location displayed in Fields 2 through 6.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

- 28. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.

Proceed to Step 35.

- 29. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.

Refer to RMI circuit pack LEDs described in Step 36 and isolation and repair step **Specific Fault Codes** for further isolation techniques.

- 30. When a circuit status of 4 indicates a faulty ID chip, perform Steps 31 through 34.

- 31. Check the specific fault code displayed in Field 12.

- a. If the specific fault code displayed in Field 12 is 396, replace the remote RMI circuit pack.
- b. If the specific fault code displayed in Field 12 is **not** 396, replace the circuit pack at the equipment location displayed in Fields 3 through 6.

- 32. Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

- 33. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Proceed to Step 35.

- 34. If the circuit pack fails, the **RED** LED is lighted on the faceplate of the circuit pack. Check the wiring associated with the circuit pack replaced.

- 35. The **NETWORK SWITCH** fault indicator is turned off when the circuit passes Test 4.

The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

- 36. The LEDs on the RMI circuit pack may assist in isolating problems with RMI failures.

- a. The **RED** LED (LFAIL indicator) in position 11 of the RMI circuit pack when lighted indicates the channel between the RMI central and remote RMI is not in communication.
- b. The **GREEN** LED (FTA indicator) in position 14 of the RMI circuit pack when lighted indicates transmission to the remote RMI over the fiber.
- c. The **GREEN** LED (FRA indicator) in position 16 of the RMI circuit pack when lighted indicates reception from the remote RMI over the fiber.

- 37. Examine the LEDs on the RMI circuit pack.

- a. If the **RED** LED in position 11 is not lighted, then communication between the central and remote RMIs is good. Proceed to Step 38.
 - b. If the **RED** LED in position 11 is lighted, check the communication path between the central and remote RMIs.
38. Examine the **GREEN** LEDs in positions 14 and 16 of the RMI circuit pack.
- Perform corrective action based on whether transmission or reception is failing.

TSI Demand Test

Overview

To ensure the integrity of the switch, the TSI demand test is executed prior to leaving the customer's premises when any circuit packs in unit type 8 (maintenance interface), unit type 9 (module clock), unit type 10 (TSI ALU), unit type 11 (TSI PSTORE), unit type 13 (PDS), and unit type 15 (PDI) are replaced.

Fault Isolation

To run the TSI demand test, perform the following steps:

1. Step to Test 2 of **PROC 620**.
2. Use the **CHANGE FIELD** sequence to enter unit type 99 in Field 2
CHANGE FIELD; 2; ENTER; 99; ENTER.

Note: Unit type 99 cannot be stepped to by using **NEXT UNIT**.

3. Depress **EXECUTE**.
If Test 2 passes the TSI demand test, all corrective action is complete.
If Test 2 fails the TSI demand test, proceed to Step 4.
4. Enter Test 4 and test the following unit types in the order listed by using **NEXT UNIT** and **NEXT CIRCUIT** (as applicable) to select the unit type and circuit pack to be tested. Perform Steps 6 through 66 (as required) of isolation and repair step **One Digital Network Circuit Failure** for each unit type and circuit pack (as applicable) that fails.
Unit type 11 - TSI PSTORE.
Unit type 13 - PDS (test all PDS circuit packs, 0 through 5).
Unit type 15 - PDI (test all PDI circuit packs, 0 through 23).
Unit type 9 - Module clock.
Unit type 8 - MIF.
Unit type 10 - TSI ALU.
5. When all unit types pass Test 4, corrective action is complete.

Special Error Code 88**Overview**

Assumption: **PROC 620**, Test 4 displays special error code 88 when testing the MCC or a trouble exists where the common control cannot communicate with a network module.

The problem lies somewhere above the MCC or in the cabling between the MCC and the 4 MHZ channels.

Fault Isolation

1. Execute Test 2 of **PROC 611** (common control I/O tests).
2. If Test 2 of **PROC 611** fails, perform the corrective action listed in the repair guide part of **PROC 611** until Test 2 passes.
3. Perform Test 4 of **PROC 620** and test the MCC (unit type 6).
 - If Test 4 passes, corrective action is complete.
 - If Test 4 fails, check the cabling and wiring between the MCC and the common control.

Special Error Code 90**Overview**

Assumption: **PROC 620**, Test 4 displays special error code 90 (test passed, see documentation) when performing a diagnostic or verification test.

Special error code 90 (test passed, see documentation) can occur when testing unit type 23 (TMS/network duplication), a trunk in unit type 27 (GPP), or a trunk in unit type 72 (EIA trunk) after the diagnostic or verification test **passes**.

Special error code 90 (test passed, see documentation) indicates that further diagnosis of the possible trouble should be performed.

Unit Type 23 (TMS/network duplication) Fault Isolation

1. Record the TMS/network duplication channel displayed in Fields 2 through 7.
2. Enter **PROC 621**, Test 2 and perform a soft switch of the TMS/network duplication channel displaying special error code 90 by performing the following:
 - a. Enter the module, cabinet, and carrier number (recorded in Step 1) in Fields 3 through 5 of **PROC 621**.
 - b. Depress **EXECUTE**.
 - c. Depress **CHANGE FIELD; 8; ENTER; 1; ENTER**.

- d. Depress **EXECUTE**.

Note: The first time **EXECUTE** is depressed, the soft switch does not occur. Special error code 85 (push **EXECUTE** twice to switch) is displayed in the **MAAP** error code field.

Depress **EXECUTE**.

3. Enter **PROC 620**, Test 4 and enter the TMS/network duplication channel recorded in Step 1 in Fields 2 through 7.
4. Depress **EXECUTE**.
5. Determine the status of the circuit by observing the LEDs on the faceplate of the circuit pack displayed in Fields 3 through 6.

Note: The unit type and equipment location displayed in Fields 2 through 7 may not be the circuit selected for testing. Test 4 performs a diagnostic analysis test which may isolate the problem to a circuit pack which interfaces with the circuit pack selected for testing.

6. If the circuit passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status equals 4 (unable to communicate or not plugged in), a fault ID chip on the circuit pack is the problem. Proceed to Step 29.

If the circuit status does not equal 4, proceed to Step 33.

7. If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code board, corrective action is complete.

Note: Both sides of the TMS/network duplication channel have been checked and passed with a **GREEN** LED lighted on the faceplate of the circuit pack and special error code 90 displayed.

8. If the circuit fails, indicated by a specific fault code displayed in Field 12 and the **RED** LED lighted on the faceplate of the circuit pack, record the specific fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

9. At the equipment location displayed in Fields 3 through 6, reseal the circuit pack.
Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
10. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

Note: A verification test is automatically performed by Test 4 on the circuit pack reseated or replaced without any steps performed by maintenance personnel, other than reseating or replacing the circuit pack.

11. If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

12. If special error code 90 (test passed, see documentation) is displayed in the **MAAP** error code board, corrective action is complete.

Note: Both sides of the TMS/network duplication channel have been checked and passed with a **GREEN** LED lighted on the faceplate of the circuit pack and special error code 90 displayed.

13. Check the circuit status displayed in Field 10.

If the circuit status equals 4 (unable to communicate or not plugged in), a faulty ID chip on the circuit pack is the problem. Proceed to Step 29.

If the circuit status does not equal 4, proceed to Step 33.

14. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.

At the equipment location displayed in Fields 2 through 6, replace the circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

15. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.

Proceed to Step 33.

16. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the circuit pack.

- a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.

- b. If Fields 2 through 14 are dashed, no alternate circuit pack is available for replacement.

Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

17. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.

The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.

18. At the equipment location displayed in Fields 3 through 6, reseal the alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

19. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.

If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.

Proceed to Step 33.

20. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.

At the equipment location displayed in Fields 2 through 6, replace the alternate circuit pack.

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

21. Observe the **RED** and **GREEN** LEDs on the faceplate of the alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the alternate circuit pack.
Proceed to Step 33.
22. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the alternate circuit pack.
 - a. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
 - b. If Fields 2 through 14 are dashed, no other alternate circuit pack is available for replacement.
Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.
23. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 3 through 6.
The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.
24. At the equipment location displayed in Fields 3 through 6, reseal the second alternate circuit pack.

Caution: *Wait several seconds after unseating the circuit pack before reseating it in its slot or the verification test is not performed.*

Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.

25. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.
Proceed to Step 33.
26. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.
At the equipment location displayed in Fields 3 through 6, replace the second alternate circuit pack.
Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
27. Observe the **RED** and **GREEN** LEDs on the faceplate of the second alternate circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the second alternate circuit pack.
Proceed to Step 33.
28. If the circuit pack fails again, the **RED** LED is lighted on the faceplate of the second alternate circuit pack.
Refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

29. When a circuit status of 4 indicates a faulty ID chip, perform Steps 30 through 32.
30. At the equipment location displayed in Fields 3 through 6, replace the circuit pack.
Wait until the **WAIT** lamp on the **MAAP** goes off before checking the status of the LEDs.
31. Observe the **RED** and **GREEN** LEDs on the faceplate of the circuit pack.
If the circuit pack passes, the **GREEN** LED is lighted on the faceplate of the circuit pack.
Proceed to Step 33.
32. If the circuit pack fails, the **RED** LED is lighted on the faceplate of the circuit pack. Check the wiring associated with the circuit pack replaced.
33. The **NETWORK SWITCH** fault indicator is turned off when the circuit passes Test 4.
The **MAJOR** or **MINOR** alarm indicator is also turned off if no other sources are affecting both alarm indicators.

Unit Type 27 (GPP) Trunk Fault Isolation

1. Perform Test 1 of **PROC 646** on the equipment location displayed in Fields 3 through 7.
2. If the GPP trunk fails Test 1 of **PROC 646**, replace circuit pack SN270B or SN271 at the equipment location displayed in Fields 7 through 11 of **PROC 646**.
3. Repeat Test 1 of **PROC 646**.
4. If Test 1 of **PROC 646** passes, return to Test 4 of **PROC 620** to retire the cause of the fault indicator.
If Test 1 of **PROC 646** fails again, check the wiring associated with the circuit pack replaced.

Unit Type 72 (EIA) Trunk Fault Isolation

1. Perform Test 1 of **PROC 646** on the equipment location displayed in Fields 3 through 7.
2. If the EIA trunk fails Test 1 of **PROC 646**, replace circuit pack SN238 at the equipment location displayed in Fields 7 through 11 of **PROC 646**.
3. Repeat Test 1 of **PROC 646**.
4. If Test 1 of **PROC 646** passes, return to Test 4 of **PROC 620** to retire the cause of the fault indicator.
If Test 1 of **PROC 646** fails again, check the option settings on the terminal associated with the equipment location displayed in Fields 7 through 11 of **PROC 646**.
5. Repeat Test 1 of **PROC 646**.
6. If Test 1 of **PROC 646** passes, return to Test 4 of **PROC 620** to retire the cause of the fault indicator.
If Test 1 of **PROC 646** fails again, check the wiring between the SN238 and the associated terminal.

Specific Fault Codes

Overview

A specific fault code is a number used to provide a description of a failure.

1. This description provides more detail about the failure associated with a circuit.
2. The failure is directly observed at a hardware sensor point or is the result of processing data observed at several hardware sensor points.

Specific fault codes are recorded during periodic or time available testing in PMIDS. Demand testing specific fault codes are recorded in DMIDS.

Both the PMIDS and DMIDS specific fault codes (normally the same) are available for display during testing.

Specific Fault Code Lists

A list of the specific fault codes is provided in 2 tables.

1. Table AG, PROC 620 - Specific Fault Code Definitions, lists the specific fault codes in numerical sequence with a definition for each specific fault code.
2. Table AH, PROC 620 - Specific Fault Code Definitions By Unit Type, lists the specific fault codes displayed when testing a circuit within the unit type listed. In addition, Table AH provides other circuits that could cause (with lower probability) the same failure.

Fault Isolation Using Specific Fault Code Tables

Further isolation of a failure may be accomplished as follows:

1. Analyze the specific fault codes recorded from PMIDS (first specific fault code recorded before executing Test 4) and DMIDS (second specific fault code recorded after Test 4 failed).
2. Determine from the specific fault codes recorded (using Table AG, PROC 620 - Specific Fault Code Definitions, or Table AH, PROC 620 - Specific Fault Code Definitions By Unit Type) if any additional corrective action can be performed (i.e., cabling, connectors, etc.).

Note: The circuit packs listed as circuits 1, 2, and 3 probably have been replaced as the primary candidate and the alternate circuit packs for the failure being investigated.

3. Specific fault codes not listed in Table AG or Table AH are not displayed by **PROC 620** for Release 2, Version 4.
4. Check the wiring associated with the circuit pack(s) replaced [point to point depending upon specific fault code(s) recorded].

TABLE AG.

PROC 620—SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
0	NO FAILURE
2	TPIO ERROR FROM A MAINTENANCE ROUTINE
3	NO RESPONSE TO AN EOM FROM A MAINTENANCE ROUTINE
4	DATA PARITY ERROR ON A MAINTENANCE OR MODULE (OR TMS) PROCESSOR BUS WRITE
5	OTHER NON-SYSIO ERROR ON A MAINTENANCE OR MODULE (OR TMS) PROCESSOR BUS WRITE
6	NO POSITIVE ACKNOWLEDGE USING QUI_PORT, INIT_TSI, OR MODULE PROCESSOR BUS WRITE
7	DISTRIB DATA AFTER BYTE INCORRECT TO A PDI
8	DISTRIB DATA AFTER BYTE INCORRECT TO A PCI
9	DISTRIB DATA AFTER BYTE INCORRECT TO A PORT
10	NO POSITIVE ACKNOWLEDGE AFTER MAINTENANCE ORDER TO TMS PROCESSOR
11	BUS PROBLEM CAUSED MODULE (OR TMS) PROCESSOR SHUTDOWN
12	TIME SLOT UNAVAILABLE
13	CIRCUIT IN USE BY CALL PROCESSING
14	ID CHIP FAILURE
15	MAJOR MODULE (OR TMS) PROCESSOR FAILURE—NO SWITCH REQUIRED
16	MAJOR FAILURE FOUND IN MODULE (OR TMS) PROCESSOR TEST
17	MAJOR DUPLICATION/UPDATE FAILURE IN MODULE (OR TMS) PROCESSOR TEST
18	MAJOR MODULE (OR TMS) PROCESSOR FAILURE
19	MINOR MODULE (OR TMS) PROCESSOR FAILURE
21	BAD MCC/MODULE (OR TMS) PROCESSOR COMMUNICATIONS
22	MODULE (OR TMS) PROCESSOR ADDRESS PARITY FAILURE
23	CANNOT MANIPULATE MCC STATUS REGISTER BITS
24	CRITICAL MCC CIRCUIT FAILURE
27	CANNOT MANIPULATE MCC STATUS REGISTER BITS OR AEH4 ALARM DISTRIBUTION AND AIR FLOW MONITOR
28	BUS PROBLEM CAUSED MODULE (OR TMS) PROCESSOR SHUTDOWN
29	CIRCUIT PACK PULLED OR 4-MHZ CABLE DISCONNECTED
30	INCORRECT CLOCK OUTPUT SEQUENCE (INCORRECT SAC)
31	MAINTENANCE INTERFACE FAILURE CAUSED INCORRECT SAC READOUT
32	GPP DATA CLOCK LOST MOMENTARILY (INCORRECT DCE READOUT)

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
33	MAINTENANCE INTERFACE FAILURE CAUSED INCORRECT DCE READOUT
34	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (SIMPLEX WITH SCS)
35	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (SIMPLEX WITH SCS)
36	MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE ON-LINE
37	MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE OFF-LINE
38	CLOCK FREQUENCY GENERATOR FAILED
39	MIF FAILURE CAUSED INCORRECT DCE OOL READOUT
40	OFF-LINE CLOCK APPEARS AS MASTER WITH NO SCS/LGI PRESENT
41	MIF FAILURE CAUSED OFF-LINE CLOCK TO APPEAR AS MASTER WITH NO SCS/LGI PRESENT
42	CLOCK APPEARS AS MASTER WITH SCS/LGI PRESENT
43	MIF FAILURE CAUSED CLOCK TO APPEAR AS MASTER WITH SCS/LGI PRESENT
44	ON-LINE CLOCK APPEARS AS SLAVE WITH NO SCS/LGI PRESENT
45	MIF FAILURE CAUSED MAINTENANCE INTERFACE APPEARANCE OF ON-LINE CLOCK AS SLAVE WITH NO SCS/LGI PRESENT
50	TSI PSTORE RESOURCES NOT AVAILABLE
51	PORT RESOURCES NOT AVAILABLE
52	TSI PSTORE INTERMITTENTLY REPORTS INVALID NETWORK TEST ACTIVITY
53	A ZERO VALUE CANNOT BE READ OVER THE PST MAINTENANCE BUS PATH
54	INTERMITTENT ADDRESSING FAULT WITHIN THE TSI
55	A NON-ZERO VALUE CANNOT BE READ OVER THE PST MAINTENANCE BUS PATH
56	AT LEAST ONE PDS IS RECEIVING PCM DATA FROM A DOUBLE-CONNECT
57	INTERMODULE DATA STORE OR MODULE CLOCK OUT OF LOCK CAUSED TSI TEST FAILURE
58	TEST VECTOR 128-255 OUTPUT FROM MIF INCORRECT
59	PDS DATA OR ADDRESSING IN OUTPUT STORE INCORRECT
60	PDI ADDRESSING OR CONTROL INCORRECT
61	ALU RECEIVES INCORRECT DATA FROM PDS
62	PDI OUTPUT DATA INCORRECT
63	INTERMITTENT FAULT IN PCM DATA PATH

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
64	INTERMITTENT PDI READ ERROR OVER PORT COMMAND BUS
65	INTERMITTENT ALU READ ERROR OVER MAINTENANCE BUS PATH
66	INTERMITTENT PDS READ ERROR OVER MAINTENANCE BUS PATH
67	PST ERRONEOUSLY REPORTS NETWORK TEST ACTIVITY
68	MIF OUTPUTS TEST VECTORS WHEN SHUT OFF
69	PDS OUTPUT STORE GENERATES NETWORK TEST FLAGS ON PORTS NOT PRESENTLY IN-USE OR ILLEGAL CONNECTION TO PORT
70	PDS INPUT STORE GENERATES NETWORK TEST FLAGS
71	PDI GENERATES NETWORK TEST FLAGS
72	ALU ACCUMULATOR TO DESTINATION SPN ZERO ADDRESSING FAULT
73	MIF TEST VECTOR CIRCUITRY FAULTY
74	MIF TVB CONTENTS INCORRECT
75	BAD PST MEMORY PARITY
76	PST NOT CYCLING
77	INTERMITTENT PDS READ ERROR OVER MAINTENANCE BUS PATH
78	ALU ADDRESS PROCESSING SUSPECTED
79	PDS ADDRESS PROCESSING SUSPECTED
80	PDI LOOP-AROUND OR DATA FAILURE
81	PDS INPUT STORE ADDRESSING OR DATA FAILURE
82	PST INSTRUCTION ADDRESSING FAULT
83	PDS INTERNAL ADDRESSING FAULT OR ILLEGAL CONNECTION TO PORT
84	PST ADDRESS OR MEMORY FAULT OR ILLEGAL CONNECTION TO PORT
85	PST MEMORY OR OUTPUT FAULT
86	ALU ADDRESS PROCESSING FAULT
87	ALU PCM DATA FAULT
88	ALU DATA FAULT OR FAULTY INTERFACE ON PCM BUS BY TN440 PDS OR TN441 IDS
89	TSI PSTORE HAS MULTIPLE PARITY ERRORS
90	FAILED THE MODULE (OR TMS) PROCESSOR BASED DUP_TST
92	DUP BOARD STATUS BITS WOULD NOT SET OR CLEAR
93	ON-LINE TN530 ERROR FLAG WAS SET
94	OFF-LINE TN530 ERROR FLAG WAS SET
95	STATE OF HEALTH COMPARATOR TEST FAILED
96	DOUBLE WRITE CONTROL TEST FAILED
97	DOUBLE WRITE WITH BAD PARITY TEST FAILED
98	DUPLICATION CHANNEL DID NOT DETECT BAD PARITY
99	DETECTED DOUBLE WRITES OFF AND TURNED THEM ON

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
100	NON-ZERO IDLE PORT CONTROL REGISTER
101	DEFECTIVE GATE ARRAY A
102	DEFECTIVE GATE ARRAY B
103	DEFECTIVE GATE ARRAY C
104	FAULTY PORT SELECT IN GATE ARRAY A
105	FAULTY PORT SELECT IN GATE ARRAY B
106	FAULTY PORT SELECT IN GATE ARRAY C
109	FAULTY SET OF LA FLIP-FLOP
110	FAULTY SET OF CPU FLIP-FLOP
118	FAULTY CLEAR OF LA FLIP-FLOP
120	VALID TONE PRESENT BIT STUCK ACTIVE IN SUMMARY BOARD SCAN
121	VALID TONE PRESENT NOT INDICATED IN SUMMARY BOARD SCAN (REORDER OR DATA ANSWER TONE USED)
122	VALID TONE PRESENT NOT INDICATED IN TONE REGISTER (REORDER OR DATA ANSWER TONE USED)
123	TONE NOT DETECTED IN TONE REGISTER (REORDER OR DATA ANSWER TONE USED)
124	FAULTY CLEAR OF CPU FLIP-FLOP
125	OFF-HOOK ERROR POSSIBLY FROM ATTACHED STATION
126	OFF-HOOK ERROR FROM BAD LA CLEAR OR ATTACHED STATION
128	RING DETECTION ERROR POSSIBLY FROM ATTACHED CO
129	GND DETECTION ERROR POSSIBLY FROM EXTERNAL CIRCUIT SIGNALING
130	ACTIVE SEZD* ERROR POSSIBLY FROM BUSY CODE CALL CKT
131	TERMINATED LINE FAILED TO INDICATE OFF-HOOK
133	OFF-HOOK STATUS FAILED TO LATCH
134	CPT REFLECTION DETECTOR FAILED TO STABILIZE
135	CPT TONE TEST DETECTION FAILED TO STABILIZE
136	CPT REFLECTION DATA READY FLAG STUCK ACTIVE
137	CPT TONE TEST DATA READY FLAG STUCK ACTIVE
138	NORM CURRENT DETECTOR STUCK ACTIVE
139	GROUND DETECTOR FAILED TO DETECT GROUND
140	GS RELAY STUCK OPERATED
141	REV CURRENT DETECTOR STUCK ACTIVE
142	CPT TONE TEST DETECTION FAILED TO STABILIZE
143	CODE CALL DIGIT DONE* IMPROPERLY ACTIVE
144	CODE CALL DIGIT DONE* IMPROPERLY INACTIVE

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
145	FAULTY CODE CALL CHIME PERIOD
146	FAULTY DIGITAL SIGNAL PROCESSOR
147	CODE SEZD* IMPROPERLY INACTIVE
149	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
150	EXCESSIVE 440-HZ ON-HOOK REFLECTION
151	INSUFFICIENT 440-HZ OFF-HOOK REFLECTION
152	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
153	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
154	ON-HOOK STATUS FAILED TO POWER DOWN CODEC
155	CODEC POWER UP STUCK ACTIVE
156	FAULTY FIRST TONE TEST FREQUENCY IDLE INDICATION
157	FAULTY SECOND TONE TEST FREQUENCY IDLE INDICATION
158	FAULTY FIRST TONE TEST QUIET TIME IDLE INDICATION
159	FAULTY SECOND TONE TEST QUIET TIME IDLE INDICATION
160	FAULTY 440-HZ FREQUENCY
161	FAULTY DIAL TONE FIRST TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
162	FAULTY DIAL TONE SECOND TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
163	FAULTY FIRST TONE TEST QUIET TIME NON-IDLE INDICATION
164	FAULTY SECOND TONE TEST QUIET TIME NON-IDLE INDICATION
165	FAULTY INTERRUPTED DIAL TONE FIRST TONE FREQUENCY
166	FAULTY INTERRUPTED DIAL TONE SECOND TONE FREQUENCY
167	FAULTY INTERRUPTED DIAL TONE FIRST TONE QUIET TIME
168	FAULTY INTERRUPTED DIAL TONE SECOND TONE QUIET TIME
169	FAULTY AUDIBLE RING FIRST TONE FREQUENCY
170	FAULTY AUDIBLE RING SECOND TONE FREQUENCY
171	FAULTY AUDIBLE RING FIRST TONE QUIET TIME
172	FAULTY AUDIBLE RING SECOND TONE QUIET TIME
173	FAULTY SPECIAL AUDIBLE RING FIRST TONE FREQUENCY
174	FAULTY SPECIAL AUDIBLE RING SECOND TONE FREQUENCY
175	FAULTY SPECIAL AUDIBLE RING FIRST TONE QUIET TIME
176	FAULTY SPECIAL AUDIBLE RING SECOND TONE QUIET TIME
177	FAULTY INTERCEPT FIRST TONE FREQUENCY
178	FAULTY INTERCEPT SECOND TONE FREQUENCY
179	FAULTY INTERCEPT FIRST TONE QUIET TIME

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
180	FAULTY INTERCEPT SECOND TONE QUIET TIME
181	FAULTY BUSY FIRST TONE FREQUENCY
182	FAULTY BUSY SECOND TONE FREQUENCY
183	FAULTY BUSY FIRST TONE QUIET TIME
184	FAULTY BUSY SECOND TONE QUIET TIME
185	FAULTY REORDER FIRST TONE FREQUENCY
186	FAULTY REORDER SECOND TONE FREQUENCY
187	FAULTY REORDER FIRST TONE QUIET TIME
188	FAULTY REORDER SECOND TONE QUIET TIME
189	FAULTY 440-HZ REFLECTION DETECTOR IDLE INDICATION
190	FAULTY BROAD BAND REFLECTION DETECTOR IDLE INDICATION
191	FAULTY 440-HZ REFLECTION DETECTOR NON-IDLE INDICATION
192	FAULTY BROAD BAND REFLECTION DETECTOR NON-IDLE INDICATION
193	FAULTY RECEPTION OF AUXILIARY IMMEDIATE RINGBACK TONE
194	BATTERY FEED REVERSAL STUCK ACTIVE OR IDLE CIRCUIT INDICATES LOOP CLOSURE
196	BATTERY FIELD REVERSAL STUCK INACTIVE
197	FAULTY DIAL TONE FIRST TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
198	FAULTY DIAL TONE SECOND TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
199	BUSY OUT FAILED
200	CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
201	DEFECTIVE GATE ARRAY D
202	FAULTY PORT SELECT IN GATE ARRAY D
203	E OR M SIGNAL INDICATOR STUCK ACTIVE
204	FAILURE OF OP SET
205	M-SIGNAL SENT INDICATOR STUCK INACTIVE
206	POSSIBLE EXTERNAL CIRCUIT SIGNALING
208	CLEARING LOOP-AROUND FAILS TO REMOVE 440-HZ SIGNAL
211	OFF-HOOK STATUS (GRND SIGNAL DETECTOR) FAILS TO POWER UP THE CODEC
214	FAILURE OF GATE ARRAY OR E-SIGNAL RECEIVER
215	FAILURE OF OP FLIP-FLOP
216	INCORRECT ENCODE IN TIE TRUNK ID CHIP
218	NETWORK ORDER FAILED
219	RELEASE BUSY OUT FAILED

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
220	DSP CHECKSUM STUCK ACTIVE
235	440-HZ TRANSMISSION FAILURE BETWEEN 2 PORTS
236	EXCESSIVE SIGNAL OTHER THAN 440-HZ AT SEND PORT
237	IMPROPER 440-HZ TRANSMISSION FROM RECEIVE INPUT TO SEND OUTPUT ON THE SAME PORT
239	TEST VECTOR 0-127 OUTPUT FROM MIF INCORRECT
240	MAINTENANCE BUS TO TSI ALU IS BAD
241	TSI ALU LOSSING/LINEARIZING FAULT
242	TSI ALU OPCODE FAILURE
243	TSI ALU ACCUMULATOR FAILURE
244	TSI ALU ACCUMULATOR ADDRESSING FAULT
245	ALU/MIF INTERFACE ERROR
246	IDLE CODE GENERATOR FAILURE
247	TSI ACCUMULATOR RESOURCES NOT AVAILABLE
264	PORT COMMAND BUS—BAD TEST REGISTER VALUE FROM IOBI
265	PORT COMMAND BUS—BAD TEST REGISTER VALUE FROM PCI
266	PORT COMMAND BUS—BAD TEST REGISTER VALUE FROM PDI
267	PORT COMMAND BUS—BAD TEST REGISTER VALUE FROM PORT
268	MAINTENANCE BUS—BAD TEST REGISTER VALUE FROM MIF
269	MAINTENANCE BUS—BAD TEST REGISTER VALUE FROM TARGET BOARD
270	PORT COMMAND BUS—BAD SAC VALUE FROM IOBI
271	PORT COMMAND BUS—BAD SAC VALUE FROM PCI
272	PORT COMMAND BUS—END OF MESSAGE TIMEOUT
273	PORT COMMAND BUS—BAD CLOCK ON MIF
274	PORT COMMAND BUS—IOBI DID NOT FLAG BAD PARITY
275	PORT COMMAND BUS—BAD (ON/OFF) LINE CONTROL
276	PORT COMMAND BUS—BAD CONTROL COMPLEX SIGNAL TO TN454 AND TN452
277	MAINTENANCE INTERFACE BUS—BAD SAC VALUE
278	MAINTENANCE BUS—MIF DID NOT FLAG BAD PARITY
280	MLP CONTROLLER FAULT
281	MLP 48-V OVERLOAD
282	MLP DRIVER CIRCUITRY FAILURE
283	MLP FAILED TO RETURN ID REQUEST
284	MLP RESPONDED TO OFF-HOOK TEST WITH SOMETHING BESIDES ON, OFF, OR NO RESPONSE

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
285	IDLE SENDER SUM SCAN INDICATES DIAL TONE DETECTED
286	IDLE SENDER STATUS REGISTER INDICATES PORT BUSY
287	IDLE SENDER STATUS REGISTER INDICATES DIGIT QUEUE FULL
288	IDLE SENDER STATUS REGISTER INDICATES TEST TONE NOT SENT
289	SENDER CKT SUM CHECK FAILURE
290	SENDER NOT BUSY WHILE TEST TONE BEING SENT
291	SENDER STATUS REGISTER INDICATES TEST TONE COMPLETE WHILE SENDING
292	SENDER FAILS TO SEND 440-HZ TEST TONE
293	NO IDLE RECEIVER FOUND FOR SENDER RETEST
294	SENDER NOT BUSY WHILE SENDING VALID TONE
295	SENDER STATUS REGISTER INDICATES TOUCH-TONE SIGNAL DONE WHILE BEING SENT
296	SENDER FAILS TO SEND A VALID TOUCH-TONE
297	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER
298	SENDER FAILS TO DETECT DIAL TONE
299	SENDER DETECTS DIAL TONE AFTER DIAL TONE REMOVED
300	NO TRANSMISSION THROUGH RECEIVER, LOW PATH TO HIGH PATH
301	NO TRANSMISSION THROUGH RECEIVER, HIGH PATH TO LOW PATH
302	NO IDLE SENDER FOUND FOR RECEIVER RETEST
303	IDLE RECEIVER SUMMARY SCAN INDICATES RECEPTION OF TOUCH-TONE
304	IDLE RECEIVER PORT CONTROL REGISTER INDICATES RECEPTION OF VALID TOUCH-TONE
305	RECEIVER FAILS TO RECEIVE LOW LEVEL DIGIT
306	RECEIVER FAILS TO RECOGNIZE TOUCH-TONE
307	RECEIVER FAILS TO RECOGNIZE LOW LEVEL DIGIT
308	RECEIVER RECEIVES FALSE TONE
309	SENDER CKT SUM CHECK FAILURE
310	SENDER NOT BUSY WHILE SENDING VALID TONE
311	SENDER STATUS REGISTER INDICATES TOUCH-TONE SIGNAL DONE WHILE BEING SENT
312	EXPECTED VALID TOUCH-TONE DIGIT NOT FOUND IN RECEIVER DIGIT REGISTER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER
313	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
315	LOOP CLOSURE DETECTION MAY BE DUE TO CO ATTEMPTING SEIZE
316	INSUFFICIENT 600-OHM TERMINATION REFLECTION POSSIBLY CAUSED BY OPEN TRANSMISSION OPTION SWITCH
317	EXCESSIVE 600-OHM TERMINATION REFLECTION
318	INSUFFICIENT SHORT CIRCUIT TERMINATION REFLECTION
319	EXCESSIVE SHORT CIRCUIT TERMINATION REFLECTION
330	TSI PSTORE INSTRUCTION PARITY CHECKING CIRCUITRY FAILED
331	TSI ALU DATA PARITY CHECKING CIRCUITRY FAILED
334	PDI DATA PARITY CHECKING CIRCUITRY FAILED
337	HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
338	DATA MODULE DOES NOT RESPOND TO A QUERY
340	ALL GPP PORTS FAILED THE DATA CLOCK TEST
344	INSUFFICIENT TOUCH-TONE SIGNAL REFLECTION
345	EXCESSIVE TOUCH-TONE SIGNAL REFLECTION
350	GPP DTL FAULT (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC DIGITAL SELF-TEST FAULT
351	GPP DTL IDLE BIT SET (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC DTL IDLE BIT SET
352	GPP DTLI AND DTLF TOGETHER (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC DIGITAL SELF-TEST AND DTLI TOGETHER
353	GPP 48-VOL BIT SET (CURRENT OVERLOAD) (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC ANALOG SELF-TEST FAULT
354	GPP 48-VOL AND DTLF BITS SET (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC ANALOG AND DIGITAL SELF-TEST FAULT TOGETHER
355	GPP 48-VOL AND DTLI BITS SET (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC ANALOG SELF-TEST AND DTLI TOGETHER
356	GPP 48-VOL, DTLI, AND DTLF BITS SET (NON-REMOTED BOARD OR REMOTED BOARD) OR ADFTC ANALOG, DIGITAL SELF-TEST FAULT, AND DTLI TOGETHER
357	ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOTED BOARD OR REMOTED BOARD)
358	MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOTED BOARD OR REMOTED BOARD)
359	GPP TEST RECEIVED NO RESPONSE FROM ADFTC OR ASSOCIATED DI (NON-REMOTED BOARD OR REMOTED BOARD) AFTER ID REQUEST

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
360	GPP TEST FOUND STATE OF HEALTH BIT SET FOR ADFTC OR ASSOCIATED DI (NON-REMOTED BOARD OR REMOTED BOARD)
361	FAILURE OF PORT BLA SET (NON-REMOTED BOARD OR REMOTED BOARD)
362	SAC FAILED TO CLEAR IN PORT DTL LOOP-AROUND TEST
363	INVALID SAC SIGNATURE IN PORT DTL LOOP-AROUND TEST
364	ERROR IN TDR IN PORT DTL LOOP-AROUND TEST (NON-REMOTED BOARD OR REMOTED BOARD)
365	SOFT SWITCH FAILED
366	HARD SWITCH FAILED
367	ON-LINE INITIALIZATION FAILED
368	OFF-LINE INITIALIZATION FAILED
369	UNABLE TO READ MODULE HEALTH STATUS DURING INITIALIZATION
370	UNABLE TO WRITE TO LOAD SIGNAL REGISTER DURING INITIALIZATION
371	NEGATIVE ACKNOWLEDGE FROM INITIALIZE IOBI ORDER
372	OFF-LINE MODULE (OR TMS) PROCESSOR INITIALIZED
373	PORT PROCESSOR FAULT
374	SIGNALING PROCESSOR FAULT
375	PORT PROCESSOR AND SIGNALING PROCESSOR FAULT
376	LOSS OF DATA FAULT AND PORT PROCESSOR FAULT
377	LOSS OF DATA, PORT PROCESSOR, AND SIGNALING PROCESSOR FAULTS
378	SIGNALING PROCESSOR FAULT, INITIALIZATION SUCCESSFUL
379	SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION SUCCESSFUL
380	LOSS OF DATA, SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION SUCCESSFUL
381	SIGNALING PROCESSOR FAULT, INITIALIZATION FAILED
382	SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION FAILED
383	LOSS OF DATA, SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION FAILED
384	PORT PROCESSOR FAULT, RESET SUCCESSFUL
385	LOSS OF DATA FAULT, RESET SUCCESSFUL
386	PORT PROCESSOR FAULT, RESET FAILED
387	LOSS OF DATA FAULT, RESET FAILED

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
391	UNABLE TO READ RMI STATUS
392	UNABLE TO WRITE RMI CONTROL
393	RMI LPFAIL BIT FOUND SET, EXPECTED TO BE CLEARED
394	RMI FRMERR BIT FOUND SET, EXPECTED TO BE CLEARED
395	4-MHZ CHANNEL ERROR ON REMOTE END RMI
396	REMOTE RMI FAILURE
397	RMI FIBER LINK OR REMOTE RMI POWER FAILURE
398	4-MHZ CHANNEL TO CENTRAL RMI FAILURE (RMI STATUS NORMAL)
399	CENTRAL RMI FAILURE (4-MHZ LOOP-BACK AND RMI STATUS FAILED)
400	UNKNOWN FIFO 14 ERROR CODE
401	TSI SHUTDOWN
402	MODULE PROCESSOR INTERFACE ERROR
403	MODULE CLOCK ERROR
404	INTERMODULE DATA STORE ERROR
405	MODULE SYSTEM CLOCK SYNCHRONIZER ERROR
406	TSI PSTORE MEMORY PARITY ERROR
407	TSI PCM DATA PARITY ERROR
408	PDI PCM DATA PARITY ERROR
409	LIGHT GUIDE INTERFACE ERROR
410	ERROR FIFO DATA OUT OF SYNC
411	TMS CLOCK OSCILLATOR ERROR (OOL BIT SET)
412	TMS CLOCK OSCILLATOR ERROR (OTHER)
413	TMS CLOCK OSCILLATOR AFTER INITIALIZATION ERROR (MFP BIT SET)
414	TMS CLOCK OSCILLATOR AFTER INITIALIZATION ERROR (OTHER)
415	LOCAL CLOCK TERMINATION ERROR (ERR BIT SET)
416	LOCAL CLOCK TERMINATION ERROR (OTHER)
417	LOCAL CLOCK TERMINATION AFTER INITIALIZATION ERROR (MFP OR ACT BIT SET)
418	LOCAL CLOCK TERMINATION AFTER INITIALIZATION ERROR (OTHER)
419	MODULE INTERFACE ERROR
420	FAILED MPX RAM
421	MPX RAM PARITY ERROR RECOVERY FAILURE
422	MPX INITIALIZATION ERROR
423	MPX INITIALIZATION ALARM

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
424	MPX RAM PARITY ERROR
425	TSI RUNNING BUT INDICATES IT IS SHUTDOWN
426	RING TRIP CIRCUIT FAILURE
427	CONTROL/SUMMARY—SCAN REGISTER READ ERROR
429	PORT DIGITAL SIGNAL PROCESSOR ERROR
430	TMIF PFAIL/LATE MAKE ALARM
432	BURST OF TSI PSTORE PARITY ERRORS
433	MULTIPLE PCM DATA PARITY ERRORS FROM PDI
434	ALL PORTS OF DVDP BOARD BAD
436	MLP CONTROLLER FAULT, INITIALIZATION FAILED
437	DCLOCK SIGNAL DOES NOT GET THROUGH PDS
441	MLP CONTROLLER FAULT, INITIALIZATION SUCCESSFUL
444	TSI PSTORE WRITE FAILURE
445	MIF WRITE FAILURE
446	IOBI WRITE FAILURE
447	TMIF WRITE FAILURE
449	INITIALIZATION TMS MPX RAM TEST ERROR
450	INITIALIZATION TMS MPX RAM PARITY CHECKER ERROR
451	TMS INTERFACE ERROR
452	ILLEGAL MPX RAM ENTRY ERROR
453	TMS SYSTEM CLOCK SYNCHRONIZER ERROR
454	DTLF FAULT ON ADFTC (DIGITAL SELF-TEST)
455	48-VOL FAULT ON ADFTC (ANALOG SELF-TEST)
456	48-VOL AND DTLF FAULTS TOGETHER ON ADFTC
457	PROTOCOL ERROR ON ADFTC
458	DTL IDLE ON ADFTC
459	BLA BIT ON PORT CONTROL REGISTER FAILED TO CLEAR OR SET
460	DTLF FAULT ON DVDP
462	PROTOCOL ERROR ON EIA
463	EIA SIGNALING PROCESSOR FAULT, INITIALIZATION SUCCESSFUL
464	EIA SIGNALING PROCESSOR FAULT, INITIALIZATION FAILED
465	EIA PORT FAULT, RESET SUCCESSFUL
466	EIA PORT FAULT, RESET FAILED
467	EIA LOSS OF DATA, RESET SUCCESSFUL
468	EIA LOSS OF DATA, RESET FAILED
469	MODULE INTERFACE OUT OF FRAME ERROR

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
500	TMS CLOCK OSCILLATOR MFP FAILURE
501	SINGLE LOCAL CLOCK TERMINATION MFP FAILURE WITH MORE THAN 1 LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
502	TWO LOCAL CLOCK TERMINATION MFP FAILURES WITH MORE THAN 2 LOCAL CLOCK TERMINATION CIRCUITS INSTALLED
503	THREE LOCAL CLOCK TERMINATION MFP FAILURES WITH MORE THAN 3 LOCAL CLOCK TERMINATION CIRCUITS INSTALLED
504	ALL LOCAL CLOCK TERMINATION CIRCUITS HAVE MFP FAILURES—MORE THAN 1 LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
505	SINGLE LOCAL CLOCK TERMINATION MFP FAILURE—1 LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
506	TMS CLOCK OSCILLATOR MAINTENANCE CIRCUIT HAS MFP FAULT
507	LOCAL CLOCK TERMINATION MAINTENANCE CIRCUIT HAS MFP FAULT
508	TMS CLOCK OSCILLATOR STATE DETERMINATION AND DUPLICATION CONTROL INCORRECT
509	MAINTENANCE INTERFACE FAILURE CAUSED TMS CLOCK OSCILLATOR FAILURE
510	TMS CLOCK OSCILLATOR OOL ERROR
511	TMS CLOCK OSCILLATOR PFL ERROR
512	CANNOT COMPLETE TMS CLOCK OSCILLATOR FORCE ERROR SEQUENCE
513	LOCAL CLOCK TERMINATION PFL ERROR
514	IOBI BUS ERROR CAUSED LOCAL CLOCK TERMINATION FAILURE
515	LOCAL CLOCK TERMINATION ERR BIT SET—RESET WORKED
516	LOCAL CLOCK TERMINATION ERR BIT SET—CANNOT RESET
517	LOCAL CLOCK TERMINATION ACT FAILURE
518	CANNOT COMPLETE LOCAL CLOCK TERMINATION FORCE ERROR SEQUENCE
520	TMS IOBI BUS—BAD TEST REGISTER VALUE FROM IOBI
521	TMS IOBI BUS—BAD TEST REGISTER VALUE FROM UPCI
522	TMIS IOBI BUS—BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
523	TMS IOBI BUS—BAD SAC VALUE FROM UPCI
524	TMS IOBI BUS—BAD SAC VALUE FROM IOBI
525	TMS IOBI BUS—END OF MESSAGE TIMEOUT
526	TMS IOBI BUS—BAD CLOCK ON TMIF
527	TMS IOBI BUS—IOBI DID NOT FLAG BAD PARITY

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
528	TMS MAINTENANCE BUS—BAD TEST REGISTER VALUE FROM TMIF
529	TMS MAINTENANCE BUS—BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
530	TMS MAINTENANCE BUS—BAD SAC VALUE
531	TMS MAINTENANCE BUS—TMIF DID NOT FLAG BAD PARITY
550	TMS LIGHT GUIDE INTERFACE PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORD
551	TMS MODULE INTERFACE PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORK
552	TMS MODULE INTERFACE TIME SLOT INTEGRITY CIRCUIT FAILED TO DETECT A BUFFER ERROR
553	TMS PMX PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORD
554	TMS CLOCK OSCILLATOR MFP CHECKING CIRCUIT FAILED TO DETECT A MISSING FRAME PULSE
555	TMS LOCAL CLOCK TERMINATION ACT CHECKING CIRCUIT FAILED TO DETECT NO ACTIVITY ERROR
556	TMS LOCAL CLOCK TERMINATION ERR CHECKING CIRCUIT FAILED TO DETECT A CLOCK ERROR
557	TMS LOCAL CLOCK TERMINATION MFP CHECKING CIRCUIT FAILED TO DETECT A MISSING FRAME PULSE
558	TMS LIGHT GUIDE INTERFACE OUT OF FRAME CIRCUIT FAILED TO DETECT A FRAMING ERROR
559	TMS MODULE INTERFACE OUT OF FRAME CIRCUIT FAILED TO DETECT A FRAMING ERROR
566	TMS LIGHT GUIDE INTERFACE PARITY ERROR CANNOT BE CLEARED
567	TMS MODULE INTERFACE PARITY ERROR CANNOT BE CLEARED
568	TMS MODULE INTERFACE TIME SLOT INTEGRITY ERROR CANNOT BE CLEARED
569	TMS MPX PARITY ERROR CANNOT BE CLEARED
570	TMS CLOCK OSCILLATOR MFP ERROR CANNOT BE CLEARED
571	TMS LOCAL CLOCK TERMINATION ACT ERROR CANNOT BE CLEARED
572	TMS LOCAL CLOCK TERMINATION ERR ERROR CANNOT BE CLEARED
573	TMS LOCAL CLOCK TERMINATION MFP ERROR CANNOT BE CLEARED
574	TMS LIGHT GUIDE INTERFACE OUT OF FRAME ERROR CANNOT BE CLEARED
575	TMS MODULE INTERFACE OUT OF FRAME ERROR CANNOT BE CLEARED
576	TMS ABBREVIATED IOBI BUS TEST FAILURE

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
577	TMS ABBREVIATED MAINTENANCE BUS TEST FAILURE
582	TMS MPX RAM HAS 32 OR MORE BUSIED OUT TIME SLOTS
584	TMS MPX RAM PARITY ERROR RECOVERY FAILURE CORRECTED
585	TMS MPX RAM PARITY ERROR RECOVERY FAILURE NOT CORRECTED
586	TMS MPX RAM INITIALIZATION TEST ERROR CORRECTED
587	TMS MPX RAM INITIALIZATION TEST ERROR NOT CORRECTED
588	TMS MPX FAILED RAM CORRECTED
589	TMS MPX FAILED RAM NOT CORRECTED
600	UNDIAGNOSED MODULE INTERFACE BUFFER ERROR FROM OEP (PERIODIC ONLY)
601	UNDIAGNOSED MODULE INTERFACE BUFFER ERROR FROM OEP (PERIODIC ONLY)
602	INTERMODULE DATA STORE INPUT STORE GENERATES NETWORK TEST FLAGS
604	ALU GENERATES NETWORK TEST FLAGS
605	TMIF GENERATES TEST VECTORS WHEN SHUT OFF
606	INTERMODULE DATA STORE OUTPUT STORE GENERATES NETWORK TEST FLAGS
607	LGL TO MODULE INTERFACE SUSPECTED OF GENERATING NETWORK TEST FLAGS
608	INTERMODULE DATA STORE TRANSMITS NETWORK TEST FLAGS TO TMS
609	FAN OUT GENERATES NETWORK TEST FLAGS
610	FAN IN GENERATES NETWORK TEST FLAGS
611	MPX GENERATES NETWORK TEST FLAGS
612	LGL TO LIGHT GUIDE INTERFACE SUSPECTED OF GENERATING NETWORK TEST FLAGS
613	LIGHT GUIDE INTERFACE TRANSMITS NETWORK TEST FLAGS TO MODULES
614	LIGHT GUIDE INTERFACE OUTPUT TO TMS GENERATES NETWORK TEST FLAGS
615	LIGHT GUIDE INTERFACE INPUT FROM TMS GENERATES NETWORK TEST FLAGS
616	LGL TO MODULE INTERFACE GENERATES NETWORK TEST FLAGS
617	LGL TO LIGHT GUIDE INTERFACE GENERATES NETWORK TEST FLAGS
618	MODULE INTERFACE OUTPUT GENERATES NETWORK TEST FLAGS
619	MODULE INTERFACE INPUT GENERATES NETWORK TEST FLAGS
620	ALU READ ERROR

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
621	TMIF READ ERROR
623	MODULE INTERFACE READ ERROR
624	LIGHT GUIDE INTERFACE CROSS-COUPLING FAILURE
625	INTERMODULE DATA STORE CROSS-COUPLING FAILURE
626	ALU ADDRESSING ERROR
627	TMIF TEST VECTOR OUTPUT INCORRECT
628	INTERMODULE DATA STORE READ ERROR
629	INTERMODULE DATA STORE OUTPUT STORE FAULT
630	FAULT SUSPECTED IN LGL TO MODULE INTERFACE
631	INTERMODULE DATA STORE TRANSMIT TO TMS FAULT
632	FAN OUT READ ERROR
633	FAN OUT PCM ERROR
634	FAN IN READ ERROR
635	FAN IN PCM ERROR
636	MPX PCM ERROR
637	LIGHT GUIDE INTERFACE READ ERROR
638	FAULT SUSPECTED IN LGL TO LIGHT GUIDE INTERFACE
639	INTERMODULE DATA STORE INPUT STORE FAILURE
640	LIGHT GUIDE INTERFACE PCM TRANSMIT TO MODULE FAULT
641	LIGHT GUIDE INTERFACE OUTPUT TO TMS FAULT
642	LIGHT GUIDE INTERFACE INPUT FROM TMS FAULT
643	LGL TO MODULE INTERFACE FAULT
644	LGL TO LIGHT GUIDE INTERFACE FAULT
645	MODULE INTERFACE INPUT FAULT
646	MODULE INTERFACE OUTPUT FAULT
647	INTERMODULE DATA STORE PSTORE CONNECTION NOT DOUBLE WRITTEN
648	TMS CONNECTION NOT DOUBLE WRITTEN
649	TMS PROCESSOR DID NOT BUILD CONNECTION
650	MPX RAM CONTENTS INCORRECT FOR CONNECTION
651	TMS PROCESSOR DID NOT WRITE CONNECTION INTO MPX RAM
701	HIGH ACCURACY CLOCK—TEMPORARY LOSS OF SIGNAL
702	MAIN PHASE LOCKED LOOP—TEMPORARY LOSS OF SIGNAL
703	MAIN PHASE LOCKED LOOP—TEMPORARY OUT OF LOCK
704	HIGH ACCURACY CLOCK LOSS OF SIGNAL—BUILD OUT CONTROL ENABLED—MAIN PHASE LOCKED LOOP OPERATING CORRECTLY

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
705	HIGH ACCURACY CLOCK LOSS OF SIGNAL—BUILD OUT CONTROL HAD TO BE RE-ENABLED—MAIN PHASE LOCKED LOOP OPERATING CORRECTLY
706	MAIN PHASE LOCKED LOOP LOSS OF SIGNAL—SIMPLEX SYSTEM
707	MAIN PHASE LOCKED LOOP OUT OF LOCK AND THE SYSTEM IS ON THE HIGH ACCURACY CLOCK—SIMPLEX SYSTEM
708	MAIN PHASE LOCKED LOOP OUT OF LOCK AND GOING TO THE HIGH ACCURACY CLOCK FIXED THE MAIN PHASE LOCKED LOOP—SIMPLEX SYSTEM
709	MAIN PHASE LOCKED LOOP OUT OF LOCK AND GOING TO THE HIGH ACCURACY CLOCK DID NOT FIX THE MAIN PHASE LOCKED LOOP—SIMPLEX SYSTEM
710	HIGH ACCURACY CLOCK LOSS OF SIGNAL—MAIN PHASE LOCKED LOOP OK—DUPLEX SYSTEM
711	MAIN PHASE LOCKED LOOP LOSS OF SIGNAL—DUPLEX SYSTEM
712	MAIN PHASE LOCKED LOOP OUT OF LOCK—DUPLEX SYSTEM
713	PRIMARY REFERENCE TEMPORARY LOSS OF SIGNAL
714	ALL TRANSLATED REFERENCES TEMPORARY LOSS OF SIGNAL
715	SECONDARY REFERENCE TEMPORARY LOSS OF SIGNAL
716	SECONDARY REFERENCE STEADY LOSS OF SIGNAL—PRIMARY REFERENCE HEALTHY
717	PRIMARY REFERENCE STEADY LOSS OF SIGNAL—SECONDARY REFERENCE HEALTHY
718	ALL TRANSLATED REFERENCES STEADY LOSS OF SIGNAL
719	SECONDARY REFERENCE TEMPORARY OUT OF LOCK
720	ALL TRANSLATED REFERENCES OUT OF LOCK
721	SECONDARY REFERENCE STEADY OUT OF LOCK
722	PRIMARY REFERENCE TEMPORARY OUT OF LOCK
723	PRIMARY REFERENCE STEADY OUT OF LOCK—SECONDARY REFERENCE HEALTHY
724	ALL TRANSLATED REFERENCES STEADY OUT OF LOCK
725	INVALID DATA IN DS-1 DATA FACILITY ERROR FIFO
726	DS-1 TO SCS CABLE(S) DISCONNECTED
727	DS-1 BOARD PROCESSOR SANITY
728	UNUSABLE REFERENCE REPORTED BY SYSTEM CLOCK SYNCHRONIZER
729	LOSS OF SIGNAL AT DS-1
730	YELLOW ALARM RECEIVED
731	BOARD HEALTH

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
732	MAJOR ERROR RATE
733	MINOR ERROR RATE
734	RED ALARM DETECTED
735	CARRIER GROUP ALARM
736	SLIP RATE EXCEEDED—REFERENCES SWITCHED
737	SLIP RATE THRESHOLD EXCEEDED
738	MISFRAME THRESHOLD EXCEEDED
739	MISFRAME THRESHOLD EXCEEDED—SIGNIFICANT SLIPS ALSO OCCURRING
740	MISFRAME THRESHOLD EXCEEDED—SECONDARY REFERENCE AVAILABLE
741	REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY—HIGH ACCURACY CLOCK ON LINE
742	REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY—REFERENCES ARE REVERSED—REFERENCES SWITCHED
743	REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY—REFERENCES ARE REVERSED—SWITCH OF REFERENCES CANNOT BE MADE
744	TMS STATUS BIT NOT CONSISTENT WITH TRANSLATION
745	BOTH SYSTEM CLOCK SYNCHRONIZER ON-LINE BITS SET OR CLEARED
746	BOTH SYSTEM CLOCK SYNCHRONIZER ON-LINE BITS BACKWARDS
747	BUILD OUT CONTROL BIT HAD TO BE RESET
748	BUILD OUT CONTROL BIT SET AND CANNOT BE CLEARED
749	REFERENCE SOURCE SELECTION DOES NOT AGREE WITH STATUS MEMORY—BUS TEST FAILED
750	MISFRAME THRESHOLD EXCEEDED ON PRIMARY AND SECONDARY REFERENCES
751	SYSTEM CLOCK SYNCHRONIZER CIRCUIT PACK PULLED OR ON-LINE BIT STUCK
752	ON-LINE SYSTEM CLOCK SYNCHRONIZER OK—OFF-LINE SYSTEM CLOCK SYNCHRONIZER HAS OUT OF LOCK CONDITION
753	SYSTEM CLOCK SYNCHRONIZER CROSS-COUPPLING SIGNAL INCORRECT
754	SYSTEM CLOCK SYNCHRONIZER LOSS OF SIGNAL DETECTION CIRCUITRY FAULTY
755	SYSTEM CLOCK SYNCHRONIZER PRIMARY/SECONDARY LOSS OF SIGNAL DETECTION CIRCUIT FAULTY

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
758	LOSS OF SIGNAL BETWEEN BOTH DS-1 INTERFACES (OR BETWEEN RCL AND RCC) BEFORE GLOBAL INITIALIZATION
759	LOSS OF MULTIFRAME ALIGNMENT ON THE SIGNALING CHANNEL BEFORE GLOBAL INITIALIZATION (OOF ON SIGNALING CHANNEL)
760	LOSS OF MULTIFRAME ALIGNMENT ON THE SIGNALING CHANNEL AFTER GLOBAL INITIALIZATION (OOF)
761	REMOTE MULTIFRAME ALARM ON THE SIGNALING CHANNEL BEFORE GLOBAL INITIALIZATION (OOF AT FAR END)
762	RED ALARM RAISED AFTER GLOBAL INITIALIZATION (OUT OF FRAME)
763	REMOTE MULTIFRAME ALARM ON THE SIGNALING CHANNEL AFTER GLOBAL INITIALIZATION (OOF AT FAR END)
764	BLUE ALARM BEFORE GLOBAL INITIALIZATION (NON-LOCAL OUT OF SERVICE DS-1 FACILITY)
765	LOSS OF PROCESSOR SANITY AFTER GLOBAL INITIALIZATION
766	INTERFACE CANNOT BE GLOBALLY INITIALIZED
767	DS-1 REFERENCE JUST TESTED CANNOT BE SWITCHED ON-LINE
768	HIGH ACCURACY CLOCK COULD NOT BE SWITCHED ON-LINE
770	LOSS OF SIGNAL FROM THE DS-1 TO THE SYSTEM CLOCK SYNCHRONIZER
771	DAILY LIMIT EXCEEDED FOR SLIPS BEFORE GLOBAL INITIALIZATION
772	DAILY LIMIT EXCEEDED FOR MISFRAMES BEFORE GLOBAL INITIALIZATION
773	RED ALARM RAISED, OUT OF FRAME BEFORE GLOBAL INITIALIZATION
774	MAJOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
775	MINOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
776	BLUE ALARM AFTER GLOBAL INITIALIZATION (NON-LOCAL OUT OF SERVICE DS-1 FACILITY)
777	MAINTENANCE CONTROL REGISTER IS DEFECTIVE
778	OPTION CONTROL REGISTER IS DEFECTIVE
779	SCAN MODE CONTROL REGISTER IS DEFECTIVE
780	DISABLE SIGNALING CONTROL REGISTER IS DEFECTIVE
781	PORT CONTROL REGISTER IS DEFECTIVE
782	NO COMMUNICATION FROM FAR END BEFORE GLOBAL INITIALIZATION
783	SUMMARY SCAN REGISTER IS DEFECTIVE

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
784	STATUS RESET CONTROL REGISTER IS DEFECTIVE
785	DS-1, RCL, OR RCC INTERFACE IS NOT MAINTENANCE BUSY
788	I/O BUS FAILURE
789	MAINTENANCE BUS FAILURE
995	USE PROC 646 TO COMPLETE TESTS ON THIS CIRCUIT
996	DUP BOARD MUST BE TESTED IN OTHER ON-LINE—OFF-LINE MODE TO PASS VERIFICATION
997	MODULE SOFT LOCK FAILED OR MODULE ALREADY LOCKED
998	CANNOT TEST UNTRANSLATED PORT
999	REQUESTED TEST NOT PROVIDED FOR THIS UNIT
1000	COULD NOT SEND AN S MESSAGE
1001	FACILITY NOT TESTED FOR MORE THAN X CYCLES
1005	NO BITS RECEIVED ON A ONE-PORT ADFTC SELF-TEST
1006	DATA TRANSMISSION INTERRUPTED ONE-PORT ADFTC SELF-TEST
1007	BIT ERROR RATE EXCEEDED FOR ONE-PORT ADFTC SELF-TEST
1008	BLOCK ERROR RATE EXCEEDED FOR ONE-PORT ADFTC SELF-TEST
1009	EIA UPDATE FAILURE DURING A ONE-PORT ADFTC SELF-TEST
1010	ERROR OVERFLOW DURING A ONE-PORT ADFTC SELF-TEST
1011	UNDEFINED ERROR DURING A ONE-PORT ADFTC SELF-TEST
1012	NO BITS RECEIVED ON A TWO-PORT NORMAL ADFTC SELF-TEST
1013	DATA TRANSMISSION INTERRUPTED: TWO-PORT NORMAL ADFTC SELF-TEST
1014	BIT ERROR RATE EXCEEDED FOR TWO-PORT NORMAL ADFTC SELF-TEST
1015	BLOCK ERROR RATE EXCEEDED FOR TWO-PORT NORMAL ADFTC SELF-TEST
1016	EIA UPDATE FAILURE DURING A TWO-PORT NORMAL ADFTC SELF-TEST
1017	ERROR OVERFLOW DURING A TWO-PORT NORMAL ADFTC SELF-TEST
1018	UNDEFINED ERROR DURING A TWO-PORT NORMAL ADFTC SELF-TEST
1019	NO BITS RECEIVED ON A TWO-PORT REVERSE ADFTC SELF-TEST
1020	DATA TRANSMISSION INTERRUPTED: TWO-PORT REVERSE ADFTC SELF-TEST
1021	BIT ERROR RATE EXCEEDED FOR TWO-PORT REVERSE ADFTC SELF-TEST
1022	BLOCK ERROR RATE EXCEEDED FOR TWO-PORT REVERSE ADFTC SELF-TEST

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1023	EIA UPDATE FAILURE DURING A TWO-PORT REVERSE ADFTC SELF-TEST
1024	ERROR OVERFLOW DURING A TWO-PORT REVERSE ADFTC SELF-TEST
1025	UNDEFINED ERROR DURING A TWO-PORT REVERSE ADFTC SELF-TEST
1026	UNSENT STOP MESSAGE RECEIVED BY ADFTC
1027	DID NOT RECEIVE EXPECTED: TEST ABORTED S MESSAGE
1028	DID NOT RECEIVE EXPECTED: TEST COMPLETED S MESSAGE
1029	THE BIT AND/OR BLOCK ERROR RATES WERE NOT RECEIVED
1425	ADFTC DID NOT RETURN A SETUP (HANDSHAKE) RESULT MESSAGE
1426	ADFTC DID NOT RECEIVE A SET TEST (START HANDSHAKE) MESSAGE
1601	YELLOW ALARM RECEIVED BEFORE GLOBAL INITIALIZATION
1602	YELLOW ALARM RECEIVED AFTER GLOBAL INITIALIZATION
1604	LOSS OF SIGNAL AND NO COMMUNICATION FROM THE FAR END AFTER GLOBAL INITIALIZATION
1606	NO COMMUNICATION FROM FAR END AFTER GLOBAL INITIALIZATION
1607	FAILURES IN 1 OR 2 OF THE THREE NIB CHIPS
1608	OPTION CONTROL REGISTER AND ADMINISTERED VALUE MISMATCH
1612	PROCESSOR SANITY AND HEALTH ERROR
1613	PROCESSOR SANITY AND CONTROL PATH AND HEALTH ERROR
1614	PROCESSOR SANITY AND NIB AND HEALTH ERROR
1615	PROCESSOR SANITY AND RAM AND HEALTH ERROR
1616	PROCESSOR SANITY AND ROM AND HEALTH ERROR
1619	FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
1620	FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION
1621	FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
1622	FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
1623	FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
1624	FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
1625	ONE OR MORE ENVIRONMENTAL ERRORS HAVE BEEN DETECTED
1626	REFLECTED SIGNAL IS ABOVE THE HIGH THRESHOLD
1627	REFLECTED SIGNAL IS BELOW THE LOW THRESHOLD
1628	NO VALID REFLECTED SIGNAL WAS RECEIVED
1629	SANITY AND HEALTH AND IO FAILURE
1630	PORT FAILURE ON REMOTE ANALOG BOARD
1631	RCC INTERFACE HAS ERROR BITS SET
1632	RCL INTERFACE HAS ERROR BITS SET

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1633	PORT FAILURE ON REMOTE EIA BOARD
1634	FIRMWARE ERROR ON RCC INTERFACE
1635	FIRMWARE ERROR ON RCL INTERFACE
1636	PORT FAILURE ON REMOTE GPP BOARD
1637	MAJOR ALARM FROM ERROR RATE ON RCC INTERFACE
1638	MAJOR ALARM FROM ERROR RATE ON RCL INTERFACE
1639	MINOR ALARM FROM ERROR RATE ON RCC INTERFACE
1640	MINOR ALARM FROM ERROR RATE ON RCL INTERFACE
1641	PORT FAILURE ON REMOTE MFAT BOARD
1642	PORT FAILURE ON REMOTE MFET BOARD
1643	PROCESSOR SANITY AND HEALTH AND PER TIME SLOT PCM FAILURE
1644	FIBER STATUS REGISTER CONTENTS DO NOT AGREE WITH ADMINISTERED VALUE FOR THE RCL T1/FIBER OPTION
1647	NO RESPONSE FROM FIRMWARE TEST 1 REQUEST
1648	LOSS OF SIGNAL BETWEEN FIBER TERMINATION POINT AND DS-1 CHIP SET ON THE RCL
1649	LOSS OF SIGNAL BETWEEN RCL AND RCC WITH A FIBER CONNECTION
1651	ERROR REPORTED IN PROCESSOR STATUS REGISTER
1652	ERROR REPORTED IN FIBER STATUS REGISTER
1653	OTHER ERROR REPORTED BUT NO ERROR FOUND
1850	BOARD PROCESSOR SANITY
1851	ERROR REPORTED IN PROCESSOR STATUS REGISTER
1852	ERROR REPORTED IN ENVIRONMENT REGISTER
1853	LOSS OF SIGNAL REPORTED BY SCS BOARD
1854	ERROR REPORTED IN FIBER STATUS REGISTER
1855	LOSS OF SIGNAL REPORTED BY DS-1 BOARD
1856	EXCESSIVE SLIPS
1857	EXCESSIVE MISFRAMES
1858	LOSS OF FRAMING REPORTED BY FAR END (YELLOW ALARM)
1859	BOARD HEALTH ERROR
1860	MAJOR ERROR RATE ALARM
1861	MINOR ERROR RATE ALARM
1862	LOSS OF FRAMING REPORT (RED ALARM)
1863	LOSS OF MULTIFRAME ALIGNMENT

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1864	LOSS OF MULTIFRAME ALIGNMENT REPORTED BY FAR END
1865	FAR END IN LOOPAROUND (BLUE ALARM)
1866	OTHER ERROR REPORT - NO ERRORS FOUND
1900	DUAL PORT RAM ADDRESSING FAILURE
1901	BLUE ALARM DETECTED BEFORE GLOBAL INITIALIZATION
1902	BLUE ALARM DETECTED AFTER GLOBAL INITIALIZATION
1903	LOSS OF SIGNAL BETWEEN PRIS BEFORE GLOBAL INITIALIZATION
1904	DS-1 CHIP SET AND HEALTH ERROR
1905	DUAL PORT AND HEALTH ERROR
1906	FIBER STATUS REGISTER CONTENTS DO NOT AGREE WITH ADMINISTERED VALUE FOR THE PRI T1/FIBER OPTION
1907	FIFO AND HEALTH ERROR
1908	LOSS OF SIGNAL BETWEEN PRIS WITH A FIBER CONNECTION
1909	HIGH ACCURACY CLOCK CAN NOT BE SWITCHED ON-LINE
1910	HEALTH BIT OF SELECTED PRI IS SET BEFORE GLOBAL INITIALIZATION INDICATING THAT A FIRMWARE TEST FAILED
1911	HEALTH BIT OF SELECTED PRI IS SET AFTER GLOBAL INITIALIZATION INDICATING THAT A FIRMWARE TEST FAILED
1912	PRI CAN NOT BE GLOBALLY INITIALIZED
1913	I/O BUS IS DEFECTIVE
1914	K DEFAULT REGISTER DEFECTIVE
1915	D-CHANNEL LOOPAROUND AND HEALTH ERROR
1916	MAJOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
1917	MAINTENANCE BUS IS DEFECTIVE
1918	MINOR ERROR FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
1919	DAILY LIMIT EXCEEDED FOR MISFRAMES BEFORE GLOBAL INITIALIZATION
1920	N200 DEFAULT REGISTER DEFECTIVE
1921	PRI IS NOT MAINTENANCE BUSY
1922	OPTION CONTROL REGISTER DEFECTIVE
1923	RAM AND HEALTH ERROR
1924	OUT OF FRAME DETECTED (RED ALARM) BEFORE GLOBAL INITIALIZATION
1925	OUT OF FRAME DETECTED (RED ALARM) AFTER GLOBAL INITIALIZATION
1927	ROM AND HEALTH ERROR
1928	LOSS OF PRI PROCESSOR SANITY AFTER GLOBAL INITIALIZATION

TABLE AG. (Contd)

PROC 620—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1929	DAILY LIMIT EXCEEDED FOR SLIPS BEFORE GLOBAL INITIALIZATION
1930	LOSS OF SIGNAL FROM THE PRI TO THE SCS
1931	T200 DEFAULT REGISTER DEFECTIVE
1932	T203 DEFAULT REGISTER DEFECTIVE
1933	TEI DEFAULT REGISTER DEFECTIVE
1934	OUT OF FRAME AT FAR END (YELLOW ALARM) DETECTED BEFORE GLOBAL INITIALIZATION
1935	OUT OF FRAME AT FAR END (YELLOW ALARM) DETECTED AFTER GLOBAL INITIALIZATION
1936	CONTROL REGISTER DEFECTIVE
1937	OTHER AND HEALTH ERROR
1938	REGISTER AND HEALTH ERROR
2005	BAD PACKET CHECKSUM
2006	MAINTENANCE BUSY OUT FAILED, I/O FAILURE
2007	RELEASE MAINTENANCE BUSY OUT FAILED, I/O FAILURE

TABLE AH.

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
6	11	TN401	TN444	TN400	BUS PROBLEM CAUSED MODULE (OR TMS) PROCESSOR SHUTDOWN - ALL TN400 BOARDS IN CARRIER, TN530, TN445, AND TN380 (TN381) ARE ALSO SUSPECT
	16	TN401	TN530	TN380 OR TN381	MAJOR FAILURE FOUND IN MODULE (OR TMS) PROCESSOR TEST
	21	TN401	TN380 OR TN381		BAD MCC/MODULE (OR TMS) PROCESSOR COMMUNICATIONS
	23	TN401			CANNOT MANIPULATE MCC STATUS REGISTER BITS
	24	TN401			CRITICAL MCC CIRCUIT FAILURE
	27	TN401	AEH4		CANNOT MANIPULATE MCC STATUS REGISTER BITS OR AEH4 ALARM DISTRIBUTION AND AIR FLOW MONITOR
	28	TN401	TN444 OR TN482	TN400	BUS PROBLEM CAUSED MODULE (OR TMS) PROCESSOR SHUTDOWN - ALL TN400 BOARDS IN CARRIER, TN530, TN445, AND TN380 (TN381) ARE ALSO SUSPECT
	29	TN401	TN380 OR TN381		CIRCUIT PACK PULLED OR 4-MHZ CABLE DISCONNECTED
	269	TN401	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	370	TN401	TN402	CABLE	UNABLE TO WRITE TO LOAD SIGNAL REGISTER DURING INITIALIZATION
	402	TN401			MODULE PROCESSOR INTERFACE ERROR
	529	TN401	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
7	2	TN380 OR TN381	TN401	TN402	TPIO ERROR FROM A MAINTENANCE ROUTINE
	3	TN380 OR TN381	TN401	TN444 OR TN482	NO RESPONSE TO AN EOM FROM A MAINTENANCE ROUTINE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
7 (Contd)	15	TN380 OR TN381	TN401	TN444 OR TN482	MAJOR MODULE (OR TMS) PROCESSOR FAILURE - NO SWITCH REQUIRED
	18	TN380 OR TN381	TN401	TN444 OR TN482	MAJOR MODULE (OR TMS) PROCESSOR FAILURE
	19	TN380 OR TN381	TN401	TN530	MINOR MODULE (OR TMS) PROCESSOR FAILURE
	22	TN380 OR TN381	TN401		MODULE (OR TMS) PROCESSOR ADDRESS PARITY FAILURE
	269	TN380	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	362	TN380 OR TN381	TN401	TN444	OFF-LINE MODULE (OR TMS) PROCESSOR INITIALIZED
	367	TN380 OR TN381	TN401	TN444	ON-LINE INITIALIZATION FAILED. ALL BOARDS IN UPPER HALF CARRIER ARE SUSPECT. 4-MHZ CABLE ALSO SUSPECT
	368	TN380 OR TN381	TN401	TN444	OFF-LINE INITIALIZATION FAILED. ALL BOARDS IN UPPER HALF CARRIER ARE SUSPECT. 4-MHZ CABLE ALSO SUSPECT
	369	TN380 OR TN381	TN401		UNABLE TO READ MODULE HEALTH STATUS DURING INITIALIZATION
	400	TN380 OR TN381			UNKNOWN FIFO 14 ERROR CODE
	410	TN380 OR TN381			ERROR FIFO DATA OUT OF SYNC
	529	TN381	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
	649	TN381	TN470		TMS PROCESSOR DID NOT BUILD CONNECTION
	651	TN381			TMS PROCESSOR DID NOT WRITE CONNECTION INTO MPX RAM

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
7 (Contd)	725	TN380			INVALID DATA IN DS-1 DATA FACILITY ERROR FIFO
	2005	TN380			BAD PACKET CHECKSUM
	2006	TN380			MAINTENANCE BUSY OUT FAILED. I/O FAILURE
	2007	TN380			RELEASE MAINTENANCE BUSY OUT FAILED. I/O FAILURE.
8	4	TN444 OR TN482	TN380 OR TN381		DATA PARITY ERROR ON A MAINTENANCE OR MODULE (OR TMS) PROCESSOR BUS WRITE
	5	TN444 OR TN482	TN380 OR TN381		OTHER NON-SYSIO ERROR ON A MAINTENANCE OR MODULE (OR TMS) PROCESSOR BUS WRITE
	58	TN444	TN441 OR TN460		TEST VECTOR 128-255 OUTPUT FROM MIF INCORRECT. BAD TEST VECTORS CAUSED BY POWER FAILURE ARE RESTORED AFTER REPORTING THIS SPECIFIC FAULT CODE
	68	TN444			MIF OUTPUTS TEST VECTORS WHEN SHUT OFF
	73	TN444	TN441 OR TN460		MIF TEST VECTOR CIRCUITRY FAULTY
	74	TN444			MIF TVB CONTENTS INCORRECT. BAD TEST VECTORS CAUSED BY POWER FAILURE ARE RESTORED AFTER REPORTING THIS SPECIFIC FAULT CODE
	239	TN444	TN441 OR TN460		TEST VECTOR 0-127 OUTPUT FROM MIF INCORRECT
	245	TN444	TN446		ALU/MIF INTERFACE ERROR
	246	TN444			IDLE CODE GENERATOR FAILURE
	268	TN444			MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM MIF
	269	TN444	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	273	TN444	TN400	TN380	PORT COMMAND BUS - BAD CLOCK ON MIF
	277	TN444			MAINTENANCE INTERFACE BUS - BAD SAC VALUE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
8 (Contd)	278	TN444			MAINTENANCE BUS - MIF DID NOT FLAG BAD PARITY
	402	TN444			MODULE PROCESSOR INTERFACE ERROR
	407	TN444			TSI PCM DATA PARITY ERROR
	445	TN444			MIF WRITE FAILURE
9	32	TN460	TN444		GPP DATA CLOCK LOST MOMENTARILY (INCORRECT DCE READOUT)
	33	TN460	TN444		MAINTENANCE INTERFACE FAILURE CAUSED INCORRECT DCE READOUT
	34	TN460	TN444		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (SIMPLEX, NO SCS)
		TN460	TN460		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (DUPLEX, NO SCS)
		TN460	TN463	TN444	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (SIMPLEX WITH SCS)
	35	TN460	TN444		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (SIMPLEX, NO SCS)
		TN460	TN460		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (DUPLEX, NO SCS)
		TN460	TN463	TN444	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (SIMPLEX WITH SCS)
	36	TN460	TN444		MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE ON-LINE
	37	TN460	TN444		MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE OFF-LINE
	38	TN460	TN444		CLOCK FREQUENCY GENERATOR FAILED
	39	TN460	TN444		MIF FAILURE CAUSED INCORRECT DCE OOL READOUT
	40	TN460	TN444	TN530	OFF-LINE CLOCK APPEARS AS MASTER WITH NO SCS/LGI PRESENT

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
9 (Contd)	41	TN460	TN444		MIF FAILURE CAUSED OFF-LINE CLOCK TO APPEAR AS MASTER WITH NO SCS/LGI PRESENT
	42	TN460	TN463	TN444	CLOCK APPEARS AS MASTER WITH SCS/LGI PRESENT
	43	TN460	TN444		MIF FAILURE CAUSED CLOCK TO APPEAR AS MASTER WITH SCS/LGI PRESENT
	44	TN460	TN444		ON-LINE CLOCK APPEARS AS SLAVE WITH NO SCS/LGI PRESENT
	45	TN460	TN444		MIF FAILURE CAUSED MAINTENANCE INTERFACE APPEARANCE OF ON-LINE CLOCK AS SLAVE WITH NO SCS/LGI PRESENT
	57	TN460			INTERMODULE DATA STORE OR MODULE CLOCK OUT OF LOCK CAUSED TSI TEST FAILURE
	269	TN441 OR TN460	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	340	TN441 OR TN460	TN440	TN454	ALL GPP PORTS UNDER THIS UNIT TYPE FAILED THE DATA CLOCK TEST. OTHER INDICTMENTS ARE SN270/SN271 GPP BOARDS OR UNPLUGGED DIGITAL INSTRUMENTS IN THE SAME HALF CARRIER AS A FAILING UNIT TYPE 15, TN454 PDI
10	403	TN460			MODULE CLOCK ERROR
	65	TN446	TN444		INTERMITTENT ALU READ ERROR OVER MAINTENANCE BUS PATH
	72	TN446	TN445		ALU ACCUMULATOR TO DESTINATION SPN ZERO ADDRESSING FAULT
	78	TN446	TN445		ALU ADDRESS PROCESSING SUSPECTED
	86	TN446	TN445		ALU ADDRESS PROCESSING FAULT
	87	TN446	TN445		ALU PCM DATA FAULT
	88	TN446	TN445		ALU DATA FAULT. ALSO CAUSED BY FAULTY INTERFACE ON PCM BUS BY TN440 PDS OR TN441 IDS
	240	TN446	TN444		MAINTENANCE BUS TO TSI ALU IS BAD

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
10 (Contd)	241	TN446	TN445		TSI ALU LOSSING/LINEARIZING FAULT
	242	TN446	TN445		TSI ALU OPCODE FAILURE
	243	TN446	TN445		TSI ALU ACCUMULATOR FAILURE
	244	TN446	TN445		TSI ALU ACCUMULATOR ADDRESSING FAULT
	247	TN446			TSI ACCUMULATOR RESOURCES NOT AVAILABLE
	269	TN446	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	331	TN446			TSI ALU DATA PARITY CHECKING CIRCUITRY FAILED
	407	TN446			TSI PCM DATA PARITY ERROR
	604	TN446	TN445	TN444	ALU GENERATES NETWORK TEST FLAGS
	620	TN446	TN444		ALU READ ERROR
	626	TN446	TN445	TN444	ALU ADDRESSING ERROR
11	6	TN445	TN380		NO POSITIVE ACKNOWLEDGE USING QUI_PORT, INIT_TSI, OR MODULE PROCESSOR BUS WRITE
	52	TN445	TN444	TN440	TSI PSTORE INTERMITTENTLY REPORTS INVALID NETWORK TEST ACTIVITY
	53	TN445	TN444		A ZERO VALUE CANNOT BE READ OVER THE PST MAINTENANCE BUS PATH
	54	TN445	TN446	TN440	INTERMITTENT ADDRESSING FAULT WITHIN THE TSI
	55	TN445	TN444		A NON-ZERO VALUE CANNOT BE READ OVER THE PST MAINTENANCE BUS PATH
	67	TN445			PST ERRONEOUSLY REPORTS NETWORK TEST ACTIVITY
	75	TN445	TN444		BAD PST MEMORY PARITY
	76	TN445	TN441 OR TN460	TN444	PST NOT CYCLING
	82	TN445	TN444		PST INSTRUCTION ADDRESSING FAULT
	84	TN445	TN444		PST ADDRESS OR MEMORY FAULT. ALSO CAUSED BY ILLEGAL CONNECTION TO PORT
	85	TN445			PST MEMORY OR OUTPUT FAULT
	89	TN445	TN444		TSI PSTORE HAS MULTIPLE PARITY ERRORS

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
11 (Contd)	269	TN445	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	330	TN445			TSI PSTORE INSTRUCTION PARITY CHECKING CIRCUITRY FAILED
	401	TN445			TSI SHUTDOWN
	402	TN445			MODULE PROCESSOR INTERFACE ERROR
	406	TN445			TSI PSTORE MEMORY PARITY ERROR
	425	TN445			TSI RUNNING, BUT INDICATES IT'S SHUTDOWN
	432	TN445			BURST OF TSI PSTORE PARITY ERRORS
	444	TN445			TSI PSTORE WRITE FAILURE
12	264	TN400			PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM IOBI
	269	TN400	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	270	TN400			PORT COMMAND BUS - BAD SAC VALUE FROM IOBI
	272	TN400			PORT COMMAND BUS - END OF MESSAGE TIMEOUT
	274	TN400			PORT COMMAND BUS - IOBI DID NOT FLAG BAD PARITY
	371	TN400	TN444	TN380	NEGATIVE ACKNOWLEDGE FROM INITIALIZE IOBI ORDER - ALL TN400 BOARDS IN CARRIER ARE SUSPECT
	402	TN400			MODULE PROCESSOR INTERFACE ERROR
	446	TN400			IOBI WRITE FAILURE
	451	TN400			TMS INTERFACE ERROR
	514	TN400	TN462		IOBI BUS ERROR CAUSED LOCAL CLOCK TERMINATION FAILURE
	520	TN400			TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI
	524	TN400			TMS IOBI BUS - BAD SAC VALUE FROM IOBI
	525	TN400			TMS IOBI BUS - END OF MESSAGE TIMEOUT
	527	TN400			TMS IOBI BUS - IOBI DID NOT FLAG BAD PARITY

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
12 (Contd)	529	TN400	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
13	56	TN440	TN446		AT LEAST ONE PDS IS RECEIVING PCM DATA FROM A DOUBLE-CONNECT
	59	TN440	TN446	TN444	PDS DATA OR ADDRESSING IN OUTPUT STORE INCORRECT
	61	TN440	TN454	TN446	ALU RECEIVES INCORRECT DATA FROM PDS
	63	TN440	TN446		INTERMITTENT FAULT IN PCM DATA PATH
	66	TN440	TN444		INTERMITTENT PDS READ ERROR OVER MAINTENANCE BUS PATH
	69	TN440	TN446		PDS OUTPUT STORE GENERATES NETWORK TEST FLAGS ON PORTS NOT PRESENTLY IN-USE. ALSO CAUSED BY ILLEGAL CONNECTION TO PORT
	70	TN440	TN454	TN446	PDS INPUT STORE GENERATES NETWORK TEST FLAGS
	77	TN440	TN444		INTERMITTENT PDS READ ERROR OVER MAINTENANCE BUS PATH
	79	TN440	TN446		PDS ADDRESS PROCESSING SUSPECTED
	81	TN440	TN446	TN454	PDS INPUT STORE ADDRESSING OR DATA FAILURE
	83	TN440	TN446		PDS INTERNAL ADDRESSING FAULT. ALSO CAUSED BY ILLEGAL CONNECTION TO PORT
	269	TN440	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	276	TN440	TN380	CABLE	PORT COMMAND BUS - BAD CONTROL COMPLEX SIGNAL TO TN454 AND TN452
	340	TN440	TN454	TN441 OR TN460	ALL GPP PORTS UNDER THIS UNIT TYPE FAILED THE DATA CLOCK TEST. OTHER INDICTMENTS ARE SN270/SN271 GPP BOARDS OR UNPLUGGED DIGITAL INSTRUMENTS IN THE SAME HALF CARRIER AS A FAILING UNIT TYPE 15, TN454 PDI
	407	TN440			TSI PCM DATA PARITY ERROR

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
13 (Contd)	437	TN440			DCLOCK SIGNAL DOES NOT GET THROUGH PDS. FAULT MAY RESIDE ELSEWHERE ALONG DCLOCK SIGNAL PATH (IDS/MODULE CLOCK, PDS, PDI, GPP)
14	8	TN452	TN400		DISTRIB DATA AFTER BYTE INCORRECT TO A PCI
	265	TN451 OR TN452	TN400	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PCI
	271	TN451 OR TN452	TN400	TN451	PORT COMMAND BUS - BAD SAC VALUE FROM PCI
	275	TN451 OR TN452	TN440	TN380	PORT COMMAND BUS - BAD (ON/OFF) LINE CONTROL
	521	TN452	TN400		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM UPCI
	523	TN452	TN400		TMS IOBI BUS - BAD SAC VALUE FROM UPCI
	788	TN451	ANN11 OR ANN15 OR ANN16		I/O BUS FAILURE
	789	TN451	ANN11 OR ANN15 OR ANN16		MAINTENANCE BUS FAILURE
15	7	TN454	TN452	TN400	DISTRIB DATA AFTER BYTE INCORRECT TO A PDI
	60	TN454	TN440	TN452	PDI ADDRESSING OR CONTROL INCORRECT
	62	TN454	TN440		PDI OUTPUT DATA INCORRECT
	64	TN454	TN452		INTERMITTENT PDI READ ERROR OVER PORT COMMAND BUS
	71	TN454	TN440		PDI GENERATES NETWORK TEST FLAGS
	80	TN454	TN440	TN452	PDI LOOP AROUND OR DATA FAILURE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
15 (Contd)	266	TN454	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PDI
	334	TN454	TN446		PDI DATA PARITY CHECKING CIRCUITRY FAILED
	340	TN454	TN440	TN441 OR TN460	ALL GPP PORTS UNDER THIS UNIT TYPE FAILED THE DATA CLOCK TEST. OTHER INDICTMENTS ARE SN270/SN271 GPP BOARDS OR UNPLUGGED DIGITAL INSTRUMENTS IN THE SAME HALF CARRIER AS A FAILING UNIT TYPE 15, TN454 PDI
	408	TN454			PDI PCM DATA PARITY ERROR
	426	TN454			RING TRIP CIRCUIT FAILURE
	433	TN454			MULTIPLE PCM DATA PARITY ERRORS FROM PDI
16	12	SN250			TIME SLOT UNAVAILABLE
	134	SN250	TN454	TN452	CPT REFLECTION DETECTOR FAILED TO STABILIZE
	135	SN250	TN454	TN452	CPT TONE TEST DETECTION FAILED TO STABILIZE
	136	SN250	TN454	TN452	CPT REFLECTION DATA READY FLAG STUCK ACTIVE
	137	SN250	TN454	TN452	CPT TONE TEST DATA READY FLAG STUCK ACTIVE
	142	SN250	TN454	TN452	CPT TONE TEST DETECTION FAILED TO STABILIZE
	156	SN250	TN454		FAULTY FIRST TONE TEST FREQUENCY IDLE INDICATION
	157	SN250	TN454		FAULTY SECOND TONE TEST FREQUENCY IDLE INDICATION
	158	SN250	TN454		FAULTY FIRST TONE TEST QUIET TIME IDLE INDICATION
	159	SN250	TN454		FAULTY SECOND TONE TEST QUIET TIME IDLE INDICATION
	161	SN250	TN454		FAULTY DIAL TONE FIRST TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
16 (Contd)	162	SN250	TN454		FAULTY DIAL TONE SECOND TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
	163	SN250	TN454		FAULTY FIRST TONE TEST QUIET TIME NON-IDLE INDICATION
	164	SN250	TN454		FAULTY SECOND TONE TEST QUIET TIME NON-IDLE INDICATION
	165	SN250	TN454		FAULTY INTERRUPTED DIAL TONE FIRST TONE FREQUENCY
	166	SN250	TN454		FAULTY INTERRUPTED DIAL TONE SECOND TONE FREQUENCY
	167	SN250	TN454		FAULTY INTERRUPTED DIAL TONE FIRST TONE QUIET TIME
	168	SN250	TN454		FAULTY INTERRUPTED DIAL TONE SECOND TONE QUIET TIME
	169	SN250	TN454		FAULTY AUDIBLE RING FIRST TONE FREQUENCY
	170	SN250	TN454		FAULTY AUDIBLE RING SECOND TONE FREQUENCY
	171	SN250	TN454		FAULTY AUDIBLE RING FIRST TONE QUIET TIME
	172	SN250	TN454		FAULTY AUDIBLE RING SECOND TONE QUIET TIME
	173	SN250	TN454		FAULTY SPECIAL AUDIBLE RING FIRST TONE FREQUENCY
	174	SN250	TN454		FAULTY SPECIAL AUDIBLE RING SECOND TONE FREQUENCY
	175	SN250	TN454		FAULTY SPECIAL AUDIBLE RING FIRST TONE QUIET TIME
	176	SN250	TN454		FAULTY SPECIAL AUDIBLE RING SECOND TONE QUIET TIME
	177	SN250	TN454		FAULTY INTERCEPT FIRST TONE FREQUENCY
	178	SN250	TN454		FAULTY INTERCEPT SECOND TONE FREQUENCY
	179	SN250	TN454		FAULTY INTERCEPT FIRST TONE QUIET TIME
	180	SN250	TN454		FAULTY INTERCEPT SECOND TONE QUIET TIME

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CKT 1	CKT 1	CKT 2	CKT 3	DEFINITION
16 (Contd)	181	SN250	TN454		FAULTY BUSY FIRST TONE FREQUENCY
	182	SN250	TN454		FAULTY BUSY SECOND TONE FREQUENCY
	183	SN250	TN454		FAULTY BUSY FIRST TONE QUIET TIME
	184	SN250	TN454		FAULTY BUSY SECOND TONE QUIET TIME
	185	SN250	TN454		FAULTY REORDER FIRST TONE FREQUENCY
	186	SN250	TN454		FAULTY REORDER SECOND TONE FREQUENCY
	187	SN250	TN454		FAULTY REORDER FIRST TONE QUIET TIME
	188	SN250	TN454		FAULTY REORDER SECOND TONE QUIET TIME
	189	SN250	TN454		FAULTY 440-HZ REFLECTION DETECTOR IDLE INDICATION
	190	SN250	TN454		FAULTY BROAD BAND REFLECTION DETECTOR IDLE INDICATION
	191	SN250	TN454		FAULTY 440-HZ REFLECTION DETECTOR NON-IDLE INDICATION
	192	SN250	TN454		FAULTY BROAD BAND REFLECTION DETECTOR NON-IDLE INDICATION
	197	SN250	TN454		FAULTY DIAL TONE FIRST TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
	198	SN250	TN454		FAULTY DIAL TONE SECOND TONE FREQUENCY OR TONE TEST NON-IDLE INDICATION
	199	SN250			BUSY OUT FAILED
	218	SN250			NETWORK ORDER FAILED
	219	SN250			RELEASE BUSY OUT FAILED
	267	SN250	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	429	SN250			PORT DIGITAL SIGNAL PROCESSOR ERROR
	1628	SN250	TN454	TN451	NO VALID REFLECTED SIGNAL WAS RECEIVED
23	17	TN530	TN401	TN380 OR TN381	MAJOR DUPLICATION/UPDATE FAILURE IN MODULE (OR TMS) PROCESSOR TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
23 (Contd)	90	TN530	TN400	TN380 OR TN381	FAILED THE MODULE (OR TMS) PROCESSOR BASED DUP_TST
	92	TN530	TN530	TN380 OR TN381	DUP BOARD STATUS BITS WOULD NOT SET OR CLEAR
	93	TN530	TN530	TN380 OR TN381	ON-LINE TN530 ERROR FLAG WAS SET
	94	TN530	TN445	TN380 OR TN381	OFF-LINE TN530 ERROR FLAG WAS SET
	95	TN530	TN530	TN400	STATE OF HEALTH COMPARATOR TEST FAILED
	96	TN530	TN530	TN400	DOUBLE WRITE CONTROL TEST FAILED
	97	TN530	TN530	TN380 OR TN381	DOUBLE WRITE WITH BAD PARITY TEST FAILED
	98	TN530	TN530	TN380 OR TN381	DUPLICATION CHANNEL DID NOT DETECT BAD PARITY
	99	TN530	TN530		DETECTED DOUBLE WRITES OFF AND TURNED THEM ON
	269	TN530	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	365	TN530	TN380 OR TN381	TN401	SOFT SWITCH FAILED
	366	TN530	TN380 OR TN381	TN401	HARD SWITCH FAILED
	402	TN530			MODULE PROCESSOR INTERFACE ERROR
	529	TN530	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
	647	TN530	TN530	TN441	INTERMODULE DATA STORE PSTORE CONNECTION NOT DOUBLE WRITTEN
	648	TN530	TN530	TN470	TMS CONNECTION NOT DOUBLE WRITTEN

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
23 (Contd)	996				DUP BOARD MUST BE TESTED IN OTHER ON-LINE - OFF-LINE MODE TO PASS VERIFICATION
	997				MODULE SOFT-LOCKED FAILED OR MODULE ALREADY LOCKED
24	12	SN252			TIME SLOT UNAVAILABLE
	13	SN252			CIRCUIT IN USE BY CALL PROCESSING
	51	SN252			PORT RESOURCES NOT AVAILABLE
	199	SN252			BUSY OUT FAILED
	200	SN252			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
	218	SN252			NETWORK ORDER FAILED
	219	SN252			RELEASE BUSY OUT FAILED
	285	SN252	TN452	TN400	IDLE SENDER SUM SCAN INDICATES DIAL TONE DETECTED
	286	SN252	TN452	TN400	IDLE SENDER STATUS REGISTER INDICATES PORT BUSY
	287	SN252	TN452	TN400	IDLE SENDER STATUS REGISTER INDICATES DIGIT QUEUE FULL
	288	SN252	TN452	TN400	IDLE SENDER STATUS REGISTER INDICATES TEST TONE NOT SENT
	289	SN252	TN452	TN400	SENDER CKT SUM CHECK FAILURE
	290	SN252	SN250	TN452	SENDER NOT BUSY WHILE TEST TONE BEING SENT
	291	SN252	SN250	TN452	SENDER STATUS REGISTER INDICATES TEST TONE COMPLETE WHILE SENDING
	292	SN252	SN250	TN454	SENDER FAILS TO SEND 440-HZ TEST TONE
	293	SN252			NO IDLE RECEIVER FOUND FOR SENDER RETEST
	294	SN252	SN251	TN452	SENDER NOT BUSY WHILE SENDING VALID TONE
	295	SN252	SN251	TN452	SENDER STATUS REGISTER INDICATES TOUCH-TONE SIGNAL DONE WHILE BEING SENT
	296	SN252	SN251	TN454	SENDER FAILS TO SEND A VALID TOUCH-TONE
	297	SN252	SN251	TN454	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
24 (Contd)	298	SN252	TN454	TN400	SENDER FAILS TO DETECT DIAL TONE
	299	SN252	TN454	TN400	SENDER DETECTS DIAL TONE AFTER DIAL TONE REMOVED
	309	SN252	TN452	TN400	SENDER CIRCUIT SUM CHECK FAILURE
	310	SN252	SN251	TN452	SENDER NOT BUSY WHILE SENDING VALID TONE
	311	SN252	SN251	TN452	SENDER STATUS REGISTER INDICATES TOUCH-TONE SIGNAL DONE WHILE BEING SENT
	312	SN252	SN251	TN454	EXPECTED VALID TOUCH-TONE DIGIT NOT FOUND IN RECEIVER DIGIT REGISTER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER, SO PEGGED AGAINST BOTH
	313	SN252	SN251	TN454	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER, SO PEGGED AGAINST BOTH
25	12	SN251			TIME SLOT UNAVAILABLE
	13	SN251			CIRCUIT IN USE BY CALL PROCESSING
	51	SN251			PORT RESOURCES NOT AVAILABLE
	199	SN251			BUSY OUT FAILED
	200	SN251			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
	219	SN251			RELEASE BUSY OUT FAILED
	285	SN251	SN252	TN452	IDLE SENDER SUM SCAN INDICATES DIAL TONE DETECTED
	286	SN251	SN252	TN452	IDLE SENDER STATUS REGISTER INDICATES PORT BUSY
	287	SN251	SN252	TN452	IDLE SENDER STATUS REGISTER INDICATES DIGIT QUEUE FULL
	288	SN251	SN252	TN452	IDLE SENDER STATUS REGISTER INDICATES TEST TONE NOT SENT
	297	SN251	SN252	TN454	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER
	300	SN251	SN250	TN454	NO TRANSMISSION THROUGH RECEIVER, LOW PATH TO HIGH PATH

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
25 (Contd)	301	SN251	SN250	TN454	NO TRANSMISSION THROUGH RECEIVER, HIGH PATH TO LOW PATH
	302	SN251			NO IDLE SENDER FOUND FOR RECEIVER RETEST
	303	SN251	SN252	TN452	IDLE RECEIVER SUMMARY SCAN INDICATES RECEPTION OF TOUCH-TONE
	304	SN251	SN252	TN452	IDLE RECEIVER PORT CONTROL REGISTER INDICATES RECEPTION OF VALID TOUCH-TONE
	305	SN251	SN252	TN454	RECEIVER FAILS TO RECEIVE LOW LEVEL DIGIT
	306	SN251	SN252	TN454	RECEIVER FAILS TO RECOGNIZE TOUCH-TONE
	307	SN251	SN252	TN454	RECEIVER FAILS TO RECOGNIZE LOW LEVEL DIGIT
	308	SN251	SN252	TN454	RECEIVER RECEIVES FALSE TONE
	312	SN251	SN252	TN454	EXPECTED VALID TOUCH-TONE DIGIT NOT FOUND IN RECEIVER DIGIT REGISTER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER, SO PEGGED AGAINST BOTH
	313	SN251	SN252	TN454	NO TOUCH-TONE DIGIT RECEIVED AT RECEIVER. FAILURE COULD NOT BE ISOLATED TO EITHER SENDER OR RECEIVER, SO PEGGED AGAINST BOTH
	427	SN251			CONTROL/SUMMARY - SCAN REGISTER READ ERROR
27	199	SN270 OR SN271			BUSY OUT FAILED
	219	SN270 OR SN271			RELEASE BUSY OUT FAILED
	267	SN270 OR SN271	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	SN270 OR SN270			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
27 (Contd)	338	SN270 OR SN271			DATA MODULE DOES NOT RESPOND TO A QUERY
	350	SN270 OR SN271	TN452	TN400	GPP DTL FAULT (NON-REMOTED BOARD)
	350	SN270 OR SN271	ANN16		GPP DTL FAULT (REMOTED BOARD)
	351	SN270 OR SN271	TN452	TN400	GPP DTL IDLE BIT SET (NON-REMOTED BOARD)
	351	SN270 OR SN271	ANN16		GPP DTL IDLE BIT SET (REMOTED BOARD)
	352	SN270 OR SN271	TN452	TN400	GPP DTLI AND DTLF TOGETHER (NON-REMOTED BOARD)
	352	SN270 OR SN271	ANN16		GPP DTLI AND DTLF TOGETHER (REMOTED BOARD)
	353	SN270 OR SN271	TN452	TN400	GPP 48-VOL BIT SET (CURRENT OVERLOAD) (NON-REMOTED BOARD)
	353	SN270 OR SN271	ANN16		GPP 48-VOL BIT SET (CURRENT OVERLOAD) (REMOTED BOARD)
	354	SN270 OR SN271	TN452	TN400	GPP 48-VOL AND DTLF BITS SET (NON-REMOTED BOARD)
	354	SN270 OR SN271	ANN16		GPP 48-VOL AND DTLF BITS SET (REMOTED BOARD)
	355	SN270 OR SN271	TN452	TN400	GPP 48-VOL AND DTLI BITS SET (NON-REMOTED BOARD)
	355	SN270 OR SN271	ANN16		GPP 48-VOL AND DTLI BITS SET (REMOTED BOARD)

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
27 (Contd)	356	SN270 OR SN271	TN452	TN400	GPP 48-VOL, DTLI, AND DTLF BITS SET (NON-REMOTED BOARD)
	356	SN270 OR SN271	ANN16		GPP 48-VOL, DTLI, AND DTLF BITS SET (REMOTED BOARD)
	357	SN270 OR SN271	TN452	TN400	ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOTED BOARD)
	357	SN270 OR SN271	ANN16		ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (REMOTED BOARD)
	358	SN270 OR SN271	TN452	TN400	MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOTED BOARD)
	358	SN270 OR SN271	ANN16		MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (REMOTED BOARD)
	361	SN270 OR SN271	TN452	TN400	FAILURE OF PORT BLA SET (NON-REMOTED BOARD)
	361	SN270 OR SN271	ANN16		FAILURE OF PORT BLA SET (REMOTED BOARD)
	362	SN270 OR SN271	TN454		SAC FAILED TO CLEAR IN PORT DTL LOOP AROUND TEST
	363	SN270 OR SN271	TN454		INVALID SAC SIGNATURE IN PORT DTL LOOP AROUND TEST
	364	SN270 OR SN271	TN454		ERROR IN TDR IN PORT DTL LOOP AROUND TEST (NON-REMOTED BOARD)
	364	SN270 OR SN271	ANN16		ERROR IN TDR IN PORT DTL LOOP AROUND TEST (REMOTED BOARD)
	434	SN270 OR SN271			ALL PORTS OF DVDP BOARD BAD

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
27 (Contd)	459	SN270 OR SN271			BLA BIT ON PORT CONTROL REGISTER FAILED TO CLEAR OR SET
	460	SN270 OR SN271			DTLF FAULT ON DVDP
	998	SN270 OR SN271			CANNOT TEST UNTRANSLATED PORT
	1619	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
	1620	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION
	1621	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
	1622	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
	1623	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
	1624	SN270 OR SN271	ANN16		FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
	1636	SN270 OR SN271			PORT FAILURE ON REMOTE GPP BOARD
28	13	SN224			CIRCUIT IN USE BY CALL PROCESSING
	51	SN224			PORT RESOURCES NOT AVAILABLE
	109	SN224	TN454	TN400	FAULTY SET OF LA FLIP-FLOP
	110	SN224	TN452	TN400	FAULTY SET OF CPU FLIP-FLOP
	118	SN224	TN452	TN400	FAULTY CLEAR OF LA FLIP-FLOP
	124	SN224	TN452	TN400	FAULTY CLEAR OF CPU FLIP-FLOP
	125	SN224	TN452	TN400	OFF-HOOK ERROR, POSSIBLY FROM ATTACHED STATION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
28 (Contd)	131	SN224	TN452	TN400	TERMINATED LINE FAILED TO INDICATE OFF-HOOK
	149	SN224	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	150	SN224	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION
	152	SN224	TN454	SN250	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
	154	SN224	TN454	SN250	ON-HOOK STATUS FAILED TO POWER DOWN CODEC
	199	SN224			BUSY OUT FAILED
	219	SN224			RELEASE BUSY OUT FAILED
	267	SN224	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	280	SN224	TN452	TN400	MLP CONTROLLER FAULT
	281	SN224	TN452	TN400	MLP 48-V OVERLOAD
	282	SN224	TN401		MLP DRIVER CIRCUITRY FAILURE
	283	SN224	TN452	TN400	MLP FAILED TO RETURN ID REQUEST
	436	SN224			MLP CONTROLLER FAULT, INITIALIZATION FAILED
	441	SN224			MLP CONTROLLER FAULT, INITIALIZATION SUCCESSFUL
	998	SN224			CANNOT TEST UNTRANSLATED PORT
	999	SN224			REQUESTED TEST NOT PROVIDED FOR THIS UNIT
	1619	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
	1620	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION
	1621	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
	1622	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
	1623	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
	1624	SN224	ANN16		FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
	1642	SN224			PORT FAILURE ON REMOTE MFET BOARD

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
29	12	SN228 OR SN229			TIME SLOT UNAVAILABLE
	13	SN228 OR SN229			CIRCUIT IN USE BY CALL PROCESSING
	51	SN228 OR SN229			PORT RESOURCES NOT AVAILABLE
	100	SN228 OR SN229	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	101	SN228 OR SN229	TN452	TN400	DEFECTIVE GATE ARRAY A
	102	SN228 OR SN229	TN452	TN400	DEFECTIVE GATE ARRAY B
	104	SN228 OR SN229	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY A
	105	SN228 OR SN229	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY B
	125	SN228 OR SN229	TN452	TN400	OFF-HOOK ERROR, POSSIBLY FROM ATTACHED STATION
	126	SN228 OR SN229	TN452	TN400	OFF-HOOK ERROR FROM BAD LA CLEAR OR ATTACHED STATION
	131	SN228 OR SN229	TN452	TN400	TERMINATED LINE FAILED TO INDICATE OFF-HOOK
	133	SN228 OR SN229	TN452	TN400	OFF-HOOK STATUS FAILED TO LATCH
	149	SN228 OR SN229	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
29 (Contd)	150	SN228 OR SN229	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION
	152	SN228 OR SN229	TN454	SN250	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
	153	SN228 OR SN229	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	154	SN228 OR SN229	TN454	SN250	ON-HOOK STATUS FAILED TO POWER DOWN CODEC
	160	SN228 OR SN229	TN454	SN250	FAULTY 400-HZ FREQUENCY
	199	SN228 OR SN229			BUSY OUT FAILED
	218	SN228 OR SN229			NETWORK ORDER FAILED
	219	SN228 OR SN229			RELEASE BUSY OUT FAILED
	267	SN228 OR SN229	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	SN228 OR SN229			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
	427	SN228 OR SN229			CONTROL/SUMMARY - SCAN REGISTER READ ERROR
	1619	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
	1620	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
29 (Contd)	1621	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
	1622	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
	1623	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
	1624	SN228 OR SN229	ANN16		FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
	1630	SN228 OR SN229			PORT FAILURE ON REMOTE ANALOG BOARD
31	13	SN253			CIRCUIT IN USE BY CALL PROCESSING
	51	SN253			PORT RESOURCES NOT AVAILABLE
	130	SN253	TN452	TN400	ACTIVE SEZD* ERROR, POSSIBLY FROM BUSY CODE CALL CKT
	143	SN253	TN452	TN400	CODE CALL DIGIT DONE* IMPROPERLY ACTIVE
	144	SN253	TN452	TN400	CODE CALL DIGIT DONE* IMPROPERLY INACTIVE
	145	SN253	TN452	TN400	FAULTY CODE CALL CHIME PERIOD
	146	SN253	TN452	TN400	FAULTY DIGITAL SIGNAL PROCESSOR
	147	SN253	TN452	TN400	CODE CALL SEZD* IMPROPERLY INACTIVE
	193	SN253	TN454	SN250	FAULTY RECEPTION OF AUXILIARY IMMEDIATE RINGBACK TONE
	199	SN253			BUSY OUT FAILED
	219	SN253			RELEASE BUSY OUT FAILED
	220	SN253	TN452	TN400	DSP CHECKSUM STUCK ACTIVE
	267	SN253	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	429	SN253			PORT DIGITAL SIGNAL PROCESSOR ERROR
32	13	SN230			CIRCUIT IN USE BY CALL PROCESSING
	51	SN230			PORT RESOURCES NOT AVAILABLE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
32 (Contd)	100	SN230	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	101	SN230	TN452	TN400	DEFECTIVE GATE ARRAY A
	103	SN230	TN452	TN400	DEFECTIVE GATE ARRAY C
	104	SN230	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY A
	106	SN230	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY C
	128	SN230	TN452	TN400	RING DETECTION ERROR POSSIBLY FROM ATTACHED CO
	129	SN230	TN452	TN400	GND DETECTION ERROR POSSIBLY FROM EXTERNAL CIRCUIT SIGNALING
	138	SN230	TN452	TN400	NORM CURRENT DETECTOR STUCK ACTIVE
	139	SN230	TN452	TN400	GROUND DETECTOR FAILED TO DETECT GROUND
	140	SN230	TN452	TN400	GS RELAY STUCK OPERATED
	141	SN230	TN452	TN400	REV CURRENT DETECTOR STUCK ACTIVE
	149	SN230	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	153	SN230	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	155	SN230	TN454	SN250	CODEC POWER UP STUCK ACTIVE
	199	SN230			BUSY OUT FAILED
	200	SN230			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
	219	SN230			RELEASE BUSY OUT FAILED
	267	SN230	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	SN230			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
33	9	SN232	TN452	TN400	DISTRIB DATA AFTER BYTE INCORRECT TO A PORT
	13	SN232			CIRCUIT IN USE BY CALL PROCESSING
	51	SN232			PORT RESOURCES NOT AVAILABLE
	100	SN232	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	131	SN232	TN452	TN400	TERMINATED LINE FAILED TO INDICATE OFF-HOOK

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
33 (Contd)	149	SN232	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	150	SN232	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION
	151	SN232	TN454	SN250	INSUFFICIENT 440-HZ OFF-HOOK REFLECTION
	152	SN232	TN454	SN250	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
	153	SN232	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	154	SN232	TN454	SN250	ON-HOOK STATUS FAILED TO POWER DOWN CODEC
	194	SN232	TN452	TN400	BATTERY FEED REVERSAL STUCK ACTIVE OR IDLE CIRCUIT INDICATES LOOP CLOSURE
	196	SN232	TN452	TN400	BATTERY FEED REVERSAL STUCK INACTIVE
	199	SN232			BUSY OUT FAILED
	200	SN232			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
	201	SN232	TN452	TN400	DEFECTIVE GATE ARRAY D
	202	SN232	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY D
	219	SN232			RELEASE BUSY OUT FAILED
	267	SN232	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	315	SN232			LOOP CLOSURE DETECTION MAY BE DUE TO CO ATTEMPTING SEIZE
	337	SN232			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
34	13	SN233 OR SN243			CIRCUIT IN USE BY CALL PROCESSING
	51	SN233 OR SN243			PORT RESOURCES NOT AVAILABLE
	100	SN233 OR SN243	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
34 (Contd)	109	SN233	TN452	TN400	FAULTY SET OF LA FLIP-FLOP
	110	SN233	TN452	TN400	FAULTY SET OF CPU FLIP-FLOP
	124	SN233	TN452	TN400	FAULTY CLEAR OF CPU FLIP-FLOP
	125	SN243	TN452	TN400	OFF-HOOK ERROR, POSSIBLY FROM ATTACHED STATION
	126	SN243	TN452	TN400	OFF-HOOK ERROR FROM BAD LA CLEAR OR ATTACHED STATION
	131	SN243	TN452	TN400	TERMINATED LINE FAILED TO INDICATE OFF-HOOK
	133	SN243	TN452	TN400	OFF-HOOK STATUS FAILED TO LATCH
	149	SN233 OR SN243	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	150	SN233 OR SN243	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION
	152	SN243	TN454	SN250	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
	153	SN233 OR SN243	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	154	SN243	TN454	SN250	ON-HOOK STATUS FAILED TO POWER DOWN CODEC
	169	SN243	TN454	SN250	FAULTY AUDIBLE RING FIRST TONE FREQUENCY
	170	SN243	TN454	SN250	FAULTY AUDIBLE RING SECOND TONE FREQUENCY
	171	SN243	TN454	SN250	FAULTY AUDIBLE RING FIRST TONE QUIET TIME
	172	SN243	TN454	SN250	FAULTY AUDIBLE RING SECOND TONE QUIET TIME
	199	SN233 OR SN243			BUSY OUT FAILED
	200	SN233 OR SN243			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
34 (Contd)	201	SN233 OR SN243	TN452	TN400	DEFECTIVE GATE ARRAY D
	202	SN233 OR SN243	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY D
	203	SN233	TN454	SN250	E OR M SIGNAL INDICATOR STUCK ACTIVE
	204	SN233	TN454	SN250	FAILURE OF OP SET
	205	SN233	TN452	TN400	M-SIGNAL SENT INDICATOR STUCK INACTIVE
	206	SN233	TN454	SN250	POSSIBLE EXTERNAL CIRCUIT SIGNALING
	208	SN233	TN454	SN250	CLEARING LOOP AROUND FAILS TO REMOVE 440-HZ SIGNAL
	211	SN233	TN454	SN250	OFF-HOOK STATUS (GRND SIGNAL DETECTOR) FAILS TO POWER UP THE CODEC
	214	SN233	TN452	TN400	FAILURE OF GATE ARRAY OR E-SIGNAL RECEIVER
	215	SN233	TN452	TN400	FAILURE OF OP FLIP-FLOP
	216	SN233	TN452	TN400	INCORRECT ENCODE IN TIE TRUNK ID CHIP
	219	SN243			RELEASE BUSY OUT FAILED
	267	SN233 OR SN243	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	SN243			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
44	13	SN233			CIRCUIT IN USE BY CALL PROCESSING
	51	SN233			PORT RESOURCES NOT AVAILABLE
	100	SN233	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	109	SN233	TN452	TN400	FAULTY SET OF LA FLIP-FLOP
	110	SN233	TN452	TN400	FAULTY SET OF CPU FLIP-FLOP
	124	SN233	TN452	TN400	FAULTY CLEAR OF CPU FLIP-FLOP
	149	SN233	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	150	SN233	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
44 (Contd)	153	SN233	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	199	SN233			BUSY OUT FAILED
	201	SN233	TN452	TN400	DEFECTIVE GATE ARRAY D
	202	SN233	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY D
	203	SN233	TN454	SN250	E OR M SIGNAL INDICATOR STUCK ACTIVE
	204	SN233	TN454	SN250	FAILURE OF OP SET
	205	SN233	TN452	TN400	M-SIGNAL SENT INDICATOR STUCK INACTIVE
	206	SN233	TN454	SN250	POSSIBLE EXTERNAL CIRCUIT SIGNALING
	208	SN233	TN454	SN250	CLEARING LOOP AROUND FAILS TO REMOVE 440-HZ SIGNAL
	214	SN233	TN452	TN400	FAILURE OF GATE ARRAY OR E-SIGNAL RECEIVER
	215	SN233	TN452	TN400	FAILURE OF OP FLIP-FLOP
	216	SN233	TN452	TN400	INCORRECT ENCODE IN TIE TRUNK ID CHIP
	219	SN233			RELEASE BUSY OUT FAILED
	267	SN233	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	SN233			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
45	13	SN231			CIRCUIT IN USE BY CALL PROCESSING
	51	SN231			PORT RESOURCES NOT AVAILABLE
	100	SN231	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	101	SN231	TN452	TN400	DEFECTIVE GATE ARRAY A
	102	SN231	TN452	TN400	DEFECTIVE GATE ARRAY B
	104	SN231	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY A
	105	SN231	TN452	TN400	FAULTY PORT SELECT IN GATE ARRAY B
	129	SN231	TN452	TN400	GND DETECTION ERROR POSSIBLY FROM EXTERNAL CIRCUIT SIGNALING
	141	SN231	TN452	TN400	REV CURRENT DETECTOR STUCK ACTIVE
	153	SN231	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
45 (Contd)	199	SN231			BUSY OUT FAILED
	200	SN231			CANNOT TEST: THIS IS THE ONLY AVAILABLE FACILITY
	219	SN231			RELEASE BUSY OUT FAILED
	267	SN231	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	316	SN231	TN454	SN250	INSUFFICIENT 600-OHM TERMINATION REFLECTION POSSIBLY CAUSED BY OPEN TRANSMISSION OPTION SWITCH
	317	SN231	TN454	SN250	EXCESSIVE 600-OHM TERMINATION REFLECTION
	318	SN231	TN454	SN250	INSUFFICIENT SHORT CIRCUIT TERMINATION REFLECTION
	319	SN231	TN454	SN250	EXCESSIVE SHORT CIRCUIT TERMINATION REFLECTION
	337	SN231			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
46	13	SN254			CIRCUIT IN USE BY CALL PROCESSING
	51	SN254			PORT RESOURCES NOT AVAILABLE
	153	SN254	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	199	SN254			BUSY OUT FAILED
	219	SN254			RELEASE BUSY OUT FAILED
	235	SN254	TN454	SN250	440-HZ TRANSMISSION FAILURE BETWEEN 2 PORTS
	236	SN254	TN454	SN250	EXCESSIVE SIGNAL OTHER THAN 440-HZ AT SEND PORT
	237	SN254	TN454	SN250	IMPROPER 440-HZ TRANSMISSION FROM RECEIVE INPUT TO SEND OUTPUT ON THE SAME PORT
	267	SN254	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
50	411	TN461			TMS CLOCK OSCILLATOR ERROR (OOL BIT SET)
	412	TN461			TMS CLOCK OSCILLATOR ERROR (OTHER)

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
50 (Contd)	413	TN461			TMS CLOCK OSCILLATOR AFTER INITIALIZATION ERROR (MFP BIT SET)
	414	TN461			TMS CLOCK OSCILLATOR AFTER INITIALIZATION ERROR (OTHER)
	500	TN461	CABLE		TMS CLOCK OSCILLATOR MFP FAILURE
	504	TN461	CABLE		ALL LOCAL CLOCK TERMINATION CIRCUITS HAVE MFP FAILURES - MORE THAN ONE LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
	506	TN461	CABLE		TMS CLOCK OSCILLATOR MAINTENANCE CIRCUIT HAS MFP FAULT
	508	TN461	CABLE		TMS CLOCK OSCILLATOR STATE DETERMINATION AND DUPLICATION CONTROL INCORRECT
	510	TN461	TN461		TMS CLOCK OSCILLATOR OOL ERROR (OFF-LINE TMS CLOCK OSCILLATOR FIRST CHOICE)
	511	TN461			TMS CLOCK OSCILLATOR PFL ERROR
	512	TN461			CANNOT COMPLETE TMS CLOCK OSCILLATOR FORCE ERROR SEQUENCE
	529	TN461	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
	554	TN461			TMS CLOCK OSCILLATOR MFP CHECKING CIRCUIT FAILED TO DETECT A MISSING FRAME PULSE
	570	TN461			TMS CLOCK OSCILLATOR MFP ERROR CANNOT BE CLEARED
	577	TN461	TN482		TMS ABBREVIATED MAINTENANCE BUS TEST FAILURE
51	415	TN462			LOCAL CLOCK TERMINATION ERROR (ERR BIT SET)
	416	TN462			LOCAL CLOCK TERMINATION ERROR (OTHER)
	417	TN462			LOCAL CLOCK TERMINATION AFTER INITIALIZATION ERROR (MFP OR ACT BIT SET)
	418	TN462			LOCAL CLOCK TERMINATION AFTER INITIALIZATION ERROR (OTHER)

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
51 (Contd)	501	TN462	CABLE	TN461	SINGLE LOCAL CLOCK TERMINATION MFP FAILURE WITH MORE THAN ONE LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
	502	CABLE	TN462	TN461	TWO LOCAL CLOCK TERMINATION MFP FAILURES WITH MORE THAN TWO LOCAL CLOCK TERMINATION CIRCUITS INSTALLED
	503	CABLE	TN462	TN461	THREE LOCAL CLOCK TERMINATION MFP FAILURES WITH MORE THAN THREE LOCAL CLOCK TERMINATION CIRCUITS INSTALLED
	505	TN462	CABLE	TN461	SINGLE LOCAL CLOCK TERMINATION MFP FAILURE - ONE LOCAL CLOCK TERMINATION CIRCUIT INSTALLED
	507	TN462	CABLE		LOCAL CLOCK TERMINATION MAINTENANCE CIRCUIT HAS MFP FAULT
	513	TN462			LOCAL CLOCK TERMINATION PFL ERROR
	515	TN462			LOCAL CLOCK TERMINATION ERR BIT SET - RESET WORKED
	516	TN462			LOCAL CLOCK TERMINATION ERR BIT SET - CANNOT RESET
	517	TN462	TN461		LOCAL CLOCK TERMINATION ACT FAILURE
	518	TN462	TN461	CABLE	CANNOT COMPLETE LOCAL CLOCK TERMINATION FORCE ERROR SEQUENCE
	522	TN462	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	555	TN462			TMS LOCAL CLOCK TERMINATION ACT CHECKING CIRCUIT FAILED TO DETECT NO ACTIVITY ERROR
	556	TN462			TMS LOCAL CLOCK TERMINATION ERR CHECKING CIRCUIT FAILED TO DETECT A CLOCK ERROR
	557	TN462			TMS LOCAL CLOCK TERMINATION MFP CHECKING CIRCUIT FAILED TO DETECT A MISSING FRAME PULSE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
51 (Contd)	571	TN462			TMS LOCAL CLOCK TERMINATION ACT ERROR CANNOT BE CLEARED
	572	TN462			TMS LOCAL CLOCK TERMINATION ERR ERROR CANNOT BE CLEARED
	573	TN462			TMS LOCAL CLOCK TERMINATION MFP ERROR CANNOT BE CLEARED
	576	TN462	TN452	TN400	TMS ABBREVIATED IOBI BUS TEST FAILURE
52	269	TN463	TN444		MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET BOARD
	405	TN463			MODULE SYSTEM CLOCK SYNCHRONIZER ERROR
	453	TN463			TMS SYSTEM CLOCK SYNCHRONIZER ERROR
	529	TN463	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
	701	TN463			HIGH ACCURACY CLOCK - TEMPORARY LOSS OF SIGNAL
	702	TN463			MAIN PHASE LOCKED LOOP - TEMPORARY LOSS OF SIGNAL
	703	TN463			MAIN PHASE LOCKED LOOP - TEMPORARY OUT OF LOCK
	704	TN463			HIGH ACCURACY CLOCK LOSS OF SIGNAL - BUILD OUT CONTROL ENABLED - MAIN PHASE LOCKED LOOP OPERATING CORRECTLY
	705	TN463			HIGH ACCURACY CLOCK LOSS OF SIGNAL - BUILD OUT CONTROL HAD TO BE RE-ENABLED - MAIN PHASE LOCKED LOOP OPERATING CORRECTLY
	706	TN463			MAIN PHASE LOCKED LOOP LOSS OF SIGNAL - SIMPLEX SYSTEM
	707	TN463			MAIN PHASE LOCKED LOOP OUT OF LOCK AND THE SYSTEM IS ON THE HIGH ACCURACY CLOCK - SIMPLEX SYSTEM
	708	TN463			MAIN PHASE LOCKED LOOP OUT OF LOCK AND GOING TO THE HIGH ACCURACY CLOCK FIXED THE MAIN PHASE LOCKED LOOP - SIMPLEX SYSTEM

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
52 (Contd)	709	TN463			MAIN PHASE LOCKED LOOP OUT OF LOCK AND GOING TO THE HIGH ACCURACY CLOCK DID NOT FIX THE MAIN PHASE LOCKED LOOP - SIMPLEX SYSTEM
	710	TN463			HIGH ACCURACY CLOCK LOSS OF SIGNAL - MAIN PHASE LOCKED LOOP OK - DUPLEX SYSTEM
	711	TN463			MAIN PHASE LOCKED LOOP LOSS OF SIGNAL - DUPLEX SYSTEM
	712	TN463			MAIN PHASE LOCKED LOOP OUT OF LOCK - DUPLEX SYSTEM
	714	TN463	ANN11	ANN11	ALL TRANSLATED REFERENCES TEMPORARY LOSS OF SIGNAL
	718	TN463	ANN11	ANN11	ALL TRANSLATED REFERENCES STEADY LOSS OF SIGNAL
	720	TN463	ANN11	ANN11	ALL TRANSLATED REFERENCES OUT OF LOCK
	724	TN463	ANN11	ANN11	ALL TRANSLATED REFERENCES STEADY OUT OF LOCK
	726	TN463			DS-1 TO SYSTEM CLOCK SYNCHRONIZER CABLE(S) DISCONNECTED
	728	TN463	ANN11		UNUSABLE REFERENCE REPORTED BY SYSTEM CLOCK SYNCHRONIZER
	741	TN463			REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY - HIGH ACCURACY CLOCK ON-LINE
	742	TN463			REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY - REFERENCES ARE REVERSED - REFERENCES SWITCHED
	743	TN463			REFERENCE SOURCE SELECTION HARDWARE DOES NOT AGREE WITH STATUS MEMORY - REFERENCES ARE REVERSED - SWITCH OF REFERENCES CANNOT BE MADE
	744	TN463			TMS STATUS BIT NOT CONSISTENT WITH TRANSLATION
	745	TN463			BOTH SYSTEM CLOCK SYNCHRONIZERS ON-LINE BITS SET OR CLEARED

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
52 (Contd)	746	TN463			BOTH SYSTEM CLOCK SYNCHRONIZERS ON-LINE BITS BACKWARDS
	747	TN463			BUILD OUT CONTROL BIT HAD TO BE RESET
	748	TN463			BUILD OUT CONTROL BIT SET AND CANNOT BE CLEARED
	749	TN463			REFERENCE SOURCE SELECTION DOES NOT AGREE WITH STATUS MEMORY - BUS TEST FAILED
	751	TN463			SYSTEM CLOCK SYNCHRONIZER CIRCUIT PACK PULLED OR ON-LINE BIT STUCK
	752	TN463			ON-LINE SYSTEM CLOCK SYNCHRONIZER OK - OFF-LINE SYSTEM CLOCK SYNCHRONIZER HAS OUT OF LOCK CONDITION
	753	TN463			SYSTEM CLOCK SYNCHRONIZER CROSS COUPLING SIGNAL INCORRECT
	754	TN463			SYSTEM CLOCK SYNCHRONIZER LOSS OF SIGNAL DETECTION CIRCUITRY FAULTY
	755	TN463			SYSTEM CLOCK SYNCHRONIZER PRIMARY/SECONDARY LOSS OF SIGNAL DETECTION CIRCUITRY FAULTY
	768	TN463			HIGH ACCURACY CLOCK COULD NOT BE SWITCHED ON-LINE
53	10	TN470	TN381		NO POSITIVE ACKNOWLEDGE AFTER MAINTENANCE ORDER TO TMS PROCESSOR
	420	TN470			FAILED MPX RAM
	421	TN470			MPX RAM PARITY ERROR RECOVERY FAILURE
	422	TN470			MPX INITIALIZATION ERROR
	423	TN470			MPX INITIALIZATION ALARM
	424	TN470			MPX RAM PARITY ERROR
	449	TN470			INITIALIZATION TMS MPX RAM TEST ERROR
	450	TN470			INITIALIZATION TMS MPX RAM PARITY CHECKER ERROR
	452	TN470			ILLEGAL MPX RAM ENTRY ERROR

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
53 (Contd)	522	TN470	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	553	TN470			TMS MPX PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORD
	569	TN470			TMS MPX PARITY ERROR CANNOT BE CLEARED
	576	TN470	TN452	TN400	TMS ABBREVIATED IOBI BUS TEST FAILURE
	582	TN470			TMS MPX RAM HAS 32 OR MORE BUSIED OUT TIME SLOTS
	584	TN470			TMS MPX RAM PARITY ERROR RECOVERY FAILURE CORRECTED
	585	TN470			TMS MPX RAM PARITY ERROR RECOVERY FAILURE NOT CORRECTED
	586	TN470			TMS MPX RAM INITIALIZATION TEST ERROR CORRECTED
	587	TN470			TMS MPX RAM INITIALIZATION TEST ERROR NOT CORRECTED
	588	TN470			TMS MPX FAILED RAM CORRECTED
	589	TN470			TMS MPX FAILED RAM NOT CORRECTED
	611	TN470	TN480 OR TN482	UN150	MPX GENERATES NETWORK TEST FLAGS
	636	TN470	TN480 OR TN482	UN150	MPX PCM ERROR
	650	TN470	TN381		MPX RAM CONTENTS INCORRECT FOR CONNECTION
54	522	TN473	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	609	TN473	TN480 OR TN482		FANOUT GENERATES NETWORK TEST FLAGS
	632	TN473	TN452	TN400	FANOUT READ ERROR
	633	TN473	TN480 OR TN482		FANOUT PCM ERROR

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
55	419	TN480			MODULE INTERFACE ERROR
	469	TN480			MODULE INTERFACE OUT OF FRAME ERROR
	522	TN480	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	551	TN480	TN481		TMS MODULE INTERFACE PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORD
	552	TN480	TN481	TN441	TMS MODULE INTERFACE TIME SLOT INTEGRITY CIRCUIT FAILED TO DETECT A BUFFER ERROR
	559	TN480	TN470		TMS MODULE INTERFACE OUT OF FRAME CIRCUIT FAILED TO DETECT A FRAMING ERROR
	567	TN480	TN481	TN441	TMS MODULE INTERFACE PARITY ERROR CANNOT BE CLEARED
	568	TN480	TN481	TN441	TMS MODULE INTERFACE TIME SLOT INTEGRITY ERROR CANNOT BE CLEARED
	575	TN480	TN470		TMS MODULE INTERFACE OUT OF FRAME ERROR CANNOT BE CLEARED
	576	TN480	TN452	TN400	TMS ABBREVIATED IOBI BUS TEST FAILURE
	600	TN480	TN481		UNDIAGNOSED MODULE INTERFACE BUFFER ERROR FROM OEP (PERIODIC ONLY)
	607	TN481	TN480	TN441	LGL TO MODULE INTERFACE SUSPECTED OF GENERATING NETWORK TEST FLAGS
	616	TN480	TN481		LGL TO MODULE INTERFACE GENERATES NETWORK TEST FLAGS
	618	TN480	TN482		MODULE INTERFACE OUTPUT GENERATES NETWORK TEST FLAGS
	619	TN480	TN482	TN470	MODULE INTERFACE INPUT GENERATES NETWORK TEST FLAGS
	623	TN480	TN452	TN400	MODULE INTERFACE READ ERROR
	630	TN481	TN480	TN441	FAULT SUSPECTED IN LGL TO MODULE INTERFACE
	643	TN480	TN481		LGL TO MODULE INTERFACE FAULT
	645	TN480	TN482	TN470	MODULE INTERFACE INPUT FAULT
	646	TN480	TN482		MODULE INTERFACE OUTPUT FAULT

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
56	30	TN441 OR TN460	TN444		INCORRECT CLOCK OUTPUT SEQUENCE (INCORRECT SAC)
	31	TN441 OR TN460	TN444		MAINTENANCE INTERFACE FAILURE CAUSED INCORRECT SAC READOUT
	32	TN441	TN444		GPP DATA CLOCK LOST MOMENTARILY (INCORRECT DCE READOUT)
	33	TN441	TN444		MAINTENANCE INTERFACE FAILURE CAUSED INCORRECT DCE READOUT
	34	TN441	TN444		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (SIMPLEX, NO SCS)
		TN441	TN441		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (DUPLEX, NO SCS)
		TN441	TN463 OR TN481	TN444	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (SIMPLEX WITH SCS)
		TN441	TN463 OR TN481	TN462	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE ON-LINE (DUPLEX WITH SCS)
	35	TN441	TN444		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (SIMPLEX, NO SCS)
		TN441	TN441		CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (DUPLEX, NO SCS)
		TN441	TN463 OR TN481	TN444	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (SIMPLEX WITH SCS)
		TN441	TN463 OR TN481	TN462	CLOCK OUT OF LOCK WITH REFERENCE CLOCK, MODULE OFF-LINE (DUPLEX WITH SCS)
	36	TN441	TN444		MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE ON-LINE
	37	TN441	TN444		MIF FAILURE CAUSED INCORRECT OOL READOUT, MODULE OFF-LINE
	38	TN441	TN444		CLOCK FREQUENCY GENERATOR FAILED

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
56 (Contd)	39	TN441	TN444		MIF FAILURE CAUSED INCORRECT DCE OOL READOUT
	40	TN441	TN444	TN530	OFF-LINE CLOCK APPEARS AS MASTER WITH NO SCS/LGI PRESENT
	41	TN441	TN444		MIF FAILURE CAUSED OFF-LINE CLOCK TO APPEAR AS MASTER WITH NO SCS/LGI PRESENT
	42	TN441	TN463 OR TN481	TN444	CLOCK APPEARS AS MASTER WITH SCS/LGI PRESENT
	43	TN441	TN444		MIF FAILURE CAUSED CLOCK TO APPEAR AS MASTER WITH SCS/LGI PRESENT
	44	TN441	TN444		ON-LINE CLOCK APPEARS AS SLAVE WITH NO SCS/LGI PRESENT
	45	TN441	TN444		MIF FAILURE CAUSED MAINTENANCE INTERFACE APPEARANCE OF ON-LINE CLOCK AS SLAVE WITH NO SCS/LGI PRESENT
	57	TN441			INTERMODULE DATA STORE OR MODULE CLOCK OUT OF LOCK CAUSED TSI TEST FAILURE
	404	TN441	TN461		INTERMODULE DATA STORE ERROR
	407	TN441			TSI PCM DATA PARITY ERROR
	601	TN441			UNDIAGNOSED MODULE INTERFACE BUFFER ERROR FROM OEP (PERIODIC ONLY)
	602	TN441	TN481	TN446	INTERMODULE DATA STORE INPUT STORE GENERATES NETWORK TEST FLAGS
	606	TN441	TN446		INTERMODULE DATA STORE OUTPUT STORE GENERATES NETWORK TEST FLAGS
	608	TN441			INTERMODULE DATA STORE TRANSMITS NETWORK TEST FLAGS TO TMS
	625	TN441	TN481	TN446	INTERMODULE DATA STORE CROSS COUPLING FAILURE
	628	TN441	TN444		INTERMODULE DATA STORE READ ERROR
	629	TN441	TN446		INTERMODULE DATA STORE OUTPUT STORE FAULT

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
56 (Contd)	631	TN441			INTERMODULE DATA STORE TRANSMIT TO TMS FAULT
	639	TN441	TN481	TN446	INTERMODULE DATA STORE INPUT STORE FAILURE
57	409	TN481			LIGHT GUIDE INTERFACE ERROR
	550	TN481	TN480		TMS LIGHT GUIDE INTERFACE PARITY CHECKING CIRCUIT FAILED TO DETECT A BAD PARITY WORD
	558	TN481	TN441		TMS LIGHT GUIDE INTERFACE OUT OF FRAME CIRCUIT FAILED TO DETECT A FRAMING ERROR
	566	TN481	TN480		TMS LIGHT GUIDE INTERFACE PARITY ERROR CANNOT BE CLEARED
	574	TN481	TN441		TMS LIGHT GUIDE INTERFACE OUT OF FRAME ERROR CANNOT BE CLEARED
	577	TN481	TN444		TMS ABBREVIATED MAINTENANCE BUS TEST FAILURE
	612	TN481	TN480	TN441	LGL TO LIGHT GUIDE INTERFACE SUSPECTED OF GENERATING NETWORK TEST FLAGS
	613	TN481			LIGHT GUIDE INTERFACE TRANSMITS NETWORK TEST FLAGS TO MODULES
	614	TN481	TN441		LIGHT GUIDE INTERFACE OUTPUT TO TMS GENERATES NETWORK TEST FLAGS
	615	TN481	TN441		LIGHT GUIDE INTERFACE INPUT FROM TMS GENERATES NETWORK TEST FLAGS
	617	TN481	TN480		LGL TO LIGHT GUIDE INTERFACE GENERATES NETWORK TEST FLAGS
	624	TN481	TN441	TN480	LIGHT GUIDE INTERFACE CROSS COUPLING FAILURE
	637	TN481	TN444		LIGHT GUIDE INTERFACE READ ERROR
	638	TN481	TN480	TN441	FAULT SUSPECTED IN LGL TO LIGHT GUIDE INTERFACE
	640	TN481			LIGHT GUIDE INTERFACE PCM TRANSMIT TO MODULE FAULT
	641	TN481	TN441		LIGHT GUIDE INTERFACE OUTPUT TO TMS FAULT

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
57 (Contd)	642	TN481	TN441		LIGHT GUIDE INTERFACE INPUT FROM TMS FAULT
	644	TN481	TN480		LGL TO LIGHT GUIDE INTERFACE FAULT
58	522	UN150	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	610	UN150	TN473		FAN IN GENERATES NETWORK TEST FLAGS
	634	UN150	TN452	TN400	FAN IN READ ERROR
	635	UN150	TN473		FAN IN PCM ERROR
59	430	TN482			TMIF PFAIL/LATE MAKE ALARM
	447	TN482			TMIF WRITE FAILURE
	451	TN482			TMS INTERFACE ERROR
	509	TN482	TN461		MAINTENANCE INTERFACE FAILURE CAUSED TMS CLOCK OSCILLATOR FAILURE
	522	TN482	TN452		TMS IOBI BUS - BAD TEST REGISTER VALUE FROM IOBI SPACE BOARD
	526	TN482	TN400	TN381	TMS IOBI BUS - BAD CLOCK ON TMIF
	528	TN482			TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TMIF
	529	TN482	TN482		TMS MAINTENANCE BUS - BAD TEST REGISTER VALUE FROM TARGET IOBI BOARD
	530	TN482			TMS MAINTENANCE BUS - BAD SAC VALUE
	531	TN482			TMS MAINTENANCE BUS - TMIF DID NOT FLAG BAD PARITY
	605	TN482			TMIF GENERATES TEST VECTORS WHEN SHUT OFF
	621	TN482			TMIF READ ERROR
	627	TN482			TMIF TEST VECTOR OUTPUT INCORRECT
62	12	SN261			TIME SLOT UNAVAILABLE
	199	SN261			BUSY OUT FAILED
	218	SN261			NETWORK ORDER FAILED
	219	SN261			RELEASE BUSY OUT FAILED
	337	SN261			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
	350	SN261	TN452	TN400	ADFTC DIGITAL SELF-TEST FAULT
	351	SN261	TN452	TN400	ADFTC DTL IDLE BIT SET

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
62 (Contd)	352	SN261	TN452	TN400	ADFTC DIGITAL SELF-TEST AND DTLI TOGETHER
	353	SN261	TN452	TN400	ADFTC ANALOG SELF-TEST FAULT
	354	SN261	TN452	TN400	ADFTC ANALOG AND DIGITAL SELF-TEST FAULT TOGETHER
	355	SN261	TN452	TN400	ADFTC ANALOG SELF-TEST AND DTLI TOGETHER
	356	SN261	TN452	TN400	ADFTC ANALOG, DIGITAL SELF-TEST FAULT, AND DTLI TOGETHER
	357	SN261	TN452	TN400	ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED
	358	SN261	TN452	TN400	MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED
	359	SN261			GPP TEST RECEIVED NO RESPONSE FROM ADFTC AFTER ID REQUEST
	360	SN261			GPP TEST FOUND STATE OF HEALTH BIT SET FOR ADFTC
	361	SN261	TN452	TN400	FAILURE OF PORT BLA SET (NON REMOTED BOARD)
	362	SN261	TN454		SAC FAILED TO CLEAR IN PORT DTL LOOP AROUND TEST
	363	SN261	TN454		INVALID SAC SIGNATURE IN PORT DTL LOOP AROUND TEST
	364	SN261	TN454		ERROR IN TDR IN PORT DTL LOOP AROUND TEST (NON REMOTED BOARD)
	454	SN261			DTLF FAULT ON ADFTC (DIGITAL SELF-TEST)
	455	SN261			48-VOL FAULT ON ADFTC (ANALOG SELF-TEST)
	456	SN261			48-VOL AND DTLF FAULTS TOGETHER ON ADFTC
	457	SN261			PROTOCOL ERROR ON ADFTC
	458	SN261			DTL IDLE ON ADFTC
	1000	SN261			COULD NOT SEND AN S MESSAGE
	1001	SN261			FACILITY NOT TESTED FOR MORE THAN X CYCLES
	1005	SN261			NO BITS RECEIVED ON A ONE PORT ADFTC SELF-TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
62 (Contd)	1006	SN261			DATA TRANSMISSION INTERRUPTED: ONE PORT ADFTC SELF-TEST
	1007	SN261			BIT ERROR RATE EXCEEDED FOR ONE PORT ADFTC SELF-TEST
	1008	SN261			BLOCK ERROR RATE EXCEEDED FOR ONE PORT ADFTC SELF-TEST
	1009	SN261			EIA UPDATE FAILURE DURING A ONE PORT ADFTC SELF-TEST
	1010	SN261			ERROR OVERFLOW DURING A ONE PORT ADFTC SELF-TEST
	1011	SN261			UNDEFINED ERROR DURING A ONE PORT ADFTC SELF-TEST
	1012	SN261			NO BITS RECEIVED ON A TWO PORT NORMAL ADFTC SELF-TEST
	1013	SN261			DATA TRANSMISSION INTERRUPTED: TWO PORT NORMAL ADFTC SELF-TEST
	1014	SN261			BIT ERROR RATE EXCEEDED FOR TWO PORT NORMAL ADFTC SELF-TEST
	1015	SN261			BLOCK ERROR RATE EXCEEDED FOR TWO PORT NORMAL ADFTC SELF-TEST
	1016	SN261			EIA UPDATE FAILURE DURING A TWO PORT NORMAL ADFTC SELF-TEST
	1017	SN261			ERROR OVERFLOW DURING A TWO PORT NORMAL ADFTC SELF-TEST
	1018	SN261			UNDEFINED ERROR DURING A TWO PORT NORMAL ADFTC SELF-TEST
	1019	SN261			NO BITS RECEIVED ON A TWO PORT REVERSE ADFTC SELF-TEST
	1020	SN261			DATA TRANSMISSION INTERRUPTED: TWO PORT REVERSE ADFTC SELF-TEST
	1021	SN261			BIT ERROR RATE EXCEEDED FOR TWO PORT REVERSE ADFTC SELF-TEST
	1022	SN261			BLOCK ERROR RATE EXCEEDED FOR TWO PORT REVERSE ADFTC SELF-TEST
	1023	SN261			EIA UPDATE FAILURE DURING A TWO PORT REVERSE ADFTC SELF-TEST
	1024	SN261			ERROR OVERFLOW DURING A TWO PORT REVERSE ADFTC SELF-TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
62 (Contd)	1025	SN261			UNDEFINED ERROR DURING A TWO PORT REVERSE ADFTC SELF-TEST
	1026	SN261			UNSENT STOP MESSAGE RECEIVED BY ADFTC
	1027	SN261			DID NOT RECEIVE EXPECTED: TEST ABORTED S MESSAGE
	1028	SN261			DID NOT RECEIVE EXPECTED: TEST COMPLETED S MESSAGE
	1029	SN261			THE BIT AND/OR BLOCK ERROR RATES WERE NOT RECEIVED
	1425	SN261			ADFTC DID NOT RETURN A SETUP (HANDSHAKE) RESULT MESSAGE
	1426	SN261			ADFTC DID NOT RECEIVE A SET TEST (START HANDSHAKE) MESSAGE
66	100	SN255	TN452	TN400	NON-ZERO IDLE PORT CONTROL REGISTER
	120	SN255	TN452	TN400	VALID TONE PRESENT BIT STUCK ACTIVE IN SUMMARY BOARD SCAN
	121	SN255	TN454	SN250 OR SN253	VALID TONE PRESENT NOT INDICATED IN SUMMARY BOARD SCAN (REORDER OR DATA ANSWER TONE USED)
	122	SN255	TN454	SN250 OR SN253	VALID TONE PRESENT NOT INDICATED IN TONE REGISTER (REORDER OR DATA ANSWER TONE USED)
	123	SN255	TN454	SN250 OR SN253	TONE NOT DETECTED IN TONE REGISTER (REORDER OR DATA ANSWER TONE USED)
	146	SN255	TN452	TN400	FAULTY DIGITAL SIGNAL PROCESSOR
	427	SN255			CONTROL/SUMMARY - SCAN REGISTER READ ERROR
68	199	ANN11			BUSY OUT FAILED
	219	ANN11			RELEASE BUSY OUT FAILED
	267	ANN11	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	337	ANN11			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
	364	ANN11			ERROR IN TDR IN PORT DTL LOOP AROUND TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
68 (Contd)	713	ANN11	TN463		PRIMARY REFERENCE TEMPORARY LOSS OF SIGNAL
	715	ANN11	TN463		SECONDARY REFERENCE TEMPORARY LOSS OF SIGNAL
	716	ANN11	TN463		SECONDARY REFERENCE STEADY LOSS OF SIGNAL - PRIMARY REFERENCE HEALTHY
	717	ANN11	TN463		PRIMARY REFERENCE STEADY LOSS OF SIGNAL - SECONDARY REFERENCE HEALTHY
	719	ANN11	TN463		SECONDARY REFERENCE TEMPORARILY OUT OF LOCK
	721	ANN11	TN463		SECONDARY REFERENCE STEADY OUT OF LOCK
	722	ANN11	TN463		PRIMARY REFERENCE TEMPORARILY OUT OF LOCK
	723	ANN11	TN463		PRIMARY REFERENCE STEADY OUT OF LOCK - SECONDARY REFERENCE HEALTHY
	727	ANN11			BOARD PROCESSOR SANITY
	729	FAC	ANN11		LOSS OF SIGNAL AT DS-1
	730	FAC	ANN11		YELLOW ALARM RECEIVED
	731	ANN11			BOARD HEALTH
	732	FAC	ANN11		MAJOR ERROR RATE
	733	FAC	ANN11		MINOR ERROR RATE
	734	FAC	ANN11		RED ALARM DETECTED
	735	FAC	ANN11		CARRIER GROUP ALARM
	736	FAC	ANN11		SLIP RATE EXCEEDED - REFERENCES SWITCHED
	737	FAC	ANN11		SLIP RATE THRESHOLD EXCEEDED
	738	FAC	ANN11		MISFRAME THRESHOLD EXCEEDED
	739	FAC	ANN11		MISFRAME THRESHOLD EXCEEDED - SIGNIFICANT SLIPS ALSO OCCURRING
	740	FAC	ANN11		MISFRAME THRESHOLD EXCEEDED - SECONDARY REFERENCE AVAILABLE
	750	FAC	ANN11	ANN11	MISFRAME THRESHOLD EXCEEDED ON PRIMARY AND SECONDARY REFERENCES

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
68 (Contd)	758	LINK	ANN11		LOSS OF SIGNAL BETWEEN BOTH DS-1 INTERFACES BEFORE GLOBAL INITIALIZATION
	759	LINK	ANN11		LOSS OF MULTIFRAME ALIGNMENT ON THE SIGNALING CHANNEL BEFORE GLOBAL INITIALIZATION (OOF ON SIGNALING CHANNEL)
	760	LINK	ANN11		LOSS OF MULTIFRAME ALIGNMENT ON THE SIGNALING CHANNEL AFTER GLOBAL INITIALIZATION (OOF)
	761	ANN11	LINK		REMOTE MULTIFRAME ALARM ON THE SIGNALING CHANNEL BEFORE GLOBAL INITIALIZATION (OOF AT FAR END)
	762	FAC	LINK	ANN11	RED ALARM RAISED AFTER GLOBAL INITIALIZATION (OUT OF FRAME)
	763	ANN11	LINK		REMOTE MULTIFRAME ALARM ON THE SIGNALING CHANNEL AFTER GLOBAL INITIALIZATION (OOF AT FAR END)
	764	LINK	ANN11		BLUE ALARM BEFORE GLOBAL INITIALIZATION (NON-LOCAL OUT OF SERVICE DS-1 FACILITY)
	765	ANN11			LOSS OF PROCESSOR SANITY AFTER GLOBAL INITIALIZATION
	766	ANN11			INTERFACE CANNOT BE GLOBALLY INITIALIZED
	767				DS-1 REFERENCE JUST TESTED CANNOT BE SWITCHED ON-LINE
	770	REF WIRE	TN463	ANN11	LOSS OF SIGNAL FROM THE DS-1 TO THE SYSTEM CLOCK SYNCHRONIZER
	771	FAC	LINK	ANN11	DAILY LIMIT EXCEEDED FOR SLIPS BEFORE GLOBAL INITIALIZATION
	772	FAC	LINK	ANN11	DAILY LIMIT EXCEEDED FOR MISFRAMES BEFORE GLOBAL INITIALIZATION
	773	FAC	LINK	ANN11	RED ALARM RAISED, OUT OF FRAME BEFORE GLOBAL INITIALIZATION
	774	FAC	LINK	ANN11	MAJOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
	775	FAC	LINK	ANN11	MINOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
68 (Contd)	776	LINK	ANN11		BLUE ALARM AFTER GLOBAL INITIALIZATION (NON-LOCAL OUT OF SERVICE DS-1 FACILITY)
	777	ANN11			MAINTENANCE CONTROL REGISTER IS DEFECTIVE
	778	ANN11			OPTION CONTROL REGISTER IS DEFECTIVE
	779	ANN11			SCAN MORE CONTROL REGISTER IS DEFECTIVE
	780	ANN11			DISABLE SIGNALING CONTROL REGISTER IS DEFECTIVE
	781	ANN11			PORT CONTROL REGISTER IS DEFECTIVE
	783	ANN11			SUMMARY SCAN STATUS REGISTER IS DEFECTIVE
	784	ANN11			STATUS RESET CONTROL REGISTER IS DEFECTIVE
	785				DS-1 REFERENCE IS NOT MAINTENANCE BUSY. WARNING: IF THIS INTERFACE IS A REFERENCE, THEN BUSYING OUT THE CIRCUIT AND TESTING IT MAY BE SERVICE AFFECTING TO OTHER DIGITAL FACILITIES BECAUSE THE CAPABILITY TO COMMUNICATE AT A DIGITAL RATE WOULD BE LOST FOR THE DURATION OF THE TEST
	1601	LINK	ANN11		YELLOW ALARM RECEIVED BEFORE GLOBAL INITIALIZATION
	1602	LINK	ANN11		YELLOW ALARM RECEIVED AFTER GLOBAL INITIALIZATION
	1850	ANN11			BOARD PROCESSOR SANITY
	1851	ANN11			ERROR REPORTED IN PROCESSOR STATUS REGISTER
	1852	ANN11			ERROR REPORTED IN ENVIRONMENT REGISTERS
	1853	ANN11			LOSS OF SIGNAL REPORTED BY SYSTEM CLOCK SYNCHRONIZER BOARD
	1854	ANN11			ERROR REPORTED IN FIBER STATUS REGISTER

TABLE AH. (Contd)

PROC 620 - FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
68 (Contd)	1855	ANN11			LOSS OF SIGNAL REPORTED BY DS-1 BOARD
	1856	ANN11			EXCESSIVE SLIPS
	1857	ANN11			EXCESSIVE MISFRAMES
	1858	ANN11			LOSS OF FRAMING REPORTED BY FAR END (YELLOW ALARM)
	1859	ANN11			BOARD HEALTH ERROR
	1860	ANN11			MAJOR ERROR RATE ALARM
	1861	ANN11			MINOR ERROR RATE ALARM
	1862	ANN11			LOSS OF FRAMING REPORT (RED ALARM)
	1863	ANN11			LOSS OF MULTIFRAME ALIGNMENT
	1864	ANN11			LOSS OF MULTIFRAME ALIGNMENT REPORTED BY FAR END
	1865	ANN11			FAR END IN LOOP AROUND (BLUE ALARM)
	1866	ANN11			OTHER ERROR REPORT - NO ERRORS FOUND
69	13	ANN17			CIRCUIT IN USE BY CALL PROCESSING
	51	ANN17			PORT RESOURCES NOT AVAILABLE
	109	ANN17	TN452	TN400	FAULTY SET OF LA FLIP-FLOP
	110	ANN17	TN452	TN400	FAULTY SET OF CPU FLIP-FLOP
	118	ANN17	TN452	TN400	FAULTY CLEAR OF LA FLIP-FLOP
	124	ANN17	TN452	TN400	FAULTY CLEAR OF CPU FLIP-FLOP
	125	ANN17	TN452	TN400	OFF-HOOK ERROR, POSSIBLY FROM ATTACHED STATION
	131	ANN17	TN452	TN400	TERMINATED LINE FAILED TO INDICATE OFF-HOOK
	149	ANN17	TN454	SN250	INSUFFICIENT 440-HZ ON-HOOK REFLECTION
	150	ANN17	TN454	SN250	EXCESSIVE 440-HZ ON-HOOK REFLECTION
	152	ANN17	TN454	SN250	EXCESSIVE 440-HZ OFF-HOOK REFLECTION
	153	ANN17	TN454	SN250	EXCESSIVE SIGNAL AT OTHER THAN 440-HZ
	154	ANN17	TN454	SN250	ON-HOOK STATUS FAILED TO POWER DOWN CODEC

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 1	CKT 3	DEFINITION
69 (Contd)	199	ANN17			BUSY OUT FAILED
	219	ANN17			RELEASE BUSY OUT FAILED
	267	ANN17	TN451 OR TN452	TN451	PORT COMMAND BUS - BAD TEST REGISTER VALUE FROM PORT
	280	ANN17	TN452	TN400	MLP CONTROLLER FAULT
	281	ANN17	TN452	TN400	MLP 48-V OVERLOAD
	282	ANN17	TN401		MLP DRIVER CIRCUITRY FAILURE
	283	ANN17	TN452	TN400	MLP FAILED TO RETURN ID REQUEST
	284	ANN17	TN452	TN400	MLP RESPONDED TO OFF-HOOK TEST WITH SOMETHING BESIDES ON, OFF, OR NO RESPONSE
	344	ANN17	TN454	SN250	INSUFFICIENT TOUCH-TONE SIGNAL REFLECTION
	345	ANN17	TN454	SN250	EXCESSIVE TOUCH-TONE SIGNAL REFLECTION
	436	ANN17			MLP CONTROLLER FAULT, INITIALIZATION FAILED
	441	ANN17			MLP CONTROLLER FAULT, INITIALIZATION SUCCESSFUL
	998	ANN17			CANNOT TEST UNTRANSLATED PORT
	999	ANN17			REQUESTED TEST NOT PROVIDED FOR THIS UNIT
	1619	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
	1620	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION
	1621	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
	1622	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
	1623	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
	1624	ANN17	ANN16		FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
	1641	ANN17			PORT FAILURE ON REMOTE MFAT BOARD

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
71	391	TN456 CENTRAL	TN452	TN400	UNABLE TO READ REMOTE MODULE INTERFACE STATUS
	392	TN456 CENTRAL	TN452	TN400	UNABLE TO WRITE REMOTE MODULE INTERFACE CONTROL
	393	TN456 CENTRAL	TN456 REMOTE	FIBER	REMOTE MODULE INTERFACE LFAIL BIT FOUND SET, EXPECTED TO BE CLEARED
	394	TN456 CENTRAL	TN456 REMOTE	FIBER	REMOTE MODULE INTERFACE FRMERR BIT FOUND SET, EXPECTED TO BE CLEARED
	395	TN401	CABLE	TN456 REMOTE	4-MHZ CHANNEL ERROR ON REMOTE END REMOTE MODULE INTERFACE
	396	TN456 REMOTE	TN456 CENTRAL	FIBER	REMOTE RMI FAILURE
	397	FIBER	TN456 REMOTE	TN456 CENTRAL	REMOTE MODULE INTERFACE FIBER LINK OR REMOTE RMI POWER FAILURE
	398	TN402	CABLE	TN456 CENTRAL	4-MHZ CHANNEL TO CENTRAL REMOTE MODULE INTERFACE FAILURE (RMI STATUS NORMAL)
	399	TN456 CENTRAL	TN452	TN400	CENTRAL REMOTE MODULE INTERFACE FAILURE (4-MHZ LOOP BACK FAILED AND RMI STATUS FAILED)
72	13	SN238			CIRCUIT IN USE BY CALL PROCESSING
	199	SN238			BUSY OUT FAILED
	219	SN238			RELEASE BUSY OUT FAILED
	337	SN238			HYPERACTIVE PORT (RECEIVING TOO MANY SIGNALS)
	357	SN238	TN452	TN400	ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOVED BOARD)

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
72 (Contd)	357	SN238	ANN16		ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (REMOTED BOARD)
	358	SN238	TN452	TN400	MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (NON-REMOTED BOARD)
	358	SN238	ANN16		MORE THAN ONE S CHANNEL RETRANSMISSION TO THE PORT HAS OCCURRED (REMOTED BOARD)
	359	SN238			GPP TEST RECEIVED NO RESPONSE FROM ASSOCIATED DI AFTER ID REQUEST (NON-REMOTED BOARD)
	359	SN238	ANN16		GPP TEST RECEIVED NO RESPONSE FROM ASSOCIATED DI AFTER ID REQUEST (REMOTED BOARD)
	360	SN238			GPP TEST FOUND STATE OF HEALTH BIT SET FOR ASSOCIATED DI (NON-REMOTED BOARD)
	360	SN238	ANN16		GPP TEST FOUND STATE OF HEALTH BIT SET FOR ASSOCIATED DI (REMOTED BOARD)
	373	SN238			PORT PROCESSOR FAULT
	374	SN238			SIGNALING PROCESSOR FAULT
	375	SN238			PORT PROCESSOR AND SIGNALING PROCESSOR FAULT
	376	SN238			LOSS OF DATA FAULT AND PORT PROCESSOR FAULT
	377	SN238			LOSS OF DATA, PORT PROCESSOR, AND SIGNALING PROCESSOR FAULTS
	378	SN238			SIGNALING PROCESSOR FAULT, INITIALIZATION SUCCESSFUL
	379	SN238			SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION SUCCESSFUL
	380	SN238			LOSS OF DATA, SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION SUCCESSFUL
	381	SN238			SIGNALING PROCESSOR FAULT, INITIALIZATION FAILED

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
72 (Contd)	382	SN238			SIGNALING AND PORT PROCESSOR FAULTS, INITIALIZATION FAILED
	383	SN238			LOSS OF DATA, SIGNALING, AND PORT PROCESSOR FAULTS, INITIALIZATION FAILED
	384	SN238			PORT PROCESSOR FAULT, RESET SUCCESSFUL
	385	SN238			LOSS OF DATA FAULT, RESET SUCCESSFUL
	386	SN238			PORT PROCESSOR FAULT, RESET FAILED
	387	SN238			LOSS OF DATA FAULT, RESET FAILED
	462	SN238			PROTOCOL ERROR ON EIA
	463	SN238			EIA SIGNALING PROCESSOR FAULT, INITIALIZATION SUCCESSFUL
	464	SN238			EIA SIGNALING PROCESSOR FAULT, INITIALIZATION FAILED
	465	SN238			EIA PORT FAULT, RESET SUCCESSFUL
	466	SN238			EIA PORT FAULT, RESET FAILED
	467	SN238			EIA LOSS OF DATA, RESET SUCCESSFUL
	468	SN238			EIA LOSS OF DATA, RESET FAILED
	995	SN238			USE PROC 646 TO COMPLETE TESTS ON THIS CIRCUIT
	998	SN238			CANNOT TEST UNTRANSLATED PORT
	1619	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 1 BEFORE GLOBAL INITIALIZATION
	1620	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 1 AFTER GLOBAL INITIALIZATION
	1621	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 2 BEFORE GLOBAL INITIALIZATION
	1622	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 2 AFTER GLOBAL INITIALIZATION
	1623	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 3 BEFORE GLOBAL INITIALIZATION
	1624	SN238	ANN16		FAILURE ON REMOTE PORT BOARD 3 AFTER GLOBAL INITIALIZATION
	1633	SN238			PORT FAILURE ON REMOTE EIA BOARD
74	364	ANN15			ERROR IN TDR IN PORT DTL LOOP AROUND TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
74 (Contd)	758	LINK	ANN15 OR ANN16		LOSS OF SIGNAL BETWEEN RCL AND RCC BEFORE GLOBAL INITIALIZATION
	762	LINK	ANN15 OR ANN16		RED ALARM RAISED AFTER GLOBAL INITIALIZATION (OUT OF FRAME)
	765	ANN15 OR ANN16			LOSS OF PROCESSOR SANITY AFTER GLOBAL INITIALIZATION
	766	ANN15 OR ANN16			INTERFACE CANNOT BE GLOBALLY INITIALIZED
	771	LINK	ANN15 OR ANN16		DAILY LIMIT EXCEEDED FOR SLIPS BEFORE GLOBAL INITIALIZATION
	772	LINK	ANN15 OR ANN16		DAILY LIMIT EXCEEDED FOR MISFRAMES BEFORE GLOBAL INITIALIZATION
	773	LINK	ANN15 OR ANN16		RED ALARM RAISED, OUT OF FRAME BEFORE GLOBAL INITIALIZATION
	774	LINK	ANN15 OR ANN16		MAJOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
	775	LINK	ANN15 OR ANN16		MINOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
	777	ANN15 OR ANN16			MAINTENANCE CONTROL REGISTER IS DEFECTIVE
	782	LINK	ANN16	ANN15	NO COMMUNICATION FROM FAR END BEFORE GLOBAL INITIALIZATION
	784	ANN15 OR ANN16			STATUS RESET CONTROL REGISTER IS DEFECTIVE
	785				RCL OR RCC INTERFACE IS NOT MAINTENANCE BUSY
	1601	LINK	ANN15 OR ANN16		YELLOW ALARM RECEIVED BEFORE GLOBAL INITIALIZATION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
74 (Contd)	1602	LINK	ANN15 OR ANN16		YELLOW ALARM RECEIVED AFTER GLOBAL INITIALIZATION
	1604	LINK	ANN15		LOSS OF SIGNAL AND NO COMMUNICATION FROM THE FAR END AFTER GLOBAL INITIALIZATION
	1606	LINK	ANN15		NO COMMUNICATION FROM FAR END AFTER GLOBAL INITIALIZATION
	1607	ANN15			FAILURES IN ONE OR TWO OF THE THREE NIB CHIPS
	1608	ANN15			OPTION CONTROL REGISTER AND ADMINISTERED VALUES MISMATCH
	1612	ANN15 OR ANN16			PROCESSOR SANITY AND HEALTH ERROR
	1613	ANN15			PROCESSOR SANITY AND CONTROL PATH AND HEALTH ERROR
	1614	ANN15			PROCESSOR SANITY AND NIB AND HEALTH ERROR
	1615	ANN15 OR ANN16			PROCESSOR SANITY AND RAM AND HEALTH ERROR
	1616	ANN15 OR ANN16			PROCESSOR SANITY AND ROM AND HEALTH ERROR
	1625				ONE OR MORE ENVIRONMENTAL ERRORS HAVE BEEN DETECTED
	1626	ANN16	LINK		REFLECTED SIGNAL IS ABOVE THE HIGH THRESHOLD
	1627	ANN16	LINK		REFLECTED SIGNAL IS BELOW THE LOW THRESHOLD
	1629	ANN16			SANITY AND HEALTH AND IO FAILURE
	1631	ANN16	LINK		RCC INTERFACE HAS ERROR BITS SET
	1632	ANN15	LINK		RCL INTERFACE HAS ERROR BITS SET
	1634	ANN16			FIRMWARE ERROR ON RCC INTERFACE
	1635	ANN15			FIRMWARE ERROR ON RCL INTERFACE
	1637	LINK	ANN16		MAJOR ALARM FROM ERROR RATE ON RCC INTERFACE

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
74 (Contd)	1638	LINK	ANN15		MAJOR ALARM FROM ERROR RATE ON RCL INTERFACE
	1639	LINK	ANN16		MINOR ALARM FROM ERROR RATE ON RCC INTERFACE
	1640	LINK	ANN15		MINOR ALARM FROM ERROR RATE ON RCL INTERFACE
	1643	ANN16			PROCESSOR SANITY AND HEALTH AND PER TIME SLOT PCM FAILURE
	1644				FIBER STATUS REGISTER CONTENTS DO NOT AGREE WITH ADMINISTERED VALUE FOR THE RCL T1/FIBER OPTION
	1647	LINK			NO RESPONSE FROM FIRMWARE TEST 1 REQUEST
	1648	ANN15			LOSS OF SIGNAL BETWEEN FIBER TERMINATION POINT AND DS-1 CHIP SET ON THE RCL
	1649	LINK	ANN15		LOSS OF SIGNAL BETWEEN RCL AND RCC WITH A FIBER CONNECTION
	1651	ANN16			ERROR REPORTED IN PROCESSOR STATUS REGISTER
	1652	ANN16			ERROR REPORTED IN FIBER STATUS REGISTER
	1653	ANN16			OTHER ERROR REPORTED BUT NO ERROR FOUND
	1850	ANN15 OR ANN16			BOARD PROCESSOR SANITY
	1851	ANN15 OR ANN16			ERROR REPORTED IN PROCESSOR STATUS REGISTER (I/O ERROR - LOSS OF PROTOCOL)
	1852	ANN15 OR ANN16			ERROR REPORTED IN ENVIRONMENT REGISTERS
	1853	ANN15 OR ANN16			LOSS OF SIGNAL REPORTED BY SYSTEM CLOCK SYNCHRONIZER BOARD
	1854	ANN15 OR ANN16			ERROR REPORTED IN FIBER STATUS REGISTER

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
74 (Contd)	1855	ANN15 OR ANN16			LOSS OF SIGNAL REPORTED BY DS-1 BOARD
	1856	ANN15 OR ANN16			EXCESSIVE SLIPS
	1857	ANN15 OR ANN16			EXCESSIVE MISFRAMES
	1858	ANN15 OR ANN16			LOSS OF FRAMING REPORTED BY FAR END (YELLOW ALARM)
	1859	ANN15 OR ANN16			BOARD HEALTH ERROR
	1860	ANN15 OR ANN16			MAJOR ERROR-RATE ALARM
	1861	ANN15 OR ANN16			MINOR ERROR-RATE ALARM
	1862	ANN15 OR ANN16			LOSS OF FRAMING REPORT (RED ALARM)
	1863	ANN15 OR ANN16			LOSS OF MULTIFRAME ALIGNMENT
	1864	ANN15 OR ANN16			LOSS OF MULTIFRAME ALIGNMENT REPORTED BY FAR END
	1865	ANN15 OR ANN16			FAR END IN LOOP AROUND (BLUE ALARM)
	1866	ANN15 OR ANN16			OTHER ERROR REPORT - NO ERRORS FOUND
75	364	ANN35			ERROR IN TDR IN PORT DTL LOOP AROUND TEST
	1850	ANN35			BOARD PROCESSOR SANITY

TABLE AH. (Contd)

PROC 620 - SEPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
75 (Contd)	1851	ANN35			ERROR REPORTED IN PROCESSOR STATUS REGISTER
	1852	ANN35			ERROR REPORTED IN ENVIRONMENT REGISTERS
	1853	ANN35			LOSS OF SIGNAL REPORTED BY SYSTEM CLOCK SYNCHRONIZER BOARD
	1854	ANN35			ERROR REPORTED IN FIBER STATUS REGISTER
	1855	ANN35			LOSS OF SIGNAL REPORTED BY DS-1 BOARD
	1856	ANN35			EXCESSIVE SLIPS
	1857	ANN35			EXCESSIVE MISFRAMES
	1858	ANN35			LOSS OF FRAMING REPORTED BY FAR END (YELLOW ALARM)
	1859	ANN35			BOARD HEALTH ERROR
	1860	ANN35			MAJOR ERROR-RATE ALARM
	1861	ANN35			MINOR ERROR-RATE ALARM
	1862	ANN35			LOSS OF FRAMING REPORT (RED ALARM)
	1863	ANN35			LOSS OF MULTIFRAME ALIGNMENT
	1864	ANN35			LOSS OF MULTIFRAME ALIGNMENT REPORTED BY FAR END
	1865	ANN35			FAR END IN LOOP AROUND (BLUE ALARM)
	1866	ANN35			OTHER ERROR REPORT - NO ERRORS FOUND
	1900	ANN35			DUAL PORT RAM ADDRESSING FAILURE
	1901				BLUE ALARM DETECTED BEFORE GLOBAL INITIALIZATION
	1902				BLUE ALARM DETECTED AFTER GLOBAL INITIALIZATION
	1903	LINK	ANN35		LOSS OF SIGNAL BETWEEN PRIS BEFORE GLOBAL INITIALIZATION
	1904	ANN35			DS-1 CHIP SET AND HEALTH ERROR
	1905	ANN35			DUAL PORT AND HEALTH ERROR
	1906				FIBER STATUS REGISTER CONTENTS DO NOT AGREE WITH ADMINISTERED VALUE FOR THE PRI T1/FIBER OPTION

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
75 (Contd)	1907	ANN35			FIFO AND HEALTH ERROR
	1908	LINK	ANN35		LOSS OF SIGNAL BETWEEN PRIS WITH A FIBER CONNECTION
	1909	TN463			HIGH ACCURACY CLOCK CANNOT BE SWITCHED ON-LINE
	1910	ANN35			HEALTH BIT OF SELECTED PRI IS SET BEFORE GLOBAL INITIALIZATION INDICATING THAT A FIRMWARE TEST FAILED
	1911	ANN35			HEALTH BIT OF SELECTED PRI IS SET AFTER GLOBAL INITIALIZATION INDICATING THAT A FIRMWARE TEST FAILED
	1912	ANN35			PRI CANNOT BE GLOBALLY INITIALIZED
	1913	TN451	ANN35		I/O BUS IS DEFECTIVE
	1914	ANN35			K DEFAULT REGISTER DEFECTIVE
	1915	ANN35			D-CHANNEL LOOP AROUND AND HEALTH ERROR
	1916	LINK	ANN35		MAJOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
	1917	TN451	ANN35		MAINTENANCE BUS IS DEFECTIVE
	1918	LINK	ANN35		MINOR ALARM FROM ERROR RATE BEFORE GLOBAL INITIALIZATION
	1919	LINK	ANN35		DAILY LIMIT EXCEEDED FOR MISFRAMES BEFORE GLOBAL INITIALIZATION
	1920	ANN35			N200 DEFAULT REGISTER DEFECTIVE
	1921				PRI IS NOT MAINTENANCE BUSY. WARNING: IF THIS INTERFACE IS A REFERENCE, THEN BUSYING OUT THE CIRCUIT AND TESTING IT MAY BE SERVICE AFFECTING TO OTHER DIGITAL FACILITIES BECAUSE THE CAPABILITY TO COMMUNICATE AT A DIGITAL RATE WOULD BE LOST FOR THE DURATION OF THE TEST

TABLE AH. (Contd)

PROC 620 - SPECIFIC FAULT CODE DEFINITIONS BY UNIT TYPE (Contd)					
UNIT TYPE	FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION
75 (Contd)	1922	ANN35			OPTION CONTROL REGISTER DEFECTIVE
	1923	ANN35			RAM AND HEALTH ERROR
	1924	LINK	ANN35		OUT OF FRAME DETECTED (RED ALARM) BEFORE GLOBAL INITIALIZATION
	1925	LINK	ANN35		OUT OF FRAME DETECTED (RED ALARM) AFTER GLOBAL INITIALIZATION
	1927	ANN35			ROM AND HEALTH ERROR
	1928	ANN35			LOSS OF PRI PROCESSOR SANITY AFTER GLOBAL INITIALIZATION
	1929	LINK	ANN35		DAILY LIMIT EXCEEDED FOR SLIPS BEFORE GLOBAL INITIALIZATION
	1930	REF WIRE	TN463	ANN35	LOSS OF SIGNAL FROM THE PRI TO THE SYSTEM CLOCK SYNCHRONIZER
	1931	ANN35			T200 DEFAULT REGISTER DEFECTIVE
	1932	ANN35			T203 DEFAULT REGISTER DEFECTIVE
	1933	ANN35			TEI DEFAULT REGISTER DEFECTIVE
	1934	LINK	ANN35		OUT OF FRAME AT FAR END (YELLOW ALARM) DETECTED BEFORE GLOBAL INITIALIZATION
	1935	LINK	ANN35		OUT OF FRAME AT FAR END (YELLOW ALARM) DETECTED AFTER GLOBAL INITIALIZATION
	1936	ANN35			CONTROL REGISTER DEFECTIVE
	1937	ANN35			OTHER AND HEALTH REGISTER
	1938	ANN35			REGISTER AND HEALTH ERROR

PROC 621 - NETWORK DUPLICATION CHANNEL

FLIPCHART ISSUE 1						+ + NETWORK DUPLICATION CHANNEL + + 845552223					
EQUIP. TYPE (FIELD 2): 1 = NETWORK MODULE 2 = TMS		ON-LINE STATUS (FIELD 6): 0 = ON-LINE 1 = ON-LINE & LOCKED 2 = OFF-LINE 3 = OFF-LINE & LOCKED		SWITCH STATUS (FIELD 7): 0 = SOFT SWITCH PERMITTED 1 = SOFT SWITCH PERMITTED BUT PROBLEMS EXIST 2 = SOFT SWITCH NOT PERMITTED		ENABLED (FIELD 8): 0 = SWITCH/INIT. DISABLED 1 = SWITCH/INIT. ENABLED		SWITCH TYPE (FIELD 19): 1 = 32 HR PERIODIC SOFT SWITCH 2 = CRAFT REQUEST HARD SWITCH 3 = CRAFT REQUEST SOFT SWITCH 4 = RECOVERY SOFT SWITCH 5 = HARDWARE FAILURE HARD SWITCH		UNIT TYPE (FIELD 20): UNIT TYPE OF FAILURE CAUSING SWITCH. (SEE UNIT TYPE LIST FOR PROC 600)	
WARD 0 NETWORK										621	

FLIPCHART ISSUE 4						+ + NETWORK DUPLICATION CHANNEL + + 845552223													
TEST 1: DISPLAYS SWITCH HISTORY. USE 'NEXT DATA' TO DISPLAY SWITCH HISTORY. USE 'CLEAR DATA,' 'EXECUTE' TO CLEAR SWITCH HISTORY.		TEST 2: SOFT SWITCH. SET FIELD 8 = 1 AND PUSH 'EXECUTE' TWICE TO SWITCH. USE 'NEXT CIRCUIT' TO CHANGE DISPLAYED DUPLICATION CHANNEL. USE 'BUSY OUT' AND 'RLS BUSY OUT' TO CONTROL SOFT LOCK. (TEST 2 & 3)		TEST 3: HARD SWITCH. USE 'NEXT CIRCUIT' TO CHANGE DISPLAYED CONTROL CARRIER. USE 'EXECUTE' TO DISPLAY STATE OF HEALTH CODES. (TEST 4)		TEST 4: INITIALIZATION SPECIAL ERROR CODES: 80-SWITCH FAILED 81-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED 82-HARD SWITCH WILL OCCUR 83-LOCK/UNLOCK FAILED 84-TMS/MODULE CONTROL CHANNEL UNDUPLICATED-ONLY TEST 4 CAN BE USED		85-PUSH 'EXECUTE' TWICE TO SWITCH/INITIALIZE 86-INITIALIZATION FAILED		NETWORK 621									
TEST NO 1	EQUIPMENT TYPE 2	EQUIPMENT LOCATION TESTS 2 THRU 4		T 2 ON-LINE STATUS 6	T 2-4 SWITCH STATUS 7	TESTS 2 THRU 4						TEST 1							
		TEST 1				HEALTH CODE						TIME SWITCHED ON LINE					SWITCH CAUSE		
		MODULE 3	CABINET 4			CARRIER 5	ENABLE 8	CC 9	SHUT DOWN 10			SOFT 11	SOFT A1 12	SOFT A2 13	SOFT A3 14	SWITCH INDEX 15	DAY 16	HOUR 17	MINUTE 18

Purpose

PROC 621 is used to determine the current state of health of both sides of the TMS or network duplication channel.

PROC 621 provides the capability to perform a soft or hard switch between sides of the TMS or network module control complex to support maintenance of the digital network.

PROC 621 provides the capability to reinitialize the TMS control or network module carrier, if it is duplicated, on-line, off-line, or unduplicated.

PROC 621 is used to:

1. Display the times and causes of the last seven (maximum) switches that occurred in any TMS or module control complex.
2. Display the current state of health for both sides of the TMS or network module.
3. Perform a soft switch of the TMS or network module control complex.
4. Perform a hard switch of the TMS or network module control complex.
5. Prevent a soft switch to the off-line side of a TMS or network module.
6. Reinitialize the TMS control or network module carrier.

Field Definitions and Codes

Each field of **PROC 621** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AI, PROC 621 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Field 2 - Select equipment type (TMS or network module duplication channel) to be tested or displayed.
3. Field 3 - Select a specific module to be tested or displayed (Test 1 only).
4. Fields 3 through 5 - Select a specific equipment location to be tested or displayed (Tests 2 through 4 only).
5. Field 8 - Enable a switch (soft or hard) to be performed (Tests 2 and 3 only) or enable a reinitialization (Test 4 only).

Operation of Procedure

Overview

PROC 621 is used to determine the number and cause of switches, the current state of health for both sides of a control complex, to lock a control complex off-line, to perform a soft or hard switch of a control complex, and to perform a reinitialization of control carriers.

To call in **PROC 621**, perform the following:

1. Depress **PROC NO; 621; ENTER**.
2. If the translation records indicate the TMS/network module is not duplicated, special error code 84 (TMS/module control channel unduplicated - only Test 4 can be used) is displayed in the **MAAP** error code field immediately upon entry to Test 1 of **PROC 621**.

Field 1 (test number) is blinking indicating that no key inputs other than depressing **NEXT TEST** are allowed. However, Test 4 may be used to reinitialize an unduplicated TMS control or network module carrier.
3. For duplicated TMS control or network module complexes, Test 1 is automatically selected.

Field 1 displays a 1, Field 2 displays a 1 (defaults to network module duplication channel equipment type) and all other fields are dashed.
4. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Four tests are available for duplicated TMS or network module control complexes. Only Test 4 can be used for unduplicated TMS or network control channels.

1. Test 1 - Displays the time and cause of the last seven switches and clears the switch history.
2. Test 2 - Allows a soft switch of the TMS or network module control complex.

Test 2 is also used to prevent a soft switch from taking place by **soft locking** the off-line TMS or network module duplication channel.

3. Test 3 - Allows a hard switch of the network module control complex.
4. Test 4 - Allows a reinitialization of an unduplicated or duplicated TMS control or network module carrier.

TABLE AI.

PROC 621 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-4	Test number.	8	0-1	Switch/Initialization:
2	1,2	Equipment type:		0	Disabled.
	1	Network module duplication channel.		1	Enabled.
	2	Time multiplex switch (TMS) duplication channel.	9-14		Health code: 0 = Condition not present. 1 = Condition present.
3-5		Equipment location of displayed duplication channel:	9	0,1	CC - Driven by MCC on command from 501CC.
3	0-30	Network module number.	10	0,1	Shutdown - Set when TMS or module processor is stopped.
	99	TMS module number.	11	0,1	SOFTB - Set by TMS or module processor software.
4	0-7	Cabinet number.		0,1	SOFTA1 - Set by 501CC maintenance software.
5	0-3	Carrier number.	12	0,1	SOFTA2 - Set by 501CC maintenance software.
6	0-3	On-line status:	13	0,1	SOFTA3 - Set by 501CC maintenance software.
	0	On-line.	14	0,1	Switch index: Index into the switch time and cause table.
	1	On-line and soft locked.			
	2	Off-line.	15	0-7	Time switched on-line:
	3	Off-line and soft locked.	16-18		
7	0-2	Switch status:	16	1-31	Day of month.
	0	Soft switch permitted.	17	0-23	Hour of day.
	1	Soft switch permitted but problems exist.	18	0-59	Minute of hour.
	2	Soft switch not permitted.			

TABLE AI. (Contd)

PROC 621 FIELD DEFINITIONS AND CODES		
FIELD	CODE	DEFINITION
19	1-5	Switch type:
	1	32-hour periodic soft switch.
	2	Hard switch caused by craft request.
	3	Soft switch caused by craft request.
	4	Recovery soft switch.
	5	Hardware failure hard switch.
20		Unit type of failure causing switch. (See unit type list for PROC 600.)

Test 1

Test 1 is used to determine the time and cause when the last seven switches occurred for the on-line duplication channel entered in Fields 2 through 5.

Test 1 is also used to clear the table of last seven switches (maximum) for the duplication channel displayed in Fields 2 through 5.

1. Test 1 is the default test when entering **PROC 621** or is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. If the translation records indicate the TMS/network module is not duplicated, special error code 84 (TMS/module control channel unduplicated - only Test 4 can be used) is displayed in the **MAAP** error code field immediately upon entry to Test 1 of **PROC 621**.
3. Field 1 (test number) is blinking indicating that no key inputs other than depressing **NEXT TEST** are allowed. However, Test 4 may be used to reinitialize an unduplicated TMS control or network module carrier.
4. When Test 1 is initially called in, a default equipment location may be displayed in Fields 2 through 5.
Field 2 is blinking, indicating an optional entry field.
5. The default equipment location can be the last equipment location displayed in Test 2 through 4 of **PROC 621** or can be passed from **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure) while it is still displayed in **PROC 600** or **PROC 620** when it is passed.
6. A specific TMS or network module duplication channel or the default equipment location can be tested.

To test the default equipment location displayed in Fields 2 through 5, proceed to Step 11.

7. A specific TMS or network module duplication channel can be selected for testing by one of the following methods (Steps 8 through 10) depending on whether or not a default equipment location is displayed.
8. Depress **NEXT CIRCUIT** to step through the duplication channels until the equipment type and on-line duplication channel to be tested is displayed in Fields 2 through 5.

Proceed to Step 11.

9. Depress **NEXT UNIT** until the equipment type to be tested is displayed in Field 2.

Note: Field 2 defaults to a 1 (network module duplication channel equipment type) when Test 1 is entered and no default equipment location is displayed.

Depress **NEXT CIRCUIT** to step through the duplication channels associated with the equipment type selected until the on-line duplication channel to be tested is displayed in Fields 3 through 5.

Proceed to Step 11.

10. If no default equipment location is displayed, either the duplication channel can be directly entered, or the **CHANGE FIELD** sequence can be used.
 - a. **(Equipment type); ENTER; (Module number of duplication channel to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type); ENTER; (Module number of duplication channel to be tested); ENTER.**

Proceed to Step 11.

11. To start Test 1, depress **EXECUTE**.
12. If no switches occurred for the duplication channel selected for testing, the following is displayed:

Field 1 - 1.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of duplication channel tested.

Fields 6 through 14 - Dashed.

Field 15 - 0 (indicating no switches occurred for the duplication channel tested).

Fields 16 through 20 - Dashed.
13. If any switches occurred for the duplication channel selected for testing, the following is displayed:

Field 1 - 1.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of duplication channel tested.

Field 6 - On-line status when switch occurred (0 = on-line, 1 = on-line and locked, 2 = off-line, 3 = off-line and locked).

PROC 621, Test 1

Fields 7 through 14 - Dashed.

Field 15 - Number of switches that occurred (maximum of 7) for the duplication channel tested.

Field 16 - Day of month the switch occurred.

Field 17 - Hour of day the switch occurred.

Field 18 - Minute of day the switch occurred.

Field 19 - Switch type (1 through 5).

Field 20 - Unit type that caused the switch.

Note: Fields 16 through 20 display the latest switch that occurred and the switch cause (switch type and unit type) of the switch for the duplication channel tested. Refer to Table G, PROC 600 - Field Definitions and Codes on page 85 to determine the unit type of the failure that caused the switch.

14. When Field 15 is greater than 1, depressing **NEXT DATA** decrements Field 15 and displays (in Fields 16 through 20) when the next to last switch occurred and the cause (switch type and unit type) of the switch for the duplication channel tested.

15. Depressing **NEXT DATA** repeatedly displays the remaining switches that occurred (and the cause [switch type and unit type] for each switch) for the duplication channel tested.

When the last switch is displayed, depressing **NEXT DATA** again dashes Fields 7 through 20.

16. Depressing **NEXT DATA** once more begins the sequence over starting with the latest switch that occurred for the duplication channel tested.

17. The **CLEAR DATA; EXECUTE** sequence can be used to clear the table of last 7 switches for the duplication channel displayed in Fields 2 through 5 after **EXECUTE** is used to initiate Test 1.

18. To clear the table of last 7 switches for the duplication channel displayed in Fields 2 through 5, perform the following:

Depress **CLEAR DATA; EXECUTE**.

Fields 15 through 20 display dashes indicating the table of last 7 switches for the duplication channel displayed in Fields 2 through 5 is cleared.

Note: The tables of last 7 switches for other duplication channels are not affected. Only the table for the duplication channel displayed in Fields 2 through 5 is cleared.

19. When another duplication channel is to be tested, the **CHANGE FIELD** sequence or **NEXT CIRCUIT** and/or **NEXT UNIT** and **NEXT CIRCUIT** can be used to select the specific duplication channel to be tested (Steps 19 through 21).

20. **CHANGE FIELD; 2; ENTER; (Equipment type); ENTER; (Module number of duplication channel to be tested); ENTER.**

21. Depress **NEXT CIRCUIT** to step through the duplication channels until the equipment type and on-line duplication channel to be tested are displayed in Fields 2 through 5.

22. Depress **NEXT UNIT** until the equipment type to be tested is displayed in Field 2. Depress **NEXT CIRCUIT** to step through the duplication channels associated with the equipment type selected until the on-line duplication channel to be tested is displayed in Fields 3 through 5.
23. **EXECUTE** must be depressed to test the specific duplication channel selected for testing.

Test 2

Test 2 is used to perform a user-transparent soft switch of TMS or network module control complexes and updates memory after the switch. The soft switch may not be transparent to data connections.

Soft switches cannot be performed if the off-line state-of-health is worse than the on-line state-of-health.

Problems in the modules affect the module's state-of-health which can affect the soft switch of modules. Problems in the TMS affect the TMS's state-of-health which can affect the soft switch of TMSs.

TN481 (Light Guide Interface) installed in the module control carrier affects the soft switch of the TMS and **not** the soft switch of the modules.

To assist in troubleshooting network problems, Test 2 is used to prevent a soft switch from taking place by **soft locking** the off-line TMS or network module duplication channel.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. If the translation records indicate the TMS/network module is not duplicated, special error code 84 (TMS/module control channel unduplicated - only Test 4 can be used) is displayed in the **MAAP** error code field immediately upon entry to Test 2 of **PROC 621**.
3. Field 1 (test number) is blinking indicating that no key inputs other than depressing **NEXT TEST** are allowed. However, Test 4 may be used to reinitialize an unduplicated TMS control or network module carrier.
4. When Test 2 is initially called in, a default equipment location may be displayed in Fields 2 through 5.
Field 2 is blinking, indicating an optional entry field.
5. The default equipment location can be the last equipment location displayed in Test 1, 3, or 4 of **PROC 621** or can be passed from **PROC 600** or **PROC 620** while it is still displayed in **PROC 600** or **PROC 620** when it is passed.
6. A specific on-line TMS or network module duplication channel or the default equipment location can be selected to be soft switched.
To soft switch the default equipment location displayed in Fields 2 through 5, proceed to Step 11.
7. A specific on-line TMS or network module duplication channel can be selected to be soft switched by one of the following methods (Steps 8 through 10) depending on whether or not a default equipment location is displayed.

8. Depress **NEXT CIRCUIT** to step through the duplication channels until the equipment type and on-line duplication channel to be soft switched is displayed in Fields 2 through 5.

Proceed to Step 11.

9. Depress **NEXT UNIT** until the equipment type to be soft switched is displayed in Field 2.

Depress **NEXT CIRCUIT** to step through the duplication channels associated with the equipment type selected until the on-line duplication channel to be soft switched is displayed in Fields 3 through 5.

Proceed to Step 11.

10. If no default equipment location is displayed, either the on-line duplication channel can be directly entered, or the **CHANGE FIELD** sequence can be used.
 - a. **(Equipment type); ENTER; (Module number of on-line duplication channel to be soft-switched); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type); ENTER; (Module number of on-line duplication channel to be soft switched); ENTER.**

Proceed to Step 11.

11. To start Test 2, depress **EXECUTE**.
12. When **EXECUTE** is depressed, the following is displayed:

Field 1 - 2.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of duplication channel to be soft switched.

Field 6 - On-line status (0 = on-line, 1 = on-line and locked).

Field 7 - Switch status (0 = soft switch permitted, 1 = soft switch permitted but problems exist, 2 = soft switch not permitted).

Field 8 - 0 (switch disabled).

Fields 9 through 14 - State of health code for the duplication channel displayed in Fields 2 through 5 (0 = pass, 1 = condition present).

Fields 15 through 20 - Dashed.

13. To perform a soft switch of the TMS or network module control complex, check the switch status in Field 7.
 - a. If Field 7 equals 2, a soft switch cannot be performed.

Note: If a switch of the TMS or network module control complex is still required, proceed to Test 3 and perform a hard switch.
 - b. If Field 7 equals 0 or 1, a soft switch of the TMS or network module control complex is possible.
14. Check the on-line status displayed in Field 6.
 - a. If Field 6 equals 0, proceed to Step 18.

- b. If Field 6 equals 1, proceed to Step 15.

Note: A soft switch of the TMS or network module control complex cannot be performed if the off-line side is **soft locked**.

15. Depress **RLS BUSY OUT** to release the TMS or network module control complex from the locked condition.

Note: In the event that the state of health for the on-line side is worse than the off-line side, a hard switch may occur. Special error code 82 (hard switch will occur) is displayed in the **MAAP** error code field.

16. If special error code 82 is not displayed, proceed to Step 18.

Caution: A hard switch causes a disruption of service and effects normal call processing.

17. If special error code 82 is displayed and a switch of the network control complex is still required, depress **RLS BUSY OUT** again.

Field 6 displays a 3 for the duplication channel displayed in Fields 2 through 5, indicating that the channel is off-line and locked.

18. To enable the soft switch of the TMS or network module control complex, change Field 8 to a 1 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 8; ENTER; 1; ENTER.

Note: Prior to a switch of the TMS, the network modules **must** be working.

19. Depress **EXECUTE**.

The first time **EXECUTE** is depressed, the soft switch does not occur.

Note: Special error code 85 (push **EXECUTE** twice to switch) is displayed in the **MAAP** error code field indicating that **EXECUTE** **must** be depressed twice to perform a soft switch.

20. Depress **EXECUTE**.

Note: If the soft switch cannot be performed after **EXECUTE** is depressed twice, Field 8 displays a 1 (switch enabled) and special error code 80 (switch failed) is displayed in the **MAAP** error code field.

If a switch of the TMS or network module control complex is still required, proceed to Test 3 and perform a hard switch.

21. The **WAIT** indicator on the **MAAP** is lighted while the switch is taking place.
22. When the **WAIT** indicator turns off and the switch is successful, the following is displayed:

Field 1 - 2.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of the now off-line duplication channel.

PROC 621, Test 2

Field 6 - On-line status (2 = off-line).

Field 7 - Switch status (0 = soft switch permitted, 1 = soft switch permitted but problems exist, 2 = soft switch not permitted).

Field 8 - 0 (switch disabled).

Fields 9 through 14 - State of health code for the duplication channel displayed in Fields 2 through 5 (0 = pass, 1 = condition present).

Fields 15 through 20 - Dashed.

Note: The cause and time of the switch is updated in status memory.

23. If the switch passes but automatically switches back to the previous configuration, some type of failure in the original off-line side occurred to lower its state-of-health. An alarm on the original off-line side may be indicated by **PROC 600**, Test 1.
24. If the switch failed, indicated by a 1 displayed in Field 8 (switch enabled) and special error code 80 (switch failed) displayed in the **MAAP** error code field, use **PROC 620**, Test 4 to test the duplication channel (unit type 23) displayed in Fields 2 through 5. Perform corrective action as required.

An off-line TMS or network module duplication channel can be **soft locked** to prevent a soft switch from taking place while maintenance personnel are working on the off-line TMS or network module control carrier.

A hardware failure that causes a switch of the TMS or network module control complex overrides a **soft lock**.

A **soft lock** of the off-line TMS or network module duplication channel is normally performed after a demand soft switch by maintenance personnel. However, any TMS or network module duplication channel can be **soft locked**.

A **soft lock** of an off-line TMS or network module duplication channel is performed as follows:

1. Depress **NEXT UNIT** until the equipment type to be **soft locked** is displayed in Field 2.

Depress **NEXT CIRCUIT** to step through the duplication channels associated with the equipment type selected until the off-line duplication channel to be **soft locked** is displayed in Fields 3 through 5.

2. Depress **EXECUTE**.

The on-line status and state of health for the off-line TMS or network module duplication channel is displayed in Fields 6 and 9 through 14.

3. Depress **BUSY OUT**.

Field 6 changes from a 2 (off-line) to a 3 (off-line and locked).

4. The **BUSY OUT** indicator on the **MAAP** is lighted if not already lighted from another circuit that is busied out.

Caution: If **PROC 621** is exited with a TMS or network module duplication channel soft locked, a soft switch of the TMS or network module control complex cannot be performed.

5. Prior to exiting **PROC 621**, release the TMS or network module duplication channel that is **soft locked** from busy out by depressing **RLS BUSY OUT** when the TMS or network module duplication channel is displayed in Fields 2 through 5 and **EXECUTE** is depressed.

Caution: When BUSY OUT is depressed in Test 2 of PROC 621 the busy out status cannot be released by PROC 630 (busy out/release busy out).

Test 3

Test 3 is used to perform a hard switch of TMS or network module control complexes and updates memory after the switch.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. If the translation records indicate the TMS/network module is not duplicated, special error code 84 (TMS/module control channel unduplicated - only Test 4 can be used) is displayed in the **MAAP** error code field immediately upon entry to Test 3 of **PROC 621**.
3. Field 1 (test number) is blinking indicating that no key inputs other than depressing **NEXT TEST** are allowed. However, Test 4 may be used to reinitialize an unduplicated TMS control or network module carrier.
4. When Test 3 is initially called in, a default equipment location may be displayed in Fields 2 through 5.

Field 2 is blinking, indicating an optional entry field.

5. The default equipment location can be the last equipment location displayed in Test 1, 2, or 4 of **PROC 621** or can be passed from **PROC 600** or **PROC 620** while it is still displayed in **PROC 600** or **PROC 620** when it is passed.
6. A specific on-line TMS or network module duplication channel or the default equipment location can be selected to be hard switched.
To hard switch the default equipment location displayed in Fields 2 through 5, proceed to Step 11.
7. A specific on-line TMS or network module duplication channel can be selected to be hard switched by one of the following methods (Steps 8 through 10) depending on whether or not a default equipment location is displayed.
8. Depress **NEXT CIRCUIT** to step through the duplication channels until the equipment type and on-line duplication channel to be hard switched is displayed in Fields 2 through 5.
Proceed to Step 11.
9. Depress **NEXT UNIT** until the equipment type to be hard switched is displayed in Field 2.
Depress **NEXT CIRCUIT** to step through the duplication channels associated with the equipment type selected until the on-line duplication channel to be hard switched is displayed in Fields 3 through 5.
Proceed to Step 11.
10. If no default equipment location is displayed, either the on-line duplication channel can be directly entered, or the **CHANGE FIELD** sequence can be used.

- a. **(Equipment type); ENTER; (Module number of on-line duplication channel to be hard switched); ENTER.**
- b. **CHANGE FIELD; 2; ENTER; (Equipment type); ENTER; (Module number of on-line duplication channel to be hard switched); ENTER.**

Proceed to Step 11.

11. To start Test 3, depress **EXECUTE**.
12. When **EXECUTE** is depressed, the following is displayed:
Field 1 - 3.
Field 2 - Equipment type (1 = network module, 2 = TMS).
Fields 3 through 5 - Equipment location of duplication channel to be hard switched.
Field 6 - On-line status (0 = on-line, 1 = on-line and locked).
Field 7 - Dashed.
Field 8 - 0 (switch disabled).
Fields 9 through 14 - State of health code for the TMS or network module duplication channel displayed in Fields 2 through 5 (0 = pass, 1 = condition present).
Fields 15 through 20 - Dashed.
13. To perform a hard switch of the TMS or network module control complex, check the on-line status in Field 6.
14. If Field 6 equals 0, proceed to Step 18.
If Field 6 equals 1, proceed to Step 15.

Note: A hard switch of the TMS or network module control complex cannot be performed if the off-line side is **soft locked**.

15. Depress **RLS BUSY OUT** to release the TMS or network module control complex from the locked condition.

Note: In the event that the state of health for the on-line side is worse than the off-line side, a hard switch may occur. Special error code 82 (hard switch will occur) is displayed in the **MAAP** error code field.

16. If special error code 82 is not displayed, proceed to Step 18.

Caution: A hard switch causes a disruption of service and effects normal call processing.

17. If special error code 82 is displayed and a switch of the TMS or network control complex is still required, depress **RLS BUSY OUT** again.
Field 6 displays a 3 for the TMS or network module duplication channel displayed in Fields 2 through 5, indicating that the channel is off-line and locked.
18. To enable the hard switch of the TMS or network module control complex, change Field 8 to a 1 using the **CHANGE FIELD** sequence:
CHANGE FIELD; 8; ENTER; 1; ENTER.

19. Depress **EXECUTE**.

The first time **EXECUTE** is depressed, the hard switch does not occur.

Note: Special error code 85 (push **EXECUTE** twice to switch) is displayed in the **MAAP** error code field indicating that **EXECUTE must** be depressed twice to perform a hard switch.

20. Depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is lighted while the switch is taking place.

21. When the **WAIT** indicator turns off and the switch is successful, the following is displayed:

Field 1 - 3.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of the now off-line duplication channel.

Field 6 - On-line status (3 = off-line and locked).

Note: When a demand hard switch is completed, the now off-line side is automatically soft locked to prevent it from switching back in event the now off-line side's state of health is better than the on-line side.

Field 7 - Dashed.

Field 8 - 0 (switch disabled).

Fields 9 through 14 - State of health code for the duplication channel displayed in Fields 2 through 5 (0 = pass, 1 = condition present).

Fields 15 through 20 - Dashed.

Note: The cause and time of the switch is updated in status memory.

22. If the switch failed, indicated by a 1 displayed in Field 8 (switch enabled) and special error code 80 (switch failed) displayed in the **MAAP** error code field, use **PROC 620**, Test 3 to continuously test the duplication channel displayed in Fields 2 through 5. Suspect a cabling problem. Perform corrective action as required.

In addition, if any soft A or soft B problems exist as indicated by Fields 11 through 14, use **PROC 600**, Test 2 to determine if any type of network problems exist. Perform corrective action as required.

Test 4

Test 4 is used to perform an initialization on the TMS or module control carrier.

Test 4 can be used to reinitialize the TMS or module control carrier, if it is duplicated, on-line, off-line, or unduplicated.

Test 4 is useful when the state of health bits (SOH) indicate the control carrier to be shutdown or when all tests for the TMS or module control carrier in **PROC 620** fail.

PROC 621, Test 4

If the **GREEN LED** on TN380 (module processor) or TN381 (TMS processor) is not flashing (no heartbeat), reinitialization should be performed.

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 4; ENTER.

2. When Test 4 is initially called in, a default equipment location may be displayed in Fields 2 through 5.

Field 2 is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Test 1 through 3 of **PROC 621** or can be passed from **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure) while it is still displayed in **PROC 600** or **PROC 620** when it is passed.
4. A specific TMS or module control carrier or the default equipment location can be reinitialized.

To reinitialize the default equipment location displayed in Fields 2 through 5, proceed to Step 9.

5. A specific TMS or module control carrier can be selected for reinitialization by one of the following methods (Steps 6 through 8) depending on whether or not a default equipment location is displayed.
6. Depress **NEXT CIRCUIT** to step through the duplication channels until the equipment type and on-line duplication channel to be reinitialized is displayed in Fields 2 through 5.

Proceed to Step 9.

7. Depress **NEXT UNIT** until the equipment type to be reinitialize is displayed in Field 2.

Note: Field 2 defaults to a 1 (network module equipment type) when Test 4 is entered and no default equipment location is displayed.

Depress **NEXT CIRCUIT** to step through the control carriers associated with the equipment type selected until the control carrier to be reinitialized is displayed in Fields 3 through 5.

Proceed to Step 9.

8. If no default equipment location is displayed, either the TMS or module control carrier can be directly entered, or the **CHANGE FIELD** sequence can be used.

a. **(Equipment type); ENTER; (Module number of TMS or module control carrier to be reinitialized); ENTER.**

b. **CHANGE FIELD; 2; ENTER; (Equipment type); ENTER; (Module number of TMS or module control carrier to be reinitialized); ENTER.**

Proceed to Step 9.

9. To start Test 4, depress **EXECUTE**.

10. When **EXECUTE** is depressed, the following is displayed:

Field 1 - 4.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of control carrier to be reinitialized.

Field 6 - On-line status (0 = on-line, 1 = on-line and locked, 2 = off-line, 3 = off-line and locked).

Field 7 - Dashed.

Field 8 - 0 (initialization disabled).

Fields 9 through 14 - State of health code for the control carrier displayed in Fields 2 through 5 (0 = pass, 1 = condition present).

Fields 15 through 20 - Dashed.

Caution: *A reinitialization of the TMS or module control carrier causes a disruption of service and effects normal call processing if reinitialization of the TMS or module control carrier is performed on-line. Reinitialization should be performed on the off-line side of the TMS or module control carrier (if duplicated).*

11. To enable the reinitialization of the TMS or module control carrier, change Field 8 to a 1 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 8; ENTER; 1; ENTER.

12. Depress **EXECUTE**.

The first time **EXECUTE** is depressed, reinitialization does not occur.

Note: Special error code 85 (push **EXECUTE** twice to initialize) is displayed in the **MAAP** error code field indicating that **EXECUTE** **must** be depressed twice to perform reinitialization.

13. Depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is lighted while reinitialization is taking place.

14. When the **WAIT** indicator turns off and reinitialization is successful, the following is displayed:

Field 1 - 4.

Field 2 - Equipment type (1 = network module, 2 = TMS).

Fields 3 through 5 - Equipment location of control carrier reinitialized.

Field 6 - On-line status (0 = on-line, 1 = on-line and locked, 2 = off-line, 3 = off-line and locked).

Field 7 - Dashed.

Field 8 - 0 (initialization disabled).

Fields 9 through 14 - State of health code for the control carrier displayed in Fields 2 through 5 (0 = pass, 1 = condition present).

Fields 15 through 20 - Dashed.

15. If the reinitialization failed, indicated by a 1 displayed in Field 8 (initialization enabled) and special error code 86 (initialization failed) displayed in the **MAAP** error code field, use **PROC 620**, Test 4 to test unit types 6 (MCC) and 7 (TMS/module processor) on the control carrier displayed in Fields 2 through 5.

PROC 622 - NETWORK PERIPHERALS

FLIPCHART ISSUE 3		+		+		NETWORK PERIPHERALS		+		+		845552223	
EQUIPMENT TYPE (FIELD 2): 1 = PDM 2 = 74 SERIES 3 = DTDM 4 = 72 SERIES 5 = TDM 6 = PDM/2 7 = TDM/2 8 = 7407D VOICE STATION		9 = 7407D DATA MODULE 10 = BCT 510 VOICE STATION 11 = BCT 510 DATA MODULE 12 = BCT 515 VOICE STATION 13 = BCT 515 DATA MODULE 14 = 7404D VOICE STATION 15 = 7404D DATA MODULE 16 = AP32 EVEN PORT CHANNEL		17 = AP32 ODD PORT CHANNEL 18 = 73 SERIES 20 = 7406D VOICE STATION 21 = PC EVEN PORT CHANNEL 22 = PC ODD PORT CHANNEL		ALARM STATUS (FIELD 9): 0 = NO ERRORS RECORDED 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED		CIRCUIT STATUS (FIELD 10): 0 = IDLE 1 = IN USE 2 = BUSIED OUT LOCAL/REMOTE (FIELD 8) 0 = LOCAL PORT 1 = REMOTE PORT, T1 CARRIER 2 = REMOTE PORT, FIBER		TEST MODE (FIELD 11): 0 = NON-SERVICE AFFECTING 1 = SERVICE AFFECTING NOTE: THE TEST NUMBER CAN ONLY BE CHANGED BY 'NEXT TEST.'		FAULT CODE (FIELD 12): 0 = PASSED TEST 1 = IN USE 2-99 = TYPE OF FAILURE FOUND, SEE DOCUMENTATION	
WARNING CAUTION: OPERATING 'BUSY OUT' FOR A DIGITAL TERMINAL WITH BRIDGED APPEARANCES CAUSES ALL CALLS ON THOSE TERMINALS TO BE DROPPED. NETWORK												622	

FLIPCHART ISSUE 1		+		+		NETWORK PERIPHERALS		+		+		845552223			
TEST 1: DISPLAYS FAILURE HISTORY BY ALARM SEVERITY, EQUIP TYPE AND/OR PORT EQUIPMENT LOCATION WITHIN EQUIP TYPE. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARMS.		TEST 2: ONE ITERATION TESTING OF ONE OR MORE DEVICES.		TEST 3: CONTINUOUS TESTING OF ONE OR MORE DEVICES.		TEST 4: CONTINUOUS TESTING OF DIGITAL TRANSMISSION LINK TO ONE OR MORE DEVICES.		SPECIAL ERROR CODES: 81-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED. 82-DMIDS OVERFLOW 83-TEST OF RANGE NOT COMPLETED		84-TEST 4 MUST BE RUN IN MODE 1. 85-LOCATION RANGE ERROR 86-WAIT UNTIL TEST COMPLETES 87-EQPT TYPE CANNOT BE TESTED IN TEST 4		88 - FIELDS 3-7 MUST BE ENTERED BEFORE USE OF BUSY OUT.			
USE 'NEXT DATA' TO DISPLAY FAULT CODE (TEST 2, 3, & 4) USE 'NEXT FAULT' TO ADVANCE TO NEXT FAULT CODE (TESTS 3 & 4).		NOTE: IF FIELD 2 IS LEFT BLANK OR DASHED, ALL EQUIP TYPES IN THE SPECIFIED RANGE WILL BE TESTED.													
TEST NO	TESTS 2, 3, & 4 EQUIPMENT LOCATION						LOCAL/REMOTE	ALARM STATUS	CIRCUIT STATUS	TEST MODE	FAULT CODE	NUMBER DEVICES TESTED	NUMBER DEVICES FAILED	FAILURE INDEX	NETWORK
	EQUIPMENT TYPE	MODULE	CABINET	CARRIER	SLOT	CIRCUIT						NUMBER TIMES TESTED	NUMBER TIMES FAILED		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	622

Purpose

PROC 622 is used when referenced from **PROC 600** (alarm causes/error log) or when the **NETWORK PERIPH EQPT** and **MINOR** or **WARNING** alarm indicators on the alarm panel are lighted.

PROC 622 is used to:

1. Display the failure history for network peripherals.

Network peripherals include the Processor Data Module (PDM), 74 series terminal, Digital Telephone Data Module (DTDM), 72 series terminal, Trunk Data Module (TDM), Enhanced Processor Data Module (PDM/2), Enhanced Trunk Data Module (TDM/2), 7407D voice station, 7407D data module, BCT 510D voice station, BCT 510D data module, BCT 515 Voice Station, BCT 515 data module, 7404D voice station, 7404D data module, AP32 even port channel, AP32 odd port channel, 73 series terminal, 7406D voice station, PC even port channel, and PC odd port channel.

2. Manually turn off any alarms activated because of a network peripheral failure.

Note: When the alarm indicator is turned off, the alarmed entry for the network peripheral failure causing the alarm to be activated is marked as resolved in PMIDS.

3. Test one or more network peripherals once and display the test results.
4. Test one or more network peripherals in a continuous cycle and display the test results.

5. Continuously test the transmission quality to one or more network peripherals.
6. Automatically turn off the fault indicator when all network peripherals that caused an alarm to be raised are tested as good in Test 2 or 3.

Note: Alarmed network peripheral entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 622** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AJ, PROC 622 - Field Definitions and Codes.

Optional input fields are:

1. Field 2 - Select equipment type to be tested (Tests 2 through 4 only).
Equipment types include: 1 = PDM, 2 = 74 series terminal, 3 = DTDM, 4 = 72 series terminal, 5 = TDM, 6 = PDM/2, 7 = TDM/2, 8 = 7407D voice station, 9 = 7407D data module, 10 = 510D voice station, 11 = 510D data module, 12 = BCT 515 voice station, 13 = BCT 515 data module, 14 = 7404D voice station, 15 = 7404D data module, 16 = AP32 even port channel, 17 = AP32 odd port channel, 18 = 73 series terminal, 20 = 7406D voice station, 21 = PC even port channel, and 22 = PC odd port channel.
2. Fields 3 through 7 - Select equipment location of a specific network peripheral, range of network peripherals, or all network peripherals in a equipment type to be tested (Tests 2 through 4 only).
3. Field 11 - Enable the mode of test (nonservice affecting or service affecting) to be performed (Tests 2 through 4 only).

Operation of Procedure

Overview

PROC 622 is used to determine the cause of the **NETWORK PERIPH EQPT** and **MINOR** or **WARNING** alarm indicators being lighted resulting from a network peripheral failure.

To call in **PROC 622**, perform the following:

1. Depress **PROC NO; 622; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Four tests are available:

1. Test 1 - Displays failure history by severity of alarm, equipment type and/or port equipment location within an equipment type.
Test 1 is also used to manually turn off the **NETWORK PERIPH EQPT** fault indicator.

Note: Alarmed network peripheral entries in PMIDS are marked as resolved.

TABLE AJ.

PROC 622 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-4	Test number.	2 (Contd)	21	PC even port channel.
2	1-22	Equipment type:		22	PC odd port channel.
	1	Processor data module (PDM).	3-7		Equipment location:
	2	74 series terminal.			
	3	Digital telephone data module (DTDM).	3	0-30	Module number.
	4	72 series terminal.	4	0-7	Cabinet number.
	5	Trunk data module (TDM).	5	0-3	Carrier number.
	6	Enhanced processor data module (PDM/2).	6	00-03, 05-08, 13-16, 18-21	Slot number.
	7	Enhanced trunk data module (TDM/2).	7	0-3	Circuit number.
	8	7407D voice station.	8	0-2	Local/Remote:
	9	7407D data module.		0	Local.
	10	BCT 510 voice station.		1	Remoted via a T1 carrier.
	11	BCT 510 data module.		2	Remoted via optical fiber.
	12	BCT 515 voice station.	9	0-5	Alarm status:
	13	BCT 515 data module.		0	No errors recorded.
	14	7404D voice station.		1	Major.
	15	7404D data module.		2	Minor.
	16	AP32 even port channel.		3	Warning.
	17	AP32 odd port channel.		4	Errors recorded.
	18	73 series.		5	Alarm resolved.
	20	7406D voice station.	10	0-2	Circuit status:
				0	Circuit is idle.
				1	Circuit is in-use.
				2	Circuit is busied out.

TABLE AJ. (Contd)

PROC 622					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
11	0,1	Test mode:	12 (Contd)	14	Both bits set in GPP status register (48-volt overload and DTL fault).
	0	Test does not affect service.		15	Both bits set in GPP status register (48-volt overload and DTL idle).
	1	Test affects service.		16	Three bits set in GPP status register (48-volt overload, DTL idle, and DTL fault).
12	0-99	Fault code:		17	Two bits set in MLP status register (MFET and controller failure).
	0	Test passed.		18	Two bits set in MLP status register (48-volt overload and controller failure).
	1	In-use.		19	Two bits set in MLP status register (48-volt overload and MFET failure).
	2	48-volt overload.		20	Three bits set in MLP status register (48-volt overload, MFET, and controller failure).
	3	DTL link idle.		21	Even channel of digital set is stuck in DTL looparound.
	4	DTL link fault.		22	Hyperactive data set or data module sending too many signals to the switch.
	5	MFET set failed.		23	Network peripheral error other than 48-volt fault.
	6	MLP controller failure.			
	7	Digital instrument has bad state of health.			
	8	Transmission failure to digital instrument.			
	9	DTL looparound failure at digital set.			
	10	DTL looparound failure at GPP.			
	11	Digital set did not reset correctly.			
	12	No response from digital set.			
	13	Both bits set in GPP status register (DTL idle and DTL fault).			

TABLE AJ. (Contd)

PROC 622					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
12 (Contd)	24	Touch-tone digits sent on MFD T S channel.	12 (Contd)	29	Peripheral causing DTLF - frame error.
	25	No response from firmware DTL looparound test on remote peripheral.		0-9999	Number of devices tested or number of times device was tested.
	26	Cannot run firmware DTL looparound test on remote peripheral.		0-999	Number of devices failed or number of times device failed.
	27	Firmware DTL looparound test failed on remote peripheral.		0-99	Failure index: Index into PMIDS or DMIDS table of the failure record currently displayed.
	28	Odd channel of digital set is stuck in DTL looparound.	15		

2. Test 2 - Tests one or more network peripherals one time.
3. Test 3 - Tests one or more network peripherals continuously.
4. Test 4 - Continuously tests the transmission quality to one or more network peripherals.

Test 1

Test 1 provides a failure history of the network peripheral failures detected by the on-line software.

Failures are displayed in alarm order, i.e., failures with an alarm status of minor followed by failures with an alarm status of warning. Network peripherals with errors recorded against them are displayed by equipment type and then by port equipment location within equipment type.

Test 1 is also used to manually turn off the **NETWORK PERIPH EQPT** fault indicator and to resolve the network peripheral alarmed entries in PMIDS.

1. Test 1 is the default test when entering **PROC 622** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. When Test 1 is initially called in, Field 1 displays a 1, and all other fields are dashed.
3. To start Test 1, depress **EXECUTE**.
4. The network peripheral failure history is sorted and a summary is displayed.

5. If no network peripheral failures exist, the following summary is displayed:
 Field 1 - 1.
 Field 15 - 0 (indicating no failures).
6. If any network peripheral failures exist, the summary displays a 1 in Field 1, and the total number of network peripherals that failed in Field 14.
7. Depressing **NEXT CIRCUIT** displays the first failure in order of severity, as follows:
 Field 1 - 1.
 Field 2 - Equipment type of failing network peripheral.
 Fields 3 through 7 - Port equipment location of failing network peripheral.
 Field 8 - Local/remote status of failing port.
 Field 9 - Alarm status of failing network peripheral.
 Fields 10 and 11 - Dashed.
 Field 12 - Fault code.
 Field 13 - Dashed.
 Field 14 - Number of times that the network peripheral displayed in Fields 3 through 7 failed.
 Field 15 - Failure index.
8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing network peripherals.
9. To step through the failure records for a specific equipment type, depressing **NEXT UNIT** causes the first failure of the next equipment type with failures to be displayed.
 Field 15 decrements corresponding to the number of failures passed over (if any) when stepping from equipment type to equipment type.
NEXT CIRCUIT is used to step through the failures of the displayed equipment type.
10. When all failing network peripherals are displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** dashes Fields 2 through 13 and 15.
 Depressing **NEXT CIRCUIT** once more starts the sequence over, and the failing network peripherals can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.
11. The **CLEAR DATA; EXECUTE** sequence is used to manually resolve individual alarmed network peripheral failures or all alarmed network peripheral failures after **EXECUTE** is used to initiate Test 1.
 The failures which are resolved are those failures with an alarm status of 2 or 3 displayed in Field 9.
12. To resolve individual network peripheral failures with an alarm status of 2 or 3, perform the following:
 Use **NEXT CIRCUIT** to display the failing network peripheral with an alarm status of 2 or 3 on the **MAAP**.

Requirement: Individual network peripheral failures cannot be resolved unless the failing network peripheral is displayed on the **MAAP**.

PROC 622, Test 1 and Test 2

13. Depress **CLEAR DATA; EXECUTE**.
14. Field 9 (alarm status) displays a 5 indicating that the failing network peripheral entry in PMIDS is marked as resolved.

The **NETWORK PERIPH EQPT** fault indicator is turned off if no other network peripheral failures exist.
15. If the **CLEAR DATA; EXECUTE** sequence is performed when a dash is displayed in Field 2 (equipment type), all network peripheral failures with an alarm status of 2 or 3 are resolved and the **NETWORK PERIPH EQPT** fault indicator is turned off.
16. All network peripheral failures with an alarm status of 2 or 3 can be resolved when the summary is initially displayed, i.e., upon entry to **PROC 622**, Test 1 and after displaying all network peripheral failures and then using **NEXT CIRCUIT** to display the summary.

Note: When the summary is displayed, Field 2 is dashed.

Caution: *The network peripheral failures should be displayed and recorded prior to resolving the failures in order that a record of the equipment location and fault code of the network peripheral failures are available for maintenance personnel.*

17. After entering Test 1 and depressing **EXECUTE**, the summary is displayed.

Depress **CLEAR DATA; EXECUTE**.
18. Field 14 (number devices failed) changes to indicate the number of network peripheral failures with an alarm status of 2 or 3 which are resolved.

All network peripheral failures with an alarm status of 2 or 3 are marked as resolved in PMIDS and the **NETWORK PERIPH EQPT** fault indicator is turned off.
19. After displaying and recording all network peripheral failures, depress **NEXT CIRCUIT** until the summary is displayed.

Then, depress **CLEAR DATA; EXECUTE**.
20. Field 14 (number devices failed) changes to indicate the number of network peripheral failures with an alarm status of 2 or 3 which are resolved.

All network peripheral failures with an alarm status of 2 or 3 are marked as resolved in PMIDS and the **NETWORK PERIPH EQPT** fault indicator is turned off.
21. The **MINOR** or **WARNING** alarm indicator is also turned off when no other sources affecting the **MINOR** or **WARNING** alarm indicator are present.

Test 2

Test 2 is used to test one or more network peripherals once and display the results of the test.

Network peripherals can be selected for testing by equipment type, a range of port equipment locations, or on a single circuit basis.

Two modes of testing are provided in Test 2; i.e., service-affecting and nonservice-affecting.

1. The use of the nonservice-affecting test mode performs only transparent tests on network peripherals without affecting customer's service.
2. The service-affecting test mode provides complete testing of a network peripheral and is destructive, aborting any call in progress to a network peripheral and taking the network peripheral selected for testing out-of-service.

Test 2 automatically turns off the **NETWORK PERIPH EQPT** fault indicator when all network peripherals that raised an alarm pass Test 2.

Test 2 Data Entry

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 3 through 7. Field 9 displays the alarm status, Field 10 displays the circuit status, and Field 11 (test mode) displays a 0.

Field 2 (equipment type) is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Test 1, 3, or 4 of **PROC 622** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

The default equipment location can also be passed from **PROC 620** as long as the equipment location is a network peripheral port equipment location and is still displayed in **PROC 620** when it is passed.

4. All network peripherals, a range of network peripherals, all network peripherals within an equipment type, a combination of equipment type and range (i.e., all network peripherals of an equipment type in the range specified), a specific network peripheral, or the default equipment location can be tested.
5. To select the entire switch to be tested, Fields 2 through 7 must be dashed.
 - a. If no default equipment location is displayed, depress **ENTER**.
 - b. If a default equipment location is displayed, depress **CHANGE FIELD; 2; ENTER; ENTER**.

Test 2 starts with the first module, first cabinet and carrier and runs until all network peripherals in the switch are tested.

Proceed to Step 23.

6. In addition to testing all network peripherals in the entire switch, a range of network peripherals (all network peripherals in a module, cabinet, carrier, or slot) can be selected for testing.

Note: Selection of a range of network peripherals to be tested depends on whether or not a default equipment location is displayed. If a default equipment location is displayed, the **CHANGE FIELD** sequence **must** be used. If no default equipment location is displayed, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the range of network peripherals to be tested.

7. To select all network peripherals in a module for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number to be tested); ENTER.**

Test 2 starts with the first network peripheral in the module selected and runs until all network peripherals in the module are tested.

Proceed to Step 23.

8. To select all network peripherals in a cabinet for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

Test 2 starts with the first network peripheral in the cabinet selected and runs until all network peripherals in the cabinet are tested.

Proceed to Step 23.

9. To select all network peripherals in a carrier for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**

Test 2 starts with the first network peripheral in the carrier selected and runs until all network peripherals in the carrier are tested.

Proceed to Step 23.

10. To select all network peripherals in a slot for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**

Test 2 starts with the first network peripheral in the slot selected and runs until all network peripherals in the slot are tested.

Proceed to Step 23.

11. To select all network peripherals within an equipment type to be tested, the appropriate equipment type must be entered in Field 2.

Equipment types include: 1 = PDM, 2 = 74 series terminal, 3 = DTDM, 4 = 72 series terminal, 5 = TDM, 6 = PDM/2, 7 = TDM/2, 8 = 7407D voice station, 9 = 7407D data module, 10 = 510D voice station, 11 = 510D data module, 12 = BCT 515 voice station, 13 = BCT 515 data module, 14 = 7404D voice station, 15 = 7404D data module, 16 = AP32 even port channel, 17 = AP32 odd port channel, 18 = 73 series terminal, 20 = 7406D voice station, 21 = PC even port channel, and 22 = PC odd port channel.

12. An equipment type can be selected in several ways; i.e., by depressing **NEXT UNIT** until the correct equipment type is displayed or by entering the equipment type and depressing **ENTER**.
13. If no default equipment location is displayed, enter the equipment type to be tested in Field 2 and depress **ENTER** or use **NEXT UNIT** to step through the equipment types in numerical sequence until the equipment type to be tested is displayed in Field 2.

If a default equipment location is displayed, enter the equipment type to be tested in Field 2 and depress **ENTER**.

Test 2 starts with the first network module, first cabinet and carrier, and runs until all network peripherals of the equipment type selected are tested.

Proceed to Step 23.

14. In addition to testing all network peripherals in a specified equipment type, a range of network peripherals for the equipment type (all network peripherals for an equipment type in a module, cabinet, carrier, or slot) can be selected for testing.
15. To select all network peripherals for an equipment type in a module for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type to be tested); ENTER; (Module number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type to be tested); ENTER; (Module number to be tested); ENTER.**

Test 2 starts with the first network peripheral of the equipment type specified, in the module selected, and runs until all network peripherals of the equipment type in the module are tested.

Proceed to Step 23.

16. To select all network peripherals for an equipment type in a cabinet for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type to be tested); ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type to be tested); ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

Test 2 starts with the first network peripheral of the equipment type specified, in the cabinet selected, and runs until all network peripherals of the equipment type in the cabinet are tested.

Proceed to Step 23.

17. To select all network peripherals for an equipment type in a carrier for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type to be tested); ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type to be tested); ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**

Test 2 starts with the first network peripheral of the equipment type specified, in the carrier selected, and runs until all network peripherals of the equipment type in the carrier are tested.

Proceed to Step 23.

18. To select all network peripherals for an equipment type in a slot for testing, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type to be tested); ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type to be tested); ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**

Test 2 starts with the first network peripheral of the equipment type specified, in the slot selected, and runs until all network peripherals of the equipment type in the slot are tested.

Proceed to Step 23.

19. A specific network peripheral can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**

Proceed to Step 22.

20. A specific network peripheral can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.
 - a. Depress **NEXT UNIT** until the equipment type of the network peripheral to be tested is displayed in Field 2.
 - b. Depress **NEXT CIRCUIT** until the port equipment location of the network peripheral to be tested is displayed in Fields 3 through 7.

Proceed to Step 22.

21. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 22.

Caution: *Busying out a port equipment location results in loss of customer calls or data when the port equipment location is in use.*

22. Individual port equipment locations can be placed in maintenance busy out status for testing by performing the following:
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status = 2, proceed to Step 23.

If the circuit status does not equal 2, depress **BUSY OUT** and proceed to Step 23.

Note: If Fields 3 through 7 are not entered, special error code 88 (Fields 3 through 7 must be entered before use of **BUSY OUT**) is displayed in the **MAAP** error code field.

23. Prior to starting Test 2, it must be determined if nonservice-affecting tests or service-affecting tests are to be executed.

Caution: *A customer's normal service is aborted when service-affecting tests are performed as the network peripheral (or peripherals) is taken out-of-service while service-affecting tests are being performed.*

24. To perform service-affecting tests, Field 11 (test mode) must be changed to a 1 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 11; ENTER; 1; ENTER.

Test 2 Execution

1. To start Test 2 after selecting the network peripheral(s) to be tested and the test mode, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

2. When an in-use network peripheral is encountered during Test 2 execution in the nonservice-affecting test mode (for a range of network peripherals or for a single network peripheral) the **IN-USE** indicator is lighted on the **MAAP** while the transparent test is being performed.
3. Test 2 operation and display of test results is different when a specific network peripheral or default equipment location is tested and when the entire switch or a range of network peripherals are tested.
4. For test operation and display of test results for a default equipment location or a specific network peripheral, proceed to Step 1 of Test 2 Operation and Test Result Display for a Single Circuit.
5. For test operation and display of test results for the entire switch or a range of network peripherals, proceed to Step 1 of Test 2 Operation and Test Result Display for a Range of Circuits.

Test 2 Operation and Test Result Display for a Single Circuit

1. When Test 2 is completed for a default equipment location or a specific network peripheral, the **WAIT** indicator is turned off and the following is displayed:

Field 1 - 2.

Field 2 - Equipment type of network peripheral tested.

Fields 3 through 7 - Port equipment location of network peripheral tested.

Field 8 - Local/remote status of failing port.

Field 9 - Alarm status of network peripheral tested.

Field 10 - Current circuit status of network peripheral tested (0 = idle, 1 = in-use, 2 = busied out).

Field 11 - Test mode (0 or 1).

Field 12 - Dashed.

Field 13 - 1 (indicating one network peripheral tested).

Field 14 - 0 (indicating no failures were found for the peripheral tested) or 1 (indicating that the network network peripheral failed the test).

Field 15 - Dashed.

2. When a specific network peripheral or the default equipment location fails Test 2 (indicated by a 1 in Field 14), depressing **NEXT DATA** displays the fault code recorded for the network peripheral tested in Field 12 and Field 15 (failure index) displays a 1.

Note: When the port equipment location was busied out and the test passed, or the problem was corrected, the circuit should be released from busy using **RLS BUSY OUT**.

3. When another specific network peripheral is to be tested, the **CHANGE FIELD** sequence must be used to select the specific network peripheral.

CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

4. **EXECUTE** must be depressed to test the specific network peripheral selected for testing.

Test 2 Operation and Test Result Display for a Range of Circuits

1. When the entire switch or a range of circuits is being tested for network peripheral failures, the **WAIT** indicator is turned on and the following fields are incremented as a circuit is tested:

Field 2 - Equipment type of network peripheral being tested.

Fields 3 through 7 - Port equipment location of network peripheral being tested.

Field 8 - Dashed.

Field 9 - Alarm status of network peripheral being tested.

Field 10 - Current circuit status of network peripheral being tested (0 = idle, 1 = in-use, 2 = busied out).

Field 13 - Number of network peripherals tested.

Field 14 - Number of network peripherals failed (if any).

2. The failure information returned in the test is stored in DMIDS.

If DMIDS becomes full at any time during the test, Test 2 is stopped and the **WAIT** indicator is turned off.

The last network peripheral tested is displayed in Fields 2 through 7, Field 11 displays the test mode, and special error code 82, (DMIDS overflow), is displayed in the **MAAP** error code field.

3. Results of the test can be examined at this time (See Steps 11 through 15 below) and Test 2 can be continued from where it was stopped; i.e., from the port equipment location displayed in Fields 3 through 7.

Caution: *If Test 2 is continued from where it was stopped by a DMIDS overflow, any test results gathered to that point are lost and only new failure data is retained.*

Note: Before depressing **EXECUTE** to continue Test 2 from where it was stopped because of a DMIDS overflow, the failure data should be examined and recorded.

4. If Test 2 is halted because of a DMIDS overflow, a new range of network peripherals to be tested can be entered instead of continuing the test from where it was stopped.
5. The **CHANGE FIELD** sequence must be used to enter the new range of network peripherals to be tested.
 - a. Refer to Steps 7 through 10 of Test 2 Data Entry above to select a range of network peripherals to be tested in a module, cabinet, carrier, or slot.
 - b. Refer to Steps 15 through 18 of Test 2 Data Entry above to select a range of network peripherals within an equipment type to be tested in a module, cabinet, carrier, or slot.

EXECUTE must be depressed to begin Test 2 from the new range of network peripherals entered or from where the test was stopped.

6. **STOP** can be depressed when the entire switch or a range of network peripherals is being tested.

Note: Test 2 does not stop until the network peripheral being tested is completed. Special error code 86 (wait until test completes) is displayed in the **MAAP** error code field until the test is completed.

7. If Test 2 is stopped before one complete testing pass through the range of network peripherals specified is made, the total number of network peripherals tested and the total number of network peripherals failed (if any) are displayed in Fields 13 and 14.

The equipment type and port equipment location of the last network peripheral tested is displayed in Fields 2 through 7, Field 11 displays the test mode, and special error code 83 (test of range not completed) is displayed in the **MAAP** error code field.

PROC 622, Test 2

8. Test result information for failing network peripherals (if any) can be stepped through as described in Steps 11 through 15 below when Test 2 is halted using **STOP** even though the entire range is not tested.
9. To restart the test when Test 2 is halted by use of **STOP** before the range of network peripherals are tested at least once, **EXECUTE** is depressed and Test 2 starts at the port equipment location following the last port equipment location tested.

Note: When Test 2 is discontinued from where it was stopped, any test results gathered to that point are lost and only new failure data is retained.

10. When the entire switch or a range of network peripherals are tested, the **WAIT** indicator is turned off and a summary is displayed.

If no network peripherals failed, the following summary is displayed:

Field 1 - 2.

Fields 2 through 6 - Equipment type and location of the range of network peripherals tested.

Field 11 - Test mode (0 or 1).

Field 13 - Number of network peripherals tested.

Field 14 - 0 (indicating no failures).

11. If any network peripherals failed, the summary displays a 2 in Field 1, the equipment type and location of the range of network peripherals tested in Fields 2 through 6, the test mode in Field 11, the total number of network peripherals tested in Field 13, and the total number of failures in Field 14.

12. Depressing **NEXT CIRCUIT** displays the first failure, as follows:

Field 1 - 2.

Field 2 - Equipment type of failing network peripheral.

Fields 3 through 7 - Port equipment location of failing network peripheral.

Field 8 - Local/remote status of failing port.

Field 9 - Alarm status of failing network peripheral.

Field 10 - Current circuit status of failing network peripheral (0 = idle, 1 = in-use, 2 = busied out).

Field 11 - Test mode (0 or 1).

Field 12 - Fault code.

Field 13 - Number of times the network peripheral was tested.

Field 14 - Number of times the network peripheral failed.

Field 15 - Failure index.

13. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing network peripherals.
14. When more than one equipment type is tested, depressing **NEXT UNIT** causes the first network peripheral of the next equipment type with failures to be displayed.

Field 15 decrements corresponding to the number of failures passed over (if any) when stepping from equipment type to equipment type.

NEXT CIRCUIT is used to step through the failures of the displayed equipment type.

15. When all failing network peripherals are displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** dashes Fields 2 through 10 and 12 through 15.

Depressing **NEXT CIRCUIT** or **NEXT UNIT** once more causes the number of devices tested and failed to be displayed in Fields 13 and 14, and the failing network peripherals can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.

16. To select another range of network peripherals to test, the **CHANGE FIELD** sequence must be used.
 - a. Refer to Steps 7 through 10 of Test 2 Data Entry above to select a range of network peripherals to be tested in a module, cabinet, carrier, or slot.
 - b. Refer to Steps 15 through 18 of Test 2 Data Entry above to select a range of network peripherals within a equipment type to be tested in a module, cabinet, carrier, or slot.

EXECUTE must be depressed to test the range of network peripherals selected for testing.

17. The **NETWORK PERIPH EQPT** fault indicator is turned off when Test 2 completes with no failures detected for all network peripherals that had raised an alarm.

Note: Network peripheral alarmed circuit entries in PMIDS are marked as resolved.

18. The **MINOR** or **WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

Test 3

Test 3 is used to test one or more network peripherals in a continuous cycle.

Two modes of testing are provided in Test 3; i.e., service-affecting and nonservice-affecting.

1. The use of the nonservice-affecting test mode performs only transparent tests on network peripherals without affecting customer's service.
2. The service-affecting test mode provides complete testing of a network peripheral and is destructive, aborting any call in progress to a network peripheral and taking the network peripheral selected for testing out-of-service.

Test 3 is mainly used when an intermittent fault is suspected, when using test equipment to further isolate a problem, or to trace wiring problems.

Network peripherals can be selected for testing by equipment type, a range of port equipment locations, or on a single circuit basis.

Test 3 Data Entry

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

PROC 622, Test 3

2. When Test 3 is initially called in, a default equipment location may be displayed in Fields 3 through 7. Field 9 displays the alarm status, Field 10 displays the circuit status, and Field 11 (test mode) displays a 0.

Field 2 (equipment type) is blinking, indicating an optional entry field.

3. Normally, a specific network peripheral or the default equipment location is tested in Test 3. However, network peripheral selection for testing in Test 3 is identical to Test 2.

All network peripherals, a range of network peripherals, all network peripherals within an equipment type, a combination of equipment type and range (i.e., all network peripherals of an equipment type in the range specified), a specific network peripheral, or the default equipment location can be tested.

4. When all network peripherals in the switch are to be tested continuously, refer to Step 5 of Test 2 Data Entry for network peripheral selection.
 - a. To select all network peripherals in a specific module to be tested continuously, refer to Step 7 of Test 2 Data Entry.
 - b. To select all network peripherals in a specific cabinet to be tested continuously, refer to Step 8 of Test 2 Data Entry.
 - c. To select all network peripherals in a specific carrier to be tested continuously, refer to Step 9 of Test 2 Data Entry.
 - d. To select all network peripherals in a specific slot to be tested continuously, refer to Step 10 of Test 2 Data Entry.

Proceed to Step 10.

5. When all network peripherals in an equipment type are to be tested continuously, refer to Steps 11 and 12 of Test 2 Data Entry for equipment type selection.
 - a. To select all network peripherals of an equipment type in a specific module to be tested continuously, refer to Step 15 of Test 2 Data Entry.
 - b. To select all network peripherals of an equipment type in a specific cabinet to be tested continuously, refer to Step 16 of Test 2 Data Entry.
 - c. To select all network peripherals of an equipment type in a specific carrier to be tested continuously, refer to Step 17 of Test 2 Data Entry.
 - d. To select all network peripherals of an equipment type in a specific slot to be tested continuously, refer to Step 18 of Test 2 Data Entry.

Proceed to Step 10.

6. A specific network peripheral can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**

Proceed to Step 9.

7. A specific network peripheral can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.
 - a. Depress **NEXT UNIT** until the equipment type of the network peripheral to be tested is displayed in Field 2.
 - b. Depress **NEXT CIRCUIT** until the port equipment location of the network peripheral to be tested is displayed in Fields 3 through 7.

Proceed to Step 9.

8. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 9.

Caution: *Busying out a port equipment location results in loss of customer calls or data when the port equipment location is in use.*

9. Individual port equipment locations can be placed in maintenance busy out status for testing by performing the following:
 - a. Check the circuit status displayed in Field 10.
 - b. If the circuit status equals 2, proceed to Step 10.

If the circuit status does not equal 2, depress **BUSY OUT** and proceed to Step 10.

Note: If Fields 3 through 7 are not entered, special error code 88 (Fields 3 through 7 must be entered before use of **BUSY OUT**) is displayed in the **MAAP** error code field.

10. Prior to starting Test 3, it must be determined if nonservice-affecting tests or service-affecting tests are to be executed.

Caution: *A customer's normal service is aborted when service-affecting tests are performed as the network peripheral (or peripherals) is taken out-of-service while service-affecting tests are being performed.*

11. To perform service-affecting tests, Field 11 (test mode) must be changed to a 1 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 11; ENTER; 1; ENTER.

Test 3 Execution

1. To start Test 3 after selecting the network peripheral(s) to be tested and the test mode, depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

2. When an in-use network peripheral is encountered during Test 3 execution in the nonservice-affecting test mode (for a range of network peripherals or for a single network peripheral), the **IN USE** indicator is lighted on the **MAAP** while the transparent test is being performed.
3. If the DMIDS storage buffer becomes full, either during testing of a range of network peripherals or a single network peripheral, special error code 82, (DMIDS overflow), is displayed in the **MAAP** error code field.

Note: Testing is not stopped when the DMIDS buffer becomes full.

PROC 622, Test 3

4. When multiple network peripherals are being tested, new errors detected are discarded. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed

Refer to Test 3 Result Display for a Range of Circuits below.

5. When testing a single network peripheral, new errors detected are added to the failure list and the oldest errors are deleted. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed.

Refer to Test 3 Result Display for a Single Circuit below.

6. Only 99 errors can be displayed when the DMIDS buffer becomes full. When multiple network peripherals are being tested, the 99 errors are the oldest errors recorded. When a single network peripheral is tested, the 99 errors are the newest errors recorded.

7. When the entire switch or a range of network peripherals is being tested continuously in Test 3, the following fields are incremented as a network peripheral is tested:

Field 2 - Equipment type of network peripheral being tested.

Fields 3 through 7 - Port equipment location of network peripheral being tested.

Field 9 - Alarm status of network peripheral being tested.

Field 10 - Current circuit status of network peripheral being tested (0 = idle, 1 = in-use, 2 = busied out).

Field 13 - Number of network peripherals tested.

Field 14 - Number of network peripherals failed (if any).

8. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

Note: Test 3 does not stop until the network peripheral being tested is completed. Special error code 86 (wait until test completes) is displayed in the **MAAP** error code field until the test is completed.

9. Display of test results is different when a specific network peripheral or default equipment location is tested and when the entire switch or a range of network peripherals are tested.
10. For display of test results when testing a default equipment location or a specific network peripheral, proceed to Step 1 of Test 3 Result Display for a Single Circuit.

For display of test results when testing the entire switch or a range of network peripherals, proceed to Step 1 of Test 3 Result Display for a Range of Circuits.

Test 3 Result Display for a Single Circuit

1. When Test 3 is stopped while testing a default equipment location or a specific network peripheral, the following is displayed:

Field 1 - 3.

Field 2 - Equipment type of network peripheral tested.

Fields 3 through 7 - Port equipment location of network peripheral tested.

Field 8 - Local/remote status of failing port.

Field 9 - Alarm status of network peripheral tested.

Field 10 - Current circuit status of network peripheral tested (0 = idle, 1 = in-use, 2 = busied out).

Field 11 - Test mode (0 or 1).

Field 12 - Dashed.

Field 13 - Number of times the network peripheral was tested.

Field 14 - 0 (indicating no failures were detected for the network peripheral tested) or number of times the network peripheral failed.

Field 15 - Dashed.

2. When a specific network peripheral or the default equipment location failed Test 3 (indicated by Field 14), depressing **NEXT DATA** displays the fault code recorded for the network peripheral tested in Field 12.

Field 15 displays the number of fault codes recorded against the failing network peripheral.

3. Multiple fault codes may have been recorded for the failing network peripheral displayed in Fields 3 through 7 as indicated by Field 15 displaying more than 1 (which is an index to fault codes).
4. Depressing **NEXT FAULT** displays in Field 12 the next fault code (if any) recorded against the failing network peripheral and Field 15 is decremented corresponding to the number of fault codes which were the same.

Note: When **NEXT FAULT** is depressed, Fields 12 through 15 may be dashed. This indicates that all remaining fault codes were the same. Dashing of Fields 12 through 15 can occur at any time when **NEXT FAULT** is depressed, no matter what number was displayed in Field 15 before **NEXT FAULT** was depressed.

5. When all fault codes for the failing network peripheral are displayed, depressing **NEXT FAULT** once more dashes Fields 12 through 15.

Depressing **NEXT FAULT** again displays the first fault code recorded for the failing network peripheral.

6. When the port equipment location was busied out and the test passed, or the problem was corrected, the circuit should be released from busy using **RLS BUSY OUT**.
7. When another specific network peripheral is to be tested, the **CHANGE FIELD** sequence must be used to select the specific network peripheral.

CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.

8. **EXECUTE** must be depressed to test the specific network peripheral selected for testing.

Test 3 Result Display for a Range of Circuits

1. When Test 3 is stopped while testing the entire switch or a range of network peripherals, a summary is displayed.

PROC 622, Test 3

2. If no network peripherals failed, the following summary is displayed:
 - Field 1 - 3.
 - Fields 2 through 7 - Equipment type and location of the last network peripheral tested.
 - Field 9 - Alarm status of the network peripheral tested.
 - Field 10 - Current circuit status of the network peripheral tested (0 = idle, 1 = in-use, 2 = busied out).
 - Field 11 - Test mode (0 or 1).
 - Field 13 - Number of network peripherals tested.
 - Field 14 - 0 (indicating no failures).
3. If any network peripherals failed, the summary displays a 3 in Field 1, the equipment type and location of the last network peripheral tested in Fields 2 through 7, the alarm status in Field 9, the current circuit status in Field 10, the test mode in Field 11, the total number of network peripherals tested in Field 13, and the total number of failures in Field 14.
4. Depressing **NEXT CIRCUIT** displays the first failure, as follows:
 - Field 1 - 3.
 - Field 2 - Equipment type of failing network peripheral.
 - Fields 3 through 7 - Port equipment location of failing network peripheral.
 - Field 8 - Local/remote status of failing port.
 - Field 9 - Alarm status of failing network peripheral.
 - Field 10 - Current circuit status of failing network peripheral (0 = idle, 1 = in-use, 2 = busied out).
 - Field 11 - Test mode (0 or 1).
 - Field 12 - Fault code.
 - Field 13 - Number of times the network peripheral was tested.
 - Field 14 - Number of times the network peripheral failed.
 - Field 15 - Failure index.

Note: Multiple fault codes are not recorded for each failing network peripheral when a range of network peripherals are tested.
5. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing network peripherals.
6. When more than one equipment type is tested, depressing **NEXT UNIT** causes the first network peripheral of the next equipment type with failures to be displayed.
 - Field 15 decrements corresponding to the number of failures passed over (if any) when stepping from equipment type to equipment type.
 - NEXT CIRCUIT** is used to step through the failures of the displayed equipment type.
7. When all failing network peripherals are displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** dashes Fields 2 through 10, and 12 through 15.

Depressing **NEXT CIRCUIT** or **NEXT UNIT** once more causes the number of devices tested and failed to be displayed in Fields 13 and 14, and the failing network peripherals can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.

8. Test 3 can be restarted without changing the default equipment location or range of network peripherals originally entered for testing by depressing **EXECUTE**.

The same default equipment location or range of network peripherals is used as the basis for the new execution of Test 3.

Any data gathered in the last execution of Test 3 is lost when **EXECUTE** is depressed.

9. To select another range of network peripherals to test, the **CHANGE FIELD** sequence must be used.
 - a. Refer to Test 2 Data Entry, Steps 7 through 10 to select a range of network peripherals to be tested in a module, cabinet, carrier, or slot.
 - b. Refer to Test 2 Data Entry, Steps 15 through 18 to select a range of network peripherals within a equipment type to be tested in a module, cabinet, carrier, or slot.

EXECUTE must be depressed to test the range of network peripherals selected for testing.

10. The **NETWORK PERIPH EQPT** fault indicator is turned off when Test 3 completes with no failures detected for all network peripherals that had raised an alarm.

Note: Network peripheral alarmed circuit entries in PMIDS are marked as resolved.

11. The **MINOR** or **WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

Test 4

Test 4 is used to continuously test the transmission quality to a specific network peripheral or a range of network peripherals.

Test 4 uses the Digital Transmission Link (DTL) loop-around test to detect bit errors over the DTL link.

Test 4 **must** be performed in the service-affecting test mode.

Network peripherals can be selected for testing by equipment type, a range of port equipment locations, or on a single circuit basis.

Test 4 Data Entry

1. Test 4 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 4.

2. When Test 4 is initially called in, a default equipment location may be displayed in Fields 3 through 7. Field 9 displays the alarm status, Field 10 displays the circuit status, and Field 11 (test mode) displays a 0.

Field 2 (equipment type) is blinking, indicating an optional entry field.

3. Normally, a specific network peripheral or the default equipment location is tested in Test 4. However, network peripheral selection for testing in Test 4 is identical to Test 2.

Caution: Testing a range of network peripherals in the service-affecting test mode affects properly functioning network peripherals.

4. All network peripherals, a range of network peripherals, all network peripherals within an equipment type, a combination of equipment type and range (i.e., all network peripherals of an equipment type in the range specified), a specific network peripheral, or the default equipment location can be tested.
5. When all network peripherals in the switch are to be tested continuously, refer to Step 5 of Test 2 Data Entry for network peripheral selection.
 - a. To select all network peripherals in a specific module to be tested continuously, refer to Step 7 of Test 2 Data Entry.
 - b. To select all network peripherals in a specific cabinet to be tested continuously, refer to Step 8 of Test 2 Data Entry.
 - c. To select all network peripherals in a specific carrier to be tested continuously, refer to Step 9 of Test 2 Data Entry.
 - d. To select all network peripherals in a specific slot to be tested continuously, refer to Step 10 of Test 2 Data Entry.

Proceed to Step 11.

6. When all network peripherals in an equipment type are to be tested continuously, refer to Steps 11 and 12 of Test 2 Data Entry for equipment type selection.
 - a. To select all network peripherals of an equipment type in a specific module to be tested continuously, refer to Step 15 of Test 2 Data Entry.
 - b. To select all network peripherals of an equipment type in a specific cabinet to be tested continuously, refer to Step 16 of Test 2 Data Entry.
 - c. To select all network peripherals of an equipment type in a specific carrier to be tested continuously, refer to Step 17 of Test 2 Data Entry.
 - d. To select all network peripherals of an equipment type in a specific slot to be tested continuously, refer to Step 18 of Test 2 Data Entry.

Note: Special error code 87 (equipment type can not be tested in test 4) is displayed in the **MAAP** error code field if equipment type 4 (72 series terminal) or 18 (73 series terminal) is selected for testing and **EXECUTE** is depressed.

Proceed to Step 11.

7. A specific network peripheral can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**

- b. **CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**

Proceed to Step 10.

- 8. A specific network peripheral can also be selected for testing by use of **NEXT UNIT** and **NEXT CIRCUIT**.
 - a. Depress **NEXT UNIT** until the equipment type of the network peripheral to be tested is displayed in Field 2.
 - b. Depress **NEXT CIRCUIT** until the port equipment location of the network peripheral to be tested is displayed in Fields 3 through 7.

Proceed to Step 10.

- 9. To test the default equipment location displayed in Fields 2 through 7, proceed to Step 10.

Caution: *Busying out a port equipment location results in loss of customer calls or data when the port equipment location is in use.*

- 10. Individual port equipment locations can be placed in maintenance busy out status for testing by checking the circuit status displayed in Field 10.
- 11. If the circuit status equals 2, proceed to Step 13.
- 12. If the circuit status does not equal 2, depress **BUSY OUT** and proceed to Step 13.

Note: If Fields 3 through 7 are not entered, special error code 88 (Fields 3 through 7 must be entered before use of **BUSY OUT**) is displayed in the **MAAP** error code field.

Caution: *A customer's normal service is aborted when service-affecting tests are performed as the network peripheral (or peripherals) is taken out-of-service while service-affecting tests are being performed.*

- 13. To perform Test 4 (service-affecting), Field 11 (test mode) **must** be changed to a 1 using the **CHANGE FIELD** sequence:
CHANGE FIELD; 11; ENTER; 1; ENTER.

Note: Special error code 84 (test 4 must be run in mode 1) is displayed in the **MAAP** error code field if Field 11 is not changed to a 1 and **EXECUTE** is depressed.

Test 4 Execution

- 1. To start Test 4 after selecting the network peripheral(s) to be tested and test mode 1, depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 4 execution.

- 2. If the DMIDS storage buffer becomes full either during testing of a range of network peripherals or a single network peripheral, special error code 82 (DMIDS overflow) is displayed in the **MAAP** error code field.

Note: Testing is not stopped when the DMIDS buffer becomes full.

3. When multiple network peripherals are being tested, new errors detected are discarded. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed.

Refer to Test 4 Result Display for a Range of Circuits below.

4. When testing a single network peripheral, new errors detected are added to the failure list, and the oldest errors are deleted. Test results can be examined when the DMIDS buffer becomes full and **STOP** is depressed.

Refer to Test 4 Result Display for a Single Circuit below.

5. Only 99 errors can be displayed when the DMIDS buffer becomes full. When multiple network peripherals are tested, the 99 errors are the oldest errors recorded. When a single network peripheral is tested, the 99 errors are the newest errors recorded.

6. When the entire switch or a range of network peripherals is being tested continuously in Test 4, the following fields are incremented as a network peripheral is tested:

Field 2 - Equipment type of network peripheral being tested.

Fields 3 through 7 - Port equipment location of network peripheral being tested.

Field 9 - Alarm status of network peripheral being tested.

Field 10 - Current circuit status of network peripheral being tested (0 = idle, 1 = in-use, 2 = busied out).

Field 13 - Number of network peripherals tested.

Field 14 - Number of network peripherals failed (if any).

7. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

Note: Test 4 does not stop until the network peripheral being tested is completed. Special error code 86 (wait until test completes) is displayed in the **MAAP** error code field until the test is completed.

8. Display of test results is different when a specific network peripheral or default equipment location is tested and when the entire switch or a range of network peripherals are tested.
9. For display of test results when testing a default equipment location or a specific network peripheral, proceed to Step 1 of Test 4 Result Display for a Single Circuit.
10. For display of test results when testing the entire switch or a range of network peripherals, proceed to Step 1 of Test 4 Result Display for a Range of Circuits.

Test 4 Result Display for a Single Circuit

1. When Test 4 is stopped while testing a default equipment location or a specific network peripheral, the following is displayed:

Field 1 - 4.

Field 2 - Equipment type of network peripheral tested.

Fields 3 through 7 - Port equipment location of network peripheral tested.

Field 8 - Local/remote status of failing port.

Field 9 - Alarm status of network peripheral tested.

Field 10 - Current circuit status of network peripheral tested (0 = idle, 1 = in-use, 2 = busied out).

Field 11 - Test mode (1).

Field 12 - Dashed.

Field 13 - Number of times the network peripheral was tested.

Field 14 - 0 (indicating no failures were detected for the network peripheral tested) or number of times the network peripheral failed.

Field 15 - Dashed.

2. When a specific network peripheral or the default equipment location fails Test 4 (indicated by Field 14), depressing **NEXT DATA** displays the fault code recorded for the network peripheral tested in Field 12.

Field 15 displays the number of fault codes recorded against the failing network peripheral.

3. Multiple fault codes may have been recorded for the failing network peripheral displayed in Fields 3 through 7 as indicated by Field 15 displaying more than 1 (which is an index to fault codes).
4. Depressing **NEXT FAULT** displays in Field 12 the next fault code (if any) recorded against the failing network peripheral and Field 15 is decremented corresponding to the number of fault codes which were the same.

Note: When **NEXT FAULT** is depressed, Fields 12 through 15 may be dashed. This indicates that all remaining fault codes were the same. Dashing of Fields 12 through 15 can occur at any time when **NEXT FAULT** is depressed, no matter what number was displayed in Field 15 before **NEXT FAULT** was depressed.

5. When all fault codes for the failing network peripheral are displayed, depressing **NEXT FAULT** once more dashes Fields 12 through 15.

Depressing **NEXT FAULT** again displays the first fault code recorded for the failing network peripheral.

6. When the port equipment location was busied out and the test passed, or the problem was corrected, the circuit should be released from busy using **RLS BUSY OUT**.
7. When another specific network peripheral is to be tested, the **CHANGE FIELD** sequence must be used to select the specific network peripheral.
 - a. **CHANGE FIELD; 2; ENTER; (Equipment type of network peripheral to be tested); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number to be tested); ENTER.**
 - b. Enter test mode 1 and depress **EXECUTE**.

Test 4 Result Display for a Range of Circuits

1. When Test 4 is stopped while testing the entire switch or a range of network peripherals, a summary is displayed.

PROC 622, Test 4

2. If no network peripherals failed, the following summary is displayed:
Field 1 - 4.
Fields 2 through 7 - Equipment type and location of the last network peripheral tested.
Field 11 - Test mode (1).
Field 13 - Number of network peripherals tested.
Field 14 - 0 (indicating no failures).
3. If any network peripherals failed, the summary displays a 4 in Field 1, the equipment type and location of the last network peripheral tested in Fields 2 through 7, the alarm status in Field 9, the current circuit status in Field 10, the test mode in Field 11, the total number of network peripherals tested in Field 13, and the total number of failures in Field 14.
4. Depressing **NEXT CIRCUIT** displays the first failure as follows:
Field 1 - 4.
Field 2 - Equipment type of failing network peripheral.
Fields 3 through 7 - Port equipment location of failing network peripheral.
Field 8 - Local/remote status of failing port.
Field 9 - Alarm status of failing network peripheral.
Field 10 - Current circuit status of failing network peripheral (0 = idle, 1 = in-use, 2 = busied out).
Field 11 - Test mode (1).
Field 12 - Fault code.
Field 13 - Number of network peripherals tested.
Field 14 - Number of network peripherals failed.
Field 15 - Failure index.

Note: Multiple fault codes are not recorded for each failing network peripheral when a range of network peripherals are tested.
5. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing network peripherals.
6. When more than one equipment type is tested, depressing **NEXT UNIT** causes the first network peripheral of the next equipment type with failures to be displayed.
Field 15 decrements corresponding to the number of failures passed over (if any) when stepping from equipment type to equipment type.
NEXT CIRCUIT is used to step through the failures of the displayed equipment type.
7. When all failing network peripherals are displayed, depressing **NEXT CIRCUIT** or **NEXT UNIT** dashes Fields 2 through 10 and 12 through 15.
Depressing **NEXT CIRCUIT** or **NEXT UNIT** once more causes the number of devices tested and failed to be displayed in Fields 13 and 14, and the failing network peripherals can be stepped through again by use of **NEXT CIRCUIT** and **NEXT UNIT**.

8. Test 4 can be restarted without changing the default equipment location or range of network peripherals originally entered for testing by depressing **EXECUTE**.

The same default equipment location or range of network peripherals is used as the basis for the new execution of Test 4.

Any data gathered in the last execution of Test 4 is lost when **EXECUTE** is depressed.

9. To select another range of network peripherals to test, the **CHANGE FIELD** sequence must be used.
 - a. Refer to Test 2 Data Entry, Steps 7 through 10 to select a range off network peripherals to be tested in a module, cabinet, carrier, or slot.
 - b. Refer to Test 2 Data Entry, Steps 15 through 18 to select a range of network peripherals within a equipment type to be tested in a module, cabinet, carrier, or slot.
 - c. Enter test mode 1 and depress **EXECUTE**.

Repair Guide

Overview

The repair guide for network peripheral troubles is divided into three parts, Alarmed Troubles, Fault Isolation for Remoted Port Failures, and User Reported Troubles.

Alarmed Troubles

When the **NETWORK PERIPH EQPT**, and **MINOR** or **WARNING** alarm indicators on the alarm panel are lighted (indicating a network peripheral failure) or when **PROC 622** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and manually record the failure history generated by the on-line maintenance software.
Determine which failures have an alarm status code of 2 or 3 (minor or warning).
2. Determine the local/remote status of the failing circuits displayed in Field 8.
 - a. If the remote status displayed in Field 8 equals 0 (local), proceed to Step 3.
 - b. If the remote status displayed in Field 8 equals 1 (remote port, T1 carrier) or 2 (remote port, fiber), refer to isolation and repair step **Fault Isolation for Remoted Port Failures** for further diagnosis of the trouble.
3. When a 74 series terminal is the failing circuit, determine if the 74 series terminal is connected to a personal computer.

Note: It may not be possible for periodic or demand maintenance software to detect a defective 74 series terminal when it is connected to a powered-up personal computer that is in the PC mode.

If the 74 series terminal is connected to a personal computer, request the customer to power down the personal computer or place the computer in the non-PC mode (off-line) before testing the 74 series terminal.

PROC 622

4. When a translated peripheral is the failing circuit, determine if the peripheral is connected. When the peripheral is powered by external sources (i.e., commercial power), the power to the peripheral **must** be turned on.

Note: Tests may fail with a fault code other than the expected fault code 3 (DTL link idle) failure when the peripheral is disconnected or does not have power on when required.

5. Execute Test 2.

Test 2 runs a variable length of time depending on the number of network peripherals being tested; i.e., the entire switch, a range of network peripherals, a specific network peripheral, or the default equipment location.

6. Test 2 must be run for each network peripheral recorded in Test 1 with an alarm status of 2 or 3 (minor or warning) and for the default equipment location passed from **PROC 600**, Test 1 or 2 or from **PROC 620** (network procedure).

7. If all network peripherals pass Test 2, the **NETWORK PERIPH EQPT** fault indicator is turned off.

When Test 2 passes and network peripheral failures are recorded in Test 1 with an alarm status of 2 or 3 (minor or warning), proceed to Step 26 for further testing to ensure that no intermittent failures exist.

8. If any failures are detected in Test 2, display the network peripheral failure on the **MAAP**.

9. If Test 2 returns a single fault code of 2 (48 volt overload), determine the type of GPP circuit pack installed at the equipment location displayed in Fields 3 through 6.

If SN270 is installed, proceed to Step 10.

If SN270B or SN271 is installed, proceed to Step 16.

10. At the modular jack, disconnect the peripheral.

Replace the blown fuse, and reseal SN270.

Note: Wait at least 30 seconds before performing Test 2.

11. Repeat Test 2.

If Test 2 passes, proceed to Step 12.

If Test 2 fails, check the wiring between SN270 and the modular jack (see port testing below).

12. Connect the peripheral to the modular jack.

Repeat Test 2.

13. If Test 2 passes, corrective action is complete.

If Test 2 fails, replace the peripheral and the fuse.

Note: Wait at least 30 seconds before performing Test 2.

14. Repeat Test 2.

If Test 2 passes, corrective action is complete.

If Test 2 fails, replace SN270.

15. Repeat Test 2.
 - If Test 2 passes, corrective action is complete.
 - If Test 2 fails, check the wiring associated with the circuit pack (see port testing below).
16. At the modular jack, disconnect the peripheral.
 - Note:** Wait at least 30 seconds before performing Test 2.
 - Repeat Test 2.
17. If Test 2 passes, proceed to Step 19.
 - If Test 2 fails, replace SN270B or SN271.
18. Repeat Test 2.
 - If Test 2 passes, corrective action is complete.
 - If Test 2 fails, check the wiring between SN270B or SN271 and the modular jack (see port testing below).
19. Connect the peripheral to the modular jack.
 - Repeat Test 2.
20. If Test 2 passes, corrective action is complete.
 - If Test 2 fails, replace the peripheral.
21. Repeat Test 2.
 - If Test 2 passes, corrective action is complete.
 - If Test 2 fails, check the wiring associated with the circuit pack (see port testing below).
22. If Test 2 returns a single fault code of 7 (digital instrument has bad state of health), replace the network peripheral and proceed to Step 26.
23. If Test 2 returns a single fault code of 3 (DTL link idle) or 12 (no response from network peripheral), perform Steps 24 and 25.
24. When fault code 3 or 12 is displayed, maintenance personnel **must** go to the location of the suspect network peripheral and check the DTL cable.
 - Note:** PROC 622 is unable to resolve the difference between a dead network peripheral and a severed DTL cable.
25. Check to see if phantom power is being supplied.
 - a. If no voltage can be measured, the DTL cable should be inspected and repaired or replaced.
 - b. If voltage is present, the network peripheral should be replaced with a network peripheral of the same type.
 - Proceed to Step 26.
26. Execute Test 3 in a nonservice-affecting test mode.

- a. It may be the case that a malfunctioning network peripheral always looks in-use.

If this is true, the nonservice-affecting mode of testing does not test the network peripheral. This situation requires the service-affecting mode of testing.

Caution: *Testing a large range of network peripherals in the service-affecting mode may affect many properly functioning network peripherals.*

Note: It is recommended that service-affecting mode testing be performed on only one network peripheral at-a-time.

- b. When network peripherals always look in-use (results are obtained from Test 2) use the service-affecting mode to test the network peripheral.

The network peripheral being tested is the default equipment location from Test 2 of **PROC 622**.

27. Continuously test the suspect network peripheral to determine if it fails.

If the network peripheral passes Test 3, proceed to Step 30.

If the network peripheral fails Test 3, proceed to Step 28.

28. Use **PROC 620**, Test 4 (unit type 27, 28, or 29) to test the General Purpose Port (GPP), 72 series terminal, or 73 series terminal associated with the failing network peripheral.

- a. If **PROC 620** fails, take the appropriate corrective action.
- b. When **PROC 620** passes after taking corrective action, repeat Test 3 of **PROC 622** to ensure that the failure is corrected.

Proceed to Step 33.

29. If **PROC 620** passes, replace the faulty network peripheral and repeat Test 3 of **PROC 622**.

If Test 3 passes, proceed to Step 30.

If Test 3 fails, check the wiring associated with the port equipment circuit pack and the network peripheral (see port testing below).

30. It may be the case that all network peripherals pass test 2 or 3, but occasional errors are still recorded in PMIDS or a user reports occasionally garbled data.

Note: These problems may be caused by noise on the DTL lines.

31. Test 4 tests only the transmission of the DTL lines. Test 4 detects single bit errors and thus provides a sensitive indicator of noise on the DTL lines.

32. The location entered for Test 4 should be that of the port circuit connected to the suspect DTL lines.

Note: Equipment locations should be tested one-at-a-time as Test 4 is a service-affecting test.

33. Execute Test 4 and operate large electrical appliances (i.e., arc welders, jet engines, fusion reactors, laser space weapons systems, etc.) and the network peripheral in the vicinity of the DTL lines to see if they influence the noise on the DTL link.

If ambient electrical noise is the problem, the DTL lines and/or network peripheral may need to be relocated or reoriented.

34. In order to resolve the alarmed entries and turn off the **NETWORK PERIPH EQPT** fault indicator, all failing network peripherals with an alarm status of 2 or 3 (minor or warning) must pass Test 2 or 3.

Repeat Steps 2 through 34 (as appropriate) for each failing network peripheral with an alarm status of 2 or 3.

35. The **MINOR** or **WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

Port Tester

The port tester (comcode 105138424) verifies the continuity of station wiring (whether analog, hybrid, or digital) at various locations of a System 85 installation. (Refer to Figure 12.)

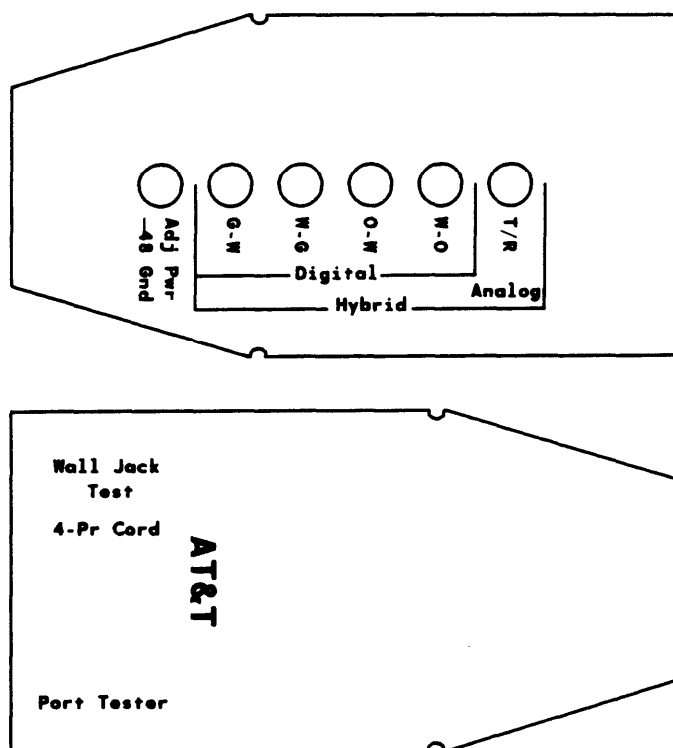


Figure 12. Port Tester

The port tester can detect signals at:

1. The purple field in the equipment room.
2. The white fields in the closets.
3. The wall jack.

The wall jack is the primary testing point for the port tester because the test from the wall jack verifies the total wire path.

The port tester is used with 110-type hardware and 8-pin modular jacks. The 3-pair plug attached to the port tester's cord tests at the cross-connect points of an installation.

The 8-pin jack, labeled **Wall Jack Test** on the port tester tests all voice ports using a D8W line cord, which is not provided.

WARNING: The port tester will overheat if plugged into an active circuit longer than 20 seconds.

The port tester displays the status of the equipment port leads by lighting the LEDs that correspond to those leads in each type of port tested. Table AK, Port Tester LED Designation/Color Description indicates which leads each LED is connected to.

There is a wiring problem:

1. When the LED indication is an incorrect color.
For example, the leads may be switched or the leads may be interchanged between pairs.
2. If the LED is not lighted and a signal is expected, there is an open connection between the port and the location of the test.

TABLE AK.

PORT TESTER LED DESIGNATION/COLOR DESCRIPTION		
LED DESIGNATION/ COLOR	PAIR TESTED	LEAD DESCRIPTION
T/R	1	Voice pair for analog and hybrid sets.
W-O	2	Tip lead of first data pair for digital and hybrid sets.
O-W	2	Ring lead of first data pair digital and hybrid sets.
W-G	3	Tip lead of second data pair for digital and hybrid sets.
G-W	3	Ring lead of second data pair for digital and hybrid sets.
-48/GRD	4	Fourth pair of jack is connected to a -48 V supply.

For the various types of ports tested, Table AL, LED Indications for Tested Ports lists the correct LED indications for the port tested. (G = Green; R = Red, and a dash (-) = not lighted. If adjunct power is present, the ADJ PWR -48V GND is lighted green.)

Fault Isolation for Remoted Port Failures

Fault isolation for remoted port failures is divided into two parts.

1. Part one is performed at the customer's premises using the **MAAP** to verify the existence of a failure and to determine the alternate circuit packs (if any) required to correct the trouble.

2. Part two is performed at the remote carrier group and reseats or replaces circuit packs in the remote carrier group using the remote carrier group circuit pack insertion test to correct the trouble.

TABLE AL.

LED INDICATIONS FOR TESTED PORTS					
PORT	T-R	W-O	O-W	W-G	G-W
ANALOG	G	-	-	-	-
GPP	-	G	G	G	G
MFET	G	G	G	G	G
MFAT	-	R	R	R	G

Part One - Verifying Failure

1. Display the failing circuit with a remote status of 1 (remote port, T1 carrier) or 2 (remote port, fiber) displayed in Field 8 in Test 1 of **PROC 622**.
2. Enter **PROC 622**, Test 2.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 622** is the default equipment location displayed in Test 2 of **PROC 622**.

3. When a 74 series terminal is the failing circuit, determine if the 74 series terminal is connected to a personal computer.

Note: It may not be possible for periodic or demand maintenance software to detect a defective 74 series terminal when it is connected to a powered-up personal computer that is in the PC mode.

If the 74 series terminal is connected to a personal computer, request the customer to power down the personal computer or place the computer in the non-PC mode (off-line) before testing the 74 series terminal.

4. When a translated peripheral is the failing circuit, determine if the peripheral is connected. When the peripheral is powered by external sources (i.e., commercial power), the power to the peripheral **must** be turned on.

Note: Tests may fail with a fault code other than the expected fault code 3 (DTL link idle) failure when the peripheral is disconnected or does not have power on when required.

5. Depress **EXECUTE**.

PROC 622

6. Determine the status of the circuit by checking the display in Field 14.

If the circuit passes, a 0 is displayed in Field 14. Record the equipment type and equipment location of the circuit tested displayed in Fields 2 through 7.

Note: When the circuit was alarmed in Test 1 of **PROC 622** and passes the diagnostic analysis test in Test 2 of **PROC 622**, further analysis of the problem should be performed by running a continuous test of the circuit in Test 3 of **PROC 622** to ensure that the failure is not intermittent.

Proceed to Step 8.

7. If the circuit fails (indicated by a 1 displayed in Field 14), record the equipment type and equipment location of the failing circuit displayed in Fields 2 through 7.

Proceed to Step 11.

8. Use **NEXT TEST** to step to Test 3 of **PROC 622**.

Note: The circuit that was displayed in Test 2 is the default equipment location displayed in Test 3.

9. Depress **EXECUTE**.

Allow Test 3 to execute for a period of time (or until a 1 is displayed in Field 14) and depress **STOP**.

If the circuit passes Test 3 (indicated by a 0 displayed in Field 14), repeat Test 2 to turn off the **NETWORK PERIPH EQPT** fault indicator.

10. If the circuit fails Test 3 (indicated by a 1 displayed in Field 14), record the equipment type and equipment location displayed in Fields 2 through 7.

Proceed to Step 11.

11. Use **PROC 620**, Test 4 to test the circuit displayed in Fields 3 through 7 of **PROC 622**, Test 2 or Test 3.

If **PROC 620** passes, replace the peripheral at the remote carrier group associated with the equipment location recorded in Step 6 or Step 7.

12. If **PROC 620** fails, use **PROC 625** to determine the health status of the RCL and RCC.

If the health status for the RCL or RCC is not good, perform isolation and repair step **Remote Carrier Group (unit type 74) Failures** for RCL or RCC failures in the repair guide section of **PROC 620**.

13. If the health status for both the RCL and RCC is good, replace the circuit pack at the remote carrier group associated with the equipment location recorded in Step 6 or Step 7.

If the port circuit pack insertion test fails, replace the peripheral associated with the equipment location recorded in Step 6 or Step 7.

14. Dispatch maintenance personnel to the remote carrier group with the required circuit packs and/or peripherals and the equipment location of the failing circuit pack(s) displayed in Fields 2 through 7.

Part Two - Remote Carrier Group Port Circuit Pack Replacement

Port circuit pack replacement in the remote carrier group is dependent upon observation of the **RED** and **GREEN** LEDs on the port circuit pack being reseated or replaced. There is **no MAAP** display to determine whether the port circuit pack passes or fails the test.

The remote carrier group port circuit pack insertion test consists of a hardware test.

Indications on the progress and results of the hardware test is provided by lighting LEDs on the port circuit pack inserted.

The port circuit pack recorded in part one for the failing circuit should be reseated prior to being replaced. The port circuit pack should be replaced if the port circuit pack insertion test fails when the port circuit pack is reseated.

The equipment location recorded in part one for the failing circuit is not the true physical location in the remote carrier group of the circuit pack to be reseated or replaced.

The remote carrier group contains a label (refer to Figure 11, page 304) which shows the relationship of the **MAAP** display to the remote carrier group slot number to be replaced for the failing circuit pack.

When replacing a GPP circuit pack, refer to **Port Circuit Pack Insertion** below for the results of the test.

Note: When a GPP circuit pack is unseated or replaced in the remote carrier group, wait **at least 30 seconds** before reseating the SN270B or SN271 circuit pack. The auto reset may not take effect because of the circuit pack being horizontally mounted unless the circuit pack is unseated for at least 30 seconds.

Port Circuit Pack Insertion

When a port circuit pack is inserted in the remote carrier group, the following occurs.

Note: When a GPP circuit pack is tested, all translated peripherals should be connected. When the terminal(s) are powered by external sources (i.e., commercial power), the power to the terminal(s) **must** be turned on.

1. The hardware test on the port circuit pack is performed.
The **RED** LED on the port circuit pack is turned on, then off.
The **GREEN** LED on the port circuit pack is turned on, then off.
2. If the port circuit pack hardware test passes, both LEDs remain off.
If the port circuit hardware test fails, the **RED** LED is lighted on the port circuit pack.

Note: No software test is executed for any port circuit packs.

3. If the port circuit pack fails the hardware test indicated by a **RED** LED being lighted, replace the circuit pack and repeat the port circuit pack insertion test.

User Reported Troubles

When user troubles associated with network peripherals are reported and there are no alarms, perform the following steps (as appropriate) for the type of network peripheral reported as the trouble. Repair guidelines for PDM, TDM, or DTDM data modules, and 72 or 74 series terminals are listed below.

PDM, TDM, and DTDM Data Module Repair Strategy:

For the following user reported troubles, the following steps are provided.

1. Cannot originate calls.
 - a. Ask the user to run a self test on the data module and 74 series terminal (if DTDM).
 - b. If the self test fails, replace the data module or 74 series terminal.

If the self test passes, use **PROC 622**, Test 1 to check for errors recorded against the data module or 74 series terminal. Use **PROC 622**, Test 3 to isolate the trouble.
2. Cannot receive calls.
 - a. Ask the user to run a self test on the data module and 74 series terminal (if DTDM).
 - b. If the self test fails, replace the data module or 74 series terminal.

If the self test passes, use **PROC 622**, Test 1 to check for errors recorded against the data module or 74 series terminal. Use **PROC 622**, Test 3 to isolate the trouble.
3. Data call is apparently set up, but no data can be sent or received.

Ask the user to run the following local tests (Steps 4 through 6) on the data module.
4. Self test - If this test fails, replace the data module.
5. Local loop back - If this test fails, there is a problem between the user's terminal equipment and the data module.
6. Remote loop back or remote loop back and self test combined.

Note: If the user can perform a remote loop back test using the user's terminal equipment, that is the preferred test.

- a. Set up a connection to the remote data terminal and operate the remote loop back button.

Note: For DTL mode 0 and 1 operation, the remote loop back button must be operated before the call is set up.

- b. Perform a remote loop back test or operate the self test button.
- c. If the test passes, the problem is in the remote data module or the user's remote terminal equipment.

If the test fails, the trouble could be in either data module or in any of the circuits between the data modules.

72 and 74 Series Terminal Repair Strategy:

For the following user reported troubles, the following steps are provided.

1. No dial tone.

Use **PROC 622**, Test 1 to check for errors recorded against the terminal and perform **PROC 622**, Test 3 to isolate the trouble.

2. Cannot dial.

Replace the terminal.

3. Cannot receive calls.

Use **PROC 622**, Test 1 to check for errors recorded against the terminal and perform **PROC 622**, Test 3 to isolate the trouble.

4. Does not ring.

- a. Assuming that there are no other indications of an incoming call, ask the user to perform the dial-up test for ringer.
- b. If the dial-up test does not pass, replace the 72 or 74 series terminal.
- c. Repeat the dial-up test.
- d. If the dial-up test fails again, use **PROC 620**, Test 4 to check the associated port circuit.

Replace the port circuit as necessary.

5. Indicator does not light.

Ask the user to perform the dial-up test for indicator.

If the dial-up test fails, replace the terminal.

6. Buttons do not work.

Ask the user to perform the dial-up test for buttons.

If the dial-up test fails, replace the terminal.

7. Cannot hear.

Replace the handset or terminal.

8. Cannot be heard.

Replace the handset or terminal.

74 Series Terminals Connected to a Personal Computer

When troubles with 74 series terminals connected to a personal computer are reported by the user, the user should be informed to power down the personal computer.

Note: It may not be possible for periodic or demand software maintenance software to detect a defective 74 series terminal when it is connected to a powered-up personal computer.

PROC 622

A personal computer can consist of an AT&T PC6300, AT&T PC7300, IBM personal computer, or equivalent. The personal computer is connected to a DCPI interface card to allow an interface to the switch.

The signaling channels S1 and S2 from a GPP port are connected to the DCPI interface card and then to the 74 series terminal.

Since the DCPI interface card interprets and responds to S channel messages, even if the 74 series terminal is not connected, maintenance of the terminal is impossible from switch software when the personal computer is powered-up.

Request the customer to power down the personal computer before performing or repeating maintenance on the defective 74 series terminal.

The terminal is not tested if the personal computer is powered up and the DCPI interface card is in the PC control mode.

Note: If the personal computer is powered down, the 74 series terminal being tested fails with a fault code of 28 (odd channel of digital set is stuck in loop-around).

A display of fault code 28 indicates the terminal is good. When a fault code other than 28 is displayed, use the appropriate repair procedure for the terminal being tested.

PROC 623 - ANI FAILURES

FLIPCHART ISSUE 1		+ + ANI FAILURES + + 845552223													
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARMS.		TEST 2: SENDS 4 TEST MESSAGES THROUGH THE DISPLAYED ANI TRUNK CIRCUIT.		TEST 3: SENDS A SINGLE TEST MESSAGE THROUGH THE DISPLAYED TRUNK CIRCUIT. USE 'NEXT DATA' TO SELECT ANOTHER DATA PATTERN.		TEST 4: SENDS EACH OF 4 TEST MESSAGES ALTERNATELY TO EACH CIRCUIT OF THE SELECTED ANI TRUNK BOARD CONTINUOUSLY UNTIL AN ERROR IS DETECTED OR 'STOP' IS PRESSED.		FAILURE CODES (FIELD 8): 0 = PASS 1 = NO ACKNOWLEDGE 2 = 2/5 ERROR 3 = ALWAYS BUSY 4 = NO WORD SHIFT 5 = NO LOOP CURRENT 6 = WRONG CHANNEL 7 = BID ERROR							
		USE THE ANI TEST SET. USE 'NEXT UNIT' TO DISPLAY ADDITIONAL FAILURES AFTER TEST IS EXECUTED.													
TEST NO	TEST 3 DATA	TRUNK CIRCUIT						FAILURE	FAILURES PER HOUR	ANI ATTEMPTS	LOAD ERRORS	TIME OUT ERRORS	TRANS- MISSION ERRORS	QUEUE OVERFLOW ERRORS	NETWORK 623
		MODULE	CAB	CARR	SLOT	CKT									
1	2	3	4	5	6	7	8	9	10	11	12	13	14		

Purpose

PROC 623 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from an ANI failure.

This maintenance procedure **must** be performed on the customer's premises. The ANI - Data Link Test Set (J59204AJ) must be connected to the switch and test set-up steps performed prior to executing Tests 2 through 4.

PROC 623 is used to:

1. Display ANI trunk circuit failures.
2. Send messages to test an ANI trunk circuit.
3. Turn off the **OTHER FAILS** fault indicator when all ANI trunk circuits pass Test 2.

Note: ANI alarmed entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 623** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AM, PROC 623 - Field Definitions and Codes.

Field 1 is an optional input field for changing the test number to be executed.

Test Equipment Required

An ANI - Data Link Test Set (J59204AJ) is required to perform Tests 2 through 4 of **PROC 623**.

The ANI test set verifies the 4-digit trunk and station number assignment of the switch equipped with automatic number identification.

TABLE AM.

PROC 623						
FIELD DEFINITIONS AND CODES						
FIELD	CODE	DEFINITION		FIELD	CODE	DEFINITION
1	1-4	Test number.		8 (Contd)		Failure code (Contd):
2		Data message being sent in Tests 2, 3, and 4:			1	No acknowledgement from module control channel in trunk circuit path.
		Line	Trunk		2	2-out-of-5 error code.
					3	Always busy.
	0	0123	4567		4	No word shift.
	1	1357	0246		5	No loop current.
	2	2000	3988		6	Wrong channel.
	3	1010	1010	7	Bid error.	
3	0-30	Module number.		9	0-99	Failures per hour for all circuits and for individual circuits.
4	0-7	Cabinet number.				
5	0-3	Carrier number.		10	0-60,000	Number of ANI calls attempted.
6	0-3	Slot number.				
7	0,1	Circuit number.				
8	0	Failure code:		12	0-99	Maximum wait interval exceeded.
		Pass	13	0-99	Transmission errors.	
			14	0-99	Queue overflow errors.	

To set up the ANI test set in order to perform Tests 2 through 4, proceed as follows:

1. Position the test set adjacent to the SN244 trunk circuit pack to be tested.
2. At the test set, set the **POWER** switch to the **OFF** position.
3. Connect the furnished test cable to the ANI test set.
4. Connect the 117 V AC test set line cord to a 117 V AC source.
5. At the ANI test set, set the switches as follows:

ERROR MODE/VERIFY MODE - Set to **ERROR MODE**.

TRUNK/STATION - Set to **STATION**.

NORMAL/HOLD - Set to **NORMAL**.

MODE - Set to **ANI OR SLF-CH**.

ALARM - Set to **OFF**.

SELF-CHECK - Set to **OFF**.

POWER - Set to **ON**.

6. At the test cable, set the ANI **TEST** switch to **ON**.

Prior to checking any ANI trunk circuit, perform the following steps:

1. At the cross-connect field, disconnect the tip and ring leads associated with the ANI trunk circuit to be tested.

Caution: *If the ANI trunk circuit being tested is connected to the central office instead of the ANI test set, test messages may be recorded as valid ANI calls.*

2. Connect the test cable to the SN244 circuit pack corresponding to the ANI trunk circuit to be tested.
3. Set the **CHANNEL** switch on the test cable as follows:
 - a. If circuit 0 is displayed on the **MAAP** - Set **CHANNEL** switch to 9.
 - b. If circuit 1 is displayed on the **MAAP** - Set **CHANNEL** switch to 8.

In addition to the display on the **MAAP** indicating whether the trunk circuit being tested passed or failed, the following steps and observations can be performed at the ANI test set.

1. Observe the **TRUNK/STATION MATCH** display on the test set.
It sequentially displays the trunk or station numbers listed for Field 2 in Table AM, PROC 623 - Field Definitions and Codes.
2. When an error is detected, the following data may be observed on the ANI test set:
 - a. **ERROR COUNT** advances one count.
 - b. The error word(s) on the **TRUNK/STATION MATCH** display is dashed or shown incorrectly.
3. Reverse the **TRUNK/STATION** switch to complete the display of the remaining messages.
4. Set the **NORMAL/HOLD** switch to the **HOLD** position to lock an error into the display register.

If this is not done before the next message is sent, the new message clears the register.

Note: While the switch is in the **HOLD** position, succeeding messages are not displayed. However, any message with an error advances the error counter.

Operation of Procedure

Overview

PROC 623 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from an ANI trunk circuit failure.

PROC 623, Test 1

To call in **PROC 623**, perform the following:

1. Depress **PROC NO; 623; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Four tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Sends four messages to test each ANI trunk circuit.
3. Test 3 - Sends a single message to test the ANI trunk circuit.
4. Test 4 - Continuously sends each of four messages alternately to each circuit of a selected ANI trunk circuit pack.

Test 1

Test 1 provides a failure history of ANI trunk circuit failures.

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator caused by an ANI failure.

1. Test 1 is the default test when entering **PROC 623** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 1; ENTER.
2. To start Test 1, depress **EXECUTE**.
3. A summary of the failure history is displayed.
4. If one or more failures occurred, the following summary is displayed:
Field 1 - 1.
Field 9 - Failures per hour.
Field 10 - ANI attempts (number of ANI calls).
Field 11 - Load errors.
Field 12 - Time out errors (maximum wait interval exceeded).
Field 13 - Transmission errors.
Field 14 - Queue overflow errors.
5. Depressing **NEXT CIRCUIT** displays the first failing ANI equipment location in Fields 3 through 7 and updates Field 9 (failures per hour).
6. After the first failing circuit is displayed, depressing **NEXT CIRCUIT** repeatedly displays the failures per hour (Field 9) associated with the ANI trunk circuit failure displayed in Fields 3 through 7.

7. After all failures are displayed, depressing **NEXT CIRCUIT** dashes all fields except Field 1. Depressing **NEXT CIRCUIT** again causes Test 1 to be displayed from the beginning, starting with the summary.
8. To manually turn off the **OTHER FAILS** fault indicator, assuming no other sources are affecting the **OTHER FAILS** fault indicator after Test 1 is executed at least once, perform the following:
Depress **CLEAR DATA; EXECUTE**.

Note: ANI alarmed entries in PMIDS are marked as resolved.

Test 2

Test 2 automatically sends four test messages to the ANI trunk circuit displayed in Fields 3 through 7.

Test 2 requires the use of the ANI test set to avoid sending test messages to the central office.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. Depress **NEXT CIRCUIT** until the equipment location of the ANI circuit to be tested is displayed in Fields 3 through 7.
3. At the cross-connect field, disconnect the tip (T) and ring (R) leads of the ANI trunk circuit displayed in Fields 3 through 7.
4. Connect the ANI test cable to the SN244 circuit pack associated with the equipment location displayed in Fields 3 through 6.
5. At the test cable, set the **CHANNEL** switch to the setting which corresponds to the circuit number displayed in Field 7.
 - a. If circuit 0 is displayed on the **MAAP** - Set **CHANNEL** switch to 9.
 - b. If circuit 1 is displayed on the **MAAP** - Set **CHANNEL** switch to 8.
6. To start Test 2, depress **EXECUTE**.
The **WAIT** indicator turns on and Field 8 is dashed.
7. After the **WAIT** indicator turns off, the results of the test are displayed in Field 8 (failure code).
If a 0 is displayed in Field 8, Test 2 passed.
8. When a failure is detected, a failure code is displayed in Field 8.
Depressing **NEXT UNIT** repeatedly displays additional failure codes associated with the failed circuit.
9. **STOP** can be used to halt the test any time the **WAIT** indicator is turned on.
10. All ANI trunk circuits must be tested and pass Test 2 in order to resolve the ANI cause of the **OTHER FAILS** fault indicator.

PROC 623, Test 2 and Test 3

11. **NEXT CIRCUIT** is used to select the next ANI trunk circuit to be tested.

Requirement: The T and R leads from the previously tested circuit should be reconnected at the cross-connect field prior to performing Steps 2 through 10 to test the next ANI trunk circuit.

12. The **OTHER FAILS** fault indicator is automatically turned off when the ANI alarm cause, and all other alarm sources affecting the **OTHER FAILS** fault indicator are cleared.

Note: ANI alarmed entries in PMIDS are marked as resolved.

Test 3

Test 3 sends a selected single test message to the ANI trunk circuit displayed in Fields 3 through 7.

Test 3 requires the use of the ANI test set to avoid sending test messages to the central office.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. Depress **NEXT CIRCUIT** until the equipment location of the ANI circuit to be tested is displayed in Fields 3 through 7.
3. Depress **NEXT DATA** to select a test data message to be sent.
4. At the cross-connect field, disconnect the T and R leads of the ANI trunk circuit displayed in Fields 3 through 7.
5. Connect the ANI test cable to the SN244 circuit pack associated with the equipment location displayed in Fields 3 through 6.
6. At the test cable, set the **CHANNEL** switch to the setting which corresponds to the circuit number displayed in Field 7.
 - a. If circuit 0 is displayed on the **MAAP** - Set **CHANNEL** switch to 9.
 - b. If circuit 1 is displayed on the **MAAP** - Set **CHANNEL** switch to 8.
7. To start Test 3, depress **EXECUTE**.
The **WAIT** indicator turns on and Field 8 is dashed.
8. At the conclusion of Test 3, the **WAIT** indicator turns off, and the results of the test are displayed in Field 8 (failure code).
If a 0 is displayed in Field 8, Test 3 passed.
9. If a failure is detected, the following is displayed:
Field 1 - 3.
Field 2 - Data message being sent.
Fields 3 through 7 - Equipment location of the ANI trunk circuit.
Field 8 - Failure code associated with the failed ANI trunk circuit.
10. Depressing **NEXT UNIT** repeatedly displays additional failure codes associated with the displayed equipment location and the test data message sent.

11. **STOP** can be used to halt the test any time the **WAIT** indicator is turned on.
12. **NEXT DATA** advances the test data message index in Field 2, and another test pattern can be sent by depressing **EXECUTE**.
13. **NEXT CIRCUIT** is used to select the next ANI trunk circuit to be tested.

Requirement: The T and R leads from the previously tested circuit should be reconnected at the cross-connect field prior to performing Steps 2 through 12 to test the next ANI trunk circuit.

14. When Test 3 passes, Test 2 must be repeated for all ANI trunk circuits in order to resolve the ANI cause of the **OTHER FAILS** fault indicator.

Test 4

Test 4 sends four messages, first to one circuit on the displayed SN244 circuit pack equipment location, then to the other circuit on the circuit pack.

Test 4 is used to continuously test the ANI trunk circuits suspected of having intermittent failures or to trace wiring problems.

Test 4 requires the use of the ANI test set to avoid sending test messages to the central office.

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 4; ENTER.
2. Depress **NEXT CIRCUIT** until the equipment location of the SN244 circuit pack to be tested is displayed in Fields 3 through 6.
3. At the cross-connect field, disconnect the T and R leads of the ANI trunk circuits associated with the SN244 circuit pack displayed in Fields 2 through 6.
4. Connect the ANI test cable to the SN244 circuit pack associated with the equipment location displayed in Fields 3 through 6.
5. At the test cable, set the **CHANNEL** switch to the setting which corresponds to the circuit number displayed in Field 7.
 - a. If circuit 0 is displayed on the **MAAP** - Set **CHANNEL** switch to 9.
 - b. If circuit 1 is displayed on the **MAAP** - Set **CHANNEL** switch to 8.
6. To start Test 4, depress **EXECUTE**.
7. The test runs continuously until a failure is detected or **STOP** is depressed.

Note: The testing interval for the ANI trunk circuits is determined by maintenance personnel performing the test and is ended by depressing **STOP**. This allows maintenance personnel time to trace wiring problems associated with the SN244 circuit pack.

8. If a 0 is displayed in Field 8, Test 4 passed.

PROC 623, Test 4

9. If a failure is detected, the following is displayed:
Field 1 - 4.
Fields 3 through 7 - Equipment location of the ANI trunk circuit.
Field 8 - Failure code associated with the ANI trunk circuit.
Field 10 - ANI attempts (number of ANI calls attempted).
10. Depressing **NEXT UNIT** repeatedly displays additional failure codes associated with the displayed equipment location.
11. **STOP** can be used to halt the test.
12. **NEXT CIRCUIT** is used to select the next ANI trunk circuit pack (SN244) to be tested.

Requirement: The T and R leads from the previously tested circuits should be reconnected at the cross-connect field prior to performing Steps 2 through 10 to test the next ANI trunk circuit pack (SN244).

13. When Test 4 passes, Test 2 must be repeated for all ANI trunk circuits in order to resolve the ANI cause of the **OTHER FAILS** fault indicator.

Repair Guide

When an ANI trunk circuit failure is indicated, **PROC 623** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted, perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and record the failure history.
2. Step to Test 2.
3. Select the ANI trunk circuit to be tested by using **NEXT CIRCUIT**.
4. At the cross-connect field, disconnect the T and R leads of the ANI trunk circuit selected in Step 3.
5. Connect the ANI test set to the trunk circuit pack (SN244) containing the trunk circuit selected for testing.
6. At the test cable, set the **CHANNEL** switch to the setting which corresponds to the circuit number displayed in Field 7.
 - a. If circuit 0 is displayed on the **MAAP** - Set **CHANNEL** switch to 9.
 - b. If circuit 1 is displayed on the **MAAP** - Set **CHANNEL** switch to 8.
7. Execute Test 2 and record the results.

Note: Test 3 may be used as an aid which enables maintenance personnel to send the same message to the same circuit each time **EXECUTE** is depressed, or the test data message pattern can be changed by use of **NEXT DATA**.

8. When failures are recorded, replace circuit pack SN244.
Repeat Test 2.

9. When Test 2 is repeated after a circuit pack has been removed and a new (or same) circuit pack inserted, the test may fail because the circuit pack is not initialized properly.

Note: Repeat Test 2 before assuming the corrective action taken has not fixed the problem.

10. If Test 2 fails again, check the failure code displayed in Field 8.
 - a. If failure code 1 is displayed, test TN401 (module control channel) using **PROC 620**, Test 3 Unit type 6.
 - b. If any other failure code is displayed, check the wiring associated with circuit pack SN244.
11. If the test initially passes, or passes after corrective action is performed, connect the T and R leads disconnected in Step 4, and repeat Steps 3 through 9 for all ANI trunk circuits.
12. When intermittent ANI circuit failures or wiring problems are suspected, use Test 4 to continuously test suspect circuits.
13. After all failures are corrected, repeat Test 2 for all ANI trunk circuits in order to resolve the ANI cause of the **OTHER FAILS** fault indicator.

PROC 624

PROC 624 - CONTACT INTERFACE TEST

FLIPCHART ISSUE 1		+		+		CONTACT INTERFACE TEST		+		+		845552223					
TEST 1: AUTOMATICALLY SEQUENCE THRU ALL CONTACTS ON A BOARD, OPENING AND CLOSING EACH EXCLUSIVELY AT A 60 IPM RATE FOR 5 SECONDS.				TEST 2: SAME AS TEST 1 EXCEPT EACH CONTACT REMAINS CLOSED FOR ENTIRE 5 SECOND INTERVAL.				TEST 3: MANUAL SELECTION OF CONTACT, OPENING AND CLOSING AT A 60 IPM RATE FOR ANY DESIRED TESTING INTERVAL.				TEST 4: SAME AS TEST 3 EXCEPT CONTACT REMAINS CLOSED FOR DURATION OF TESTING INTERVAL.					
USE 'STOP' THEN 'NEXT DATA' TO ADVANCE TO THE NEXT CONTACT - TESTS 3 & 4.						NOTE: FIELDS (7-14) INDICATE CURRENT STATE OF CONTACT WHEN TESTING IS ACTIVE; 0 = OPEN, 1 = CLOSED.						FIELD 15 FAILURE CODE: 9-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED.					
CONTACT INTERFACE BOARD EQUIPMENT LOCATION		3 & 4		CONTACT STATES OF BOARD UNDER TEST										FAILURE CODE		NETWORK	
TEST NO	MODULE	CAB	CARR	SLOT	CURRENT CONTACT	CONTACT 0	CONTACT 1	CONTACT 2	CONTACT 3	CONTACT 4	CONTACT 5	CONTACT 6	CONTACT 7				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		624	

Purpose

PROC 624 is used when a contact interface circuit pack (SN241) is malfunctioning or suspected of being defective.

PROC 624 must be performed by maintenance personnel on the customer's premises as verification of relay operation is performed by monitoring the associated lamp(s).

Any or all relay contacts on a selected contact interface circuit pack can be tested.

After using **PROC 624**, all lamps on the System Status Indicators (SSI) are cleared from any previous state and are not reinitialized until further use.

Field Definitions and Codes

Each field of **PROC 624** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AN, PROC 624 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 5 - Select contact interface circuit pack for testing.
3. Field 6 - Select contact on circuit pack to be tested (Tests 3 and 4 only).

Operation of Procedure

Overview

PROC 624 is used to test a contact interface circuit pack.

To call in **PROC 624**, perform the following:

1. Depress **PROC NO; 624; ENTER.**

2. Test 1 is automatically selected.

Field 1 displays a 1 and a default contact interface circuit pack is displayed in Fields 2 through 5.

Field 6 (current contact) displays a 0 and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

TABLE AN.

PROC 624 FIELD DEFINITIONS AND CODES		
FIELD	CODE	DEFINITION
1	1-4	Test number
2	0-30	Module number
3	0-7	Cabinet number
4	0-3	Carrier number
5	0-21	SN241 slot number
6	0-7	Contact currently selected for test
7-14	0 1	State of each contact: Open Closed
15	9	Failure code: Message transmission to module processor failed.

Four tests are available:

1. Test 1 - Automatically sequences through all contacts on a contact interface circuit pack, opening and closing each contact exclusively at a 60 Interruptions Per Minute (IPM) rate for 5 seconds.
2. Test 2 - Automatically sequences through all contacts on a contact interface circuit pack.
Each contact remains closed for the entire 5-second interval of the contact's test.
3. Test 3 - Manual selection of a contact to be tested.
Each contact selected for testing is tested for any desired interval. The contact opens and closes at a 60 IPM rate.
4. Test 4 - Manual selection of a contact to be tested.
Each contact selected for testing is tested for any desired interval. The contact remains closed for the duration of the testing interval.

PROC 624, Test 1 and Test 2

Test 1

Test 1 automatically sequences through all contacts on a contact interface circuit pack, opening and closing each contact on the circuit pack at a 60 IPM rate for 5 seconds.

1. Test 1 is the default test when entering **PROC 624** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. When Test 1 is called in, a default contact interface circuit pack is displayed in Fields 2 through 5.

The default contact interface circuit pack can be tested or another contact interface circuit pack can be selected for testing.

3. A contact interface circuit pack can be selected for testing in three ways.
 - a. Upon entry to Test 1, Field 2 (module) is flashed, indicating it is an optional entry field. To select another contact interface circuit pack, enter its equipment location in Fields 2 through 5: **(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
 - b. By depressing **NEXT CIRCUIT** until the contact interface circuit pack to be tested is displayed in Fields 2 through 5.
 - c. By using the **CHANGE FIELD** sequence: **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
4. To start Test 1, depress **EXECUTE**.

5. A 5-second test is run on each contact (0 through 7) at a 60 IPM rate.

This is evident by the alternating 0s and 1s in Fields 7 through 14.

Field 6 displays the current contact on the contact interface circuit pack being tested.

6. Test 1 runs continuously until **STOP** is depressed or until a new test is called in.

This allows maintenance personnel time to observe the status of the associated lamps.

Test 2

Test 2 automatically sequences through all contacts on a contact interface circuit pack. The contacts remain closed during the testing interval.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. A contact interface circuit pack can be selected for testing in two ways.
 - a. By depressing **NEXT CIRCUIT** until the contact interface circuit pack to be tested is displayed in Fields 2 through 5.
 - b. By using the **CHANGE FIELD** sequence: **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
3. To start Test 2, depress **EXECUTE**.

4. A 5-second test is run on each contact (0 through 7) at a 60 IPM rate.
The closure of each contact is indicated by 1s in Fields 7 through 14.
Field 6 displays the current contact on the contact interface circuit pack being tested.
5. Test 2 runs continuously until **STOP** is depressed or until a new test is called in.
This allows maintenance personnel time to observe the status of the associated lamps.

Test 3

Test 3 individually tests a specific contact on a contact interface circuit pack. The contact opens and closes at a 60 IPM rate for the duration of the testing interval.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. A contact interface circuit pack can be selected for testing in two ways.
 - a. By depressing **NEXT CIRCUIT** until the contact interface circuit pack to be tested is displayed in Fields 2 through 5.
 - b. By using the **CHANGE FIELD** sequence: **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
3. When Test 3 is called in and a contact interface circuit pack is selected for testing, a default contact (0) is displayed in Field 6. The default contact can be tested or another contact can be selected for testing.
4. To select another contact for testing, perform the following:
CHANGE FIELD; 6; ENTER; (Contact number to be tested); ENTER.
5. To start Test 3, depress **EXECUTE**.
6. During the testing interval, alternating 0s and 1s are displayed in the field of the contact selected for testing.
7. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
This allows maintenance personnel time to observe the status of the associated lamp and to verify existence of intermittent failures.
8. After the first contact is tested, and **STOP** is depressed, **NEXT DATA** can be used to select another contact on the same contact interface circuit pack for testing:
NEXT DATA (depressed until desired contact is displayed); EXECUTE.
9. At this time, the displayed contact selected for testing is tested until **STOP** is depressed or until a new test is called in.

Test 4

Test 4 tests a specific contact on a contact interface circuit pack. The contact selected for testing remains closed for the duration of the testing interval.

PROC 624, Test 4

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 4; ENTER.
2. A contact interface circuit pack can be selected for testing in two ways.
 - a. By depressing **NEXT CIRCUIT** until the contact interface circuit pack to be tested is displayed in Fields 2 through 5.
 - b. By using the **CHANGE FIELD** sequence: **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
3. When Test 4 is called in and a contact interface circuit pack is selected for testing, a default contact (0) is displayed in Field 6. The default contact can be tested or another contact can be selected for testing.
4. To select another contact for testing, perform the following:
CHANGE FIELD; 6; ENTER; (Contact number to be tested); ENTER.
5. To start Test 4, depress **EXECUTE**.
6. During the testing interval, contact closure is indicated by a 1 in the contact field selected for testing.
7. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.

This allows maintenance personnel time to observe the status of the associated lamp and to verify existence of intermittent failures.
8. After the first contact is tested, and **STOP** is depressed, **NEXT DATA** can be used to select another contact on the same contact interface circuit pack for testing:
NEXT DATA (depressed until desired contact is displayed); EXECUTE.
9. At this time, the displayed contact selected for testing is tested until **STOP** is depressed or until a new test is called in.

Repair Guide

When faulty operation of a contact interface circuit pack is indicated, perform the following steps in the order listed.

1. Replace SN241.
2. Rerun Tests 1 and 2.
3. If a failure is still indicated, check the operation of the associated remote equipment.
Example: SSI.
4. If the associated remote equipment is not in working order, refer the problem to the proper personnel.
5. If the associated remote equipment is in working order, check the wiring between SN241 and the remote equipment.

PROC 625 - SYNCHRONIZATION REFERENCE MONITOR

FLIPCHART ISSUE 4					SYNCHRONIZATION REFERENCE MONITOR										845552223										
FIELD	FIELD	CODE	TESTS	DEFINITION	VALUES 3-6	FIELD	CODE	TESTS	DEFINITION																
DESCRIPTION:	8	0-6	2	3 = I/O FAILURE 4 = UNUSABLE REFERENCE 5 = NOT ADMINISTERED 6 = MAINTENANCE BUSIED	INDICATES WHY A SWITCH ATTEMPT FAILED	10	0-9	1	5 = EXCESSIVE MISFRAMES 6 = NETWORK ALARM 7 = BOARD HEALTH 8 = MAJOR ERROR RATE ALARM 9 = MINOR ERROR RATE ALARM																
	9	0-2	2	AUTOMATIC SWITCH ENABLE/DISABLE FIELD 0 = ENABLE AUTOMATIC SWITCH OF REFERENCE 1 = DISABLE SOFTWARE SWITCH 2 = DISABLE SOFTWARE AND HARDWARE SWITCH		17	0-9	2	SWITCH CAUSE FIELD 0 = CRAFT REQUEST 1 = BOARD PROCESSOR SANITY 2 = UNUSABLE REFERENCE REPORTED BY SCS 3 = LOSS OF SIGNAL REPORTED BY DS-1 4 = EXCESSIVE SLIPS 5 = EXCESSIVE MISFRAMES 6 = NETWORK ALARM 7 = BOARD HEALTH 8 = THE HIGH ACCURACY CLOCK WAS PUT ON LINE 9 = THE CAUSE OF THE LAST SWITCH HAS CLEARED																
	10	0-9	1	HEALTH CODE FIELD DASH = BOARD HEALTHY 0 = MAINTENANCE BUSY 1 = BOARD PROCESSOR SANITY 2 = UNUSABLE REFERENCE REPORTED BY SCS (REF. ONLY) 3 = LOSS OF SIGNAL REPORTED BY DS-1 4 = EXCESSIVE SLIPS	CAUTION: ENCODES 1 AND 2 IMPAIR THE RECOVERY MECHANISM OF THE SWITCH.											NETWORK FACILITY MONITOR									
															625										

FLIPCHART ISSUE 1												SYNCHRONIZATION REFERENCE MONITOR												845552223																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
TEST 1: DISPLAY FACILITY STATUS.						FIELD	CODE	TESTS	DEFINITION			FIELD	CODE	TESTS	DEFINITION			SPECIAL ERROR CODES:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
TEST 2: SWITCH SYNC. REFERENCES AND/OR TOGGLE AUTO-SWITCH.						1	1-2	1-2	TEST NUMBER FIELD			7	0-2	1-2	1 = PRIMARY REFERENCE			80-1/0 ERROR FAILURE 81-NOT TRANSLATED DS1 BOARD 82-NOT A PHYSICAL DS1 BOARD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Purpose

PROC 625 is used to determine the current state of health of synchronization references and all DS-1, RCG, or PRI circuit packs.

PROC 625 provides the capability to switch between the synchronization reference sources to support maintenance of the digital network.

PROC 625 also provides the capability to disable or reenble the automatic reference switching performed by the synchronization periodic software and by associated hardware.

PROC 625 is used to:

1. Display the current state of health and status information for each synchronization reference and DS-1, RCG, or PRI circuit pack.
2. Display the times and causes of the last eight (maximum) switches that occurred in any synchronization reference.
3. Clear the table of last 8 switches.
4. Clear the misframes count.
5. Reset slip counts for the entire switch.

PROC 625

6. Perform a switch between synchronization references.
7. Prevent automatic reference switching by the synchronization periodic software and associated hardware.

Caution: Disabling of the automatic reference switching feature for a prolonged period of time could become service affecting by impairing the recovery mechanism of the switch.

Field Definitions and Codes

Each field of **PROC 625** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AO, PROC 625 - Field Definitions and Codes.

Optional input fields are:

1. Fields 3 through 6 - Select a specific equipment location to be tested or displayed (Test 1 only).
2. Field 8 - Enable a switch of synchronization references or reset the slips count (Test 2 only).
3. Field 9 - Enable or disable automatic reference switching of synchronization references (Test 2 only).

Operation of Procedure

Overview

PROC 625 is used to determine the number and cause of switches (determined by the state of health), the current state of health for synchronization references and DS-1, RCG, or PRI circuit packs, to perform a switch of synchronization references, and to disable or reenable automatic reference switching of synchronization references. In addition, misframe counts can be cleared for an individual facility and slip counts can be reset for the entire switch.

To call in **PROC 625**, perform the following:

1. Depress **PROC NO; 625; ENTER**.
2. Test 1 is automatically selected.
Fields 1 and 2 display a 1, Fields 3 through 6 display the primary reference, the first DS-1, RCG, or PRI circuit pack in the switch.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Displays the health and status of all DS-1, RCG, or PRI circuit packs and clears the misframe count.
2. Test 2 - Allows a switch of the synchronization references, displays the time and cause of the last eight switches, clears the switch history, and resets the slip counts.

Test 2 is also used to prevent an automatic switch of references from taking place by disabling the periodic software and/or hardware switch.

TABLE AO.

PROC 625 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1,2	Test number.	8 (Contd)	2	Reset slip counts.
2	1-9	Facility type:		3-6	Encodes 3 through 6 indicate why a switch attempt failed.
	1	DS-1.		3	I/O failure.
	2	Local end of remoted pair. (RCG)		4	Unusable reference.
	3	Remote end of remoted pair. (RCG)		5	Not administered.
	4	Primary rate interface.		6	Maintenance busied.
	5-9	Reserved for future use.		0-2	Automatic switch enable or disable:
3-6		Equipment location of displayed reference, DS-1, RCG, or PRI.		0	Enable automatic switch of reference.
3	0-30	Module number.		1	Disable software switch of reference.
4	0-7	Cabinet number.		2	Disable software and hardware switch of reference.
5	0-3	Carrier number.	9		
6	0-21	Slot number.			
7	Dash, 0-2	Reference indication:		Dash, 0-9	Health code of displayed circuit:
	Dash	Nonreference DS-1 or PRI.		Dash	Board is healthy.
	0	High accuracy clock.		0	Maintenance busied.
	1	Primary reference.		1	Board processor sanity.
	2	Secondary reference.		2	Unusable reference reported by System Clock Synchronizer (SCS) - reference only.
8	0-6	Switch enable and status:		3	Loss of signal reported by DS-1 or PRI.
	0	Disable switch of reference.		4	Excessive slips.
	1	Enable switch of reference.		5	Excessive misframes.

TABLE AO. (Contd)

PROC 625					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
10 (Contd)	6	Network alarm.	17	0-9	Switch cause:
	7	Board health.		0	Craft request.
	8	Major error rate alarm.		1	Board processor sanity.
	9	Minor error rate alarm.		2	Unusable reference reported by SCS.
11	0-999	Number of slips.		3	Loss of signal reported by DS-1 or PRI.
12	0-99	Number of misframes.		4	Excessive slips.
13	0-8	Index: Index into the switch time and cause table.		5	Excessive misframes.
14-16		Switch time:		6	Network alarm.
14	1-31	Day of month.		7	Board health.
15	0-23	Hour of day.		8	High accuracy clock was placed on-line.
16	0-59	Minute of hour.		9	Cause of the last switch has been cleared.

Test 1

Test 1 is used to determine the health and status of the equipment location displayed in Fields 3 through 6.

Test 1 can also be used to clear the misframes for an individual facility.

Note: Misframes are cleared every hour without maintenance personnel intervention. Misframes should only be cleared as a diagnostic aid when performing maintenance involving misframes.

1. Test 1 is the default test when entering **PROC 625** or is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. When Test 1 is initially called in, the primary reference (if translated) is displayed in Fields 3 through 6. If a primary reference is not translated, Fields 3 through 6 display the first DS-1, RCG, or PRI circuit pack in the switch (in lowest equipment number order).

3. A specific reference, DS-1, RCG, or PRI circuit pack or the default equipment location can be tested.

To test the default equipment location displayed in Fields 3 through 5, proceed to Step 5.

4. A specific reference, DS-1, RCG, or PRI circuit pack can be selected for testing by depressing **NEXT CIRCUIT** to step through the DS-1, RCG, or PRI circuit packs until the DS-1, RCG, or PRI circuit pack to be tested is displayed in Fields 3 through 6.

Note: If a secondary reference is translated, it always follows the primary reference when **NEXT CIRCUIT** is used to step through the circuit packs in the switch.

Proceed to Step 6.

5. A specific reference, DS-1, RCG, or PRI circuit pack can also be selected for testing by using the **CHANGE FIELD** sequence:

CHANGE FIELD; 3; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.

6. To start Test 1, depress **EXECUTE**.
7. If the translation records indicate the equipment location entered is not a translated DS-1, RCG, or PRI circuit pack, special error code 81 (not a translated a DS-1 board) is displayed in the **MAAP** error code field when **EXECUTE** is depressed.
8. If the equipment location entered is not a physical DS-1, RCG, or PRI circuit pack, special error code 82 (not a physical DS-1 board) is displayed in the **MAAP** error code field when **EXECUTE** is depressed.
9. Special error code 80 (I/O failure) may be displayed in the **MAAP** error code field when **EXECUTE** is depressed indicating that Test 1 cannot be performed.

If special error code 80 is not displayed, proceed to Step 11.

10. When special error code 80 is displayed, repeat Test 1.

If special error code 80 is not displayed again, proceed to Step 11.

If special error code 80 is displayed again, perform **PROC 611** to test the common control I/O channels and/or **PROC 620** to test TN380 (module processor) or TN381 (TMS processor).

11. The health and status of the equipment location selected for testing is displayed as follows:

Field 1 - 1.

Field 2 - Facility type (1 = DS-1, 2 or 3 = RCG circuit pack, 4 = PRI circuit pack).

Fields 3 through 6 - Equipment location of synchronization reference, DS-1, RCG, or PRI circuit pack tested.

Field 7 - Reference indication (Dash = non-reference, 1 = primary reference, 2 = secondary reference).

Fields 8 and 9 - Dashed.

Field 10 - Health code of displayed circuit pack.

Note: A dash displayed in Field 10 indicates the circuit pack displayed in Fields 3 through 6 is healthy.

PROC 625, Test 1 and Test 2

Field 11 - 0 or number of slips.

Note: Record the number of slips displayed in Field 11.

Field 12 - 0 or number of misframes.

Fields 13 through 17 - Dashed.

12. The **CLEAR DATA; EXECUTE** sequence can be used to clear the misframes displayed in Field 12, after **EXECUTE** is used to initiate Test 1.

Note: Misframes are cleared every hour without maintenance personnel intervention. Misframes should only be cleared as a diagnostic aid when performing maintenance involving misframes.

13. To clear the misframes displayed in Field 12, depress **CLEAR DATA; EXECUTE**.
Field 12 displays a 0 after **EXECUTE** is depressed.
14. When another reference, DS-1, RCG, or PRI circuit pack is to be tested, the **CHANGE FIELD** sequence or **NEXT CIRCUIT** can be used to select the specific reference, DS-1, RCG, or PRI pack to be tested.
15. **CHANGE FIELD; 3; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.**
16. Depress **NEXT CIRCUIT** to step through the DS-1, RCG, or PRI circuit packs until the DS-1, RCG, or PRI circuit pack to be tested is displayed in Fields 3 through 6.

Note: If a secondary reference is translated, it always follows the primary reference when **NEXT CIRCUIT** is used to step through the circuit packs in the switch.

After all DS-1, RCG, or PRI circuit packs are displayed, depressing **NEXT CIRCUIT** dashes Fields 2 through 17.

17. **EXECUTE** must be depressed to test the specific reference, DS-1, RCG, or PRI circuit pack selected for testing.

Test 2

Test 2 is used to switch synchronization references when more than one reference is translated.

Test 2 is also used to determine the time and cause when the last eight switches occurred for the synchronization reference(s).

Test 2 can also be used to clear the table of last eight switches (maximum) for the synchronization reference(s) and to reset slip counts.

Test 2 can also be used to reset the slip counts for the entire switch.

Note: Slip counts are reset every 24 hours without maintenance personnel intervention. It is recommended that slip counts **should not** be reset unless you are diagnosing slip count problems.

The System Clock Synchronizer (SCS) circuit pack (TN463) has six yellow LEDs.

1. LED positions one and two are dedicated to the primary and secondary synchronization reference sources respectively. If either of these LEDs are lighted, it indicates the associated reference is unusable.
2. When lighted, LED positions 14, 15, and 16 indicate which reference is on-line.
3. LED position 14 is for the High Accuracy Clock (HAC), position 15 is for the primary reference, and position 16 is for the secondary reference.
4. LED position 17 is used for duplicated TMS carriers. When lighted, it indicates that the synchronization reference in this TMS carrier is being driven by the on-line reference in the on-line TMS carrier.

To assist in troubleshooting network problems, Test 2 can be used to prevent an automatic reference switch by periodic software and/or hardware from taking place by disabling the automatic reference switch.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, the following is displayed:

Field 1 - 2.

Field 2 - Facility type (dash = SCS, 1 = DS-1, 2 or 3 = RCG, 4 = PRI).

Fields 3 through 6 - Equipment location of the on-line reference.

Field 7 - Reference indication (0 = high accuracy clock, 1 = primary reference, 2 = secondary reference).

Note: The **YELLOW** LED on TN463 is lighted in position 14, 15, or 16 indicating the type of reference.

Field 8 - Switch status (0 = disable switch of reference).

Fields 9 through 12 - Dashed.

Field 13 - Dash, 0, or number of switches that occurred (maximum of 8) for the reference displayed in Fields 3 through 6.

Field 14 - Dash or day of month the switch occurred.

Field 15 - Dash or hour of day the switch occurred.

Field 16 - Dash or minute of day the switch occurred.

Field 17 - Dash or switch cause (0 through 9).

Note: Fields 14 through 16 display the time the latest switch occurred. Field 17 indicates the health of the reference just before it was switched off-line or the software/craft request.

3. Field 8 is blinking, indicating an optional entry field.

To switch the on-line reference displayed in Fields 3 through 6, proceed to Step 4.

PROC 625, Test 2

4. To enable the switch of references, Field 8 must be changed to a 1. Either **ENTER** or the **CHANGE FIELD** sequence can be used:
 - a. **1, ENTER.**
 - b. **CHANGE FIELD; 8; ENTER; 1; ENTER.**

5. Depress **EXECUTE**.

6. Special error code 80 (I/O failure) may be displayed in the **MAAP** error code field when **EXECUTE** is depressed indicating that Test 2 cannot be performed.

If special error code 80 is not displayed, proceed to Step 8.

7. When special error code 80 is displayed, repeat Test 2.

If special error code 80 is not displayed again, proceed to Step 8.

If special error code 80 is displayed again, perform **PROC 611** to test the common control I/O channels and/or **PROC 620** to test TN380 (module processor) or TN381 (TMS processor).

8. When the switch is successful, the following is displayed:

Field 1 - 2.

Field 2 - Facility type (1 = DS-1, 2 or 3 = RCG circuit pack, 4 = PRI circuit pack).

Fields 3 through 6 - Equipment location of the new on-line reference.

Field 7 - Reference indication (1 = primary reference, 2 = secondary reference).

Field 8 - Switch status (0 = disable switch of reference).

Field 9 - 0 (if automatic switch of references is allowed).

Fields 10 through 12 - Dashed.

Field 13 - Dash, 0, or number of switches that occurred (maximum of 8) for the reference displayed in Fields 3 through 6.

Field 14 - Dash or day of month the switch occurred.

Field 15 - Dash or hour of day the switch occurred.

Field 16 - Dash or minute of day the switch occurred.

Field 17 - Dash or switch cause (0 through 9).

Note: Fields 14 through 16 display the time the switch occurred. Field 17 indicates the health of the reference just before it was switched off-line or the software/craft request.

9. After the switch is successful, Fields 3 through 7 are updated with a new on-line equipment location.

Test 2 always displays the on-line reference.

Note: After preference is switched, the system slip count is automatically reset.

10. After a successful reference switch, the automatic recovery mechanism will probably switch back to the original reference.

If you want the switch reference (that you switched) to stay on-line, perform the steps listed under disabling of the automatic reference switching below to disable the automatic reference switching.

11. The cause and time of the switch is updated in status memory and the yellow LED in position 15 or 16 of TN463 changes when the switch is successful.
12. If the switch failed, Fields 3 through 6 display the original on-line reference, and Field 8 displays an encode indicating the reason the switch failed (3 = I/O failure, 4 = unusable reference, 5 = not administered, and 6 = maintenance busied).

In addition, Fields 13 through 17 (switch time and cause) remain the same as when Test 2 was first entered.

13. When Field 13 is greater than 1, depressing **NEXT DATA** decrements Field 13 and displays (in Fields 14 through 17) when the next to last switch occurred and the cause of the switch.
14. Depressing **NEXT DATA** repeatedly displays the remaining switches that occurred.

When the last switch is displayed, depressing **NEXT DATA** again dashes Fields 13 through 17.

Depressing **NEXT DATA** once more begins the sequence over starting with the latest switch that occurred.

15. The **CLEAR DATA; EXECUTE** sequence can be used to clear the table of last 8 switches before or after **EXECUTE** is used to initiate Test 2.

Note: Upon entry to Test 2, the table of last 8 switches can be cleared without determining the cause or time of any switch that may have occurred.

16. To clear the table of last 8 switches for the reference(s) before or after **EXECUTE** is used to initiate Test 2, perform the following:

Note: Fields 13 through 17 must not be dashed. Error code 00 (wrong key) is displayed in the **MAAP** error code field when **CLEAR DATA; EXECUTE** is depressed if Fields 13 through 17 are dashed (indicating no switches have occurred).

Depress **CLEAR DATA; EXECUTE**.

Fields 13 through 17 display dashes indicating the table of last 8 switches for the reference(s) is cleared.

The system slip counts can be reset in Test 2.

Note: Slip counts are reset every 24 hours without maintenance personnel intervention. It is recommended that slip counts **should not** be reset unless you are diagnosing slip count problems.

To reset the slip counts, perform the following:

1. Depress **CHANGE FIELD; 8; ENTER; 2; ENTER**.
2. Depress **EXECUTE**.

After the slip counts are reset, Field 8 changes to 0.

PROC 625, Test 2

Automatic reference switching can be disabled while maintenance personnel are working on the digital network and reenabled when the tasks are completed.

When disabled, automatic reference switching by software periodics and the hardware SCS circuit pack (TN463) cannot be performed.

Caution: Disabling of the automatic reference switching feature for a prolonged period of time could become service affecting by impairing the recovery mechanism of the switch.

Disabling of the automatic reference switching is performed as follows:

1. Enter Test 2 of **PROC 625**.
2. Determine the type of automatic reference switching to be disabled; i.e., 1 = disable software switch, 2 = disable software and hardware switch.

Note: If Test 2 of **PROC 625** is exited with a 2 (software and hardware switch disabled) displayed in Field 9, the automatic switch disable is automatically changed to a 1 (software switch disabled). This allows the hardware to switch to the HAC if the reference is lost or unusable. The change from 2 to 1 is not visible to maintenance personnel.

3. To disable the automatic reference switching, Field 9 must be changed to a 1 (software) or 2 (software and hardware). The **CHANGE FIELD** sequence must be used to disable automatic reference switching.

CHANGE FIELD; 9; ENTER; (1 or 2); ENTER.

4. Depress **EXECUTE**.
5. If Test 2 of **PROC 625** is exited with a 2 (software and hardware switch disabled) displayed in Field 9, the automatic switch disable is automatically changed to a 1 (software switch disabled). This allows the hardware to switch to the HAC if the reference is lost or unusable. The change from 2 to 1 is not visible to maintenance personnel.

Caution: If PROC 625 is exited with automatic reference switching disabled 1 (80 software switch disabled) or 2 (80 software and hardware switch disabled) displayed in Field 9, a soft switch of references cannot be performed.

6. Prior to exiting **PROC 625** reenable the automatic reference switching feature by performing the **CHANGE FIELD** sequence and depressing **EXECUTE**:

CHANGE FIELD; 9; ENTER; 0; ENTER; EXECUTE.

PROC 630 - BUSY OUT/RELEASE BUSY OUT

FLIPCHART ISSUE 1		+ + BUSY OUT/RELEASE BUSY OUT + +				845552223			
TEST NUMBERS (FIELD 1): 1 = TERMINALS 2 = TRUNKS 3 = TONE PLANTS/AUXILIARY TONE PLANTS		USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT BUSIED OUT CIRCUIT. TO FIND MAINTENANCE BUSY AND IN USE STATUS OF A PARTICULAR CIRCUIT, ENTER EQUIPMENT LOCATION AND USE 'NEXT DATA'. 'NEXT DATA' MUST BE OPERATED BEFORE 'BUSY OUT'. USE 'BUSY OUT' OR 'RELEASE BUSY' TO CHANGE MAINTENANCE BUSY STATUS. TO RELEASE BUSY OUT ON ALL CIRCUITS IN A TEST USE 'CLEAR DATA', 'EXECUTE'. CAUTION: OPERATING 'BUSY OUT' CAN DROP A CUSTOMER CALL.				MAINTENANCE BUSY STATUS (FIELD 7): 0 = NOT BUSIED 1 = DEMAND BUSIED 2 = AUTOMATIC BUSIED AUXILIARY TONE PLANT SHOULD BE BUSIED WHEN ITS ASSOCIATED TONE PLANT IS BUSIED.			
SPECIAL ERROR CODE: 81-NOT BUSIED BECAUSE MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED.									
TEST NO	EQUIPMENT LOCATION-BUSIED OUT CIRCUIT					MAINT BUSY STATUS	TOTAL NUMBER OF CIRCUITS BUSIED OUT IN THIS TEST	DISPLAYED BUSIED OUT CIRCUIT INDEX	NETWORK BUSY OUT
	TESTS 1-3		TESTS 1-2						
	MODULE	CAB	TEST 3		CKT				
	2	3	CARR	SLOT	6				
									630

Purpose

PROC 630 is used to determine the maintenance busy out status of terminals, trunks, or tone plants.

Both the total number of busied out circuits and the equipment location of each circuit of the current test type is displayed.

In addition, **PROC 630** provides the capability to busy out or release from busy terminals, trunks, or tone plants.

When all terminals, trunks, and tone plants are released from busy, the **BUSY OUT** indicator on the **MAAP** is turned off.

If the **BUSY OUT** indicator on the **MAAP** is still lighted after all terminals, trunks, and tone plants are released from busy, use **PROC 635**, Test 2 to determine the non-port uses of the busy-out lamp and the procedure referenced to investigate the cause of the busy out.

Field Definitions and Codes

Each field of **PROC 630** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AP, PROC 630 - Field Definitions and Codes.

Optional input fields are:

- Field 1 - Change test number.
- Fields 2 through 6, before **EXECUTE** - Select module, cabinet, carrier, slot, and circuit to determine the maintenance busy out status of a particular terminal (Test 1), or trunk (Test 2).
If more than one circuit of a particular type (terminal or trunk) is busied out, the display defaults to the lowest equipment number of that type busied out upon depressing **EXECUTE**.
- Fields 4 through 6, before **EXECUTE** - Select carrier, slot, and circuit to determine the maintenance busy out status of a particular terminal (Test 1), or trunk (Test 2).
If more than one circuit of a particular type (terminal or trunk) is busied out, the display defaults to the lowest equipment number of that type busied out upon depressing **EXECUTE**.

PROC 630

4. Fields 2 through 5, before **EXECUTE** - Select module, cabinet, carrier, and slot to determine the maintenance busy out status of a particular tone plant or auxiliary tone plant (Test 3).

If more than one tone plant or auxiliary tone plant is busied out, the display defaults to the lowest equipment number busied out upon depressing **EXECUTE**.

5. Fields 4 and 5, before **EXECUTE** - Select carrier and slot to determine the maintenance busy out status of a particular tone plant or auxiliary tone plant (Test 3).

If more than one tone plant or auxiliary tone plant is busied out, the display defaults to the lowest equipment number busied out upon depressing **EXECUTE**.

6. Fields 2 through 6, after **EXECUTE** - Select module, cabinet, carrier, slot, and circuit of a particular terminal (Test 1) or trunk (Test 2) to determine the maintenance busy out status or to maintenance busy out the displayed circuit.

7. Fields 2 through 5, after **EXECUTE** - Select module, cabinet, carrier, and slot of a particular tone plant or auxiliary tone plant (Test 3) to determine the maintenance busy out status or to maintenance busy out the displayed circuit.

TABLE AP.

PROC 630 FIELD DEFINITIONS AND CODES		
FIELD	CODE	DEFINITION
1	1-3	Test number
2	0-30	Module number
3	0-7	Cabinet number
4	0-3	Carrier number
5	0-21	Slot number
6	0-7	Circuit number
7	0 1 2	Maintenance busy status: Not busied Demand busied Automatic busied
8	0-999	Number of circuits busied out in the current test
9	1-999	Indicates which circuit, of a group of busied out circuits, is being displayed.

Operation of Procedure

Overview

PROC 630 is used to determine the status of maintenance busy out circuits, and to busy out or release from busy terminals, trunks, or tone plants/auxiliary tone plants.

To call in **PROC 630**, perform the following:

1. Depress **PROC NO; 630; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays busied out terminals and provides the capability to busy out or release from busy terminals.
2. Test 2 - Displays busied out trunks and provides the capability to busy out or release from busy trunks.
3. Test 3 - Displays busied out tone plants (including auxiliary tone plants) and provides the capability to busy out or release from busy tone plants and auxiliary tone plants.

Test 1

Test 1 displays the maintenance busy out status of terminals connected to analog line ports and provides the capability to busy out or release from busy terminals.

Note: Use **PROC 632** to determine the busy out status or to busy out terminals connected to digital line ports.

1. Test 1 is the default test when entering **PROC 630** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. Field 8 displays a 0 if no terminals are busied out.
4. When terminals are maintenance busied, the first of the busied out terminals (by lowest equipment number) is displayed as follows:

Fields 2 through 6 - Busied out terminal equipment location.

Field 7 - Busy out status (0 = not busied; 1 = demand busied; 2 = automatic busied).

Field 8 - Total number of busied out terminals.

Field 9 - 1 (indicating first busied out terminal).

5. Field 2 flashes indicating an optional entry field.

Either the terminals busied out can be displayed in order using **NEXT CIRCUIT** or a specific terminal can be selected for display to determine the maintenance busy or **IN USE** status. (See Step 9 below.)

6. Depressing **NEXT CIRCUIT** repeatedly displays each of the busied out terminals.

When all busied out terminals are displayed, depressing **NEXT CIRCUIT** dashes the display except for Field 1.

PROC 630, Test 1

7. Depressing **NEXT CIRCUIT** again starts Test 1 over.
8. To change the busy out status of an individual terminal, depress **RLS BUSY OUT** when the terminal is displayed.

To release all busied out terminals, depress **CLEAR DATA; EXECUTE**.

Note: **CLEAR DATA; EXECUTE** can only be used after **EXECUTE** is depressed to initiate Test 1.

9. If the maintenance busy or **IN USE** status of a particular terminal is to be determined, selection can be made, after **EXECUTE** is depressed in Step 2 above, using one of the following methods:
 - a. **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; NEXT DATA.**
 - b. **(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; NEXT DATA.**
10. **NEXT DATA** displays the maintenance busy or **IN USE** status of the terminal selected.

Note: When the **IN USE** indicator on the **MAAP** is lighted, the displayed terminal is active on a connection. Field 7 displays a 0 indicating the terminal is not maintenance busy. The **IN USE** indicator is turned on with the operation of **NEXT DATA** and remains lighted until the displayed terminal becomes idle or **BUSY OUT** is depressed.

11. After selecting a terminal for display to determine the maintenance busy or **IN USE** status by using the **CHANGE FIELD** sequence, or by entering the equipment location, depressing **NEXT CIRCUIT** displays the first busied out terminal as if **EXECUTE** had been depressed.

The fields and contents displayed are the same as when Test 1 is first executed.

12. To busy out a terminal:
Execute Test 1.
13. If any terminals are busied out, use **NEXT CIRCUIT** to determine if the terminal is already busied out.
14. If no terminals are busied out, or the terminal to be busied out is not displayed by use of **NEXT CIRCUIT**, refer to Step 9 above to select the terminal to be busied out.
15. Depress **NEXT DATA** to determine if the terminal is in-use.

Requirement: **NEXT DATA** must be used before **BUSY OUT** can be used.

16. The **IN USE** indicator on the **MAAP** lights if the terminal is in-use.

Caution: *Do not busy out a terminal that is not idle unless absolutely necessary. Operation of **BUSY OUT** busies a terminal that is in use and terminates the connection.*

17. Depress **BUSY OUT**.

Test 2

Test 2 displays the maintenance busy status of trunks and provides the capability to busy out or release from busy trunks.

1. Test 2 is selected by **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. To start Test 2, depress **EXECUTE**.
3. Field 8 displays a 0 if no trunks are busied out.
4. When trunks are maintenance busied, the first of the busied out trunks is displayed as follows:
Fields 2 through 6 - Busied out trunk equipment location.
Field 7 - Busy out status (0 = not busied; 1 = demand busied; 2 = automatic busied).
Field 8 - Total number of busied out trunks.
Field 9 - 1 (Indicating first busied out trunk).
5. Field 2 flashes indicating an optional entry field.
Either the trunks busied out can be displayed in order using **NEXT CIRCUIT** or a specific trunk can be selected for display to determine the maintenance busy or **IN USE** status. (See Step 11 below.)
6. Depressing **NEXT CIRCUIT** repeatedly displays each of the busied out trunks.
When all busied out trunks are displayed, depressing **NEXT CIRCUIT** dashes the display except for Field 1.
Depressing **NEXT CIRCUIT** again starts Test 2 over.
7. To change the busy out status of an individual trunk, depress **RLS BUSY OUT** when the trunk is displayed.
8. If the trunk is an ISDN trunk, releasing an ISDN trunk requires both switches (local and far end) to agree on releasing the ISDN trunk from busy out. If the far end does not agree, the ISDN trunk will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk in a maintenance busy state the ISDN trunk will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
 - a. Depressing **RLS BUSY OUT** does not mean the ISDN trunk is available for use.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is released from busy by checking the circuit status of the ISDN trunk.
The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.
9. To release all busied out trunks, depress **CLEAR DATA; EXECUTE**.

Note: **CLEAR DATA; EXECUTE** can only be used after **EXECUTE** is depressed to initiate Test 2.

PROC 630, Test 2

10. If any of the trunks are ISDN trunks, releasing a range of ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk(s) is available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

11. If the maintenance busy or **IN USE** status of a particular trunk is to be determined, selection can be made, after **EXECUTE** is depressed in Step 2 above, using one of the following methods:

- a. **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; NEXT DATA.**
- b. **(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; NEXT DATA.**

12. **NEXT DATA** displays the maintenance busy or **IN USE** status of the trunk selected.

Note: When the **IN USE** indicator on the **MAAP** is lighted, the displayed trunk is active on a connection. Field 7 displays a 0 indicating the trunk is not maintenance busy. The **IN USE** indicator is turned on with the operation of **NEXT DATA** and remains lighted until the displayed trunk becomes idle or **BUSY OUT** is depressed.

13. After selecting a trunk for display to determine the maintenance busy or **IN USE** status by using the **CHANGE FIELD** sequence, or by entering the equipment location, depressing **NEXT CIRCUIT** displays the first busied out trunk as if **EXECUTE** had been depressed.

The fields and contents displayed are the same as when Test 2 is first executed.

14. To busy out a trunk

Execute Test 2.

15. If any trunks are busied out, use **NEXT CIRCUIT** to determine if the trunk is already busied out.
16. If no trunks are busied out, or the trunk to be busied out is not displayed by use of **NEXT CIRCUIT**, refer to Step 11 above to select the trunk to be busied out.
17. Depress **NEXT DATA** to determine if the trunk is in-use.

Requirement: **NEXT DATA** must be used before **BUSY OUT** can be used.

18. The **IN USE** indicator on the **MAAP** lights if the trunk is in-use.

Caution: *Do not busy out a trunk that is not idle unless absolutely necessary. Operation of **BUSY OUT** busies a trunk that is in use and terminates the connection.*

19. Depress **BUSY OUT**.
20. If the trunk is an ISDN trunk, busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is busied out by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Test 3

Test 3 displays the maintenance busy out status of tone plants and auxiliary tone plants. Test 3 also provides the capability to busy out or release from busy tone plants and auxiliary tone plants.

1. Test 3 is selected by **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. To start Test 3, depress **EXECUTE**.
3. Field 8 displays a 0 if no tone plants or auxiliary tone plants are busied out.
4. When tone plants or auxiliary tone plants are maintenance busied, the first of the busied out tone plants or auxiliary tone plants is displayed as follows:
 - Fields 2 through 5 - Busied out tone plant or auxiliary tone plant equipment location.
 - Field 7 - Busy out status (0 = not busied; 1 = demand busied; 2 = automatic busied).
 - Field 8 - Total number of busied out tone plants and auxiliary tone plants.
 - Field 9 - 1 (indicating first busied out tone plant or auxiliary tone plant).
5. Field 2 flashes indicating an optional entry field.

Either the tone plants/auxiliary tone plants can be displayed in order using **NEXT CIRCUIT** or a specific tone plant/auxiliary tone plant can be selected for display to determine the maintenance busy status (See Step 10 below).
6. Depressing **NEXT CIRCUIT** repeatedly displays each of the busied out tone plants/auxiliary tone plants.
7. When all busied out tone plants/auxiliary tone plants are displayed, depressing **NEXT CIRCUIT** dashes the display except for Field 1.

Depressing **NEXT CIRCUIT** again starts Test 3 over.
8. To change the busy out status of an individual tone plant/auxiliary tone plant, depress **RLS BUSY OUT** when the tone plant/auxiliary tone plant is displayed.
9. To release all busied out tone plants/auxiliary tone plants, depress **CLEAR DATA; EXECUTE**.

Note: **CLEAR DATA; EXECUTE** can only be used after **EXECUTE** is depressed to initiate Test 3.

PROC 630, Test 3

10. If the maintenance busy status of a particular tone plant/auxiliary tone plant is to be determined, selection can be made, after **EXECUTE** is depressed in Step 2 above, using one of the following methods:

- a. **CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; NEXT DATA.**
- b. **(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; NEXT DATA.**

Note: To select a tone plant or auxiliary tone plant for display or to busy out a tone plant or auxiliary tone plant, Field 6 (circuit) is not a required entry.

11. **NEXT DATA** displays the maintenance busy status of the tone plant/auxiliary tone plant selected.

When **NEXT DATA** is depressed, the **IN USE** indicator on the **MAAP** is not lighted.

12. After selecting a tone plant/auxiliary tone plant for display to determine the maintenance busy status by using the **CHANGE FIELD** sequence, or by entering the equipment location, depressing **NEXT CIRCUIT** displays the first busied out tone plant/auxiliary tone plant as if **EXECUTE** had been depressed.

The fields and contents displayed are the same as when Test 3 is first executed.

13. To busy out a tone plant/auxiliary tone plant:

Execute Test 3.

14. If any tone plants/auxiliary tone plants are busied out, use **NEXT CIRCUIT** to determine if the tone plant/auxiliary tone plant is already busied out.
15. If no tone plants/auxiliary tone plants are busied out, or the tone plant/auxiliary tone plant to be busied out is not displayed by use of **NEXT CIRCUIT**, refer to Step 10 above to select the tone plant/auxiliary tone plant to be busied out.

Requirement: **NEXT DATA** must be used before **BUSY OUT** can be used.

16. When **NEXT DATA** is depressed, the **IN USE** indicator on the **MAAP** is **not** lighted.

Caution: *When a tone plant or auxiliary tone plant is busied out, some capability of generating tones is removed from the system. All tone plants or all auxiliary tone plants should not be busied out at the same time.*

17. Depress **BUSY OUT**.

PROC 631 - TRUNK GROUP BUSY OUT

FLIPCHART ISSUE 1		+ TRUNK GROUP BUSY OUT +								845552223		
TEST 1: BUSY OUT OR RELEASE BUSY OUT ENTIRE TRUNK GROUP. USE 'NEXT UNIT' TO ADVANCE TO NEXT EQUIPPED TRUNK GROUP.		TEST 2: BUSY OUT OR RELEASE BUSY OUT INDIVIDUAL CIRCUITS. USE 'NEXT CIRCUIT' TO DISPLAY THE NEXT CIRCUIT. USE 'EXECUTE' TO DETERMINE THE TRUNK GROUP NUMBER FOR A DISPLAYED EQUIPMENT LOCATION.			NOTE: TRUNK GROUP INDEX DOES NOT CORRESPOND TO TRUNK NUMBER USED BY TRUNK VERIFICATION.		MAINTENANCE BUSY STATUS (FIELD 10): 0 = NOT BUSIED 1 = DEMAND BUSIED 2 = AUTOMATIC BUSIED		SPECIAL ERROR CODES: 80-MORE THAN 255 TRUNKS IN GROUP. USE PROC 630 OR PROC 632 TO BUSY OUT OR RELEASE BUSY OUT REST OF TRUNKS. 81-NOT BUSIED BECAUSE MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED.			
CAUTION: OPERATING 'BUSY OUT' CAN DROP A CUSTOMER CALL.												
TEST NO	TEST 1		NUMBER OF TRUNKS IN TRUNK GROUP	NUMBER OF TRUNKS BUSIED	TEST 2					MAINT BUSY STATUS	TRUNK GROUP INDEX (SEE NOTE)	NETWORK BUSY OUT 631
	TRUNK GROUP NUMBER				EQUIPMENT LOCATION							
					MODULE	CAB	CARR	SLOT	CKT			
1	2		3	4	5	6	7	8	9	10	11	

Purpose

PROC 631 is used to determine the maintenance busy out status of individual trunks in a trunk group or the maintenance busy out status of an entire trunk group.

PROC 631 displays the total number of maintenance busied out trunks and the equipment location of each trunk of the current trunk group and its busied out status.

PROC 631 is used to maintenance busy out or release busy out all trunks in a trunk group or to step through the trunks in a trunk group and selectively busy out or release busy out individual trunks.

Field Definitions and Codes

Each field of **PROC 631** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AQ, PROC 631 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Field 2 - Select trunk group number to determine the maintenance busy status of a particular trunk group (Test 1 only).
3. Fields 5 through 9 - Select individual trunk equipment location to determine the maintenance busy status of a particular trunk (Test 2 only).

Operation of Procedure**Overview**

PROC 631 is used to determine the maintenance busy out status of trunk groups or individual trunks in a trunk group, and to busy out or release from busy an entire trunk group or individual trunks within a trunk group.

TABLE AQ.

PROC 631 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-2	Test number.	5-9		Trunk circuit equipment location (Contd):
2	18-999	Trunk group number.		0-21	Slot number.
3	0-255	Number of trunks in trunk group.		0-3	Circuit number.
4	0-255	Number of trunks busied out in the trunk group.	10	0,2	Maintenance busy status:
5-9		Trunk circuit equipment location:		0	Not busied out.
				1	Demand busied.
				2	Automatic busied.
5	0-30	Module number.	11	0-255	Position of the trunk within the trunk group.
6	0-7	Cabinet number.			
7	0-3	Carrier number.			

To call in **PROC 631**, perform the following:

1. Depress **PROC NO; 631; ENTER**.
2. Test 1 is automatically selected.

Field 1 displays a 1, Field 2 displays the smallest trunk group number, and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Displays the busy out status of an entire trunk group and provides the capability to busy out or release from busy an entire trunk group.
2. Test 2 - Displays the busy out status of individual trunks within a trunk group and provides the capability to busy out or release from busy an individual trunk within a trunk group.

Test 1

Test 1 is used to busy out or release from busy an entire trunk group.

1. Test 1 is the default test when entering **PROC 631** or is selected by using **NEXT TEST**.
2. When Test 1 is selected, the smallest trunk group number in the switch is flashed in Field 2, indicating an optional entry field.

3. Either the trunk group displayed may be used or another trunk group may be selected.
To use the trunk group displayed, **ENTER** is depressed, causing Field 2 to stop flashing.
4. Selection of another trunk group can be accomplished by one of the following three methods:
 - a. **(Trunk group number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group number); ENTER.**
 - c. Depressing **NEXT UNIT** to sequence through all the trunk groups in the switch until the trunk group to be tested is displayed in Field 2. When all trunk group numbers are displayed, depressing **NEXT UNIT** dashes Fields 2 through 14. Depressing **NEXT UNIT** once more displays the smallest trunk group number again, starting the sequence over.
5. To start Test 1, select the trunk group to be displayed, and depress **EXECUTE**.
6. Trunk group information is displayed as follows:

Field 2 - Trunk group number.

Field 3 - Number of trunks in the trunk group.

Field 4 - Number of trunks busied out in the trunk group.

Fields 5 through 9 - Equipment location of the first trunk in the trunk group.

Field 10 - Maintenance busy status of the first trunk. (0 = not busied; 1 = demand busied; 2 = automatic busied.)

Field 11 - Trunk position in the trunk group.
7. Depressing **BUSY OUT** or **RLS BUSY OUT** changes the status of the selected trunk group.

Note: Special error code 80 may be displayed in the **MAAP** error code field and is defined as follows: More than 255 trunks are in the trunk group. **PROC 631** will not busy out or release from busy more than 255 trunks. Use **PROC 630** (busy out/release busy out) or **PROC 632** (carrier busy) to busy out or release from busy the rest of the trunks.

8. To release the entire trunk group from maintenance busy, depress **RLS BUSY OUT**.
9. If the trunk group is an ISDN trunk group, releasing a range of ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
 - a. Depressing **RLS BUSY OUT** does not mean the ISDN trunks are available for use.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

PROC 631, Test 1 and Test 2

Caution: *Depressing **BUSY OUT** can drop customer calls in the entire trunk group.*

10. To busy out an entire trunk group, depress **BUSY OUT**.
11. If the trunk group is an ISDN trunk group, busying out a range of ISDN trunks takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Test 2

Test 2 is used to busy out or release from busy individual trunks within a trunk group.

Test 2 can also be used to search for the trunk group number of a trunk circuit.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is entered, either the equipment location of the first trunk in the last trunk group selected in Test 1 is displayed in Fields 5 through 9 or Field 5 is blanked and Fields 6 through 9 are dashed.
3. When an equipment location is displayed, Field 5 is flashed, indicating an optional entry.

Either the trunk displayed can be used or another trunk can be selected.

4. Selection of another trunk can be accomplished by one of the following three methods:
 - a. Depressing **NEXT CIRCUIT** to sequence through all the trunks in the trunk group displayed until the trunk to be tested is displayed in Fields 5 through 9.

When all the trunks in the trunk group are displayed, depressing **NEXT CIRCUIT** again dashes Fields 5 through 9.

Depressing **NEXT CIRCUIT** once more starts the sequence over with the first trunk in the trunk group.
 - b. When Field 5 is flashing, the equipment location of another trunk can be entered in Fields 5 through 9 as follows:
(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

- c. When Field 5 is blanked, the decimal point in the field is flashed to indicate a mandatory entry. The equipment location of a trunk must be entered in Fields 5 through 9 as follows:

(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

Note: When Field 5 is blanked, the **CHANGE FIELD** sequence cannot be used.

5. To start Test 2, select the trunk to be displayed, and depress **EXECUTE**.

6. Trunk information is displayed as follows:

Field 2 - Trunk group number for the equipment location.

Fields 5 through 9 - Equipment location of the trunk.

Field 10 - Maintenance busy status of the first trunk. (0 = not busied; 1 = demand busied; 2 = automatic busied.)

Field 11 - Position of the trunk in the trunk group.

7. Depressing **BUSY OUT** or **RLS BUSY OUT** changes the status of the selected trunk.

Note: Special error code 80 may be displayed in the **MAAP** error code field and is defined as follows: More than 255 trunks in the group. Use **PROC 630** or **PROC 632** to busy out or release busy out the trunk.

8. Trunks that are omitted (when more than 255 trunks are in a trunk group) are those with the higher internal trunk numbers.

9. If an equipment location of a trunk that is omitted is entered in Test 2, the first trunk of that trunk group will be displayed upon depressing **EXECUTE**.

This indicates that **PROC 630** or **PROC 632** must be used to busy out or release busy the trunk entered.

10. To release the trunk from maintenance busy, depress **RLS BUSY OUT**.

11. If the trunk is an ISDN trunk, releasing an ISDN trunk requires both switches (local and far end) to agree on releasing the ISDN trunk from busy out. If the far end does not agree, the ISDN trunk will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk in a maintenance busy state the ISDN trunk will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk is available for use.

b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is released from busy by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *Depressing **BUSY OUT** can drop a customer's call.*

12. To busy out the trunk, depress **BUSY OUT**.

13. If the trunk is an ISDN trunk, busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.

a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk are busied out.

b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is busied out by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

PROC 631, Test 2

To search for the trunk group number of a trunk circuit, perform the following:

1. Enter the equipment location of the trunk circuit in Fields 5 through 9.
2. Depress **EXECUTE**.
3. Information for the trunk circuit being search is displayed as follows:

Field 2 - Trunk group number for the equipment location.

Fields 5 through 9 - Equipment location of the trunk.

Field 10 - Maintenance busy status of the trunk. (0 = not busied; 1 = demand busied; 2 = automatic busied.)

Field 11 - Position of the trunk in the trunk group.

FLIPCHART ISSUE 4			+	CARRIER BUSY			+	845552223									
TEST 1: DISPLAY BUSY OUT CARRIERS. USE 'NEXT UNIT' TO FIND NEXT CARRIER BUSIED OUT OR PARTIALLY BUSIED OUT.			TEST 2: BUSY OUT OR RELEASE BUSY OUT CARRIERS. USE 'NEXT UNIT' TO ADVANCE TO NEXT CARRIER.			TEST 3: BUSY OUT OR RELEASE BUSY OUT CIRCUITS. USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT CIRCUIT. USE 'BUSY OUT' AND 'RLS BUSY OUT' TO BUSY OR RELEASE A CIRCUIT. USE 'NEXT UNIT' TO ADVANCE TO NEXT CARRIER.			CARRIER TYPE (FIELD 7): 1 = NORMAL PORT CARRIER 2 = DSI/MFAT PORT CARRIER 3 = OTHER			MNT BUSY STATUS (FIELD 8): TEST 1 & 2 0 = NOT BUSIED OUT 1 = BUSIED OUT 2 = PARTIALLY BUSIED OUT CARRIER			TEST 3: 0 = NOT BUSIED SEE WORD 0. SPECIAL ERROR CODE: B1-NOT BUSIED BECAUSE MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED.		
USE 'BUSY OUT' AND 'RLS BUSY OUT' TO BUSY OR RELEASE A CARRIER.																	
CAUTION: OPERATING 'BUSY OUT' CAN DROP A CUSTOMER CALL.																	
TEST NO	EQUIPMENT LOCATION						MAINT BUSY STATUS	TOTAL MODULES IN SYSTEM	TOTAL CAB IN MODULE	TOTAL CARR IN CAB	TOTAL CIRCUITS IN CARRIER	TOTAL CIRCUITS BUSIED IN CARRIER	TEST 1		NETWORK BUSY OUT		
	TEST 3			SLOT	Ckt	CARR TYPE							RUNNING TOTAL: CARRIERS WITH BUSY CIRCUITS				
	TEST 2												TEST 3				
	MODULE	CAB 3	CARR 4										UNIT TYPE				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	632			

PROC 632

Purpose

PROC 632 is used to determine the maintenance busy out status of carriers. Both the total number of busied out circuits in a carrier and the total number of carriers with busied out circuits are displayed.

PROC 632 finds carriers that are completely or partially busied out and displays information pertinent to the carriers.

In addition, **PROC 632** provides the capability to busy out or release from busy a complete carrier or circuits within a carrier.

Test 3 of **PROC 632** can also be used to determine the type of task which maintenance busied the circuit displayed in Fields 2 through 6.

Field Definitions and Codes

Each field of **PROC 632** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AR, PROC 632 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 4 - Select a specific carrier in a cabinet of a module to determine the maintenance busy out status or to busy out or release from busy the specific carrier (Test 2 only).
3. Fields 2 through 6 - Select a specific circuit within a carrier to determine the maintenance busy out status or to busy out or release from busy the specific circuit (Test 3 only).

Operation of Procedure

Overview

PROC 632 is used to determine the status of maintenance busied out carriers, or maintenance busied out circuits within carriers, and to busy out carriers or circuits within carriers.

To call in **PROC 632**, perform the following:

1. Depress **PROC NO; 632; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Searches for and displays completely or partially busied out carriers.
2. Test 2 - Provides the capability to busy out or release from busy a complete carrier.
3. Test 3 - Provides the capability to busy out or release from busy individual circuits within a carrier.

TABLE AR.

PROC 632 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	8 (Contd)	5	Auxiliary tone plant maintenance periodic task.
2	0-30	Module number.		6	Auxiliary trunk maintenance periodic task.
3	0-7	Cabinet number.		7	Circuit select (port maintenance test controller) periodic task.
4	0-3	Carrier number.		8	CO trunk maintenance periodic task.
5	0-21	Slot number.		9	Modem pool call processing periodic task.
6	0-7	Circuit number.		10	Data linkage audit task.
7	1-3	Carrier type:		11	Data port maintenance time available task.
	1	Normal port carrier.		12	DID trunk maintenance periodic task.
	2	DS-1/MFAT port carrier.		13	Digital service (DS-1) maintenance periodic task.
	3	Other.		14	EIA port maintenance time available task.
8	0-2	Maintenance busy status: (Test 1 and Test 2):		15	Hyperactive terminal maintenance periodic test.
	0	Not busied.		16	Facility test circuit maintenance periodic task.
	1	Busied out.		17	GPP maintenance time available task.
	2	Partially busied carrier.		18	Line circuit maintenance time available task.
8	1-648	Maintenance busied by (Test 3):			
	1	Abbreviated dial tone periodic test.			
	2	Automated transmission measurement system periodic task.			
	3	Attendant conference maintenance time available task.			
	4	Abbreviated touch-tone periodic test.			

TABLE AR. (Contd)

PROC 632					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
8 (Contd)	19	MLP maintenance time available task.	8 (Contd)	201	Attendant conference maintenance demand task.
	20	Modem pool facility maintenance periodic task.		202	Auxiliary tone plant maintenance demand task.
	21	Modem pool maintenance scheduler periodic task.		203	Auxiliary trunk maintenance demand task.
	22	Operational error processing periodic task.		204	Circuit select (port maintenance) demand task.
	23	Status memory audits task.		205	CO trunk maintenance demand task.
	24	Tie trunk maintenance periodic task.		206	Data port maintenance demand task.
	25	Tone detector maintenance time available task.		207	DID trunk maintenance demand task.
	26	Call progress tone maintenance periodic task.		208	Digital service (DS-1) maintenance demand task.
	27	Touch-tone sender receiver periodic task.		209	EIA port maintenance demand task.
	28	Trunk error call processing task.		210	Facility test circuit maintenance demand task.
	29	ISDN (busy from far-end) periodic task.		211	GPP port maintenance demand task.
	200	Automatic transmission measurement system demand task.			

TABLE AR. (Contd)

PROC 632					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
8 (Contd)	212	Line circuit maintenance demand task.	8 (Contd)	630	Procedure 630 demand task.
	213	MLP port maintenance demand task.		631	Procedure 631 demand task.
	214	Modem pooling facility maintenance demand task.		632	Procedure 632 demand task.
	215	Terminal maintenance demand task.		635	Procedure 635 demand task.
	216	Tie trunk maintenance demand task.		640	Procedure 640 demand task.
	217	Tone detector maintenance demand task.		646	Procedure 646 demand task.
	218	Call progress tone plant maintenance demand task.		647	Procedure 647 demand task.
	219	Touch-tone sender receiver maintenance demand task.		648	Procedure 648 demand task.
	220	Trunk verification by station maintenance demand task.	9	0-30	Total modules in system.
	221	Dedicated switch connection demand task.	10	1-8	Total cabinets in module.
	620	Procedure 620 demand task.	11	1-4	Total carriers in cabinet.
	622	Procedure 622 demand task.	12	1-154	Total circuits in carrier.
	623	Procedure 623 demand task.	13	1-154	Total circuits busied out in carrier.
			14	1-700	Running total of carriers with busy circuits found in Test 1 (Test 1 only).
				16-72	Unit type of port circuit displayed in Fields 2 through 6 (Test 3 only).

PROC 632, Test 1

Test 1

Test 1 is used to find a carrier that is completely or partially busied out. The carrier can then be released from busy out, or if partially busied out can be completely busied out.

Test 1 is useful for returning a cabinet to service after a total cabinet outage.

1. Test 1 is the default test when entering **PROC 632** or is selected by using **NEXT TEST**.
2. When Test 1 is initially called in, all fields are dashed except for a 1 in the test number field.
3. To start Test 1, depress **EXECUTE**.
A search for a carrier that is busied out or partially busied out is started.
4. The display on the **MAAP** is continually updated while the test is executing until a carrier that is busied out or partially busied out is found (if any).
5. If no carriers are found which are completely or partially busied out, the **MAAP** displays a 1 in Field 1, a 0 in Field 14, and dashes in all other fields.
6. When a carrier is found that is completely busied out or partially busied out, the following information is displayed:

Field 1 - 1.

Fields 2 through 4 - Equipment location of carrier.

Fields 5 and 6 - Dashed.

Field 7 - Carrier type.

Field 8 - Maintenance busy status of carrier. (0 = not busied out; 1 = busied out; 2 = partially busied out carrier.)

Field 9 - Total modules in switch.

Field 10 - Total cabinets in displayed module.

Field 11 - Total carriers in displayed cabinet.

Field 12 - Total circuits in displayed carrier.

Field 13 - Total circuits busied out in displayed carrier.

Field 14 - 1 (indicating first carrier found with busied out circuits.)

7. Depressing **RLS BUSY OUT** releases from busy out the displayed carrier.
RLS BUSY OUT releases all busied out circuits in a carrier or those circuits that are busied out in a partially busied out carrier.
8. If the displayed carrier contains ISDN trunks, releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
 - a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk(s) is available for use.

- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk(s) are released from busy by checking the circuit status of the ISDN trunk(s).

The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

- 9. Field 8 (maintenance busy status) displays a 0, Field 13 (total circuits busied out) displays a 0, and Field 14 changes from 1 to 0 when **RLS BUSY OUT** is depressed.

Caution: If a trunk or terminal that is up on a connection is busied out, the connection is dropped.

- 10. If the displayed carrier is partially busied out, depressing **BUSY OUT** busies out the rest of the circuits in the carrier.

Note: BUSY OUT cannot be used to maintenance busy out a carrier in Test 1 unless the carrier is partially busied out; i.e., only carriers that are busied out or partially busied out are displayed in Test 1.

- 11. If the displayed carrier contains ISDN trunks, busy out of a range of ISDN trunks takes a short period of time for the last few ISDN trunks to be made busied at the far end.

- a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

- 12. Fields 8 and 13 are updated to show that all circuits are busied out when **BUSY OUT** is depressed to busy out the rest of the circuits in a partially busied out carrier.

- 13. Depressing **EXECUTE** again with the **WAIT** indicator off restarts the test and the search.

The count of total carriers with busy circuits (Field 14) begins over when the test is restarted (i.e., 0 until a carrier is found (if any), then a 1 is displayed if a carrier is found).

- 14. Depressing **NEXT UNIT** after a busied out carrier is displayed finds the next carrier that is busied out or partially busied out.

Field 14 is incremented if a busied out or partially busied out carrier is found.

- 15. When the last completely or partially busied out carrier in the system is displayed, depressing **NEXT UNIT** dashes all fields except the test number and total carriers with busy circuits fields (Fields 1 and 14).

Note: After the entire switch is searched for busy carriers and the display is dashed, depressing **BUSY OUT** or **RLS BUSY OUT** causes error code 10 to be displayed.

- 16. Depressing **NEXT UNIT** again causes Test 1 to be executed, starting the sequence over.

The count of the total carriers with busy circuits (Field 14) starts over when the test is restarted (i.e., 0 until a carrier is found (if any), then a 1 is displayed if a carrier is found).

PROC 632, Test 2

Test 2

Test 2 is used to busy out an entire carrier or release from busy a completely or partially busied out carrier.

Test 2 is useful for busying out a carrier or all carriers in a cabinet when making a repair that affects the entire carrier or cabinet.

1. Test 2 is selected by **NEXT TEST**.
2. When Test 2 is called in, a default carrier is displayed in Fields 2 through 4.
A completely or partially busied out carrier last displayed in Test 1 (if any) or the first assigned carrier in the switch is the default carrier for Test 2.
3. Field 2 is flashed indicating an optional entry field.
4. Another carrier can be selected for testing by entering its location in Fields 2 through 4, or by depressing **NEXT UNIT**.

(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER.

Proceed to Step 7.

5. Depressing **NEXT UNIT** searches for and tests the next equipped carrier without depressing **EXECUTE**.

Proceed to Step 8.

6. To start Test 2, depress **EXECUTE**.
7. The status of the selected carrier is displayed as follows:

Field 1 - 2.

Fields 2 through 4 - Equipment location of carrier.

Fields 5 and 6 - Dashed.

Field 7 - Carrier type.

Field 8 - Maintenance busy status of carrier. (0 = not busied out; 1 = busied out; 2 = partially busied out carrier.)

Field 9 - Total modules in switch.

Field 10 - Total cabinets in displayed module.

Field 11 - Total carriers in displayed cabinet.

Field 12 - Total circuits in displayed carrier.

Field 13 - Total circuits busied out in displayed carrier.

Field 14 - Dashed.

8. Depressing **RLS BUSY OUT** releases from busy the entire carrier displayed (all circuits in the carrier).

Field 8 (maintenance busy status) displays a 0 and Field 13 (total circuits busied out) displays a 0 when **RLS BUSY OUT** is depressed.

9. If the displayed carrier contains ISDN trunks, releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk(s) is available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk(s) are released from busy by checking the circuit status of the ISDN trunk(s).

The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *If a trunk or terminal that is up on a connection is busied out, the connection is dropped.*

10. Depressing **BUSY OUT** busies out the entire displayed carrier (all circuits in the carrier). Fields 8 and 13 are updated to show that all circuits are busied out.
11. If the displayed carrier contains ISDN trunks, busy out of a range of ISDN trunks takes a short period of time for the last few ISDN trunks to be made busied at the far end.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are busied out by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.
12. Depressing **NEXT UNIT** finds the next equipped carrier in the switch and updates the display accordingly.
13. When the last carrier in the switch is displayed, depressing **NEXT UNIT** dashes all fields except the test number and total carriers with busy circuits fields (Fields 1 and 14).

Note: After the display is dashed, depressing **BUSY OUT** or **RLS BUSY OUT** causes error code 10 to be displayed.

14. Depressing **NEXT UNIT** again causes Test 2 to be executed, starting the sequence over with the first equipped carrier.

Test 3

Test 3 is used to busy out or release from busy an individual circuit within a carrier.

Test 3 also displays in Field 8 (maintenance busy status) the type of task which maintenance busied the circuit displayed in Fields 2 through 6.

1. Test 3 is selected by **NEXT TEST**.

PROC 632, Test 3

2. When Test 3 is called in, a default carrier may be displayed in Fields 2 through 4.

A completely or partially busied out carrier last displayed in Test 1 or 2 (if any) is the default carrier for Test 3.

The first busied out circuit within the carrier is displayed in Fields 5 and 6. Fields 7 and 8 display the carrier type and maintenance busy status of the circuit.

3. Field 2 is flashed indicating an optional entry field.
4. To execute Test 3, an equipment location must be entered in Fields 2 through 6.
5. Either the default circuit displayed can be tested or another circuit can be selected by entering its equipment location in Fields 2 through 6, or by depressing **NEXT UNIT**.

(Module number); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

Proceed to Step 9.

6. Depressing **NEXT UNIT** searches for and finds the first busied out circuit in the next equipped carrier without depressing **EXECUTE**.

Proceed to Step 10.

7. Depressing **NEXT FAULT** searches for the next busied out circuit in the carrier displayed or next equipped carrier without depressing **EXECUTE**.

Proceed to Step 10.

8. Depressing **NEXT CIRCUIT** advances to the next equipped circuit in the carrier displayed or the next equipped carrier without depressing **EXECUTE**.

Proceed to Step 10.

9. To start Test 3, depress **EXECUTE**.
10. The status of the selected circuit is displayed as follows:

Field 1 - 3.

Fields 2 through 6 - Equipment location of circuit.

Field 7 - Carrier type.

Field 8 - Maintenance busied by type of task.

Note: Refer to Table AR, PROC 632 - Field Definitions and Codes for the definition of the encode displayed in Field 8 to determine the type of task that busied out the circuit displayed in Fields 2 through 6.

Field 9 - Total modules in switch.

Field 10 - Total cabinets in displayed module.

Field 11 - Total carriers in displayed cabinet.

Field 12 - Total circuits in displayed carrier.

Field 13 - Total circuits busied out in displayed carrier.

Field 14 - Unit type of port circuit.

Note: Refer to Table AS, PROC 632 - Definition of Port Circuit Unit Types for the definition of the encode displayed in Field 14.

11. Depressing **RLS BUSY OUT** releases from busy the displayed circuit location.
12. If the displayed circuit location is an ISDN trunk, releasing an ISDN trunk requires both switches (local and far end) to agree on releasing the ISDN trunk from busy out. If the far end does not agree, the ISDN trunk will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk in a maintenance busy state the ISDN trunk will return to a busy out state at the far end, even through **RLS BUSY OUT** is depressed at the local switch.
 - a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk is available for use.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is released from busy by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Caution: *If a trunk or terminal that is up on a connection is busied out, the connection is dropped.*

13. Depressing **BUSY OUT** busies out the displayed circuit location.
14. If the displayed circuit location is an ISDN trunk, busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk are busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is busied out by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

15. If Field 14 equals unit type 27 (GPP), **NEXT DATA** can be used to display the odd port peripheral busied out status.

If Fields 8 and 14 are dashed, there is no odd port peripheral for the unit type 27 equipment location displayed in Fields 2 through 6.

16. If unit type 48 (odd port peripheral) is displayed in Field 14, the maintenance busied by type of task is displayed in Field 8.

Depressing **NEXT DATA** again dashes Fields 8 and 14.

17. Depressing **NEXT CIRCUIT** advances to the next equipped circuit in the carrier displayed or the next equipped carrier and updates the **MAAP** display with its status.
18. Depressing **NEXT UNIT** advances the test to the next equipped circuit in the next equipped carrier and updates the **MAAP** display with its status.

PROC 632, Test 3

19. Depressing **NEXT FAULT** finds the next busied out circuit in the carrier displayed or next equipped carrier and updates the **MAAP** with its status.
20. When the last circuit in the last carrier in the switch is displayed, depressing **NEXT CIRCUIT**, **NEXT UNIT**, or **NEXT FAULT** once more dashes all fields except Field 1 (test number).

Note: After the display is dashed, depressing **BUSY OUT** or **RLS BUSY OUT** causes error code 10 to be displayed.

21. Depressing **NEXT CIRCUIT**, **NEXT UNIT**, or **NEXT FAULT** again causes the first equipped carrier and the first busied out circuit in that carrier to be found and displayed.

TABLE AS.

PROC 632 DEFINITION OF PORT CIRCUIT UNIT TYPES	
UNIT TYPE	PORT CIRCUIT DEFINITION
16	Tone plant.
24	Touch-tone sender.
25	Touch-tone receiver.
27	General purpose port (GPP).
28	72 series (MFET) port.
29	Line circuit.
31	Auxiliary tone plant.
32	Central office (CO) trunk.
33	Direct inward dialing (DID) trunk.
34	Tie trunk/data port.
35	Digital trunk.
44	Attendant console interface.
45	Auxiliary trunk.
46	Attendant conference.
62	Analog/digital facility test.
66	Tone detector 2.
69	Multifunctional analog terminal (MFAT).
72	EIA.
75	Primary rate interface.

PROC 635 - CAUSE OF BUSY OUT

FLIPCHART ISSUE 1		CAUSE OF BUSY OUT		845552223	
WORD 08	PORT TYPE (FIELD 2): 01 = CALL PROGRESS TONE PLANT 16 = ON PREMISES TERMINAL 17 = ATTENDANT INTERFACE 18 = OFF PREMISES TERMINAL 19 = TRANSMISSION TEST 20 = AUXILIARY TONE PLANT 21 = DATA ANSWER TONE PORT 32 = CO TRUNK 33 = DID TRUNK 34 = TIE TRUNK 35 = AUXILIARY TRUNK 36 = TOUCH-TONE RECEIVER 37 = TOUCH-TONE SENDER 38 = ATTENDANT CONFERENCE 39 = ANI DATA TRANSMITTER 40 = DATA PORT TRUNK	41 = CONTACT INTERFACE 42 = TONE DETECTOR 2 43 = GPP DATA MODULE TRUNK 44 = EIA TRUNK 45 = PRIMARY RATE INTERFACE TRUNK 48 = MULTIFUNCTIONAL DIGITAL TERMINAL 49 = MULTIFUNCTIONAL ELECTRONIC TERMINAL 50 = MULTIFUNCTIONAL ANALOG TERMINAL 51 = GPP DATA MODULE TERMINAL 52 = EIA TERMINAL 53 = ANALOG/DIGITAL FACILITY TEST CIRCUIT 90 = DUPLICATION/UPDATE CHANNEL 91 = DATA COMMUNICATIONS INTERFACE UNIT 92 = PROCESSOR COMMUNICATIONS CIRCUIT 93 = TIME-OF-DAY CLOCK SYNCHRONIZER	LOCATION STATUS (FIELD 8): 0 = LOCAL 1 = REMOTE 2 = EVEN PORT, LOCAL 3 = ODD PORT, LOCAL 4 = EVEN PORT, REMOTE 5 = ODD PORT, REMOTE	CIRCUIT STATUS (FIELD 9): 0 = IDLE 1 = IN USE 2 = TRUNK IN LIMBO 3 = PERMANENT IN SEIZURE 4 = ISDN MAINTENANCE (NEAR-END) 5 = ISDN MAINTENANCE (FAR-END)	MAIN BUSY STATUS (FIELD 11): 0 = NOT BUSY (SEE PROC 632, WORD 0, FOR BUSIED BY ENCODES).
					NETWORK BUSY OUT
					635

FLIPCHART ISSUE 2		CAUSE OF BUSY OUT		845552223	
WORD 0A	USE 'EXECUTE' TO BEGIN A SEARCH FOR THE FIRST BUSIED OUT PORT (TEST 1), NON-NETWORK PORT (TEST 2) OR PORT BY EXTENSION (TEST 3).		NOTES:		
	USE 'NEXT FAULT' TO SEARCH FOR THE NEXT BUSIED OUT PORT, NON-NETWORK PORT OR PORT BY EXTENSION.		1. EXECUTE IS NOT REQUIRED PRIOR TO USING 'NEXT FAULT', 'NEXT CIRCUIT', 'BUSY OUT' OR 'RLS BUSY OUT'.		
	USE 'NEXT UNIT' (TEST 1) TO ADVANCE TO THE NEXT PORT TYPE.		2. IF SPECIAL ERROR CODE 81 OCCURS WHILE PERFORMING A RANGE BUSY OUT OR RELEASE BUSY IN TEST 1, THE LOCATION THAT CAUSED THE ERROR WILL BE DISPLAYED. USE 'STOP' TO ABORT THE REST OF THE RANGE OR USE 'BUSY OUT' OR 'RLS BUSY OUT' (AS APPROPRIATE) TO CONTINUE THE RANGE FROM THE DISPLAYED LOCATION.		
	USE 'NEXT CIRCUIT' (TEST 1 & 3) TO ADVANCE TO THE THE NEXT ASSIGNED PORT OR EXTENSION.		3. A DASH IN THE PORT TYPE OR EQUIPMENT LOCATION (FIELDS 2-7) INDICATES A RANGE ON THE DASHED FIELDS).		
	USE 'BUSY OUT' OR 'RLS BUSY OUT' TO BUSY OUT OR RELEASE BUSY A SINGLE PORT (TEST 1), A RANGE OF PORTS (TEST 1) OR THE PORT ASSOCIATED WITH THE DISPLAYED EXTENSION (TEST 3).		4. NON-NETWORK PORTS ARE THOSE WITH PORT TYPES (FIELD 2) NINETY OR HIGHER.		NETWORK BUSY OUT
					635

FLIPCHART ISSUE 2		+	+	CAUSE OF BUSY OUT		+	+	845552223					
TEST 1: SEARCH FOR BUSIED OUT PORTS, BUSY OUT OR RELEASE BUSY PORTS, DISPLAY AND/OR CHANGE THE STATUS OF ALL PORTS IN A DEFINABLE RANGE (SEE NOTE 3).		TEST 2: SEARCH FOR NON-NETWORK PORT USES OF (LIGHTED) MAAP BUSY OUT INDICATION, (SEE NOTE 4).		TEST 3: SEARCH FOR BUSIED OUT PORTS (BY EXTENSION), BUSY OUT OR RELEASE BUSY PORT ASSOCIATED WITH DISPLAYED EXTENSION.		SPECIAL ERROR CODES: 80-PUSH 'BUSY OUT' TWICE WHEN BUSYING OUT PORTS IN A RANGE. 81-BUSY OUT FAILED, MODULE PROCESSOR FAILED TO BLIND OR I/O ERROR (SEE NOTE 2).							
CAUTION: OPERATING 'BUSY OUT' CAN DROP A CUSTOMER CALL.													
TEST NO	PORT TYPE & EQUIPMENT LOCATION						TEST 3	MAINTENANCE BUSY STATUS	TRUNK GROUP	PROC REFER	NETWORK BUSY OUT		
	TEST 1												
	PORT TYPE	MODULE	CABINET	CARRIER	SLOT	CIRCUIT						LOCATION STATUS	CIRCUIT STATUS
1	2	3	4	5	6	7	8	9	10	11	12	13	635

Purpose

PROC 635 is used to determine the reason for the **MAAP BUSY OUT** lamp being lighted by maintenance busied ports or non-network port uses.

PROC 635 allows the user to search for busied ports in user selectable ranges.

PROC 635

In addition, **PROC 635** provides the capability to busy out or release from busy all ports in user selectable ranges or an individual port. Busy out or release busy can be performed **before** or **after** determining the status of the ports to be busied out or released from busy in user selectable ranges.

Note: The entire switch **can not** be busied out.

PROC 635 can also be used to determine the type of task which maintenance busied the port displayed in Fields 2 through 7.

PROC 635 allows the user to enter an extension number to display and change the status of the port assigned to that extension. In the case where an extension may have more than one appearance button, **PROC 635** displays the home port location.

Field Definitions and Codes

Each field of **PROC 635** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AT, PROC 635 - Field Definitions and Codes.

Optional input fields are:

1. Fields 2 through 7 (all dashed) - Search for maintenance busied ports in the entire switch (Test 1 only).

Note: The entire switch **can not** be busied out.

2. Field 2 - Select port type (number designation of the functional unit of equipment) to determine the maintenance busy out status; to busy out or release from busy ports within the selected port type (Test 1 only).
3. Fields 3 through 7 - Select equipment location of a specific port, range of ports, or all ports in a port type to determine the maintenance busy out status; to busy out or release from busy the specific port, range of ports, or all ports in a port type (Test 1 only).
4. Field 10 - Select extension number to determine the status (idle, in-use, or busied out), to busy out, or release from busy the port assigned to that extension (Test 3 only).

Operation of Procedure

Overview

PROC 635 is used to search for maintenance busied ports and non-network port uses (i.e., a port that does not reside in a network port carrier, types 11 and 12 described in **PROC 250**) to determine the cause of the **MAAP BUSY OUT** lamp being lighted. Extension numbers can be entered to display the status of the port assigned to that extension. In addition, ports can be busied out and released from busy.

To call in **PROC 635**, perform the following:

1. Depress **PROC NO; 635; ENTER**.

TABLE AT.

PROC 635 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	9 (Contd)	4	ISDN maintenance - near end.
2-7		Port type and equipment location.		5	ISDN maintenance - far end.
2	1-93	Port type.	10	0 - 99999	Extension number assigned to port.
3	0-99	Module number.		0-648	Maintenance busied by:
4	0-7	Cabinet number.	11	0	Not busied.
5	0-3	Carrier number.		1	Abbreviated dial tone periodic test.
6	0-21	Slot number.		2	Automatic transmission measurement system periodic task.
7	0-7	Circuit number.		3	Attendant conference maintenance time available task.
8	Dash, 0-5	Location status:		4	Abbreviated touch-tone periodic test.
	Dash	Does not apply.		5	Auxiliary tone plant maintenance periodic task.
	0	Local.		6	Auxiliary trunk maintenance periodic task.
	1	Remote.		7	Circuit select (port maintenance test controller) periodic task.
	2	Even port, local.		8	CO trunk maintenance periodic task.
	3	Odd port, local.		9	Modem pool call processing periodic task.
	4	Even port, remote.		10	Data linkage audit task.
	5	Odd port, remote.		11	Data port maintenance time available task.
9	Dash, 0-5	Circuit status:			
	Dash	Does not apply.			
	0	Idle.			
	1	In-use.			
	2	Trunk in limbo.			
	3	Permanent in seizure.			

TABLE AT. (Contd)

PROC 635					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
11 (Contd)	12	DID trunk maintenance periodic task.	11 (Contd)	25	Tone detector maintenance time available task.
	13	Digital service (DS-1) maintenance periodic task.		26	Call progress tone plant maintenance periodic task.
	14	EIA port maintenance time available task.		27	Touch-tone sender receiver periodic task.
	15	Hyperactive terminal maintenance periodic test.		28	Trunk error call processing task.
	16	Facility test circuit maintenance periodic task.		29	ISDN (busy from far-end) periodic task.
	17	GPP maintenance time available task.		200	Automatic transmission measurement system demand task.
	18	Line circuit maintenance time available task.		201	Attendant conference maintenance demand task.
	19	MLP maintenance time available task.		202	Auxiliary tone plant maintenance demand task.
	20	Modem pool facility maintenance periodic task.		203	Auxiliary trunk maintenance demand task.
	21	Modem pool maintenance scheduler periodic task.		204	Circuit select (port maintenance) demand task.
	22	Operational error processing periodic task.		205	CO trunk maintenance demand task.
	23	Status memory audits task.		206	Data port maintenance demand task.
	24	Tie trunk maintenance periodic task.			

TABLE AT. (Contd)

PROC 635					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
11 (Contd)	207	DID trunk maintenance demand task.	11 (Contd)	219	Touch-tone sender receiver maintenance demand task.
	208	Digital service (DS-1) maintenance demand task.		220	Trunk verification by station maintenance demand task.
	209	EIA port maintenance demand task.		221	Dedicated switch connection demand task.
	210	Facility test circuit maintenance demand task.		620	Procedure 620 demand task.
	211	GPP port maintenance demand task.		622	Procedure 622 demand task.
	212	Line circuit maintenance demand task.		623	Procedure 623 demand task.
	213	MLP port maintenance demand task.		630	Procedure 630 demand task.
	214	Modem pooling facility maintenance demand task.		631	Procedure 631 demand task.
	215	Terminal maintenance demand task.		632	Procedure 632 demand task.
	216	Tie trunk maintenance demand task.		635	Procedure 635 demand task.
	217	Tone detector maintenance demand task.		640	Procedure 640 demand task.
	218	Call progress tone plant maintenance demand task.		646	Procedure 646 demand task.

TABLE AT. (Contd)

PROC 635					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
11 (Contd)	647	Procedure 647 demand task.	13	20-52	PROC reference: The two digits displayed are the last two digits of a maintenance procedure (PROC 6XX) to be performed in order to obtain detailed information about the cause of the busy out lamp being lighted by non-network port uses.
	648	Procedure 648 demand task.			
12	Dash, 18-999	Trunk group number. (Dash does not apply.)			

2. Test 1 is automatically selected.

Field 1 displays a 1 and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Searches for and displays busied out ports in user selectable ranges. Test 1 can also be used to busy out or release from busy ports in user selectable ranges.
2. Test 2 - Allows the user to determine non-network port uses of the **BUSY OUT** lamp.
3. Test 3 - Provides the capability to display the status (idle, in-use, or busy) of an entered extension number. Test 3 can also be used to busy out or release from busy the port assigned to that extension.

Test 1

Test 1 is used to search for all busied out ports in user definable ranges.

Test 1 is also used to busy out or release from busy all ports in user definable ranges.

The following information is provided for ISDN trunk(s) that are busied out in user selectable ranges.

1. Busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.
2. Busy out of a range of ISDN trunks takes a short period of time for the last few ISDN trunks to be made busied at the far end.

3. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out. Check the circuit status of the ISDN trunks displayed in Field 9 to ensure that the ISDN trunks are busied out. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.

The following information is provided for ISDN trunk(s) that are released from busy in user selectable ranges.

1. Releasing individual or a range of ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
2. Depressing **RLS BUSY OUT** does not mean the ISDN trunk is available for use. Check the circuit status of the ISDN trunk displayed in Field 9 to ensure that the ISDN trunk is released from busy. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the

Busy out or release busy out can be performed **before** or **after** determining the status of the ports to be busied out or released from busy in user selectable ranges.

1. Test 1 is the default test when entering **PROC 635** or is selected by using **NEXT TEST**.
2. When Test 1 is initially called in, all fields are dashed except for a 1 in the test number field. Field 2 blinks for input.
3. All ports in the switch, all ports within a port type, all port types in a smaller range of the switch, a combination of port type and range (i.e., all equipment locations of a port type in the range specified), or a specific port can be selected to search for the busied out status; to busy out or release busy all ports in the selected range.
4. To select the entire switch to search for busied out ports or to release from busy all ports in the switch, Fields 2 through 7 must be dashed.

Proceed to Step 23.

Note: The entire switch **can not** be busied out.

5. In addition to searching for busied out ports or releasing from busy all ports in the entire switch, a range of ports (all ports in a module, cabinet, carrier, or slot) can also be selected to search for busied out ports, to busy out, or to release from busy ports in the selected range.
6. To select all ports in a module to search for busied out ports, to busy out, or to release from busy all ports in the selected module, perform the following:

ENTER; (Module number); ENTER.

Proceed to Step 23.

7. To select all ports in a cabinet to search for busied out ports, to busy out, or to release from busy all ports in the selected cabinet, perform the following:

ENTER; (Module number of cabinet); ENTER; (Cabinet number); ENTER.

Proceed to Step 23.

PROC 635, Test 1

8. To select all ports in a carrier to search for busied out ports, to busy out, or to release from busy all ports in the selected carrier, perform the following:

**ENTER; (Module number of carrier); ENTER; (Cabinet number of carrier);
ENTER; (Carrier number); ENTER.**

Proceed to Step 23.

9. To select all ports in a slot to search for busied out ports, to busy out, or to release from busy all ports in the selected slot, perform the following:

**ENTER; (Module number of slot); ENTER; (Cabinet number of slot); ENTER;
(Carrier number of slot); ENTER; (Slot number); ENTER.**

Proceed to Step 23.

10. To select all ports within a port type to search for busied out ports, to busy out, or to release from busy all ports in the selected port type, the appropriate port type must be entered in Field 2.

Note: Refer to Table AU, PROC 635 - Definition of Port Types Displayed in Field 2, to determine which kind of port is displayed for a particular port type.

11. A port type can be selected to search for busied out ports, to busy out, or to release from busy all ports in the selected port type in several ways: i.e., by depressing **NEXT UNIT** until the correct port type is displayed in Field 2, or by entering the port type and depressing **ENTER**.

Proceed to Step 23.

12. Depressing **NEXT UNIT** displays port type 1 (call progress tone plant) and dashes Fields 3 through 13.

- a. Depressing **NEXT UNIT** repeatedly displays all port types (1 through 53).
- b. Depressing **NEXT UNIT** once more after all port types are displayed dashes all fields except Field 1.
- c. Depressing **NEXT UNIT** again starts the sequence over.

13. In addition to searching for busied out ports, busying out, or releasing from busy all ports in a specified port type, a range of ports for the port type (all ports for a port type in a module, cabinet, carrier, or slot) can also be selected to search for busied out ports, to busy out, or to release from busy all ports in the selected range.

14. To select all ports for a port type in a module to search for busied out ports, to busy out, or to release from busy all ports for the port type and module, perform the following:

(Port type); ENTER; (Module number); ENTER.

Proceed to Step 23.

15. To select all ports for a port type in a cabinet to search for busied out ports, to busy out, or to release from busy all ports for the port type and cabinet, perform the following:

**(Port type); ENTER; (Module number of cabinet); ENTER; (Cabinet number);
ENTER.**

Proceed to Step 23.

TABLE AU.

PROC 635 DEFINITION OF PORT TYPES DISPLAYED IN FIELD 2			
PORT TYPE	DEFINITION	PORT TYPE	DEFINITION
1	Call progress tone plant.	41	Contact interface.
16	On premises terminal.	42	Tone detector 2.
17	Attendant interface.	43	GPP data module trunk.
18	Off premises terminal.	44	EIA trunk.
19	Transmission test.	45	Primary rate interface trunk.
20	Auxiliary tone plant.	48	Multifunctional digital terminal.
21	Data answer tone port.	49	Multifunctional electronic terminal.
32	Central office (CO) trunk.	50	Multifunctional analog terminal.
33	Direct inward dialing (DID) trunk.	51	GPP data module terminal.
34	TIE trunk.	52	EIA terminal.
35	Auxiliary trunk.	53	Analog/digital facility test circuit.
36	Touch-tone receiver.	90	Duplication/update channel.
37	Touch-tone sender.	91	Data communications interface unit.
38	Attendant conference.	92	Processor communications circuit.
39	ANI data transmitter.	93	Time-of-day clock synchronizer.
40	Data port trunk.		

16. To select all ports for a port type in a carrier to search for busied out ports, to busy out, or to release from busy all ports for the port type and carrier, perform the following:

(Port type); ENTER; (Module number of carrier); ENTER; (Cabinet number of carrier); ENTER; (Carrier number); ENTER.

Proceed to Step 23.

17. To select all ports for a port type in a slot to search for busied out ports, to busy out, or to release from busy all ports for the port type and slot, perform the following:

(Port type); ENTER; (Module number of slot); ENTER; (Cabinet number of slot); ENTER; (Carrier number of slot); ENTER; (Slot number); ENTER.

Proceed to Step 23.

18. A specific port can be selected to determine the maintenance busy status of the port, to busy out, or to release busy the port by performing the following:

(Port type of port); ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

Note: When a specific port is entered, Fields 8 through 13 display (as appropriate) the location status, circuit status, extension number, maintenance busy status, trunk group number, and PROC reference.

Proceed to Step 23.

PROC 635, Test 1

19. The port type field is an optional input field to test a specific port.
If the port type is unknown, **ENTER** is depressed to move to Field 3 for data entry.
20. A specific port can also be selected to determine the maintenance busy status of the port, to busy out, or to release busy the port by depressing **NEXT CIRCUIT**.

Note: Except for MFAT circuits (port type 50), circuits are displayed in physical equipment location order.

- a. When **NEXT CIRCUIT** is depressed, the next assigned port location is displayed.

Note: When the displayed port location has an odd/even pair assigned to it, Field 8 (location status) displays the port's location status. The even port's status is displayed first (Field 8 = 2 or 4). Depressing **NEXT CIRCUIT** again displays the odd port's status (Field 8 = 3 or 5).

- b. When the last assigned port in the switch is displayed, depressing **NEXT CIRCUIT** once more dashes all fields except Field 1.
 - c. Depressing **NEXT CIRCUIT** again displays the original user selectable range.
 - d. Depressing **NEXT CIRCUIT** once more displays the first assigned port.
21. Depress **NEXT CIRCUIT** until the specific port is displayed in Fields 3 through 7.

Note: When a specific port is entered, Fields 8 through 13 display (as appropriate) the location status, circuit status, extension number, maintenance busy status, trunk group number, and PROC reference.

Proceed to Step 23.

22. A specific port can also be selected to determine the maintenance busy status of the port, to busy out, or to release busy the port by use of **NEXT UNIT** and **NEXT CIRCUIT**.
 - a. Depress **NEXT UNIT** until the port type of the specific port is displayed in Field 2.
 - b. Depress **NEXT CIRCUIT** until the specific port is displayed in Fields 3 through 7.

Note: When a specific port is entered, Fields 8 through 13 display (as appropriate) the location status, circuit status, extension number, maintenance busy status, trunk group number, and PROC reference.

Proceed to Step 23.

23. To search for busied out ports in user selectable ranges, proceed to Step 24.

To release from busy ports, proceed to Step 33.

To busy out ports, proceed to Step 41.

24. To search for busied out ports, depress **NEXT FAULT** or **EXECUTE**.
 - a. Depressing **NEXT FAULT** searches for the next busied out port starting at the currently displayed location (user definable range).
 - b. Depressing **EXECUTE** begins a search for the first busied out port in the user definable range.

25. The display on the **MAAP** is continually updated while Test 1 is executing until a port that is busied out is found (if any).
26. If no ports are found which are busied out when the user definable range is completed, the **MAAP** displays a 1 in Field 1 and Fields 2 through 13 are dashed.

Depressing **NEXT FAULT**, **NEXT CIRCUIT**, or **NEXT UNIT** displays the original user definable range and Field 2 blinks for input.
27. When a port is found that is busied out, Test 1 is stopped and the following information is displayed:

Field 1 - 1.

Fields 2 through 7 - Port type and equipment location of the busied out port.

Field 8 - Location status of the busied out port.

Field 9 - Circuit status of the busied out port.

Field 10 - Extension number of the busied out port (if appropriate).

Field 11 - Maintenance busied by encode.

Note: Refer to Table AT, PROC 635 - Field Definitions and Codes, for a definition of the encode displayed in Field 11.

Field 12 - Trunk group number (if appropriate).

Field 13 - A 2-digit reference to a maintenance procedure.
28. Further diagnosis of the busy out lamp being lighted is performed by using the maintenance procedure referenced in Field 13.

The two digits referenced in Field 13 are preceded by a 6 to determine the maintenance procedure to be performed. (Example: 20 displayed in Field 13 indicates that **PROC 620** is the maintenance procedure to be performed to determine the reason for the busy out lamp being lighted).
29. Depressing **RLS BUSY OUT** releases from busy out the displayed port.

Field 11 (maintenance busy status) displays a 0 when **RLS BUSY OUT** is depressed.
30. If the displayed port is an ISDN trunk, releasing an individual ISDN trunk requires both switches (local and far end) to agree on releasing the ISDN trunk from busy out. If the far end does not agree, the ISDN trunk will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk in a maintenance busy state the ISDN trunk will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk is available for use. Check the circuit status of the ISDN trunk displayed in Field 9 to ensure that the ISDN trunk is released from busy. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.
31. Depressing **NEXT FAULT** searches for the next busied out port starting at the currently displayed location and updates Fields 2 through 12 (as appropriate) for the next busied out port.

- a. When the last busied out location in the user definable range is displayed, depressing **NEXT FAULT** once more dashes Fields 2 through 13.
 - b. Depressing **NEXT FAULT** again displays the original selected user definable range.
 - c. One more depression of **NEXT FAULT** causes a new search to begin in the original selected user definable range.
32. To start a new search over a different user definable range the **CHANGE FIELD** sequence must be used.
33. If a specific port is to be released from busy, proceed to Step 34.
If a user selected range is to be released from busy, proceed to Step 36.
34. Depressing **RLS BUSY OUT** releases from busy out the displayed port.
Field 11 (maintenance busy status) displays a 0 when **RLS BUSY OUT** is depressed.
35. If the displayed port is an ISDN trunk, releasing an individual ISDN trunk requires both switches (local and far end) to agree on releasing the ISDN trunk from busy out. If the far end does not agree, the ISDN trunk will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk in a maintenance busy state the ISDN trunk will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk is available for use. Check the circuit status of the ISDN trunk displayed in Field 9 to ensure that the ISDN trunk is released from busy. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.
36. Depressing **RLS BUSY OUT** releases from busy out all ports in the user definable range.
37. If the user definable range contains ISDN trunks, releasing a range of ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk(s) is available for use. Check the circuit status of the ISDN trunks displayed in Field 9 to ensure that the ISDN trunks are released from busy. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.
38. While ports in a user definable range are being released from busy, **STOP** can be used to halt the release busy out process.

The last port type and equipment location released from busy is displayed in Fields 2 through 7 when **STOP** is depressed.
39. If a port fails to release from busy while releasing a range of ports from busy out, Test 1 stops and special error code 81 (busy out failed, module processor failed to blind or I/O error) is displayed in the **MAAP** error code field.
40. The port type and equipment location of the port that failed to release from busy is displayed in Fields 2 through 7.

STOP can be depressed to stop the release busy process of the remaining ports in the user definable range from releasing from busy or **RLS BUSY OUT** can be depressed again to continue the releasing of busy out ports in the entire user definable range continuing from the port equipment location displayed in Fields 2 through 7.

41. To release from busy ports over a different user definable range the **CHANGE FIELD** sequence must be used.
42. If a specific port is to be busied out, proceed to Step 42.
If a user selected range is to be busied out, proceed to Step 44.

Caution: *If a port that is up on a connection is busied out, the connection is dropped.*

43. Depress **BUSY OUT**.

Field 11 (maintenance busy status) displays 635 when **BUSY OUT** is depressed.

44. If the specific port is an ISDN trunk, busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.

Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk are busied out. Check the circuit status of the ISDN trunk displayed in Field 9 to ensure that the ISDN trunk is busied out. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.

45. Depress **BUSY OUT**.

The first time **BUSY OUT** is depressed, the user definable range of ports are not busied out.

Note: Special error code 80 (push **BUSY OUT** twice when busying out ports in a range) is displayed in the **MAAP** error code field indicating that **BUSY OUT** must be depressed twice to busy out the specific range.

Caution: *All ports in the user definable range that are up on a connection when **BUSY OUT** is depressed the second time are dropped.*

46. Depress **BUSY OUT**.

47. If the user definable range contains ISDN trunks, busy out of a range of ISDN trunks takes a short period of time for the last few ISDN trunks to be made busied at the far end.

Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunks are busied out. Check the circuit status of the ISDN trunks displayed in Field 9 to ensure that the ISDN trunks are busied out. The circuit status of the ISDN trunk is independent of the busy out status displayed in Field 11 and/or the busy out lamp indication on the **MAAP**.

48. While ports in a user definable range are being busied out, **STOP** can be used to halt the busy out process.

The last port type and equipment location busied out is displayed in Fields 2 through 7 when **STOP** is depressed.

49. If a port fails to busy out while busying out a range of ports, Test 1 stops and special error code 81 (busy out failed, module processor failed to blind or I/O error) is displayed in the **MAAP** error code field.

PROC 635, Test 1 and Test 2

50. The port type and equipment location of the port that failed to busy out is displayed in Fields 2 through 7.

STOP can be depressed to stop the busy out process of the remaining ports in the user definable range from busying out or **BUSY OUT** can be depressed again to continue the busying out of ports in the entire user definable range continuing from the port equipment location displayed in Fields 2 through 7.

51. To busy out ports over a different user definable range the **CHANGE FIELD** sequence must be used.

Test 2

Test 2 is used to search for non-network port uses of the busy out lamp.

Note: Non-network ports are any ports that do not reside in a network port carrier.

Examples of non-network uses of the busy out lamp are:

1. The DCIU is removed from service in Test 2 of **PROC 650**.
2. A soft-lock of one of the duplication/update channels is performed in Test 2 of **PROC 621**.

Test 2 displays the non-network use cause of the busy out lamp being lighted for these examples or for other non-network port uses.

1. Test 2 is selected by **NEXT TEST**.
2. When Test 2 is called in, all fields are dashed except for a 2 in the test number field.
3. To start Test 2, depress **EXECUTE**.
4. If no non-network port uses of the busy out lamp are found, error code 22 (circuit not busied out) is displayed in the **MAAP** error code field.
5. If the busy out lamp is lighted because of one of the non-network port uses, the following information is displayed:

Field 2 - Port type (90, 91, 92, or 93).

Note: Refer to Table AU, PROC 635 - Definition of Port Types Displayed in Field 2, to determine which kind of non-network port use is the cause of the busy out lamp being lighted.

Field 3 - Module number for the non-network port use.

Fields 4 through 12 - Dashed.

Field 13 - A 2-digit reference to a maintenance procedure.

6. Further diagnosis of the busy out lamp being lighted by a non-network port use is performed by using the maintenance procedure referenced in Field 13.

The two digits referenced in Field 13 are preceded by a 6 to determine the maintenance procedure to be performed. (Example 21 displayed in Field 13 indicates that **PROC 621** is the maintenance procedure to be performed to determine the reason for the busy out lamp being lighted.

7. Depressing **NEXT FAULT** continues the search for the next non-network port use causing the busy out lamp to be lighted.
 - a. When the last non-network port use is displayed, depressing **NEXT FAULT** dashes Fields 2 through 13.
 - b. Depressing **NEXT FAULT** again causes a new search of non-network port uses to begin.

Test 3

Test 3 is used to display the status (idle, in-use, or busy) of the port assigned to an entered extension number.

Test 3 can also be used to busy out or release from busy the port assigned to that extension.

In addition, Test 3 can be used to search for busied out ports in extension order.

1. Test 3 is selected by **NEXT TEST**.
2. When Test 3 is initially called in, all fields are dashed except for a 3 in the test number field. Field 10 blinks for input.
3. Either a specific extension can be selected to display or change the status of the port assigned to that extension or a search for busied out ports in extension order can be performed.
To select a specific extension, proceed to Step 4.
To search for busied out ports in extension order, proceed to Step 11.
4. A specific extension can be selected to display or change the status (idle, in-use, or busied out) of the port assigned to that extension by performing the following:
(Extension number); ENTER.

Note: If an incorrect extension number is entered, an error code is displayed in the **MAAP** error code field.

When a specific extension is entered, Fields 2 through 7 display the port type and equipment location, Field 8 displays the location status, Field 9 displays the circuit status, Field 11 displays the maintenance busy status, Field 12 is dashed and Field 13 displays a 2-digit reference to a maintenance procedure.

Proceed to Step 7.

5. A specific extension can also be selected to display or change the status (idle, in-use, or busied out) of the port assigned to that extension by depressing **NEXT CIRCUIT**.
 - a. When **NEXT CIRCUIT** is depressed, the next assigned port location in extension order is displayed.
 - b. When the last assigned port location in extension order is displayed, depressing **NEXT CIRCUIT** once more dashes all fields except Field 1.
 - c. Depressing **NEXT CIRCUIT** again displays the first assigned port location in extension order.

PROC 635, Test 3

6. Depress **NEXT CIRCUIT** until the specific extension is displayed in Field 10.

When a specific extension is entered, Fields 2 through 7 display the port type and equipment location, Field 8 displays the location status, Field 9 displays the circuit status, Field 11 displays the maintenance busy status, Field 12 is dashed and Field 13 displays a 2-digit reference to a maintenance procedure.

Proceed to Step 7.

7. When the extension has more than one button appearance, Test 3 displays the home port equipment location.

Note: The home port bit does not have to be set in **PROC 052**; however, it is recommended that the bit be set. If the home bit is not set for the entered extension number, Test 3 displays the equipment location of the first port found in translation for the entered extension number.

8. The status of the port assigned to the displayed extension can be changed.
 - a. To busy out the port assigned to the displayed extension, proceed to Step 9.
 - b. To release from busy the port assigned to the displayed extension, proceed to Step 10.

9. Depress **BUSY OUT**.

Field 11 (maintenance busy status) displays 635 when **BUSY OUT** is depressed.

Note: The port equipment location assigned to the displayed extension is busied out. All extensions on that equipment location are busied out; however, not all of the button appearances of the extension are busied out.

10. Depress **RLS BUSY OUT**.

Field 11 (maintenance busy status) displays a 0 when **RLS BUSY OUT** is depressed.

Note: The port equipment location assigned to the displayed extension is released from busy. All extensions on that equipment location are released from busy; however, not all of the button appearances of the extension are released from busy.

11. To search for busied out ports in extension order, depress **EXECUTE**.

The search for the first busied out port in extension order begins with the first assigned extension in the switch.

12. If no ports are found which are busied out, the **MAAP** displays a 3 in Field 1 and dashes in Fields 2 through 13.
13. When a port is found that is busied out, Test 3 is stopped and the following information is displayed:

Field 1 - 3.

Fields 2 through 7 - Port type and equipment location of the busied out port assigned to the extension.

Field 8 - Location status of the busied out port.

Field 9 - Circuit status of the busied out port.

Field 10 - Extension number of the busied out port.

Field 11 - Maintenance busied by encode.

Note: Refer to Table AT, PROC 635 - Field Definitions and Codes, for a definition of the encode displayed in Field 11.

Field 12 - Dashed.

Field 13 - A 2-digit reference to a maintenance procedure.

14. Further diagnosis of the busy out lamp being lighted is performed by using the maintenance procedure referenced in Field 13.

The two digits referenced in Field 13 are preceded by a 6 to determine the maintenance procedure to be performed. (Example: 20 displayed in Field 13 indicates that **PROC 620** is the maintenance procedure to be performed to determine the reason for the busy out lamp being lighted.

15. The port equipment location assigned to the displayed extension can be released from busy by depressing **RLS BUSY OUT**.

Field 11 (maintenance busy status) displays a 0 when **RLS BUSY OUT** is depressed.

Note: The port equipment location assigned to the displayed extension is released from busy. All extensions on that equipment location are released from busy; however, not all of the button appearances of the extension are released from busy.

16. Depressing **NEXT FAULT** searches for the next busied out port in extension order starting at the currently displayed location and updates Fields 2 through 12 (as appropriate) for the next busied out port.
 - a. When the last busied out port in extension order is displayed, depressing **NEXT FAULT** once more dashes Fields 2 through 13.
 - b. Depressing **NEXT FAULT** again causes a new search to begin.

PROC 640

PROC 640 - TRUNK FAILURES

FLIPCHART ISSUE 3		+ + TRUNK FAILURES + + 845552223			
MAINTENANCE BUSY STATUS (FIELD 7): 0 = NOT BUSY 1 = BUSY	ALARM STATUS FIELD 8: 0 = NO ERRORS RECORDED 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS 5 = ALARM RESOLVED	TRUNK DATA: FIELD 12: 1 = SIGNALING SEQUENCE (TEST 1) 2 = DATA WHEN FAILURE OCCURRED (TEST 1) 3 = DYNAMIC DATA (TEST 2) 4 = FROZEN DATA (TEST 2)	FIELD 13: 0-6 = TRUNK TABLE INDEX 7 = SCAN STATUS 8 = FAILING STIMULUS (TEST 1), 10 MS. COUNTER (TEST 2)	FIELD 14: TRUNK DATA CODES REQUIRE EXTENSIVE CALLS PROCESSING KNOWLEDGE	FIELD 15: 0-9 = PRIOR CODE INDEX FOR FROZEN DATA (TYPE 4)
WMMD 0 NETWORK 640					

FLIPCHART ISSUE 3		+ + TRUNK FAILURES + + 845552223														
TEST 1: DISPLAY FAILURE HISTORY. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILED CIRCUIT. USE 'NEXT UNIT' TO DISPLAY DISPLAY NEXT FAIL CODE. USE 'NEXT FAULT' TO DISPLAY NEXT GROUP OF 6 FAILED CIRCUITS. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARMED CIRCUITS ONE AT A TIME.		FAILURE CODES (FIELD 9): 1 = SIGNALING SEQUENCE 2 = CALL PROCESSING 3 = QUEUE AUDIT 4 = TRUNK FALSELY ACTIVE		5 = QUARANTINE (T LIMBO) 6 = CAUSED ALARM 7 = SEQUENCE INITIALIZE 8 = UNIVERSAL TRUNK TIME-OUT 9 = PERMANENT INCOMING SEIZURE												
TEST 2 (SEE NOTE): MONITORS TRUNK DATA. USE 'EXECUTE' TO DISPLAY DYNAMIC TRUNK DATA CODE (FIELD 14). USE 'STOP' TO FREEZE DYNAMIC TRUNK DATA. USE 'NEXT UNIT' TO DISPLAY PRIOR TRUNK DATA CODES FOR DATA TYPE 4.		USE 'NEXT DATA' TO ADVANCE TRUNK DATA IN FIELDS 12 AND 13.		SPECIAL ERROR CODE: 81-NOT BUSIED BECAUSE MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED												
USE 'BUSY OUT' OR 'RELEASE BUSY OUT' TO CHANGE MAINTENANCE BUSY STATUS. CAUTION: 'BUSY OUT' MAY DROP A CUSTOMER CALL.		USE 'NEXT DATA' TO ADVANCE TRUNK DATA IN FIELDS 12 AND 13.														
TEST NO	TEST 2					MAINTENANCE BUSY STATUS	ALARM STATUS	FAILURE CODE	NUMBER OF FAILURES	FAILURE INDEX	TRUNK DATA				PRIOR CODE INDEX	NETWORK 640
	EQUIPMENT LOCATION										TYPE	INDEX	CODE			
	MODULE	CAB	CARR	SLOT	CKT											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		

Purpose

PROC 640 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a trunk failure.

PROC 640 does not perform any trunk tests.

PROC 640 is used to:

1. Display the trunk failures detected during call processing.
2. Monitor trunk activity.

The data displayed requires extensive call processing knowledge for interpretation.

Field Definitions and Codes

Each field of **PROC 640** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AV, PROC 640 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Select equipment location of trunk to be monitored (Test 2 only).

TABLE AV.

PROC 640 FIELD DEFINITIONS AND CODES		
FIELD	CODE	DEFINITION
1	1-2	Test number.
2	0-30	Module number.
3	0-7	Cabinet number.
4	0-3	Carrier number.
5	0-21	Slot number.
6	0-3	Number of circuit assigned to trunk.
7		Maintenance busy status:
	0	Not busied out.
	1	Busied out.
8	0-5	Alarm status:
	0	No errors recorded.
	1	Major.
	2	Minor.
	3	Warning.
	4	Errors recorded.
	5	Alarm resolved.
9		Failure code:
	1	Trunk signaling sequence failure.
	2	Call processing failure.
	3	Queue audit failure.
	4	Trunk falsely active failure.
	5	Trunk now in quarantine (T_LIMBO).
	6	Failure caused alarm.
	7	Sequence initialization.
	8	Universal trunk time-out.
	9	Permanent incoming seizure.
10	0-6	Number of failures.
11	1-6	Failure index for individual failures.
12		Trunk data type:
	1	Trunk signaling sequence failure (Test 1).
	2	Data when failure occurred (Test 1).
	3	Dynamic trunk data (Test 2).
	4	Frozen (dynamic) trunk data (Test 2).
13	0-7	Trunk data index (used for trunk data types 2-4).
	8	Failing stimulus (Test 1, type 2); 10-MS counter (Test 2).

TABLE AV. (Contd)

PROC 640 (Contd)										
FIELD DEFINITIONS AND CODES										
FIELD	CODE	DEFINITION								
14	0-17777	Trunk data code (displayed in octal).								
		Data type 1: When trunk data type is a 1, the trunk data code is the trunk signaling sequence order and sequence step at the time the failure occurred. (Bits 0 through 7 are the sequence step and bits 8 through 14 are the sequence number order. Bit 15 is the sequence in the control bit.)								
		Data type 2-4, Index 0-6: When trunk data types 2-4 are selected, this trunk data code corresponds to the layout of one word of trunk table 0-6, selected by the index displayed in Field 13. Note: For trunk table 2, bits 0 through 7 are the sequence step and bits 8 through 14 are the sequence order with the most significant bit being the sequence in the control bit.								
		Data type 2-4, Index 7: When trunk data Index 7 is selected, the trunk data code corresponds to the following scan status encodes (counting digit positions from left to right in Field 14): <table><tr><th>Digit Position</th><th>Contents</th></tr><tr><td>1, 2</td><td>Dial mask (0-17)*</td></tr><tr><td>3, 4</td><td>Last Look (0-17)*</td></tr><tr><td>5, 6</td><td>Demand scan (0-17)*</td></tr></table> *0-3 for most trunks	Digit Position	Contents	1, 2	Dial mask (0-17)*	3, 4	Last Look (0-17)*	5, 6	Demand scan (0-17)*
		Digit Position	Contents							
1, 2	Dial mask (0-17)*									
3, 4	Last Look (0-17)*									
5, 6	Demand scan (0-17)*									
Data type 2-4, Index 8: The stimulus from call processing at the time failure was detected by a trunk signaling sequence, or a call processing routine. The trunk data for Index 8 will be 0 for isolated failure codes 3 or 4 (corresponding to audit failures).										
15	0-9	Prior code index. Used only for trunk data type 4. When STOP is operated to freeze dynamic data (going from data type 3 to data type 4), 0 is displayed. The newest trunk data is displayed in Field 14 when the prior code index is 0. Larger prior code indexes correspond to older data.								

Operation of Procedure

Overview

PROC 640 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a trunk failure.

To call in **PROC 640**, perform the following:

1. Depress **PROC NO; 640; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Monitors trunk activity.

Test 1

Test 1 provides a failure history of trunk failures (in groups of six) recorded by the on-line maintenance software.

Test 1 can also be used to resolve the cause of the alarmed trunk circuits, one at a time.

1. Test 1 is the default test when entering **PROC 640** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. A summary of the failure history is displayed in groups of six.
4. If no failures occurred, Field 1 displays a 1, Field 12 displays a 0, and all other fields are dashed.
5. If one or more failures occurred, the following is displayed:

Field 1 - 1.

Fields 2 through 6 - Equipment location of failing trunk circuit.

Field 7 - Maintenance busy status of displayed trunk circuit.

Field 8 - Alarm status for displayed trunk circuit.

Field 9 - Lowest failure code for displayed trunk circuit.

Field 10 - Number of failures (first group).

Field 11 - Failure index.

Field 12 - Trunk data type (1, 2, or dashed).

PROC 640, Test 1

Field 13 - Trunk data index (dashed if Field 12 is dashed).

Field 14 - Trunk data code (dashed if Field 12 is dashed).

Field 15 - Dashed.

6. Depressing **NEXT UNIT** repeatedly displays the remaining failure codes (if any) associated with the displayed trunk circuit.
 - a. Depressing **NEXT UNIT** after all failure codes are displayed dashes Field 9.
 - b. Depressing **NEXT UNIT** once more displays the lowest failure code again.
7. Depressing **NEXT DATA** advances through trunk table data and scan status that were recorded when the trunk circuit failed.

Note: The trunk data displayed in Field 14 when trunk data type 2 is displayed in Field 12 requires extensive call processing knowledge for interpretation.

8. When trunk data type 2 is displayed in Field 12, indices displayed in Field 13 ranging from 0 to 6 correspond to octal encode trunk table data from TRKTBL0 through TRKTBL6.

Note: For trunk table 2, bits 0 through 7 are the sequence step and bits 8 through 14 are the sequence order with the most significant bit being the sequence in the control bit.

9. An index of 7 displayed in Field 13 corresponds to scan status for the trunk circuit at time of failure.
10. The scan status is determined by counting digit positions from left to right in Field 14:
 - a. Digit positions 1 and 2 = Dial mask (0-17) contents.
 - b. Digit positions 3 and 4 = Last look (0-17) contents.
 - c. Digit positions 5 and 6 = Demand scan (0-17) contents.

Note: Zero (0) through 3 is displayed for most trunks.

11. The stimulus from call processing at the time the failure was detected by a trunk signaling sequence or a call processing routine corresponds to an index of 8.

The trunk data for index 8 is 0 for isolated failure codes 3 or 4 (corresponding to audit failures).

12. Depressing **NEXT CIRCUIT** repeatedly displays the failure histories (maximum of six) of the remaining failed circuits in the first group.

Depressing **NEXT CIRCUIT** after all failure histories in the group are displayed (indicated by Fields 10 and 11 being equal) dashes the display.

13. When Field 10 (number of failures) equals six, depressing **NEXT FAULT** freezes the failure histories in groups of six and causes the first failed circuit within the next group to be displayed.

Depressing **NEXT CIRCUIT** steps through the remainder of the failing circuits within the new group.

14. **NEXT FAULT** can be used to step to the next group of six failures when the preceding group contained at least six failures.
15. Depressing **NEXT FAULT** when the preceding group had less than six failures, or when no other failures are recorded by the failure history dashes the display.
16. Depressing **NEXT CIRCUIT** or **NEXT FAULT** after all failures are displayed (maximum of 60) causes Test 1 to be executed, starting the sequence over with an updated failure history.

Caution: *Busying out a trunk when the trunk is in use disrupts service by disconnecting the call.*

17. Once a trunk location is displayed, **BUSY OUT** and **RLS BUSY OUT** can be used to change the maintenance busy status (Field 7) of the trunk circuit.
18. All trunks busied out during testing should be released from the busied out condition using **RLS BUSY OUT** before leaving **PROC 640**.

Note: Field 7 should be used to determine whether the trunks being tested are released from busy out as the **BUSY OUT** indicator on the **MAAP** turns off only when all circuits interfacing with the **MAAP** are no longer busied out.

19. To turn off the **OTHER FAILS** fault indicator (assuming no other sources are affecting the **OTHER FAILS** fault indicator) after Test 1 is executed at least once, perform the following for each trunk circuit recorded as failing:
 - a. Display the failing circuit in Fields 2 through 6.
 - b. Depress **CLEAR DATA; EXECUTE**.

Note: Trunk circuit alarmed entries are marked as resolved in PMIDS.

20. The **OTHER FAILS** fault indicator is automatically turned off by Test 1 (indicating the trunk alarm cause is resolved) when the following conditions are met:
 - a. All trunk circuit failures are cleared.
 - b. All other sources affecting the **OTHER FAILS** fault indicator are cleared.

Test 2

Test 2 monitors trunk data for a selected trunk circuit equipment location.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. When Test 2 is called in, a default trunk circuit (last trunk circuit displayed in Test 1) is displayed in Fields 2 through 6, or Fields 2 through 6 are dashed.
Either the default trunk circuit can be tested or another trunk circuit can be selected for testing.
3. The module field of the trunk circuit equipment location (Field 2) is flashed when Test 2 is initially called in, indicating it is an optional entry field.

4. To select another trunk circuit for testing, enter its equipment location in Fields 2 through 6:
(Trunk circuit module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.
5. To start Test 2, after selecting a trunk circuit to be tested, depress **EXECUTE**.
6. While Test 2 is executing, the following information is displayed:
Field 1 - 2.
Fields 2 through 6 - Equipment location of the trunk circuit being tested.
Field 7 - Maintenance busy status of trunk circuit being tested.
Fields 8 through 11 - Dashes.
Field 12 - Trunk data type (initial value = 3).
Field 13 - Trunk data index (initial value = 0).
Field 14 - Trunk data code (changing).
Field 15 - Prior code index (if applicable).
7. Prior code data is only saved when Test 2 is executing in the dynamic type 3 display mode. When the trunk data selected for display changes, all related trunk data are recorded for later display.
8. The maximum recording rate is approximately one sample per 30 milliseconds (ms). The dynamic type 3 display of the selected trunk data code is updated at a much slower rate.
9. Frozen changes may hold information which was never displayed.
10. Depressing **STOP** causes the trunk data type 3 (dynamic) in Field 12 to change to 4 (frozen data).
When **STOP** is depressed, all trunk data are recorded and frozen.
11. **NEXT DATA** can be used to display related frozen trunk data that was recorded at the same time the monitored trunk data change was recorded.
 - a. Depressing **NEXT DATA** advances the trunk data index (Field 13) for either dynamic data type 3 or frozen data type 4 (both in Field 12).
 - b. Depressing **NEXT DATA** continuously advances the trunk data index from 0 through 8 and back to 0.
12. Depressing **NEXT UNIT** controls the display of the prior data index in Field 15, and is restricted to the display of frozen data type 4 (Field 12).
13. If **NEXT UNIT** is depressed once, and at least one change in the dynamic data was recorded, a 1 is displayed in Field 15.
This indicates that the trunk data code in Field 14 corresponds to the contents of the dynamic display field just before it changed to the value displayed when **STOP** was depressed.
14. Depressing **NEXT UNIT** continuously increments the prior code index in Field 15 and shows corresponding older trunk data codes in Field 14.
 - a. Depressing **NEXT UNIT** after the oldest prior data is displayed dashes Fields 14 and 15.

- b. Depressing **NEXT UNIT** again displays the newest frozen data.
- 15. When type 4 frozen data is displayed, **NEXT UNIT** is depressed to display older trunk data as indicated by a prior index being displayed in Field 15.
- 16. Other data items that were recorded while in the dynamic data mode (type 3), can be displayed by repeatedly depressing **NEXT DATA**.
The displayed data corresponds to the definition defined in Table AV, PROC 640 - Field Definitions and Codes.
- 17. The relative timing between two prior data code indexes can be obtained from the two values of the 10-ms octal counter displayed (when trunk data index displayed in Field 13 = 8).
Convert this octal difference to decimal and multiply by 10 to obtain the difference in milliseconds.
- 18. When in the dynamic mode (type 3), all trunk data is recorded when the selected data changes.
- 19. **PROC 640** checks for a change about every 30 ms. Therefore, time difference accuracy is about 30 ms.
- 20. A change in less than 30 ms may not be detected.
Heavy traffic can further degrade the accuracy of these time differences.

Caution: *Busying out a trunk when the trunk is in use disrupts service by disconnecting the call.*

- 21. Once a trunk location is displayed, **BUSY OUT** and **RLS BUSY OUT** can be used to change the maintenance busy status (Field 7) of the trunk circuit.
- 22. All trunks busied out during testing should be released from the busied out condition using **RLS BUSY OUT** before leaving **PROC 640**.

Note: Field 7 should be used to determine whether the trunks being tested are released from busy out as the **BUSY OUT** indicator on the **MAAP** turns off only when all circuits interfacing with the **MAAP** are no longer busied out.

- 23. To select another trunk circuit for testing, after the first trunk circuit is tested, use the **CHANGE FIELD** sequence:
CHANGE FIELD; 2; ENTER; (Trunk circuit module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.
- 24. **EXECUTE** must be depressed to test the trunk circuit selected for testing.

Repair Guide

Overview

When a trunk failure is indicated in Test 1 or **PROC 640** is referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted, extensive call processing knowledge for interpretation of the data displayed in Test 2 is required.

PROC 640

Tier 1 maintenance personnel can test the different types of failures displayed in Test 1 by using **PROC 620**, Test 4 to test the associated hardware using the equipment location(s) displayed in Fields 2 through 6 of **PROC 640**, Test 1 or by making test calls using **PROC 642**, Test 2.

PROC 642 can be used to make outgoing test calls, but other methods must be used to check the trunk for incoming calls.

When **PROC 642** is being used, **PROC 640** cannot monitor the call, but can only be used later to display a possible failure stimulated by **PROC 642**.

However, the data displayed in Test 2 should be referred to higher level technicians for interpretation and appropriate corrective action.

PROC 642 - TERMINAL-TO-TRUNK TEST CALL

FLIPCHART ISSUE 3				+	TERMINAL TO TRUNK TEST CALL										+	845552223		
TEST 1: TESTS ALL TRUNKS HAVING SPECIFIED PRIMARY TRUNK DIAL ACCESS CODE (FIELD 12-15). USE "NEXT CIRCUIT" TO OBTAIN THE NEXT UNTESTED TRUNK TO BE TESTED. USE "NEXT UNIT" TO OBTAIN 1ST UNTESTED TRUNK OF THIS ACCESS CODE IN NEXT MODULE.				TEST 2: TESTS A SPECIFIED TRUNK. PROVIDE THE TRUNK EQUIPMENT LOCATION FIELDS (7-11).		TEST 3: TESTS ALL TRUNKS IN A SPECIFIED TRUNK GROUP (FIELD 16). USE "NEXT CIRCUIT" TO OBTAIN THE NEXT UNTESTED TRUNK. USE "NEXT UNIT" TO OBTAIN 1ST UNTESTED TRUNK OF THIS TRUNK GROUP IN NEXT MODULE.					STATE ENCODES (FIELD 17): 0 = TEST LINE OR TRUNK NOT AVAILABLE 1 = TEST LINE ON HOOK 2 = DIAL TONE THRU DIAL COMPLETION 3 = CO RESPONSE (DIAL TONE OR BUSY) 4 = WRONG ACCESS CODE 5 = END OF GROUP TEST 6 = CALL ABORTED 7 = NO RECEIVER OR NO TIME SLOT AVAILABLE 8 = NO TRUNK AVAILABLE 9 = TRUNK SEIZED INCOMING NOTE: A DEFAULT TEST LINE IS DISPLAYED AFTER BEING ADMINISTERED IN PROC 000.					SPECIAL ERROR CODES: 80-ONLY TESTING 63 TRUNKS AT A TIME 82-ILLEGAL TRUNK TYPE FOR THIS TEST.		
TEST NO	TEST LINE EQUIPMENT LOCATION				TEST 2					TEST 1					TEST 3		STATE	NETWORK TEST CALLS
	MODULE	CABINET	CARRIER	SLOT	CIRCUIT	TRUNK EQUIPMENT LOCATION					TRUNK DIAL ACCESS CODE					TRUNK GROUP		
						MODULE	CAB	CARR	SLOT	CKT	FIRST DIGIT	SECOND DIG	THIRD DIG	FOURTH DIGIT				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	642	

Purpose

PROC 642 is used to test trunks by means of terminal-to-trunk test calls using the test line and terminal equipment.

PROC 642 is normally used when a user reported trouble concerning terminal-to-trunk calls is not detected by **PROC 600** (alarm causes/error log) and **PROC 620** (network procedure).

The user reported trouble may be intermittent in nature and **PROC 642** can isolate the potential trouble to a particular trunk circuit with **PROC 620** providing further diagnostic analysis as required to correct the problem.

This maintenance procedure **must** be performed on the user's premises. Terminal equipment must be connected to the test line and test set-up steps performed prior to executing any test.

Field Definitions and Codes

Each field of **PROC 642** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AW, PROC 642 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Change test line equipment location.
3. Fields 7 through 11 - Select trunk equipment location to be tested (Test 2 only).
4. Fields 12 through 15 - Select trunk dial access code (Test 1 only).
5. Field 16 - Select trunk group to be tested (Test 3 only).

Test Equipment Required

A telephone set with two W1AP test cords and a 249A adapter or a 1013 hand test set and a 249A adapter is required to place terminal-to-trunk test calls from the test line.

TABLE AW.

PROC 642 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	15	0-9	Fourth digit of trunk dial access code.
2	0-30	Test line module number.	16	18-999	Trunk group number.
3	0-7	Test line cabinet number.		0-9	State of trunk test call:
4	0-3	Test line carrier number.	17	0	Test line or specific trunk not idle.
5	0-21	Test line slot number.		1	Test line on-hook and trunk idle.
6	0-7	Test line circuit number.		2	Dial tone through dial completion.
7	0-30	Trunk module number.		3	CO response (dial tone or busy).
8	0-7	Trunk cabinet number.		4	Wrong access code or time-out.
9	0-3	Trunk carrier number.		5	End of group test.
10	0-21	Trunk slot number.		6	Call dropped.
11	0-3	Trunk circuit number.		7	No receiver or no time slot available.
12		First digit of trunk dial access code:		8	No trunk available.
	1-9	1-9.		9	Trunk seized incoming.
	11	Touch-tone *.			
	12	Touch-tone #.			
13	0-9	Second digit of trunk dial access code.			
14	0-9	Third digit of trunk dial access code.			

Operation of Procedure

Overview

PROC 642 is used to make a terminal-to-trunk test call.

To call in **PROC 642**, perform the following:

1. Depress **PROC NO; 642; ENTER**.
2. Test 1 is automatically selected.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Tests all trunks.
2. Test 2 - Tests a specific trunk.
3. Test 3 - Tests all trunks in a specific trunk group.

Test 1

Test 1 enables maintenance personnel to test all trunks in a trunk group for the trunk dial access code specified in Fields 12 through 15.

1. Test 1 is the default test when entering **PROC 642** or is selected by using **NEXT TEST**.
2. When Test 1 is initially called in, a default test line equipment location, after first being administered through **PROC 000** (line translation - single line), is displayed in Fields 2 through 6.
3. This test line can be used or another test line can be selected.

Note: The default test line equipment location can be changed or a new test line added by using translation procedure **PROC 000** (line translation - single line).

4. The module field of the test line equipment location (Field 2) is flashed when Test 1 is initially called in, if no test line is assigned.

If a test line is assigned, Field 12 will blink.

5. If no test line is assigned, use **PROC 000** (line translation - single line) to add a test line.

If a test line is assigned and another test line is to be selected, proceed to Step 6.

6. To select another test line, enter its equipment location in Fields 2 through 6 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 2; ENTER; (Test line module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

Note: If Field 2 alone is changed, a new default test line equipment location is displayed in Fields 2 through 6.

7. A trunk dial access code **must** be entered in Fields 12 through 15. The trunk dial access code is entered as follows:

(First digit); ENTER; (Second digit - if required); ENTER; (Third digit - if required); ENTER; (Fourth digit - if required); ENTER.

8. Prior to starting Test 1, connect the telephone set or hand test set to the test line.
9. To start Test 1, depress **EXECUTE**.

Requirement: **EXECUTE** must be used before going off-hook and dialing from the test line. **EXECUTE** must be depressed before each test call is placed even when repetitive calls are attempted through the same trunk.

PROC 642, Test 1

10. If the test line is on-hook and available, the following is displayed:
 - Field 1 - 1.
 - Fields 2 through 6 - Test line equipment location.
 - Fields 7 through 11 - Equipment location of the lowest numbered trunk in the trunk group.
 - Fields 12 through 15 - Trunk dial access code.
 - Field 16 - Trunk group number.
 - Field 17 - State of the test.
11. If the test line is on-hook and available, and if the selected trunk is available, a 1 is displayed in Field 17.
 - If either the test line or the trunk is busy, a 0 is displayed in Field 17, and Test 1 should be repeated by depressing **EXECUTE** or another trunk selected for testing.
12. When the telephone or hand test set connected to the test line is taken off-hook, and the trunk dial access code displayed in Fields 12 through 15 is dialed, Field 17 changes to a 2.
13. If Field 17 does not change to a 2 at this time, the trunk under test has been seized by an incoming Central Office (CO), Foreign Exchange (FX), or Wide Area Telecommunications Service (WATS) call. (Field 17 should display 9.)
 - Wait until the trunk is idle and repeat Test 1, or select another trunk to be tested.
14. Field 17 displays a 2 during the dial access code dialing phase and changes to 3 at various times depending on several factors; e.g., touch-tone or rotary test line, SMDR, trunk type, etc.
15. The minimum change time from a display of 2 to 3 in Field 17, after the trunk dial access code is dialed, is 1 second.
 - The maximum change time after the last digit is dialed to complete the call is about 10 seconds.
16. If the terminal-to-trunk test fails, a 4, 6, 7, or 8 is displayed in Field 17.
17. When 7 or 8 is displayed, repeat Test 1.
18. If 4 is displayed, check the dial access code in Fields 12 through 15 to determine if the correct dial access code was entered. If the correct dial access code was entered and dialed, the trunk circuit is failing.
19. If 6 is displayed, the trunk circuit is failing.
 - Note:** If an intercept tone is received when making the test call, check the class of service of the test line and either change it to the least restricted class of service, or enter an unrestricted test line in Fields 2 through 6.
20. A trunk is considered to be tested successfully after **EXECUTE** is depressed, the call progresses to state 2 and either terminates by going on-hook or completes the testing sequence.
 - The tested trunk is then removed from the untested trunk list.
21. Test 1 should be performed for all trunks assigned to the trunk dial access code and trunk group displayed in Fields 12 through 16.

22. If another trunk equipment location in the trunk group is to be selected for testing, **NEXT CIRCUIT** and **NEXT UNIT** can be used as follows:
 - a. **NEXT CIRCUIT** sequences to the next untested trunk equipment location in the module.
 - b. **NEXT UNIT** sequences to the first untested trunk equipment location in the next module.
23. Sequencing beyond the end of the list of trunks in the trunk group buffer, by using **NEXT CIRCUIT** and **NEXT UNIT**, causes trunk equipment location Fields 7 through 11 to be dashed.
24. If all the trunks in the buffer are tested beyond state 1, depressing **NEXT CIRCUIT** or **NEXT UNIT** causes one more search for untested trunks.
25. If no untested trunks are found, a 5 is displayed in Field 17 to indicate that all trunks with the displayed dial access code and trunk group number are tested.
26. If any trunks in the trunk group buffer are not tested and the trunk equipment location fields are dashed, depressing **NEXT CIRCUIT** or **NEXT UNIT** displays the lowest untested trunk from the trunk group buffer, in Fields 7 through 11.

If the number of trunks in the trunk group exceeds the size of the trunk group buffer (63), an error code of 80 (only testing 63 trunks at a time) is displayed in the **MAAP** error code field to indicate that the sorted group of trunks is not complete. Testing should be continued until all additional trunks are tested.

If the size of a trunk group exceeds the capacity of the trunk group buffer, the buffer is loaded again with the untested trunks when all of the first group of trunks in the buffer are tested. These trunks are then sorted in ascending order.

When **NEXT CIRCUIT** or **NEXT UNIT** is depressed to search for the first untested trunk exceeding the capacity of the buffer, special error code 80 is displayed again in the **MAAP** error code field. This code indicates that the trunk group is exceptionally large and the next group of untested trunks is loaded in the buffer for testing.

The next set of trunks in the trunk group can now be tested, noting that state 5 (displayed in Field 17) is displayed only when all trunks in the trunk group are tested.

Test 2

Test 2 enables maintenance personnel to test a specific trunk by means of making a terminal-to-trunk test call.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is called in, Field 7 is blanked and the decimal point in that field is flashed, indicating a mandatory entry field.
3. The equipment location of the trunk to be tested is entered in Fields 7 through 11 as follows:
(Trunk module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

PROC 642, Test 2

4. Prior to starting Test 2, connect a telephone set or hand test set to the test line.
5. To start Test 2, depress **EXECUTE**.

Requirement: **EXECUTE** must be used before going off-hook and dialing from the test line. **EXECUTE** must be depressed before each test call is placed even when repetitive calls are attempted through the same trunk.

6. If the test line is on-hook and available, the following is displayed:
Field 1 - 2.
Fields 2 through 6 - Test line equipment location.
Fields 7 through 11 - Equipment location of the trunk selected for testing.
Fields 12 through 15 - Trunk dial access code.
Field 16 - Trunk group number.
Field 17 - State of the test.
7. If the test line is on-hook and available, and if the selected trunk is available, a 1 is displayed in Field 17.
8. If either the test line or the trunk is busy, a 0 is displayed in Field 17, and Test 2 should be repeated by depressing **EXECUTE** or another trunk selected for testing.
9. When the telephone or hand test set connected to the test line is taken off-hook, and the trunk dial access code displayed in Fields 12 through 15 is dialed, Field 17 changes to a 2.
10. If Field 17 does not change to a 2 at this time, the trunk under test has been seized by an incoming CO, FX, or WATS call. (Field 17 should display 9.)
Wait until the trunk is idle and repeat Test 2, or select another trunk to be tested.
11. Field 17 displays a 2 during the dial access code dialing phase and changes to 3 at various times depending on several factors; e.g., touch-tone or rotary test line, SMDR, trunk type, etc.
12. The minimum change time from a display of 2 to 3 in Field 17, after the trunk dial access code is dialed, is 1 second.
The maximum change time after the last digit is dialed to complete the call is about 10 seconds.
13. If the terminal-to-trunk test fails, a 4, 6, 7, or 8 is displayed in Field 17.
14. When 7 or 8 is displayed, repeat Test 2.
15. If 4 is displayed, check the dial access code in Fields 12 through 15 to determine if the correct dial access code was dialed. If the correct dial access code was dialed, the trunk circuit is failing.
16. If 6 is displayed, the trunk circuit is failing.

Note: If an intercept tone is received when making the test call, check the class of service of the test line and either change it to the least restricted class of service or enter an unrestricted test line in Fields 2 through 6.

17. A trunk is considered to be tested successfully after **EXECUTE** is depressed, the call progresses to state 2 and either terminates by going on-hook or completes the testing sequence.

Test 3

Test 3 enables maintenance personnel to test all trunks in a specific trunk group by means of making terminal-to-trunk test calls.

1. Test 3 is selected by use of **NEXT TEST**.
2. When Test 3 is called in, Field 16 is blanked and the decimal point in that field is flashed, indicating a mandatory entry field.
3. The number of the trunk group to be tested is entered in Field 16 as follows:
(Trunk group number); ENTER.
4. Prior to starting Test 3, connect a telephone set or hand test set to the test line.
5. To start Test 3, depress **EXECUTE**.

Requirement: **EXECUTE** must be used before going off-hook and dialing from the test line. **EXECUTE** must be depressed before each test call is placed even when repetitive calls are attempted through the same trunk.

6. If the test line is on-hook and available, the following is displayed:
Field 1 - 3.
Fields 2 through 6 - Test line equipment location.
Fields 7 through 11 - Equipment location of the lowest numbered trunk in the trunk group.
Fields 12 through 15 - Trunk dial access code.
Field 16 - Trunk group number.
Field 17 - State of the test.
7. If the test line is on-hook and available, and if the selected trunk is available, a 1 is displayed in Field 17.
8. If either the test line or the trunk is busy, a 0 is displayed in Field 17, and Test 3 should be repeated by depressing **EXECUTE** or another trunk selected for testing.
9. When the telephone or hand test set connected to the test line is taken off-hook and the trunk dial access code displayed in Fields 12 through 15 is dialed, Field 17 changes to a 2.
10. If Field 17 does not change to a 2 at this time, the trunk under test has been seized by an incoming CO, FX, or WATS call. (Field 17 should display 9.)
Wait until the trunk is idle and repeat Test 3, or select another trunk to be tested.
11. Field 17 displays a 2 during the dial access code dialing phase and changes to 3 at various times depending on several factors; e.g., touch-tone or rotary test line, SMDR, trunk type, etc.

PROC 642, Test 3

12. The minimum change time from a display of 2 to 3 in Field 17, after the trunk dial access code is dialed, is 1 second.

The maximum change time after the last digit is dialed to complete the call is about 10 seconds.

13. If the terminal-to-trunk test fails, a 4, 6, 7, or 8 is displayed in Field 17.
14. When 7 or 8 is displayed, repeat Test 3.
15. If 4 is displayed, check the dial access code in Fields 12 through 15 to determine if the correct dial access code was dialed. If the correct dial access code was dialed, the trunk circuit is failing.
16. If 6 is displayed, the trunk circuit is failing.

Note: If an intercept tone is received when making the test call, check the class of service of the test line and either change it to the least restricted class of service, or enter an unrestricted test line in Fields 2 through 6.

17. A trunk is considered to be tested successfully after **EXECUTE** is depressed, the call progresses to state 2 and either terminates by going on-hook or completes the testing sequence.
18. After the first trunk is tested, another trunk in the trunk group can be selected for testing by using **NEXT CIRCUIT** or **NEXT UNIT** as follows:
 - a. Depressing **NEXT CIRCUIT** sequences to the next untested trunk equipment location in the module.
 - b. Depressing **NEXT UNIT** sequences to the first untested trunk equipment location in the next module.
19. Repeat Steps 5 through 18 until all trunks in the trunk group selected for testing are tested which is indicated by a 5 in Field 17.

Repair Guide

When a terminal-to-trunk call is reported by the user as a trouble, and **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure) has not detected a trunk failure associated with the user's problem, the following steps should be performed by maintenance personnel, in the order listed, to isolate and replace the failing circuit pack.

1. Determine from the user reported trouble if a particular dial access code or trunk group is the potential cause of the trouble.
2. For dial access codes, perform the following:
 - a. Execute Test 1 for all trunks associated with the dial access code, or until a failure is detected. (See Step 4 below.)
 - b. Based on the test results of Test 1, use Test 2 to further test failing circuits. (See Step 4 below.)
3. For trunk groups, perform the following:
 - a. Execute Test 3 for all trunks in the specified trunk group, or until a failure is detected. (See Step 4 below.)

- b. Based on the results of Test 3, use Test 2 to further test failing circuits. (See Step 4 below.)
4. To test a trunk, proceed as follows:
 - a. At the test line, install a 249A adapter and telephone set or hand test set.
 - b. Depress **EXECUTE**.
 - c. Go off-hook and dial the displayed trunk dial access code.
 - d. Dial the appropriate number of digits to complete the call.

If a single trunk fails (Field 17 equals 6), replace the associated circuit pack.

5. Repeat Test 2.

If the test fails again, use **PROC 620**, to further isolate the problem.

If **PROC 620** cannot correct the problem, check the wiring associated with the replaced circuit pack.

A test call stuck at state 2 indicates a possible failure for CO, FX, and WATS trunks. A test call can also be stuck at state 2 for valid Common Control Switching Arrangement (CCSA)/Advanced Private Line Termination (APLT) and TIE trunks.

1. Listen to the test call to determine whether it is completed successfully.
2. If the call cannot be completed, replace the associated circuit pack.
3. Repeat Test 2.

If the test fails again, use **PROC 620**, to further isolate the problem.

If **PROC 620** cannot correct the problem, check the wiring associated with the replaced circuit pack.

PROC 643 - TERMINAL-TO-TONE TEST CALL

FLIPCHART ISSUE 1		+	+	TERMINAL TO TONE TEST CALL				+	+	845552223									
TEST 1: TRANSMITS ALL TONES SEQUENTIALLY FROM THE SPECIFIED TONE PLANT.				TEST 2: TRANSMITS SELECTED TONES FROM THE SPECIFIED TONE PLANT. PLACE 1 IN THE FIELDS OF THE TONES TO BE TRANSMITTED.				NOTES: 1. A DEFAULT TEST LINE IS DISPLAYED (AFTER BEING ADMINISTERED IN PROC 000). 2. IN TEST 2 THE TONES ARE TRANSMITTED IN THE ORDER SPECIFIED.				SPECIAL ERROR CODE: 80-NO TONE SELECTED FOR TRANSMISSION							
USE 'NEXT CIRCUIT' TO OBTAIN THE NEXT TONE PLANT. USE 'NEXT UNIT' TO OBTAIN THE FIRST TONE PLANT IN NEXT MODULE. USE 'NEXT DATA' TO TRANSMIT NEXT TONE.																			
TEST NO	TEST LINE EQUIPMENT LOCATION					TONE PLANT EQUIPMENT LOCATION				TEST 2								NETWORK TEST CALLS	
	MODULE	CABINET	CARRIER	SLOT		CIRCUIT	MODULE	CABINET	CARRIER	SLOT	TRANSMITTED TONE								
											BUSY	REOR	AUD ALERT	S P AUD ALERT	DIAL	RECALL	MISC	INCP	
1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16	17	18	643

Purpose

PROC 643 provides the capability to transmit the eight tones contained on circuit pack SN250 to a test line to allow maintenance personnel to listen to each tone to determine if problems with attenuation or improper interruption rates exist.

PROC 643 is normally used when a user reported trouble concerning tone failures is not detected by **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure).

The user reported trouble may be intermittent in nature and **PROC 643** can isolate the potential trouble to a particular tone plant with **PROC 620** providing further diagnostic analysis as required to correct the problem.

This maintenance procedure **must** be performed on the user's premises. Terminal equipment must be connected to the test line and test set-up steps performed prior to executing any test.

Field Definitions and Codes

Each field of **PROC 643** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AX, PROC 643 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Change test line equipment location.
3. Fields 7 through 10 - Select tone plant equipment location to be tested.
4. Fields 11 through 18 - Select tone to be transmitted (Test 2 only).

Test Equipment Required

A telephone set with 2 WIAP test cords and a 249A adapter or a 1013 type hand test set with a 249A adapter is required to listen to the transmitted tones at the test line.

TABLE AX.

PROC 643 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1,2	Test number.	11-18	0,1	0 = Tone is not to be transmitted. 1 = Tone is to be transmitted. Flashing 1 = Tone is active (being transmitted).
2	0-30	Test line module number.			
3	0-7	Test line cabinet number.			
4	0-3	Test line carrier number.			
5	0-21	Test line slot number.	11	0,1	Busy tone.
6	0-7	Test line circuit number.	12	0,1	Reorder tone.
7	0-30	Tone plant module number.	13	0,1	Audible alert tone.
8	0-7	Tone plant cabinet number.	14	0,1	Special audible alert tone.
9	0-3	Tone plant carrier number.	15	0,1	Dial tone.
10	0-21	Tone plant slot number.	16	0,1	Recall tone.
			17	0,1	Miscellaneous tone.
			18	0,1	Intercept tone.

Operation of Procedure

Overview

PROC 643 is used to listen to the tones transmitted to the test line.

To call in **PROC 643**, perform the following:

1. Depress **PROC NO; 643; ENTER**.
2. Test 1 is automatically selected.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Sequentially transmits busy, reorder, audible alert, special audible alert, dial, recall, miscellaneous, and interrupt tones.
2. Test 2 - Allows any of the above tones to be selected and transmitted independently of the other tones.

PROC 643, Test 1

Test 1

Test 1 enables maintenance personnel to sequentially transmit busy, reorder, audible alert, special audible alert, dial, recall, miscellaneous, and intercept tones from a specific tone plant over a test line.

1. Test 1 is the default test when entering **PROC 643** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. When Test 1 is initially called in, a default test line equipment location is displayed in Fields 2 through 6, and the first tone plant equipment location is displayed in Fields 7 through 10.
3. The first tone plant can be used for testing or another tone plant can be selected for testing.

Note: The default test line equipment location can be changed or a new test line added by using translation procedure **PROC 000** (Line translation - single line).

4. The module field of the test line equipment location (Field 2) is flashed when Test 1 is initially called in, indicating it is an optional entry field.
5. To select another test line, enter its equipment location in Fields 2 through 6:

(Test line module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

Note: The test line must be in service and not busied out. If only Field 2 is changed, a default test line for the new module is provided.

6. To select both another test line and tone plant, enter their equipment locations in Fields 2 through 10:

(Test line module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; (Tone plant module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.

7. To select another tone plant without selecting a new test line, use the **CHANGE FIELD** sequence to enter the new tone plant equipment location:

CHANGE FIELD; 7; ENTER; (Tone plant module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.

8. Depressing **NEXT CIRCUIT** repeatedly increments through all the tone plants in the switch.

Depressing **NEXT UNIT** increments to the first tone plant in the next module (and **NEXT CIRCUIT** steps through the tone plants within the selected module).

9. When Test 1 is called in, Fields 11 through 18 all contain 1's.

The 1's indicate that the tone associated with each field is selected for transmission during Test 1.

10. Prior to starting Test 1, connect the telephone set or hand test set to the test line.

11. To start Test 1, depress **EXECUTE**.

The transmission of the first tone (busy) is initiated when **EXECUTE** is depressed.

12. As the tone is transmitted, either a 0 or 1 is flashed in the associated field (Field 11).
A 0 indicates that the tone is not being transmitted; a 1 indicates that the tone is being transmitted.
13. When the telephone or hand test set connected to the test line is taken off-hook, maintenance personnel can listen to the tone being transmitted.
Maintenance personnel can determine if the tone is being transmitted or if other problems exist, such as attenuation, improper interruption rates, or if the proper tone is heard without interference from other tones.
14. Depressing **NEXT DATA** initiates transmission of the next tone in sequence.
 - a. Depressing **NEXT DATA** repeatedly sequences through the transmission of all the tones associated with Fields 11 through 18.
 - b. Depressing **NEXT DATA** during transmission of the last tone (intercept) sequences back to the first tone (busy), which is again transmitted.
15. Test 1 is stopped by depressing **NEXT TEST** or **RESET**.

Test 2

Test 2 enables maintenance personnel to transmit selected tones from a specific tone plant over a test line.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. When Test 2 is called in, the default test line and tone plant equipment locations from Test 1 are displayed in Fields 2 through 10.
Either the default tone plant can be tested or another tone plant can be selected for testing.
3. To select another tone plant for testing use the **CHANGE FIELD** sequence or **NEXT CIRCUIT** and/or **NEXT UNIT**:
 - a. **CHANGE FIELD; 7; ENTER; (Tone Plant module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
 - b. Depressing **NEXT CIRCUIT** increments through all the tone plants in the switch.
 - c. Depressing **NEXT UNIT** increments to the first tone plant in the next module while **NEXT CIRCUIT** steps through the tone plants within the selected module.
4. When Test 2 is called in, Fields 11 through 18 all contain 0's.
The 0's indicate that the tone associated with each field is not selected for transmission during Test 2.
5. The 0 in Field 11 is flashed, indicating an optional entry field.
6. To select the tone associated with Field 11 (busy) for transmission, a 1 must be entered in the field:
1; ENTER.
7. To leave the tone not selected for transmission, **ENTER** can be depressed to increment to the next field.

PROC 643, Test 2

- Each tone that is to be transmitted during Test 2 must be selected by entering a 1 in the associated field.

The order in which the tones are selected to be tested (corresponding field set to 1) is the order that the tones are transmitted.

- Prior to starting Test 2, connect the telephone set or hand test set to the test line.
- To start Test 2, depress **EXECUTE**.

Note: Depressing **EXECUTE** with no tones selected for transmission (Fields 11 through 18 all contain 0's), causes special error code 80 (no tone selected for transmission) to be displayed in the **MAAP** error code field.

- The first field selected containing a 1 is flashed when **EXECUTE** is depressed, indicating that the associated tone is being transmitted.
- Maintenance personnel can monitor the transmission of the tone selected by going off-hook at the test line.
- Depressing **NEXT DATA** sequences to the next field containing a 1 and begins transmitting the associated tone.

Repeated use of **NEXT DATA** sequences through all the selected tones, transmitting them, and back to the first tone selected which is again transmitted.
- Test 2 is stopped by depressing **NEXT TEST** or **RESET**.

Repair Guide

When tone failures are reported by the user as a trouble, and **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure) has not detected a tone plant failure, the following steps should be performed by maintenance personnel in the order listed to isolate and replace the failing circuit pack.

- At the test line, install a 249A adapter and a telephone set or hand test set.
- Execute Test 1 for the first tone plant displayed upon entering **PROC 643** and listen to each tone by going off-hook at the test line.
- If the tone plant passes, execute Test 1 for all tone plants in the switch, using **NEXT CIRCUIT** and/or **NEXT UNIT** to select the next tone plant for testing.
- If no tone plants indicate a failure, check the wiring between the terminal equipment experiencing the trouble and the associated connections to the switch.
- If a tone plant fails, determine which tones are defective, and execute Test 2 to inhibit the transmission of the fault-free tones to verify the status of the tones suspected of being defective by listening to the selected tones at the test line.
- Replace SN250 and repeat Test 1.
- If the tone plant continues to fail after replacing SN250, use **PROC 620**, Test 4 (unit type 16) to further isolate the exact cause of the problem.
- If the tone plant still fails after further diagnosis by **PROC 620**, check the wiring associated with the defective tones isolated in Step 5.

PROC 644 - TERMINAL-TO-AUXILIARY TONE TEST CALL

FLIPCHART ISSUE 3		+ + TERMINAL TO AUXILIARY TONE TEST CALL + +										845552223				
TEST 1: TRANSMITS ALL TONES SEQUENTIALLY FROM THE SPECIFIED AUXILIARY TONE PLANT.				TEST 2: TRANSMITS SELECTED TONES FROM THE SPECIFIED AUXILIARY TONE PLANT. PLACE 1 IN THE FIELDS OF THE TONES TO BE TRANSMITTED.						NOTES: 1. A DEFAULT TEST LINE IS DISPLAYED (AFTER BEING ADMINISTERED IN PROC 000). 2. IN TEST 2 THE TONES ARE TRANSMITTED IN THE ORDER SPECIFIED.				SPECIAL ERROR CODE: 80-NO TONE SELECTED FOR TRANSMISSION		
USE 'NEXT CIRCUIT' TO OBTAIN THE NEXT ASSIGNED AUXILIARY TONE PLANT. USE 'NEXT UNIT' TO OBTAIN THE FIRST ASSIGNED AUXILIARY TONE PLANT IN A SUBSEQUENT MODULE. USE 'NEXT DATA' TO TRANSMIT NEXT TONE.																
TEST NO	TEST LINE EQUIPMENT LOCATION					AUXILIARY TONE PLANT EQUIPMENT LOCATION				TEST 2						NETWORK TEST CALLS 644
	MODULE	CABINET	CARRIER	SLOT	CIRCUIT	MODULE	CABINET	CARRIER	SLOT	TRANSMITTED TONE						
1	2	3	4	5	6	7	8	9	10	IMM AUD ALERT 11	ZIP TONE 12	REM HOLD 13	DATA ANS TONE 14	PRE- EMPT TONE 15	PREC AUD ALERT 16	

Purpose

PROC 644 provides the capability to transmit the six tones contained on circuit pack SN253 to a test line to allow maintenance personnel to listen to each tone to determine if attenuation or improper interruption rate problems exist.

PROC 644 is normally used when a user reported trouble concerning auxiliary tone failures is not detected by **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure).

The user reported trouble may be intermittent in nature and **PROC 644** can isolate the potential problem to a particular auxiliary tone plant with **PROC 620** providing further diagnostic analysis as required to correct the problem.

This maintenance procedure **must** be performed on the user's premises. Terminal equipment must be connected to the test line and test set-up steps performed prior to executing any test.

Field Definitions and Codes

Each field of **PROC 644** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AY, PROC 644 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Change test line equipment location.
3. Fields 7 through 10 - Select auxiliary tone plant equipment location to be tested.
4. Fields 11 through 16 - Select tone to be transmitted (Test 2 only).

Test Equipment Required

A telephone set with 2 W1AP test cords and a 249A adapter or a 1013 type hand test set with a 249A adapter is required to listen to the transmitted tones at the test line.

TABLE AY.

PROC 644 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1,2	Test number.	11-16	0,1	0 = Tone is not to be transmitted. 1 = Tone is to be transmitted. Flashing 1 = Tone is active (being transmitted).
2	0-30	Test line module number.			
3	0-7	Test line cabinet number.			
4	0-3	Test line carrier number.			
5	0-21	Test line slot number.			
6	0-7	Test line circuit number.	11	0,1	Immediate audible alert tone.
7	0-30	Auxiliary tone plant module number.	12	0,1	Zip tone.
8	0-7	Auxiliary tone plant cabinet number.	13	0,1	Remote hold tone.
9	0-3	Auxiliary tone plant carrier number.	14	0,1	Data answer tone.
10	0-21	Auxiliary tone plant slot number.	15	0,1	Preemption tone.
			16	0,1	Precedence audible alert tone.

Operation of Procedure

Overview

PROC 644 is used to listen to the auxiliary tones transmitted to the test line.

To call in **PROC 644**, perform the following:

1. Depress **PROC NO; 644; ENTER**.
2. Test 1 is automatically selected.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Two tests are available:

1. Test 1 - Sequentially transmits immediate audible alert, zip, remote hold, data answer, preemption, and precedence audible alert tones.
2. Test 2 - Allows any of the above tones to be selected and transmitted independently of the other tones.

Test 1

Test 1 enables maintenance personnel to sequentially transmit immediate audible alert, zip, remote hold, data answer, preemption, and precedence audible alert tones from a specific auxiliary tone plant over a test line.

1. Test 1 is the default test when entering **PROC 644** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. When Test 1 is initially called in, a default test line equipment location is displayed in Fields 2 through 6, and the first auxiliary tone plant equipment location is displayed in Fields 7 through 10.
3. The first auxiliary tone plant can be tested or another auxiliary tone plant can be selected for testing.

Note: The default test line equipment location can be changed or a new test line added by using translation procedure **PROC 000** (Line translation - single line).

4. The module field of the test line equipment location (Field 2) is flashed when Test 1 is initially called in, indicating it is an optional entry field.
5. To select another test line, enter its equipment location in Fields 2 through 6:

(Test line module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER.

Note: The test line must be in service and not busied out. If only Field 2 is changed, a default test line for the new module is provided.

6. To select both another test line and auxiliary tone plant, enter their equipment locations in Fields 2 through 10:

(Test line module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER; (Circuit); ENTER; (Auxiliary tone plant module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.

7. To select another auxiliary tone plant without selecting a new test line, use the **CHANGE FIELD** sequence to enter the new auxiliary tone plant equipment location:

CHANGE FIELD; 7; ENTER; (Auxiliary tone plant module); ENTER; (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.

8. Depressing **NEXT CIRCUIT** repeatedly increments through all the auxiliary tone plants in the switch.
9. Depressing **NEXT UNIT** increments to the first auxiliary tone plant in the next module (and **NEXT CIRCUIT** steps through the auxiliary tone plants within the selected module).
10. When Test 1 is called in, Fields 11 through 16 all contain 1's.
The 1's indicate that the tone associated with each field is selected for transmission during Test 1.
11. Prior to starting Test 1, connect the telephone set or hand test set to the test line.

PROC 644, Test 1 and Test 2

12. To start Test 1, depress **EXECUTE**.
Transmission of the first tone (immediate audible alert) is initiated when **EXECUTE** is depressed.
13. As the tone is transmitted, either a 0 or 1 is flashed in the associated field (Field 11).
A 0 indicates that the tone is not being transmitted; a 1 indicates that the tone is being transmitted.
14. When the telephone or hand test set connected to the test line is taken off-hook, maintenance personnel can listen to the tone being transmitted.
15. Maintenance personnel can determine if the tone is being transmitted or if other problems exist, such as attenuation, improper interruption rates, or if the proper tone is heard without interference from other tones.
16. Depressing **NEXT DATA** initiates transmission of the next tone in sequence.
Depressing **NEXT DATA** repeatedly sequences through the transmission of all the tones associated with Fields 11 through 16.
17. Depressing **NEXT DATA** during transmission of the last tone (either data answer tone or precedence audible alert tone) sequences back to the first tone (immediate audible alert), which is again transmitted.
18. Test 1 is stopped by depressing **NEXT TEST** or **RESET**.

Test 2

Test 2 enables maintenance personnel to transmit selected tones from a specific auxiliary tone plant over a test line.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. When Test 2 is called in, the default test line and auxiliary tone plant equipment locations from Test 1 are displayed in Fields 2 through 10.
3. Either the default auxiliary tone plant can be tested or another auxiliary tone plant can be selected for testing.
4. To select another tone plant for testing, use the **CHANGE FIELD** sequence or **NEXT CIRCUIT** and/or **NEXT UNIT**:
 - a. **CHANGE FIELD; 7; ENTER; (Auxiliary tone plant module); ENTER (Cabinet); ENTER; (Carrier); ENTER; (Slot); ENTER.**
 - b. Depressing **NEXT CIRCUIT** increments through all the auxiliary tone plants in the switch.
 - c. Depressing **NEXT UNIT** increments to the first auxiliary tone plant in the next module (and **NEXT CIRCUIT** steps through the auxiliary tone plants within the selected module).
5. When Test 2 is called in, Fields 11 through 16 all contain 0's.

6. The 0's indicate that the tone associated with each field is not selected for transmission during Test 2.
7. The 0 in Field 11 is flashed, indicating an optional entry field.
8. To select the tone associated with Field 11 (immediate audible alert) for transmission, a 1 must be entered in the field:
1; ENTER.
9. To leave the tone not selected for transmission, **ENTER** can be depressed to increment to the next field.
10. Each tone that is to be transmitted during Test 2 must be selected by entering a 1 in the associated field.
11. Prior to starting Test 2, connect the telephone set or hand test set to the test line.
12. To start Test 2, depress **EXECUTE**.

Note: Depressing **EXECUTE** with no tones selected for transmission (Fields 11 through 16 all contain 0's), causes special error code 80 (no tone selected for transmission) to be displayed in the **MAAP** error code field.

13. The first field selected containing a 1 is flashed when **EXECUTE** is depressed, indicating that the associated tone is being transmitted.
14. Maintenance personnel can monitor the transmission of the tone selected by going off-hook at the test line.
15. Depressing **NEXT DATA** sequences to the next field containing a 1 and begins transmitting the associated tone.
Repeated use of **NEXT DATA** sequences through all the selected tones, transmitting them, and then back to the first tone selected which is again transmitted.
16. Test 2 is stopped by depressing **NEXT TEST** or **RESET**.

Repair Guide

When auxiliary tone failures are reported by the user as a trouble, and **PROC 600** (alarm causes/error log) or **PROC 620** (network procedure) has not detected an auxiliary tone plant failure, the following steps should be performed in the order listed to isolate and replace the failing circuit pack.

1. At the test line, install a 249A adapter and a telephone set or hand test set.
2. Execute Test 1 for the first auxiliary tone plant displayed upon entering **PROC 644**, and listen to each tone by going off-hook at the test line.
3. If the auxiliary tone plant passes, execute Test 1 for all auxiliary tone plants in the switch, using **NEXT CIRCUIT** and/or **NEXT UNIT** to select the next auxiliary tone plant for testing.
4. If no auxiliary tone plants indicate a failure, check the wiring between the terminal equipment experiencing the trouble and the associated connections to the switch.

PROC 644

5. If an auxiliary tone plant fails, determine which tones are defective, and execute Test 2 to inhibit the transmission of the fault-free tones to verify the status of the tones suspected of being defective by listening to the selected tones at the test line.
6. Replace SN253 and repeat Test 1.
7. If the auxiliary tone plant continues to fail after replacing SN253, use **PROC 620**, Test 4 (unit type 31) to further isolate the exact cause of the problem.
8. If the auxiliary tone plant still fails after further diagnosis by **PROC 620**, check the wiring associated with the defective tones isolated in Step 5.

PROC 646 - MODEM POOLING AND FACILITY TESTING

FLIPCHART ISSUE 5		+	+	MODEM POOLING AND FACILITY TESTING		+	+	845552223	
WORD 08	EQUIPMENT LOCATION TYPES (FIELD 6): 0 = ADFTC 1 = MEMBER A GPP 2 = MEMBER A DATA PORT 3 = MEMBER B GPP 4 = MEMBER B DATA PORT		TEST LENGTH, INPUT BEFORE TEST EXECUTION (FIELD 12): 1-4 = 1-4 MINUTES DASH = DEFAULT LENGTH		SPECIAL ERROR CODES: 80-EQUIPMENT LOCATION NOT COMPLETE 81-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED. 82-TEST OF RANGE NOT COMPLETED 83-NO ADFTC AVAILABLE FOR TEST 84-DIMDS OVERFLOW 85-INVALID EQUIPMENT LOCATION 86-INVALID TEST TYPE 87-INVALID CIRCUIT FIELDS 88-INVALID MEMBER 89-NO MEMBER AVAILABLE 90-INVALID DATA RATE 91-WRONG EQUIPMENT LOCATION TYPE		92-INVALID TEST TYPE FOR TRUNK GROUP MODE 93-NO CIRCUIT FOUND IN RANGE 94-MEMBER B INVALID FOR DIGITAL FACILITIES 95-WAIT FOR TEST TO STOP 96-FLDS 7-11 MUST BE ENTERED BEFORE USE OF BUSY OUT/ RELEASE BUSY OUT. 97-PROC 100 HAS DISABLED DIGITAL FACILITY TESTING FOR THIS TRUNK GROUP		
	AFTER TEST EXECUTION, DATA TYPE (FIELD 13) CONTAINS AN ENCODE THAT INDICATES THE TYPE OF DATA THAT IS DISPLAYED IN FIELD 14: 1 = SPECIFIC FAULT CODE 2 = BIT ERROR RATE/BITS SENT 3 = BLOCK ERROR RATE/BLOCKS SENT 4 = NUMBER OF CIRCUITS TESTED 5 = MAINT BUSY 6 = NOT MAINT BUSY		DATA RATE, INPUT BEFORE TEST EXECUTION (FIELD 14): DASH = DEFAULT RATE 3 = 300 BPS 12 = 1200 BPS 24 = 2400 BPS 48 = 4800 BPS 96 = 9600 BPS 192 = 19.2K BPS 560 = 56K BPS 640 = 64K BPS						
								NETWORK 646	

FLIPCHART ISSUE 4		+	+	MODEM POOLING AND FACILITY TESTING		+	+	845552223			
WORD 0A	NOTES CONTINUED: BIT/BLOCK ERROR DATA OUTPUT (FIELD 14): THE FIRST TWO DIGITS IN FIELD 14 ARE THE BIT OR BLOCK ERROR RATE, THE SECOND TWO DIGITS IN FIELD 14 ARE THE NUMBER OF BITS OR BLOCKS SENT. ZEROS (0'S) DISPLAYED IN FIELD 14 INDICATE THAT NO BITS OR BLOCKS WERE SENT. BLANKS DISPLAYED IN THE FIRST TWO DIGITS INDICATE A ZERO ERROR RATE. TO OBTAIN THE BIT OR BLOCK ERROR RATE, MULTIPLY THE FIRST (LEFT MOST) DIGIT BY 10 RAISED TO THE NEGATIVE POWER OF THE SECOND DIGIT. TO OBTAIN THE NUMBER OF BITS OR BLOCKS SENT, MULTIPLY THE THIRD DIGIT BY 10 RAISED TO THE POSITIVE POWER OF THE FOURTH DIGIT. EXAMPLE: FIELD 14 = 3586 BIT OR BLOCK ERROR RATE = 3 X 10 ⁻⁵ BITS OR BLOCKS SENT = 8 X 10 ⁶			TEST 1 TEST TYPES (FIELD 2): 0 = ALL ADFTC SELF TESTS 1 = ONE PORT ADFTC SELF TEST 2 = TWO PORT NORMAL ADFTC SELF TEST 3 = TWO PORT REVERSE ADFTC SELF TEST TEST 2 TEST TYPES (FIELD 2): 0 = ALL TESTS OR HOST ACCESS 1 = ALL ORIGINATING TESTS 2 = ALL TERMINATING TESTS 3 = TWO PORT ORIGINATING, NORMAL TEST 4 = TWO PORT ORIGINATING, REVERSE TEST 5 = TWO PORT TERMINATING, NORMAL TEST 6 = TWO PORT TERMINATING, REVERSE TEST 7 = ONE PORT ORIGINATING TEST 8 = ONE PORT TERMINATING TEST			TEST 3 TEST TYPES (FIELD 2): 0 = ALL TESTS OR HOST ACCESS 1 = ALL EIA REMOTE LOOPBACK TESTS 2 = DATA MODULE REMOTE LOOPBACK TEST 3 = EIA LOCAL LOOPBACK TEST 4 = EIA REMOTE LOOPBACK TEST, ORIGINATING 5 = EIA REMOTE LOOPBACK TEST, TERMINATING (CONTINUED ON WORD 08)			NETWORK 646	

FLIPCHART ISSUE 4		+		+		MODEM POOLING AND FACILITY TESTING				+		+		845552223			
TEST 1: TEST ADFTC		TEST 2: RUN DETECTION TEST ON MODEM POOL MEMBERS OR DIGITAL FACILITIES.				TEST 3: RUN DIAGNOSTIC TEST ON MODEM POOL MEMBERS OR DIGITAL FACILITIES.											
USE 'NEXT CIRCUIT' TO DISPLAY FAILING CIRCUITS, 'NEXT FAULT' TO DISPLAY FAULT CODES, 'BIT ERROR RATE/BITS SENT' OR BLOCK ERROR RATE/BLOCKS SENT; 'NEXT UNIT' TO DISPLAY NEXT TRUNK GROUPS' FAILURES; AND 'NEXT DATA' TO DISPLAY EQUIPMENT LOCATIONS USED DURING TEST.						NOTES: FIELDS 12 AND 14. NUMBER OF CIRCUITS TESTED OR FAILED REFERS TO NUMBER OF MODEM POOL PAIRS TESTED OR FAILED, OR NUMBER OF DIGITAL FACILITIES TESTED OR FAILED.						(NOTES CONTINUED ON WORD 0A)					
TEST NO	TEST TYPE	TEST 2 AND 3				T 2&3	EQUIPMENT LOCATION					TEST LENGTH (T 2 & 3)	DATA TYPE	TEST 2 & 3 DATA RATE		NETWORK	
		CIRCUIT					TYPE	MODULE	CAB	CARR	SLOT			CKT	NUMBER OF CIRCUITS FAILED		DATA
		TRUNK GROUP NUMBER	MEMBER A	MEMBER B													
1	2	3	4	5	6	7	8	9	10	11	12	13	14		646		

Purpose

PROC 646 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from an Analog/Digital Facility Test Circuit (ADFTC) failure, a modem pool member (MPM) failure, and/or a digital facility failure.

PROC 646 is used to:

1. Test ADFTC circuits.

PROC 646

2. Perform a detection test on MPMs and digital facilities.
3. Perform a diagnostic test on MPM and digital facilities.
4. Automatically turn off the fault indicator when all ADFTC circuits, MPMs, and/or digital facilities that caused an alarm to be raised are tested as good.

Note: Alarmed ADFTC circuits, MPM circuits, and/or digital facility circuits in PMIDS are marked as resolved.

Maintenance tests are performed on ADFTC circuits, MPMs, and data modules, EIA ports, and digital facilities that are translated as trunks.

The ADFTC (circuit pack SN261) is used in testing MPMs, data modules, EIA ports, and digital facilities.

An MPM consists of an enhanced Trunk Data Module (TDM/2) connected to a General Purpose Port (GPP) circuit pack (SN270 or SN271) and an analog modem connected to a data port trunk circuit (SN243).

An MPM is a conversion resource which allows System 85 outside users to communicate through the analog network with off/on premises facilities.

The Processor Data Module (PDM) and Trunk Data Module (TDM and TDM/2) are data modules.

The EIA port (circuit pack SN238) with a Limited Distance Modem (LDM) functions similar to a GPP port and a data module.

Digital facilities include Public Switched Digital Connectivity (PSDC), Digital Data Service (DDS), private line data facilities, and host computer access that connect to a data module or EIA port which are translated as trunks.

A Modem Pool Group (MPG) is a trunk group of MPMs all with similar data transmission characteristics.

Field Definitions and Codes

Each field of **PROC 646** flipchart and the possible displays for the fields during execution of the different tests are defined in Table AZ, PROC 646 - Field Definitions and Codes.

Optional input fields are:

1. Field 2 - Select type of test to be performed.
2. Fields 3 through 5 - Select trunk group and member number to be tested (Tests 2 and 3 only).
3. Field 6 - Select equipment location type to be tested (Tests 2 and 3 only).
4. Fields 7 through 11 - Select equipment location of the ADFTC, MPM, or digital facility to be tested.
5. Field 12 - Select length (time in minutes) of test to be performed (Tests 2 and 3 only).

TABLE AZ.

PROC 646 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	3-5		Circuit location:
2		Test types.	3	18-999	Trunk group number.
		Test 1 test types:	4	1-99	Member A.
	0-3		5	1-99	Member B.
	0	All ADFTC self-tests.	6	0-4	Equipment location type:
	1	One-port ADFTC self-test.		0	ADFTC.
	2	Two-port normal ADFTC self-test.		1	Member A GPP port.
	3	Two-port reverse ADFTC self-test.		2	Member A data port.
		Test 2 test types.		3	Member B GPP port.
	0-8			4	Member B data port.
	0	All tests or hots access.	7-11		Equipment location:
	1	All originating tests.		0-30	Module number.
	2	All terminating tests.		0-7	Cabinet number.
	3	Two-port originating normal test.		0-3	Carrier number.
	4	Two-port originating reverse test.		00-03, 05-08, 13-16, 18-21	Slot number.
	5	Two-port terminating normal test.		0-3	Circuit number.
	6	Two-port terminating reverse test.	12		Test length/number of circuits failed.
	7	One-port originating test.		1-4	Test length.
	8	One-port terminating test.		1-99	Number of circuits failed.
		Test 3 test types:			
	0-8				
	0	All tests.			
	1	All EIA remote loopback tests.			
	2	Data module remote loopback tests.			
	3	EIA local loopback tests.			
	4	EIA remote loopback originating tests.			
	5	EIA remote loopback terminating tests.			

TABLE AZ. (Contd)

PROC 646					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
13	0-6	Data type:	14 (Contd)		Data rates (Contd):
	1	Specific fault code.		48	4800 bps.
	2	Bit error rate.		96	9600 bps.
	3	Block error rate.		192	19.2 Kbps.
	4	Number of circuits tested.		560	56 Kbps.
	5	Resource maintenance busy.		640	64 Kbps.
	6	Resource non-maintenance busy.			Data: The type of information displayed in Field 14 after test execution depends on which encode is displayed in Field 13: 13= 14= 1 Specific fault code. 2 Bit error rate. 3 Block error rate. 4 Number of circuits tested.
14		Data rate/data.		0-1431 [1] [1] 1-9999	
	3-640	Data rates:			
	3	300 bps.			
	12	1200 bps.			
	24	2400 bps.			

[1] The first 2 digits in Field 14 are the bit or block error rate; the second 2 digits in Field 14 are the number of bits or blocks sent. Zeroes (0's) displayed in Field 14 indicate no bits or blocks were sent. Blanks displayed in the first 2 digits indicate a zero error rate.

To obtain the bit or block error rate, multiply the first digit (left most side) by 10 raised to the negative power of the second digit.

To obtain the number of bits or blocks sent, multiply the third digit by 10 raised to the positive power of the fourth digit.

Example: Field 14 = 3586.

Bit or block error rate = 3 x 10 to the negative 5th.

Bits or blocks sent = 8 x 10 to the positive 6th.

6. Field 14 - Select data rate required to perform the test (Tests 2 and 3 only).

Note: Fields 12 and 14 are multiple use fields; however, for optional inputs they are used for test length and data rate.

Operation of Procedure

Overview

PROC 646 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from an ADFTC failure, MPM failure, and/or digital facility failure.

To call in **PROC 646**, perform the following:

1. Depress **PROC NO; 646; ENTER**.

2. Test 1 is automatically selected.

Field 1 displays a 1, Field 2 is blanked and blinking, Field 6 displays a 0 and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Tests ADFTC circuits.
2. Test 2 - Performs detection tests on MPMs and digital facilities.
3. Test 3 - Performs diagnostic tests on MPMs and digital facilities.

Test 1

Test 1 runs a detection test on ADFTC circuit(s). Self tests are performed on ADFTC circuit(s) as determined by the test type specified in Field 2.

ADFTC self tests consist of the following test types:

1. Test type 0 - All ADFTC self tests which includes a one port, two port normal, and two port reverse detection test.
2. Test type 1 - ADFTC one port self test: A connection is made between the ADFTC and itself (port 1 to port 1) through the switch and a detection test is run.
3. Test type 2 - ADFTC two port normal test: A connection is made between the ADFTC and itself (port 1 to port 2) through the switch and a detection test is run.
4. Test type 3 - ADFTC two port reverse test: A connection is made between the ADFTC and itself (port 1 to port 2) through the switch and a detection test is run.

ADFTC circuits can be selected for testing on a single circuit basis or a range of ADFTC circuits.

If a circuit is tested with a test type of 0 (all ADFTC self tests) and no failure occurs, any alarm on that circuit is automatically resolved in PMIDS.

PROC 646, Test 1

Test 1 Data Entry

1. Test 1 is the default test when entering **PROC 646** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. When Test 1 is initially called in, Fields 7 through 11 (equipment location) are dashed, or a default equipment location may be displayed in Fields 7 through 11. Field 13 may display a default maintenance busy status and Field 14 (data) may display a specific fault code.
3. The default equipment location can be the last ADFTC equipment location displayed in Test 2 or 3 of **PROC 646** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. Field 2 (test type) is blanked and blinking indicating a mandatory entry.
5. Fields 3 through 5 (circuit fields) are dashed during Test 1 execution and Field 6 (type) defaults to 0 (ADFTC).
6. To select the type of test to be run on ADFTC circuit(s), enter the test type number in Field 2 and depress **ENTER**.
Tests that can be run on ADFTC circuits are: 0 = All ADFTC self tests; 1 = one port ADFTC self test; 2 = two port normal ADFTC self test; 3 = two port reverse ADFTC self test.
7. After the test type (Field 2) is entered, the module number field (Field 7) is blinking indicating that a module number may be entered.
8. All ADFTC circuits, a range of ADFTC circuits, a specific ADFTC circuit, or the default equipment location can be tested.
9. Selection of a range of ADFTC circuits to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the range of ADFTC circuits to be tested.
10. To select all ADFTC circuits in the switch for testing, Fields 7 through 11 must be dashed.
 - a. If no default equipment location is displayed, depress **ENTER**.
 - b. If a default equipment location is displayed, depress **CHANGE FIELD; 7; ENTER; ENTER**.

Test 1 starts with the first module, first cabinet and carrier and runs until all ADFTC circuits in the switch are tested.

Proceed to Step 1 of Test 1 Execution.

11. To select all ADFTC circuits in a module for testing, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Module number to be tested); ENTER**.
 - b. **CHANGE FIELD; 7; ENTER; (Module number to be tested); ENTER**.

Test 1 starts with the first ADFTC circuit in the module selected and runs until all ADFTC circuits in the module are tested.

Proceed to Step 1 of Test 1 Execution.

12. To select all ADFTC circuits in a cabinet for testing, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**
 - b. **CHANGE FIELD; 7; ENTER; (Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.**

Test 1 starts with the first ADFTC circuit in the cabinet selected and runs until all ADFTC circuits in the cabinet are tested.

Proceed to Step 1 of Test 1 Execution.

13. To select all ADFTC circuits in a carrier for testing, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**
 - b. **CHANGE FIELD; 7; ENTER; (Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.**

Test 1 starts with the first ADFTC circuit in the carrier selected and runs until all ADFTC circuits in the carrier are tested.

Proceed to Step 1 of Test 1 Execution.

14. To select the ADFTC circuit in a slot for testing, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**
 - b. **CHANGE FIELD; 7; ENTER; (Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.**

Test 1 tests circuit 1 of the ADFTC in the slot selected.

Proceed to Step 1 of Test 1 Execution.

15. To select a specific ADFTC circuit for testing, perform one of the following depending on whether or not a default equipment location is displayed:

Note: Port 0 (circuit number 0) cannot be tested in **PROC 646** but can be tested in **PROC 620**.

- a. **(Module number of ADFTC circuit to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number 1); ENTER.**

PROC 646, Test 1

- b. **CHANGE FIELD; 7; ENTER; (Module number of ADFTC circuit to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number 1); ENTER.**

Field 13 (data type) displays the maintenance busy status of the specific ADFTC circuit selected for testing.

Note: Special error code 85 (invalid equipment location) is displayed in the **MAAP** error code field when **EXECUTE** is depressed if the correct equipment location is not entered in Fields 7 through 11.

Proceed to Step 1 of Test 1 Execution.

16. A specific ADFTC circuit can also be selected for testing by use of **NEXT CIRCUIT**.

Depress **NEXT CIRCUIT** until the port equipment location of the ADFTC circuit to be tested is displayed in Fields 7 through 11.

Note: The **WAIT** indicator lights while a circuit is searched for. The delay is approximately 30 seconds per module.

Proceed to Step 1 of Test 1 Execution.

17. To test the default equipment location displayed in Fields 7 through 11, proceed to Step 1 of Test 1 Execution.

Test 1 Execution

1. To start Test 1 after selecting the test type and ADFTC circuit(s) to be tested, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

2. If test type 0 was selected, Field 2 changes to a 1 to indicate that test type 1 is currently being executed.

If any other test type was selected, Field 2 does not change.

3. When testing encounters an ADFTC circuit in use by the periodic test, the periodic test is stopped and the ADFTC circuit is tested.
4. **STOP** can be depressed to halt Test 1 at any time.
5. If Test 1 is stopped before one complete testing pass through a single ADFTC circuit or a range of ADFTC circuits is made, special error code 95 (wait for test to stop) is displayed in the **MAAP** error code field.

Note: One complete testing pass equals all test types selected for a single circuit are tested, or in a range of circuits all test types selected for each circuit in a range of circuits are tested.

6. After the current test is completed, special error code 82 (test of range not completed) is displayed in the **MAAP** error code field indicating that one complete pass through the ADFTC circuit or range of ADFTC circuits was not completed.

7. The port equipment location of the last ADFTC circuit tested is displayed in Fields 7 through 11, the total number of circuits tested is displayed in Field 14 (if all test types of a circuit are tested), and the total number of failures (if any) is displayed in Field 12.
8. If any failures are displayed in Field 12, test result information can be stepped through as described in Step 10 below when Test 1 is halted using **STOP** even though the ADFTC circuit or the entire range of ADFTC circuits is not tested.
9. To restart the test when Test 1 is halted by use of **STOP** before a single ADFTC circuit or range of ADFTC circuits are tested at least once, **EXECUTE** is depressed and Test 1 starts at the port equipment location and specific test following the last port equipment location and specific test fully tested.

Note: When Test 1 is continued from where it was stopped, any test results gathered to that point are retained.

10. Test 1 operation and display of test results is different when a specific ADFTC circuit or default equipment location is tested and when a range of ADFTC circuits are tested.
 - a. For test operation and display of test results for a default equipment location or a specific ADFTC circuit, proceed to Step 1 of Test 1 Result Display for a Single Circuit.
 - b. For test operation and display of test results for a range of ADFTC circuits, proceed to Step 1 of Test 1 Result Display for a Range of Circuits.

Test 1 Result Display for a Single Circuit

1. When Test 1 is completed for a default equipment location or a specific ADFTC circuit, the **WAIT** indicator is turned off and the following is displayed:
 - Field 1 - 1.
 - Field 2 - Original test type selected for testing ADFTC circuit.
 - Fields 3 through 5 - Dashed.
 - Field 6 - 0.
 - Fields 7 through 11 - Port equipment location of ADFTC circuit tested.
 - Field 12 - 0 (indicating no failures were found for the ADFTC circuit tested) or 1 (indicating the ADFTC circuit failed the test).
 - Field 13 - Data type of 4 (indicating that Field 14 indicates the number of circuits tested).
 - Field 14 - 0 (if **STOP** was depressed indicating all tests are not completed) or 1 (indicating ADFTC circuit tested).
2. Depressing **NEXT CIRCUIT** changes the display in the data type and data fields (Fields 13 and 14).
 - Field 13 displays a 1 indicating that the data in Field 14 is a specific fault code.
3. Depressing **NEXT FAULT** displays a 2 in Field 13 and the bit error rate/bits sent in Field 14.
 - Depressing **NEXT FAULT** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

PROC 646, Test 1

Note: Refer to Table AZ, PROC 646 - Field Definitions and Codes, to determine how to interpret bit, block error rates and bits/blocks sent.

4. Depressing **NEXT FAULT** repeatedly advances through each test type selected for testing displaying specific fault code (if any), bit error rate/bits sent, and block error rate/blocks sent for each test type.
 - a. After the block error rate/blocks sent of the last test type selected for testing is displayed for the circuit tested, depressing **NEXT FAULT** once more dashes all fields except Field 1.
 - b. Depressing **NEXT FAULT** again starts the cycle over with a 1 displayed in Field 13, and a specific fault code displayed in Field 14 for the same circuit.
5. When another specific ADFTC circuit is to be tested, the **CHANGE FIELD** sequence must be used to select the test type desired and the specific ADFTC circuit to be tested.

CHANGE FIELD; 2; ENTER; (Test type desired); ENTER; (Module number of ADFTC circuit to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number 1); ENTER.
6. **EXECUTE** must be depressed to test the specific ADFTC circuit selected for testing.

Test 1 Result Display for a Range of Circuits

1. When a range of ADFTC circuits is being tested, the **WAIT** indicator is turned on and the following fields are incremented as a circuit is tested:

Field 2 is updated with the test type currently being executed (i.e., 1, 2, and 3) if test type 0 (all ADFTC tests) was selected.

Fields 7 through 11 - Port equipment location of the current ADFTC circuit being tested.

Field 14 - Bit error rate/bits sent (updated every 10 seconds).
2. When testing is completed for an ADFTC circuit, the bit error rate/bits sent, block error rate/blocks sent, any specific fault code and the port equipment location are stored in DMIDS.
3. When a range of ADFTC circuits has completed testing, the **WAIT** indicator is turned off.

Field 2 displays the original test type and Fields 7 through 11 display the original equipment range selected.

Field 12 displays the number of failures (if any).

Field 13 - 4 (indicating that Field 14 displays the number of ADFTC circuits tested).

Field 14 - Number of ADFTC circuits tested.
4. **All failures with a specific fault code are displayed first followed by passing circuits with a specific fault code of 0.**

Bit and block error rates are displayed for failing and passing circuits.

When multiple tests (more than one test type) are performed on ADFTC circuits, a specific fault code (if any) and bit/block error rates are displayed for all test types executed for each ADFTC circuit tested.

5. Depressing **NEXT CIRCUIT** displays the first ADFTC circuit tested, as follows:
 - Field 1 - 1.
 - Field 2 - Test type for the displayed ADFTC circuit.
 - Fields 3 through 5 - Dashed.
 - Field 6 - 0 (default ADFTC equipment type).
 - Fields 7 through 11 - Equipment location of the displayed ADFTC circuit.
 - Field 12 - 0 or number of circuits failed.
 - Field 13 - 1 (indicating that Field 14 displays a specific fault code).
 - Field 14 - 0 or specific fault code.
6. Depressing **NEXT FAULT** displays a 2 in Field 13 and the bit error rate/bits sent in Field 14.

Depressing **NEXT FAULT** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

Note: Refer to Table AZ, PROC 646 - Field Definitions and Codes, to determine how to interpret bit and block error rates.
7. Depressing **NEXT FAULT** repeatedly advances through each test type selected for testing displaying specific fault code (if any), bit error rate/bits sent, and block error rate/blocks sent for each test type.
 - a. After the block error rate/blocks sent of the last test type selected for testing is displayed for the circuit tested, depressing **NEXT FAULT** once more dashes all fields except Field 1.
 - b. Depressing **NEXT FAULT** again starts the cycle over with a 1 displayed in Field 13, and a specific fault code displayed in Field 14 for the same circuit.
8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining tested ADFTC circuits with a 1 displayed in Field 13 and a specific fault code displayed in Field 14.
 - a. Depressing **NEXT FAULT** displays the bit error rate/bits sent and block error rate/blocks sent.
 - b. Depressing **NEXT FAULT** repeatedly advances through each test type selected for the displayed ADFTC circuit, displaying specific fault code, bit error rate/bits sent, and block error rate/blocks sent for each test type.
9. When all ADFTC circuits are displayed, depressing **NEXT CIRCUIT** dashes Fields 2 through 14.

Depressing **NEXT CIRCUIT** once more starts the sequence over with the first failure or tested ADFTC circuit.
10. If a circuit is tested with a test type of 0 (all tests) and no failure occurs, any alarm on that circuit is automatically resolved in PMIDS.
11. To select another range of ADFTC circuits to test, the **CHANGE FIELD** sequence must be used to select the test type desired and the specific range of ADFTC circuits to be tested as follows.

PROC 646, Test 1 and Test 2

- a. **CHANGE FIELD; 2; ENTER; (Test type desired); ENTER.**
 - b. Refer to Steps 10 through 13 of Test 1 Data Entry above to select a range of ADFTC circuits to test in a module, cabinet, carrier, or slot.
12. **EXECUTE** must be depressed to test the range of ADFTC circuits selected for testing.
 13. Test 1 automatically turns off the **OTHER FAILS** fault indicator when all ADFTC circuits that raised an alarm pass Test 1 assuming no MPM, digital facilities, or other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Note: ADFTC alarmed circuit entries in PMIDS are marked as resolved.

Test 2

Test 2 runs detection tests on modem pool members (MPMs) and digital facilities as determined by the test type specified in Field 2.

Detection tests consist of half duplex tests and full duplex tests. (Refer to Figure 13 - Modem Pooling and Facility Test Configurations.)

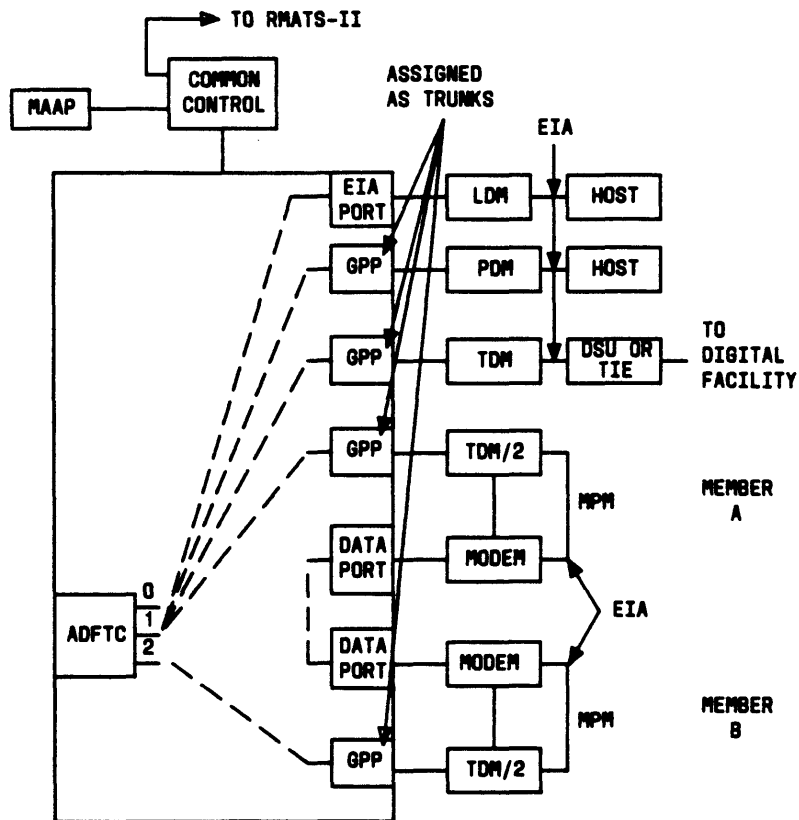


Figure 13. Modem Pooling and Facility Test Configurations

1. The half duplex test is run only on MPMs. It is run four times, from both the originating and terminating modes and in both the forward and reverse direction. The half duplex test requires the use of two MPMs. Connections are made from ports 1 and 2 of the ADFTC to the GPP of each MPM and between each MPM's data (analog) port.
2. The full duplex test is run on digital facilities assigned as trunks, and for diagnostic purposes on full duplex MPMs and the TDM/2 on half duplex MPMs. The full duplex test can put MPMs in either originating or terminating modes. Only one connection is necessary except when testing a full duplex MPM. It is made between port 1 of the ADFTC and the GPP of the data module to be tested. An additional connection must be made, when testing a full duplex MPM, between its data port and the data port of a known **good** MPM.

Types of detection tests for MPMs and digital facilities consist of all tests (test type 0 - includes test types 3 through 8); all originating tests (test type 1 - includes test types 3, 4, and 7); all terminating tests (test type 2 - includes test types 5, 6, and 8); two port originating normal test (test type 3); two port originating reverse test (test type 4); two port terminating normal test (test type 5); two port terminating reverse test (test type 6); one port originating test (test type 7); and one port terminating test (test type 8).

Each type of test is not applicable to all types of modem pool members or digital facilities. Types of modems available with modem pool members tested consist of 103J, 113C, 113D, 202S, 201C, 208B, and 212A.

Types of tests that can be run in Test 2 for modem pool members and digital facilities are:

1. Modem pool members that are both originating and terminating (all modems except 113C and 113D) - All tests except one port test (test types 0 through 6).
2. Originating only modem (i.e., 113C) - All tests (test type 0) all originating tests (test type 1), and one port originating test (test type 7).
3. Terminating only modem (i.e., 113D) - All tests (test type 0), all terminating tests (test type 2), and one port terminating test (test type 8).
4. Digital facilities and host access - All tests (test type 0).

Several different test types may be run on one modem pooling circuit (or circuit pair).

1. Some test types might fail while other test types pass.
2. Failing test types are displayed first while passing test types are displayed after all failing test types are displayed.
3. When a modem pooling circuit (or circuit pair) test fails, a specific fault code is displayed. A specific fault code of 0 is displayed for passing tests.
4. Bit and block error rates are displayed for both failing and passing circuits (or failing and passing test types) for further diagnosis (if required).

Characteristics (i.e., modem type, loop back control, etc.) of digital trunks used in modem pooling are provided in **PROC 100** Words 1 and 2.

PROC 100 Word 2 can also be used to disable the digital facility testing of a particular modem pooling trunk group.

PROC 646, Test 2

MPMs and digital facilities can be selected for testing on a single circuit basis or a range of MPMs or digital facilities (i.e., trunk group number; trunk group number and member A; trunk group number and member B (MPM only); or no entries).

If a circuit or circuit pair is tested with a test type of 0 (all tests) and no failure occurs, any alarm on that circuit or circuit pair is automatically resolved in PMIDS.

Test 2 Data Entry

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, Fields 3 through 11 (trunk group member number and equipment location) are dashed, or a default equipment location may be displayed in Fields 7 through 11. Field 13 may display a default maintenance busy status and Field 14 (data) may display a default specific fault code.
3. The default equipment location can be the last equipment location or trunk group and member number displayed in Test 3 of **PROC 646** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. The default equipment location can also be passed from **PROC 620** as long as the equipment location is a GPP or data port which is part of an MPM or digital facility and is still displayed in **PROC 620** when it is passed.
5. Field 2 (test type) is blanked and blinking indicating a mandatory entry.
6. Types of tests that can be run in Test 2 for modem pool members and digital facilities are:
 - a. Originating and terminating modem pool members (all modems except 113C and 113D) - All tests except one port test (test types 0 through 6).
 - b. 113C modem - All tests (test type 0), all originating tests (test type 1), and one port originating test (test type 7).
 - c. 113D modem - All tests (test type 0), all terminating tests (test type 2), and one port terminating test (test type 8).
 - d. Digital facilities and host access - All tests (test type 0).
7. To select the type of test to be run on MPMs or digital facilities to be tested, enter the test type number in Field 2 and depress **ENTER**.

Note: When a default equipment location is displayed, the maintenance busy status is displayed in Field 13 (data type) when the test type is entered.

8. After the test type (Field 2) is entered, the trunk group number field (Field 3) is blinking indicating that a trunk group number of the MPM or digital facility to be tested may be entered.
9. If an equipment location was carried over from Test 3 and it is an MPM or digital facility, its trunk group and member number are displayed in Fields 3 through 5 (as appropriate) and the equipment location is displayed in Fields 7 through 11.

10. A range of MPMs or digital facilities, a specific MPM or digital facility, or the default equipment location can be tested.
 - a. If a default equipment location is to be tested, proceed to Step 11.
 - b. If a range of MPMs or digital facilities, a specific MPM, or a specific digital facility is to be tested, proceed to Step 12.
11. To test the default equipment location, determine if the ADFTC to be used for testing is to be specified before testing.
 - a. If the ADFTC is to be specified, record the default equipment location (Fields 3 through 5, and 7 through 11 as appropriate) and proceed to Step 13.
 - b. If the ADFTC is not to be specified, proceed to Step 45.
12. If a specific ADFTC is to be used for testing, it **must** be selected at this time.
 - a. To select a specific ADFTC to be used for testing, proceed to Step 13.
 - b. If a specific ADFTC is not to be used for testing, proceed to Step 15.
13. The ADFTC to be used for testing can be specified by entering the complete equipment location and the correct type in Fields 6 through 11 as follows:

CHANGE FIELD; 6; ENTER; 0; ENTER; (Module number of ADFTC); ENTER; (Cabinet number of ADFTC); ENTER; (Carrier number of ADFTC); ENTER; (Slot number of ADFTC); ENTER; (Circuit number of ADFTC); ENTER.

Note: If the ADFTC is incompletely specified (all fields not entered), special error code 85 (invalid equipment location) is displayed in the **MAAP** error code field when **EXECUTE** is depressed. Field 7 (module) blinks.

Proceed to Step 14.

14. If a default equipment location is being tested, enter the default equipment location (recorded in Step 11 above) in Fields 3 through 5, and 7 through 11 (as appropriate) using the **CHANGE FIELD** sequence and proceed to Step 45.
 If a range of MPMs or digital facilities, a specific MPM or a specific digital facility is to be tested, proceed to Step 15.
15. MPMs or digital facilities can be selected for testing by one of two methods; i.e., by circuit (Fields 3 through 5) or by type and equipment location (Fields 6 through 11).
 - a. To select MPMs or digital facilities for testing using the circuit method, proceed to Step 16.
 - b. To select MPMs or digital facilities for testing using the type and equipment location, proceed to Step 35.
16. If no entries are specified in Fields 3 through 5 or 7 through 11, Test 2 is run on all trunk groups corresponding to the test type entered in Field 2.
17. If only the trunk group number is specified in Field 3, Test 2 is run on all members of the trunk group.
18. If the trunk group number and member A are specified in Fields 3 and 4, Test 2 is run only on member A using any available member B.

PROC 646, Test 2

19. If the trunk group number and member B are specified in Fields 3 and 5, Test 2 is run on all member As of the trunk group using the member B specified.
20. If the trunk group number and members A and B are specified in Fields 3 through 5, Test 2 is run only on that circuit pair.
21. Selection of a range of MPMs or digital facilities to be tested depends on whether or not a default equipment location is displayed or if a specific ADFTC is selected for testing.
 - a. If a default equipment location is displayed or if a specific ADFTC is selected for testing, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed or no specific ADFTC is selected for testing, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the range of MPMs or digital facilities to be tested.
22. To select all trunk groups corresponding to the test type entered in Field 2 for testing, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:
 - a. **ENTER.**
 - b. **CHANGE FIELD; 3; ENTER; ENTER.**

Note: Fields 3 through 11 are dashed.

Test 2 starts with the first MPM or digital facility (in equipment location order not trunk group sequence) corresponding to the test type entered in Field 2 and runs until all MPMs and/or digital facilities are tested.

Note: If a modem pooling trunk group is disabled by **PROC 100** Word 2 (Field 18 equals 0), the MPMs or digital facilities associated with the disabled trunk group are not tested.

Proceed to Step 47.

23. To select all MPMs or digital facilities in a trunk group for testing, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing.
 - a. **(Trunk group number to be tested); ENTER.**
 - b. **CHANGE FIELD; 3; ENTER; (Trunk group number to be tested); ENTER.**

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test the trunk group, proceed to Step 52.

Test 2 starts with the first MPM or digital facility in the trunk group selected (in equipment location order not trunk group sequence) and runs until all MPMs or digital facilities in the trunk group are tested.

Proceed to Step 47.

24. **NEXT UNIT** is also used to select a trunk group for testing. Depress **NEXT UNIT** until the trunk group number to be tested is displayed in Field 3. All other fields are dashed.

Note: If a modem pooling trunk group is disabled by **PROC 100** Word 2 (Field 18 equals 0), the trunk group will not be displayed by depressing **NEXT UNIT**.

Test 2 starts with the first MPM or digital facility in the trunk group selected (in equipment location order not trunk group sequence) and runs until all MPMs or digital facilities in the trunk group are tested.

Proceed to Step 47.

25. To test a single member A with any member B, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:

Note: If the trunk group number is a digital facility or MPG with one way modems, the member B field **must** be dashed.

- a. (Trunk group number of member B to be tested); ENTER; (Member A); ENTER.
- b. CHANGE FIELD; 3; ENTER; (Trunk group number of member B to be tested); ENTER; (Member A); ENTER.

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test a single member A with any member B for the trunk group number entered, proceed to Step 52.

Test 2 tests the member A specified with any member B.

Proceed to Step 47.

26. To select all member As in a trunk group for testing, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:

Note: If the trunk group number is a digital facility or MPG with one way modems, the member B field **must** be dashed since it is not required for testing member As. If the trunk group is not a digital facility or a modem pool with one way members and member B was dashed, member Bs are also selected for testing.

- a. (Trunk group number of member A to be tested); ENTER; ENTER; (Member B or dashed); ENTER.
- b. CHANGE FIELD; 3; ENTER; (Trunk group number of member A to be tested); ENTER; ENTER; (Member B or dashed); ENTER.

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test all member As for the trunk group number entered, proceed to Step 52.

PROC 646, Test 2

Test 2 starts with the first member A in the trunk group selected (in equipment location order) and runs until all member As in the trunk group are tested.

Proceed to Step 47.

27. To select a specific MPM or digital facility for testing, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:

Note: If a specific digital facility is being tested, Field 5 (member B) **must** be dashed.

- a. **(Trunk group number of MPM to be tested); ENTER; (Member A of MPM to be tested); ENTER; (Member B of MPM to be tested); ENTER.**
- b. **CHANGE FIELD; 3; ENTER; (Trunk group number of MPM to be tested); ENTER; (Member A of MPM to be tested); ENTER; (Member B of MPM to be tested); ENTER.**

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test a specific MPM or digital facility for the trunk group number entered, proceed to Step 52.

Test 2 tests the MPM specified in Fields 3 through 5 or the digital facility specified in Fields 3 and 4.

Proceed to Step 32.

28. **NEXT CIRCUIT** can be used to select a circuit or circuit pair before test execution.

Note: If a modem pooling trunk group is disabled by **PROC 100** Word 2 (Field 18 equals 0), circuits or circuit pairs associated with the disabled trunk group will not be displayed by depressing **NEXT CIRCUIT**.

29. If nothing is specified in the circuit or equipment location fields (Fields 3 through 5 and 7 through 11), two available facilities are displayed in the circuit and equipment location fields from the **first testable trunk group** when **NEXT CIRCUIT** is depressed. If the trunk group contains digital facilities or MPMs with one way modems, member B (Field 5) is dashed.

Proceed to Step 32.

30. If the circuit field is specified up to member A (Fields 3 and 4), member A is incremented to the next member A when **NEXT CIRCUIT** is depressed.

Proceed to Step 32.

31. If both members A and B are specified, the member number is advanced corresponding to the type field (Field 6) of the equipment location fields when **NEXT CIRCUIT** is depressed.

Proceed to Step 32.

32. After the circuit fields are specified, the equipment location fields (Fields 7 through 11) default to the equipment location of member A.

The type field (Field 6) defaults to 1, indicating the GPP port of member A is displayed in Fields 7 through 11.

Proceed to Step 33.

33. Before test execution, **NEXT DATA** can be depressed to examine port equipment locations associated with the circuit selected for testing.
34. Successive depression of **NEXT DATA** displays in Fields 6 through 11 the type and port equipment locations of the member A GPP, member A data port, member B GPP, and member B data port.

Note: Depressing **NEXT DATA** does not always display 4 equipment locations before testing. The type and port equipment locations (displayed in Fields 6 through 11) used for testing depends on whether MPMs or digital facilities are being tested.

The maintenance busy status of each port equipment location is displayed in Field 13.

Proceed to Step 45.

35. MPMs or digital facilities can be selected for testing using the type and equipment location fields (Fields 6 through 11).

Only one member A GPP or one member A data port can be designated as the type of facility to test if an individual circuit is to be tested.

36. A range of member A GPP (equipment location type 1) facilities can be selected for testing.

Note: Ranging is not allowed for other equipment location types.

37. To select the type of facility to test, the **CHANGE FIELD** sequence must be used:

CHANGE FIELD; 6; ENTER; (equipment location type); ENTER.

38. Equipment location types are: 1 = Member A GPP port, 2 = Member A data port for a fully specified circuit, or 1 = Member A GPP for a range test.

Note: Only equipment location type 1 (member A GPP) can be entered in Field 6 for testing of digital facilities.

39. When the equipment location type is entered in Field 6, the module field (Field 7) blinks for entry.

40. To select all member A GPPs in a module for testing, enter the following:

(Module number to be tested); ENTER.

Test 2 starts with the first member A GPP in the module selected and runs until all member A GPPs in the module are tested. In addition, any data port associated with a modem pool is also tested.

Proceed to Step 47.

41. To select all member A GPPs in a cabinet for testing, enter the following:

(Module number of cabinet to be tested); ENTER; (Cabinet number to be tested); ENTER.

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Test 2 starts with the first member A GPP in the cabinet selected and runs until all member A GPPs in the cabinet are tested.

Proceed to Step 47.

42. To select all member A GPPs in a carrier for testing, enter the following:

(Module number of carrier to be tested); ENTER; (Cabinet number of carrier to be tested); ENTER; (Carrier number to be tested); ENTER.

Test 2 starts with the first member A GPP in the carrier selected and runs until all member A GPPs in the carrier are tested.

Proceed to Step 47.

43. To select all member A GPPs in a slot for testing, enter the following:

(Module number of slot to be tested); ENTER; (Cabinet number of slot to be tested); ENTER; (Carrier number of slot to be tested); ENTER; (Slot number to be tested); ENTER.

Test 2 starts with the first member A GPP in the slot selected and runs until all member A GPPs in the slot are tested.

Proceed to Step 47.

44. To select a specific member A GPP or member A data port for testing, enter the following:

(Module number of member A GPP or member A data, port to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

Note: Equipment type (Field 6) must correspond to the equipment location selected or error code 85 (invalid equipment location) is displayed in the **MAAP** error code field.

Proceed to Step 45.

45. The maintenance busy status of the equipment location displayed in Fields 7 through 11 is displayed in Field 13.

- a. The circuit displayed in Fields 7 through 11 can be busied out (if required).
- b. If the circuit is to be busied out for testing, proceed to Step 46.

If busy out of the circuit is not required, proceed to Step 47.

46. Individual port equipment locations can be placed in maintenance busy out status for testing by performing the following:

Note: If Fields 7 through 11 are not entered, special error code 96 (fields 7 through 11 must be entered before use of **BUSY OUT**) is displayed in the **MAAP** error code field.

- a. Check the maintenance busy status displayed in Field 13.
- b. If the maintenance busy status equals 5, proceed to Step 47.

If the maintenance busy status equals 6, depress **BUSY OUT** and proceed to Step 47.

Note: Special error code 85 (invalid equipment location) may be displayed in the **MAAP** error code field when **BUSY OUT** is depressed. If you are sure that the individual port equipment location that you entered is a modem pooling port equipment location and you wish to test the MPM or digital facility entered, proceed to Step 52.

47. The length of the test (**maximum of 4 minutes for each test type executed**) can be entered in Field 12, or a default test length can be chosen.

Note: The default test length causes a very short (less than 2 seconds) test. However, processing overhead increases the delay seen at the **MAAP** to less than 15 seconds for each test type. This default test length applies to all bit rates and test types.

48. Either Field 12 (test length) is blinking or the **CHANGE FIELD** sequence must be used to enter the desired test length.

If Field 12 is blinking, proceed to Step 49.

If Field 12 is not blinking, perform **CHANGE FIELD; 12; ENTER**, and proceed to Step 49.

49. If a default test length is desired, depress **ENTER**. If a different test length is desired, enter the time (minutes) in Field 12:

(1 through 4 - maximum of 4 minutes); ENTER.

Note: The actual test length executed for each test type selected is determined by whether the test for the test type passes or fails. If the test passes, either the default test length or the time entered in Field 12 is used for the test performed. If the test fails, the time of the test is the default test length no matter what time is entered in Field 12.

50. Field 14 (data rate) blinks for entry. The data rate can be entered in Field 14, or a default data rate can be chosen.

Note: Refer to Table BA, PROC 646 Modem Bit Rates, to determine the data rate for the modem type to be tested.

TABLE BA.

PROC 646—MODEM BIT RATES	
MODEM TYPE	BIT RATE
103J	300 bits per second
113C	300 bits per second
113D	300 bits per second
201C	2400 bits per second
202S	1200 bits per second
208B	4800 bits per second
212A	300/1200 bits per second

PROC 646, Test 2

51. If a default data rate is desired, depress **ENTER**. If a different data rate is desired, enter the data rate in Field 14:

(Data rate); ENTER.

Data rate encodes are: 3 = 300 bps, 12 = 1200 bps, 24 = 2400 bps, 48 = 4800 bps, 96 = 9600 bps, 192 = 19.2 kbps, 560 = 56 kbps, 640 = 64 kbps.

52. When special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) or special error code 85 (invalid equipment location) is displayed and you are sure that the trunk group, specific MPM, or digital facility is a modem pooling trunk group or member, perform Steps 53 through 59 as appropriate.
53. Using **PROC 100** Word 2, enter the trunk group number and depress **DISPLAY, EXECUTE**.
54. Check the encode displayed in Field 18.
 - a. If the encode in Field 18 is a 0, proceed to Step 55.
 - b. If the encode in Field 18 is not a 0, you have entered the wrong trunk group number or an invalid equipment location.
55. Record the data displayed in each field of **PROC 100** Word 2 for the trunk group entered.
56. Depress **REMOVE, EXECUTE**.
57. Enter the trunk group and the data recorded in Step 55 except for Field 18. Enter a 1, 2, or 3 encode in Field 18 depending on the type of loop back control required in testing the modem pooling trunk group.
58. Depress **ADD, EXECUTE**.

The modem pooling trunk group can now be tested in **PROC 646** Test 2 or Test 3.
59. Repeat Test 2 from Step 1 of Test 2 Data Entry.

Test 2 Execution

1. To start Test 2 after selecting the test type, the ADFTC to be used for testing, the MPM(s) and/or digital facilities to be tested, the test length and data rate, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

2. If a facility is maintenance busied out, it is released from busy while under test.
3. When the test encounters a facility in use, a specific fault code is logged in DMIDS records and the test is stopped.

The data call in progress is not aborted.

When testing multiple circuits (range testing) and Test 2 encounters a facility in use, the test continues with the next circuit to be tested.

4. **STOP** can be depressed to halt Test 2 at any time.
5. If Test 2 is stopped before one complete testing pass through the facility or range of facilities specified is made, special error code 95 (wait for test to stop) is displayed in the **MAAP** error code field.

Note: One complete testing pass means that all test types selected for a single circuit have been tested; or, in a range of circuits, all test types selected for each circuit in a range of circuits have been tested.

6. After the current test is completed, special error code 82 (test of range not completed) is displayed in the **MAAP** error code field indicating that one complete pass through the facility or range of facilities is not completed.
7. The original test type selected is displayed in Field 2, the port equipment location of the last facility tested is displayed in Fields 3 through 11, the total number of circuits tested is displayed in Field 14 (if all test types of a circuit are complete), and the total number of failures (if any) is displayed in Field 12.
8. If any failures are displayed in Field 12, test result information can be stepped through as described in Step 10 below when Test 2 is halted using **STOP** even though the facility or range is not tested.
9. To restart the test when Test 2 is halted by use of **STOP** before a single facility or range of facilities are tested at least once, **EXECUTE** is depressed and Test 2 starts at the port equipment location and specific test following the last port equipment location and specific test fully tested.

Note: When Test 2 is continued from where it was stopped, any test results gathered to that point are retained.

10. Test 2 operation and display of test results are different when a specific MPM, digital facility, or default equipment location is tested and when a range of MPMs or digital facilities are tested.
 - a. For test operation and display of test results for a default equipment location or a specific MPM or digital facility, proceed to Step 1 of Test 2 Result Display for a Single Circuit.
 - b. For test operation and display of test results for a range of MPMs or digital facilities, proceed to Step 1 of Test 2 Execution and Test Result Display for a Range of Circuits.

Test 2 Result Display for a Single Circuit

1. When Test 2 is completed or **STOP** is depressed for a default equipment location, a specific MPM, or digital facility, the **WAIT** indicator is turned off and the following is displayed:
 - Field 1 - 2.
 - Field 2 - Test type originally selected for testing MPM or digital facility.
 - Fields 3 through 5 - Circuit location.
 - Field 6 - Type of equipment location (1 through 4).
 - Fields 7 through 11 - Port equipment location of MPM or digital facility tested.
 - Field 12 - 0 (indicating no failures were found for the MPM or digital facility tested) or 1 (indicating the MPM or digital facility failed the test).
 - Field 13 - Data type of 4 (indicating that Field 14 indicates the number of circuits tested).

PROC 646, Test 2

Field 14 - 0 (if **STOP** was depressed indicating all tests are not completed) or 1 (indicating 1 MPM, MPM pair, or digital facility tested).

Note: Special error code 85 (invalid equipment location) may be displayed in the **MAAP** error code field after **EXECUTE** is depressed. If you are sure that the individual port equipment location that you entered is a modem pooling port equipment location and you wish to test the MPM or digital facility entered, Refer to Step 52 of Test 2 Data Entry above.

2. Depressing **NEXT CIRCUIT** changes the display in the data type and data fields (Fields 13 and 14) and may change the type and equipment location in Fields 6 through 11 depending on the type of failure (if any).

Field 13 displays a 1 indicating that the data in Field 14 is a specific fault code.

3. Depressing **NEXT FAULT** displays a 2 in Field 13 and the bit error rate/bits sent in Field 14.

Depressing **NEXT FAULT** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

Note: Refer to Table AZ, PROC 646 - Field Definitions and Codes, to determine how to interpret bit error rate/bits sent and block error rate/blocks sent.

4. Depressing **NEXT FAULT** repeatedly advances through each test type selected displaying type and equipment location of the failure (if any), specific fault code, bit error rate/bits sent, and block error rate/blocks sent for each test type.
 - a. After the block error rate/blocks sent of the last test type selected for testing is displayed for the circuit tested, depressing **NEXT FAULT** once more dashes all fields except Field 1.
 - b. Depressing **NEXT FAULT** again starts the cycle over with a 1 displayed in Field 13 and a specific fault code displayed in Field 14 for the same circuit.
5. To examine the port equipment locations of the GPPs, data ports, and the ADFTC used in testing a MPM or digital facility, depress **NEXT DATA**.

Note: **NEXT DATA** can only be depressed after **NEXT CIRCUIT** and/or **NEXT CIRCUIT** and **NEXT FAULT** are depressed.

6. Field 6 cycles from 0 through 4 each time **NEXT DATA** is depressed, starting at different positions depending on the type of circuit(s) tested and the failures detected, and displays in Fields 7 through 11 the port equipment locations of the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), member A data port (Field 6 = 2), member B GPP (Field 6 = 3), and member B data port (Field 6 = 4).

Note: Depressing **NEXT DATA** does not always display 5 equipment locations. The type and port equipment locations (displayed in Fields 6 through 11) used for testing depends on whether MPMs or digital facilities were tested.

7. The possible starting positions are the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), or member B GPP (Field 6 = 3).

Note: One way MPMs only display the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), **or** member A data port (Field 6 = 2). Digital facilities only display the ADFTC (Field 6 = 0), **or** member A GPP (Field 6 = 1).

8. When another specific MPM, digital facility, member A GPP, or member A data port is to be tested, the **CHANGE FIELD** sequence must be used to select the test type desired and the specific MPM, digital facility, member A GPP, or member A data port to be tested.
 - a. **CHANGE FIELD; 2; ENTER; (Test type desired); ENTER.**
 - b. Refer to Steps 27 and 28 of Test 2 Data Entry above to select a specific MPM or digital facility to be tested using Fields 3 through 5 (circuit).

Refer to Steps 37 and 44 of Test 2 Data Entry above to select a specific member A GPP or member A data port to be tested using Fields 7 through 11 (equipment type and equipment location).
9. **EXECUTE** must be depressed to test the specific MPM or digital facility selected for testing.

Test 2 Execution and Test Result Display for a Range of Circuits

1. When a range of MPMs and/or digital facilities or member A GPPs are being tested, the **WAIT** indicator is turned on and the following fields are incremented as each facility is tested.

Note: Special error code 93 (no circuit found in range) may be displayed in the **MAAP** error code field after **EXECUTE** is depressed if a range of member A GPPs was selected for testing using the type and equipment location (Fields 6 through 10). If you are sure that the range of member A GPP equipment locations that you entered are modem pooling port equipment locations and you wish to test the range of member A GPPs entered, Refer to Step 52 of Test 2 Data Entry above.

Field 2 - If test type 0 through 2 was entered, Field 2 increments according to the specific tests that are executed.

Note: If host access is being tested, Field 2 does not increment.

Field 3 - Trunk group number of MPM or digital facility being tested.

Field 4 - Member A number of the current MPM or digital facility being tested.

Field 5 - Dashed or member B number if a two-way MPM is being tested.

Field 6 - 1 (Equipment type of member A GPP being tested).

Fields 7 through 11 - Port equipment location of the current MPM or digital facility being tested.

Field 13 - Data type 2 (indicating that bit error rate/bits sent is displayed in Field 14).

Field 14 - Bit error rate/bits sent.

Note: Fields 13 and 14 are updated every 10 seconds.

PROC 646, Test 2

2. When testing is completed for two MPMs, one digital facility, or a one-way MPM, the bit and block error rates, any specific fault code, and the port equipment locations are stored in DMIDS.

3. If DMIDS becomes full at any time during the test, Test 2 is stopped and the **WAIT** indicator is turned off.

The originally selected test type is displayed in Field 2, the circuit location and port equipment location of the last MPM or digital facility tested is displayed in Fields 3 through 11, the current number of circuits tested is displayed in Field 14, and the number of circuits failed is displayed in Field 12.

Special error code 84 (DMIDS overflow) is displayed in the **MAAP** error code field.

4. Results of the test can be examined at this time (see Steps 9 through 17 below) and Test 2 can be continued from where it was stopped; i.e., from the next MPM and/or digital facility in the range being tested.

Caution: *If Test 2 is continued from where it was stopped by a DMIDS overflow, any test results gathered to that point are lost and only new failure data is retained.*

5. If Test 2 is halted because of a DMIDS overflow, a new test type and range of MPMs, digital facilities, or member A GPPs can be selected instead of continuing the test from where it was stopped.

6. The **CHANGE FIELD** sequence must be used to enter the test type desired and the new range of facilities to be tested as follows:

- a. **CHANGE FIELD; 2; ENTER; (Test type desired); ENTER.**

- b. Refer to Steps 22 through 26 of Test 2 Data Entry above to select a range of MPMs or digital facilities to be tested.

Refer to Steps 36 through 43 of Test 2 Data Entry above to select a range of member A GPPs to be tested.

7. **EXECUTE** must be depressed to begin Test 2 from the new range of facilities entered or from where the test was stopped.

Note: Before depressing **EXECUTE** to continue Test 2 from where it was stopped because of a DMIDS overflow, the failure data should be examined and recorded for future maintenance activities.

8. When a range of MPMs and/or digital facilities or member A GPPs has completed testing or **STOP** is depressed, the **WAIT** indicator is turned off.

The original test type selected is displayed in Field 2, the original range selected is displayed in Fields 3 through 11, and the number of circuits tested is displayed in Field 14.

Field 12 displays the number of failures (if any).

9. **All failures with a specific fault code are displayed first followed by passing circuits with a specific fault code of 0.**

Bit and block error rates are displayed for failing and passing circuits.

When multiple tests (more than one test type) are performed on MPMs, digital facilities, or member A GPPs, a specific fault code (if any) and bit/block error rates are displayed for all test types executed for each MPM, digital facility, or member A GPP tested.

10. Depressing **NEXT CIRCUIT** displays the first failing or tested circuit as follows:

Field 1 - 2.

Field 2 - Test type for the displayed facility.

Fields 3 through 5 - Trunk group number, member A, and member B (if applicable) of failing or tested facility.

Field 6 - Type of equipment corresponding to the equipment location displayed in Fields 7 through 11 (i.e., 0 = ADFTC, 1 = member A GPP, 2 = member A data port, 3 = member B GPP, 4 = member B data port).

Fields 7 through 11 - Equipment location of the failing or tested facility (ADFTC, member A GPP, member A data port, member B GPP, or member B data port).

Field 12 - 0 or number of failures.

Field 13 - 1 (indicating that Field 14 displays a specific fault code).

Field 14 - Specific fault code.

11. Depressing **NEXT DATA** examines the port equipment numbers of the GPPs, data ports, and the ADFTC used in testing a facility or facility pair.

Note: **NEXT DATA** can only be depressed after **NEXT CIRCUIT** and/or **NEXT CIRCUIT** and **NEXT FAULT** is depressed.

12. Successive depression of **NEXT DATA** displays in Fields 6 through 11 the type and port equipment locations of the ADFTC; member A GPP; member A data port; member B data GPP; and member B port, starting at different positions depending on the type of circuit(s) tested and the failures detected.
13. The possible starting positions are the ADFTC (Field 6 = 0), member A GPP (Field 6 = 11), or member B GPP (Field 6 = 3).
14. Depressing **NEXT FAULT** displays the bit and block error rates for the tested circuit.
 - a. The first time **NEXT FAULT** is depressed, a 2 is displayed in Field 13, and the bit error rate/bits sent is displayed in Field 14.
 - b. Depressing **NEXT FAULT** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

Note: Refer to Table AZ, PROC 646 - Field Definitions and Codes, to determine how to interpret bit error rate/bits sent and block error rate/blocks sent.

15. Depressing **NEXT FAULT** repeatedly advances through each test type selected displaying type and equipment location of the failure (if any), specific fault code, bit error rate/bits sent, and block error rate/blocks sent for each test type.
 - a. After the block error rate/blocks sent of the last test type selected for testing is displayed for the circuit tested, depressing **NEXT FAULT** once more dashes all fields except Field 1.

PROC 646, Test 2 and Test 3

- b. Depressing **NEXT FAULT** again starts the cycle over with a 1 displayed in Field 13 and a specific fault code displayed in Field 14 for the same circuit.
- 16. Depressing **NEXT CIRCUIT** displays the remaining tested circuits with a 1 displayed in Field 13 and a specific fault code displayed in Field 14.

NEXT FAULT is used to obtain the bit error rate/bits sent and block error rate/blocks sent for the tested circuits.
- 17. When more than one trunk group number is tested, depressing **NEXT UNIT** causes the first tested circuit of the next tested trunk group to be displayed.
 - a. **NEXT CIRCUIT** is used to step through the tested trunk group to display the tested circuits.
 - b. **NEXT FAULT** is used to obtain the bit error rate/bits sent and block error rate/blocks sent for the tested circuits.
- 18. When all tested circuits are displayed, depressing **NEXT CIRCUIT** and/or **NEXT UNIT** dashes all fields except Field 1.
- 19. If a facility is tested with a test type of 0, all tests, and no failure occurs, then any alarm on that facility is automatically resolved in PMIDS.
- 20. To select another range of MPMs or digital facilities to test, the **CHANGE FIELD** sequence must be used to select the test type desired and the specific range of MPMs or digital facilities to be tested as follows:
 - a. **CHANGE FIELD; 2; ENTER; (Test type desired); ENTER.**
 - b. Refer to Steps 22 through 26 of Test 2 Data Entry above to select a range of MPMs or digital facilities in a trunk group, all member Bs, or all member As to be tested.

Refer to Steps 36 through 43 of Test 2 Data Entry to select a range of member A GPPs in a module, cabinet, carrier, or slot to be tested.
- 21. **EXECUTE** must be depressed to begin Test 2 from the new range of MPMs or digital facilities selected for testing.
- 22. Test 2 automatically turns off the **OTHER FAILS** fault indicator when all MPMs and/or digital facilities that raised an alarm pass Test 2 with a test type of 0 assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Note: MPMs and/or digital facilities alarmed entries in PMIDS are marked as resolved if passed with a test type of 0.

Test 3

Test 3 runs diagnostic tests on modem pool members (MPMs) and digital facilities as determined by the test type specified in Field 2.

Diagnostic tests consist of data module or EIA port remote loop back, modem analog loop back, and modem remote digital loop back (212A type modems only) originating and terminating tests. (Each test type is executed in sequence to isolate the fault.)

For digital facilities, translation defined by **PROC 100** Word 2, Field 18 determines the different places that loop backs may be done.

Types of diagnostic tests for MPMs and digital facilities consist of all tests (test type 0 - includes test types 2, 3, 4, and 5), all EIA (remote digital for 212A) remote loop back tests (test type 1 - includes test types 4 and 5), data module remote loop back test (test type 2), EIA local loop back (analog loop back) tests (test type 3), EIA remote loop back (digital) originating tests (test type 4), and EIA remote loop back (digital) terminating tests (test type 5).

Each type of test is not applicable to all types of modem pool members or digital facilities. Types of modems available with modem pool members tested consist of 103J, 113C, 113D, 202S, 203C, 208B, and 212A.

Test types that can be run in Test 3 for modem pool members and digital facilities are:

1. Test type 0 = Any MPM or digital facility being tested.
2. Test type 1 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).
3. Test type 2 = Any MPM or digital facility.
4. Test type 3 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 2 (local loop back control), or 3 (local and remote loop back control).
5. Test type 4 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).
6. Test type 5 = Any MPM if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).

Several different tests may be run on one modem pooling circuit (or circuit pair).

1. Some tests might fail while other tests pass.
2. When a modem pooling circuit (or circuit pair) test fails, a specific fault code is displayed.
3. Bit error rate/bits sent and block error rate/blocks sent are displayed for passing and failing tests.
4. The bit error rate/bits sent and block error rate/blocks sent are provided for further diagnosis (if required).

Characteristics (i.e., facility type, modem type, loop back control, etc.) of digital trunks used in modem pooling are provided in **PROC 100** Words 1 and 2.

When performing diagnostic tests on a trunk group basis, **PROC 100** Word 2 can be used to determine the loop back control of digital trunks.

1. If Field 18 (test type) of **PROC 100** Word 2 equals 1 (no loop back control), the following test types can be run: all tests (test type 0) and the data module remote loop back test (test type 2) on the digital trunk in Test 3.
2. If Field 18 (test type) of **PROC 100** Word 2 equals 2 (local loop back control), the following test types can be run: all tests (test type 0), the data module remote loop back test (test type 2), and EIA local loop back (analog loop back) tests (test type 3) on the digital trunk in Test 3.

PROC 646, Test 3

3. If Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control), the following test types can be run: all tests (test type 0), all EIA remote (remote digital) loop back tests (test type 1), the data module remote loop back test (test type 2), EIA local loop back (analog loop back) tests (test type 3), EIA remote loop back originating tests (test type 4), and EIA remote loop back terminating tests (test type 5) if the trunk group contains modem pool members.

PROC 100 Word 2 can also be used to disable the digital facility testing of a particular modem pooling trunk group.

MPMs and digital facilities can be selected for testing by trunk group number and member A; trunk group number, member A, and Member B (MPM only); or by equipment location.

Test 3 Data Entry

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. When Test 3 is initially called in, Fields 3 through 11 (trunk group member number and equipment location) are dashed, or a default equipment location may be displayed in Fields 3 through 11. Field 14 (data) may display a default specific fault code.
3. The default equipment location can be the last equipment location or trunk group member number displayed in Test 2 of **PROC 646** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. The default equipment location can also be passed from **PROC 620** as long as the equipment location is a GPP or data port which is part of an MPM or digital facility and is still displayed in **PROC 620** when it is passed.
5. Field 2 (test type) is blanked and blinking indicating a mandatory entry.
6. Test types that can be run in Test 3 for modem pool members and digital facilities are:

Test type 0 = Any MPM or digital facility being tested.

Test type 1 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).

Test type 2 = Any MPM or digital facility.

Test type 3 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 2 (local loop back control), or 3 (local and remote loop back control).

Test type 4 = Any MPM or digital facility if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).

Test type 5 = Any MPM if Field 18 (test type) of **PROC 100** Word 2 equals 3 (local and remote loop back control).

7. To select the type of test to be run on MPMs or digital facilities to be tested, enter the test type number in Field 2 and depress **ENTER**.

Note: When a default equipment location is displayed, the maintenance busy status is displayed in Field 13 (data type) when the test type is entered.

8. After the test type (Field 2) is entered, the trunk group number field (Field 3) is blinking indicating that a trunk group number of the MPM or digital facility to be tested may be entered.
9. If an equipment location was carried over from Test 2 and it is an MPM or digital facility, its trunk group and member number are displayed in Fields 3 through 5 (as appropriate) and the equipment location is displayed in Fields 7 through 11.
10. A specific MPM or digital facility or the default equipment location can be tested.

Note: Ranging is not allowed in Test 3 (diagnostic testing).

11. To test the default equipment location, proceed to Step 12.
To test a specific MPM or digital facility, proceed to Step 13.
12. To test the default equipment location, determine if the ADFTC to be used for testing is to be specified before testing.
 - a. If the ADFTC is to be specified, record the default equipment location (Fields 3 through 5, and 7 through 11 as appropriate) and proceed to Step 14.
 - b. If the ADFTC is not to be specified, proceed to Step 33.
13. If a specific ADFTC is to be used for testing, it **must** be selected at this time.
 - a. To select a specific ADFTC to be used for testing, proceed to Step 14.
 - b. If a specific ADFTC is not to be used for testing, proceed to Step 16.
14. The ADFTC to be used for testing can be specified by entering the complete equipment location and the correct type in Fields 6 through 11 as follows:

CHANGE FIELD; 6; ENTER; 0; ENTER; (Module number of ADFTC); ENTER; (Cabinet number of ADFTC); ENTER; (Carrier number of ADFTC); ENTER; (Slot number of ADFTC); ENTER; (Circuit number of ADFTC); ENTER.

Note: If the ADFTC is incompletely specified (all fields not entered), special error code 85 (invalid equipment location) is displayed in the **MAAP** error code field when **EXECUTE** is depressed. Field 7 (module) blinks.

Proceed to Step 15.

15. If a default equipment location is being tested, enter the default equipment location (recorded in Step 12 above) in Fields 3 through 5, and 7 through 11 (as appropriate) using the **CHANGE FIELD** sequence and proceed to Step 33.
16. MPMs or digital facilities can be selected for testing in one of two methods; i.e., by circuit (Fields 3 through 5) or by equipment location and type (Fields 6 through 11).
 - a. To select MPMs or digital facilities for testing using the circuit method, proceed to Step 17.
 - b. To select MPMs or digital facilities for testing using the equipment location and type, proceed to Step 28.
17. Diagnostic tests of MPMs can be specified with only a member A entry or both member A and member B if the MPM is two way.

PROC 646, Test 3

Note: Special error code 87 (invalid circuit fields) is displayed in the **MAAP** error code field if the trunk group number and member A; or trunk group number, member A, and member B are not specified when **EXECUTE** is depressed.

18. Selection of an MPM or digital facility to be tested depends on whether or not a default equipment location is displayed or if a specific ADFTC is selected for testing.
 - a. If a default equipment location is displayed or if a specific ADFTC is selected for testing, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed or no specific ADFTC is selected for testing, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the MPM or digital facility to be tested.
19. To select an MPM or digital facility to be tested by using the trunk group number and member A, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:

Note: If a specific digital facility or a one-way MPM is being tested, Field 5 (member B) **must** be dashed.

- a. (Trunk group number of MPM or digital facility to be tested); ENTER; (Member A of MPM or digital facility to be tested); ENTER; ENTER.
- b. CHANGE FIELD; 3; ENTER; (Trunk group number of MPM or digital facility to be tested); ENTER; (Member A of MPM or digital facility to be tested); ENTER; ENTER.

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test an MPM or digital facility by using the trunk group number and member A, proceed to Step 40.

Test 3 tests the MPM or digital facility specified in Fields 3 and 4.

Proceed to Step 25.

20. To select an MPM to be tested by using the trunk group number, member A, and member B, perform one of the following depending on whether or not a default equipment location is displayed or a specific ADFTC was selected for testing:

Note: Digital facilities cannot be tested by specifying a member B. Special error code 94 (member B invalid for digital facilities) is displayed in the **MAAP** error code field if member B is specified and the trunk group number is a digital facility trunk before **EXECUTE** is depressed.

- a. (Trunk group number of MPM to be tested); ENTER; (Member A of MPM to be tested); ENTER; (Member B of MPM to be tested); ENTER.
- b. CHANGE FIELD; 3; ENTER; (Trunk group number of MPM to be tested); ENTER; (Member A of MPM to be tested); ENTER; (Member B of MPM to be tested); ENTER.

Note: Special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) may be displayed in the **MAAP** error code field when the trunk group number is entered in Field 3. If you are sure that the trunk group number that you entered is a modem pooling trunk group and you wish to test an MPM by using the trunk group number, member A, and member B, proceed to Step 40.

Test 3 tests the MPM specified in Fields 3 through 5.

Proceed to Step 25.

21. **NEXT CIRCUIT** can be used to select a circuit or circuit pair before test execution.

Note: If a modem pooling trunk group is disabled by **PROC 100** Word 2 (Field 18 equals 0), circuits or circuit pairs associated with the disabled trunk group will not be displayed by depressing **NEXT CIRCUIT**.

22. If nothing is specified in the circuit or equipment location fields (Fields 3 through 5 and 7 through 11), two available facilities are displayed in the circuit and equipment location fields from the first testable trunk group when **NEXT CIRCUIT** is depressed. If the trunk group contains digital facilities or MPMs with one-way modems, member B (Field 5) is dashed.

Proceed to Step 25.

23. If the circuit field is specified up to member A (Fields 3 and 4), member A is incremented to the next member A when **NEXT CIRCUIT** is depressed.

Proceed to Step 25.

24. If both members A and B are specified, the member number is advanced corresponding to the type field (Field 6) of the equipment location fields when **NEXT CIRCUIT** is depressed.

Proceed to Step 25.

25. After the circuit fields are specified, the equipment location fields (Fields 7 through 11) defaults to the equipment location of the member A GPP.

The type field (Field 6) defaults to 1 indicating the GPP port of member A is displayed in Fields 7 through 11.

Proceed to Step 26.

26. Before test execution, **NEXT DATA** can be depressed to examine port equipment locations associated with the circuit selected for testing.
27. Successive depression of **NEXT DATA** displays in Fields 6 through 11 the type and port equipment locations of the member A GPP, member A data port, member B GPP, and member B data port.

Note: Depressing **NEXT DATA** does not always display 4 equipment locations before testing. The type and port equipment locations (displayed in Fields 6 through 11) used for testing depends on whether MPMs or digital facilities are being tested.

The maintenance busy status of each port equipment location is displayed in Field 13.

Proceed to Step 33.

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28. MPMs or digital facilities can be selected for testing using the test type and equipment location fields (Fields 6 through 11).

Member A GPP, member A data port, member B GPP, or member B data port can be designated as the type of facilities to test.

Note: Ranging is not allowed in Test 3 (diagnostic testing). Special error code 80 (equipment location not complete) is displayed in the **MAAP** error code field after **EXECUTE** is depressed if ranging is attempted.

29. To select the type of facility to test, the **CHANGE FIELD** sequence must be used:
- CHANGE FIELD; 6; ENTER; (equipment location type); ENTER.**
 - Equipment location types are: 1 = Member A GPP port, 2 = Member A data port, 3 = Member B GPP port, 4 = Member B data port.

Note: Only equipment location type 1 (member A GPP) can be entered in Field 6 for testing of digital facilities.

30. When the equipment location type is entered in Field 6, the module field (Field 7) blinks for entry.
31. To select an MPM or digital facility to be tested by using the equipment location method, enter the following:

(Module number of member A GPP, member A data port, member B GPP, or member B data port to be tested); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

Note: Equipment location type (Field 6) **must** correspond to the equipment location selected or error code 85 (invalid equipment location) is displayed in the **MAAP** error code field when **EXECUTE** is depressed.

32. After the equipment location fields are specified, the circuit fields (Fields 3 and 4) display the trunk group number and member A number.

Note: If a modem pooling trunk group is disabled by **PROC 100** Word 2 (Field 18 equals 0), the circuit fields (Fields 3 and 4) will not display the trunk group number and member A number.

33. The maintenance busy status of the equipment location displayed in Fields 7 through 11 is displayed in Field 13.
- The circuit displayed in Fields 7 through 11 can be busied out (if required).
 - If the circuit is to be busied out for testing, proceed to Step 34.

If busy out of the circuit is not required, proceed to Step 35.

34. Individual port equipment locations can be placed in maintenance busy out status for testing by performing the following.

Note: If Fields 7 through 11 are not entered, special error code 96 (fields 7 through 11 must be entered before use of **BUSY OUT**) is displayed in the **MAAP** error code field.

- a. Check the maintenance busy status displayed in Field 13.
- b. If the maintenance busy status = 5, proceed to Step 35.

If the maintenance busy status = 6, depress **BUSY OUT** and proceed to Step 35.

Note: Special error code 85 (invalid equipment location) may be displayed in the **MAAP** error code field when **BUSY OUT** is depressed. If you are sure that the individual port equipment location that you entered is a modem pooling port equipment location and you wish to test the MPM or digital facility entered, proceed to Step 40.

35. The length of the text (**maximum of 4 minutes for each test type executed**) can be entered in Field 12, or a default test length can be chosen.

Note: The default test length causes a very short (less than 2 seconds) test. However, processing overhead increases the delay seen at the **MAAP** to less than 15 seconds for each test type. This default test length applies to all bit rates and test types.

36. Either Field 12 (test length) is blinking or the **CHANGE FIELD** sequence must be used to entered the desired test length.
 - a. If Field 12 is blinking, proceed to Step 37.
 - b. If Field 12 is not blinking, perform **CHANGE FIELD; 12; ENTER** and proceed to Step 37.
37. If a default test length is desired, depress **ENTER**. If a different test length is desired, enter the time (minutes) in Field 12:

(1 through 4 - maximum of 4 minutes); ENTER.

Note: The actual test length executed for each test type selected is determined by whether the test for the test type passes or fails. If the test passes, either the default test length or the time entered in Field 12 is used for the test performed. If the test fails, the time of the test is the default test length no matter what time is entered in Field 12.

38. Field 14 (data rate) blinks for entry. The data rate can be entered in Field 14, or a default data rate can be chosen.

Note: Refer to Table BA, PROC 646 Modem Bit Rates, to determine the data rate for the modem type to be tested.

39. If a default data rate is desired, depress **ENTER**. If a different data rate is desired, enter the data rate in Field 14:

(Data rate); ENTER.

Data rate encodes are: 3 = 300 bps; 12 = 1200 bps; 24 = 2400 bps; 48 = 4800 bps; 96 = 9600 bps; 192 = 19.2 kbps; 560 = 56 kbps; 640 = 64 kbps.

40. When special error code 97 (**PROC 100** has disabled digital facility testing for this trunk group) or special error code 85 (invalid equipment location) is displayed and you are sure that the trunk group, specific MPM, or digital facility is a modem pooling trunk group or member, perform Steps 41 through 47 as appropriate.

PROC 646, Test 3

41. Using **PROC 100** Word 2, enter the trunk group number and depress **DISPLAY, EXECUTE**.
42. Check the encode displayed in Field 18.
 - a. If the encode in Field 18 is a 0, proceed to Step 43.
 - b. If the encode in Field 18 is not a 0, you have entered the wrong trunk group number or an invalid equipment location.
43. Record the data displayed in each field of **PROC 100** Word 2 for the trunk group entered.
44. Depress **REMOVE, EXECUTE**.
45. Enter the trunk group and the data recorded in Step 43 except for Field 18. Enter a 1, 2, or 3 encode in Field 18 depending on the type of loop back control required in testing the modem pooling trunk group.
46. Depress **ADD, EXECUTE**.

The modem pooling trunk group can now be tested in **PROC 646** Test 2 or Test 3.
47. Repeat Test 3 from Step 1 of Test 3 Data Entry.

Test 3 Execution

1. To start Test 3 after selecting the test type, the ADFTC to be used for testing, the MPM or digital facility to be tested, the test length and baud rate, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

2. Field 2 displays the test type being executed.

Field 13 displays a 2 indicating the bit error rate/bits sent is being displayed in Field 14.

The bit error rate/bits sent is displayed in the data field (Field 14).

Note: Fields 13 and 14 are updated every 10 seconds.

3. If a facility is maintenance busied out, it is released from busy while under test.
4. When the test encounters a facility in use, a specific fault code is logged in DMIDS records and the test is stopped.

The data call in progress is not aborted.

5. During Test 3, **STOP** can be depressed to halt the test.
6. If Test 3 is stopped before one complete testing pass through a specific MPM or digital facility or the default equipment location is made, special error code 95 (wait for test to stop) is displayed in the **MAAP** error code field.

Note: One complete testing pass means that all test types selected are tested for a specific MPM or digital facility or the default equipment location.

7. After the current test is completed, special error code 82 (test of range not completed) is displayed in the **MAAP** error code field indicating that one complete pass through the specific MPM or digital facility or the default equipment location is not completed.

8. The port equipment location of the MPM or digital facility being tested is displayed in Fields 3 through 11 and the total number of failures (if any) is displayed in Field 12.
9. If any failures are displayed in Field 12, test result information can be stepped through as described in Test 3 Result Display below when Test 3 is halted using **STOP** even though the facility is not tested.
10. To restart the test when Test 3 is halted by use of **STOP**, **EXECUTE** is depressed and Test 3 retests the MPM or digital facility selected for testing.

Note: When Test 3 is restarted after being halted by use of **STOP**, any test results gathered to that point are retained.

Test 3 Result Display

1. When Test 3 is completed or **STOP** is depressed for a default equipment location, a specific MPM or digital facility the **WAIT** indicator is turned off and the following is displayed:

Field 1 - 3.

Field 2 - Original test type selected for testing MPM or digital facility.

Fields 3 through 5 - Circuit location.

Field 6 - Type of equipment location (1 through 4).

Fields 7 through 11 - Port equipment location of MPM or digital facility tested.

Field 12 - 0 (indicating no failures were found for the MPM or digital facility tested) or 1 (indicating the MPM or digital facility failed the test).

Field 13 - Data type of 4 (indicating that Field 14 indicates the number of circuits tested).

Field 14 - 0 (if **STOP** was depressed indicating all tests are not completed) or 1 (indicating 1 MPM, MPM pair, or digital facility tested).

Note: Special error code 85 (invalid equipment location) may be displayed in the **MAAP** error code field after **EXECUTE** is depressed. If you are sure that the individual port equipment location that you entered is a modem pooling port equipment location and you wish to test the MPM or digital facility entered, Refer to Step 40 of Test 3 Data Entry above.

2. When multiple tests are performed on the MPM or digital facility tested, failing tests are displayed first, followed by tests that passed.
3. Depressing **NEXT CIRCUIT** changes the display in the data type and data fields (Fields 13 and 14) and may change the type and equipment location in Fields 6 through 11 depending on the type of failure (if any).
Field 13 displays a 1 indicating that the data in Field 14 is a specific fault code.
4. Depressing **NEXT FAULT** displays a 2 in Field 13 and the bit error rate/bits sent in Field 14.
5. Depressing **NEXT FAULT** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

Note: Refer to Table AZ, PROC 646 - Field Definitions and Codes, to determine how to interpret bit error rate/bits sent and block error rate/blocks sent.

PROC 646, Test 3

6. Depressing **NEXT FAULT** repeatedly advances through each test type selected displaying type and equipment location of the failure (if any), specific fault code, bit error rate/bits sent, and block error rate/blocks sent for each test type.
 - a. After the block error rate/blocks sent of the last test type selected for testing is displayed for the circuit tested, depressing **NEXT FAULT** once more dashes all fields except Field 1.
 - b. Depressing **NEXT FAULT** again starts the cycle over with a 1 displayed in Field 13, and a specific fault code displayed in Field 14 for the same circuit.
7. To examine the port equipment locations of the GPPs, data ports, and the ADFTC used in testing a MPM or digital facility, depress **NEXT DATA**.

Note: **NEXT DATA** can only be depressed after **NEXT CIRCUIT** and/or **NEXT CIRCUIT** and **NEXT FAULT** is depressed.

8. Field 6 cycles from 0 through 4 each time **NEXT DATA** is depressed, starting at different positions depending on the type of circuit tested and the failures detected, and displays in Fields 7 through 11 the port equipment locations of the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), member A data port (Field 6 = 2), member B GPP (Field 6 = 3), and member B data port (Field 6 = 4).

Note: Depressing **NEXT DATA** does not always display 5 equipment locations. The type and port equipment locations (displayed in Fields 6 through 11) used for testing depends on whether MPMs or digital facilities were tested.

9. The possible starting positions are the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), or member B GPP (Field 6 = 3).

Note: One way MPMs only display the ADFTC (Field 6 = 0), member A GPP (Field 6 = 1), **or** only display the ADFTC (Field 6 = 0), **or** member A GPP (Field 6 = 1).

10. When another specific MPM, digital facility, member A GPP, member A data port, member B GPP, or member B data port is to be tested, the **CHANGE FIELD** sequence must be used to select the test type desired and the specific MPM, digital facility, member A GPP, member A data port, member B GPP, or member B data port to be tested.
 - a. **CHANGE FIELD; 2; ENTER; (Test type desired); ENTER.**
 - b. Refer to Steps 19 through 24 of Test 3 Data Entry above to select a specific MPM or digital facility to be tested using the circuit method (Fields 3 through 5).

Refer to Steps 28 through 31 of Test 3 Data Entry above to select a specific MPM or digital facility to be tested using the equipment location and type method (Fields 6 through 11).
11. **EXECUTE** must be depressed to test the specific ADFTC circuit selected for testing.

Repair Guide

When an ADFTC, MPM, or digital facility failure is indicated, (**PROC 646** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed to isolate and repair the faulty unit.

The starting point for isolation and repair of alarmed ADFTC, MPM, or digital facilities is **PROC 600**.

1. Execute **PROC 600**, Test 1 to determine which type of modem pooling circuits (ADFTC, MPM, or digital facility) are alarmed (indicated by **PROC 646** being referenced in Field 15 of **PROC 600**), the severity of the alarms, and the order in which the modem pooling circuits are displayed.

Record the failing modem pooling circuits displayed in **PROC 600**, Test 1.

2. Determine from the modem pooling circuits recorded if a pattern exists that would assist in determining the type of corrective action required.
 - a. If only ADFTC failures are recorded, perform isolation and repair steps detailed in **ADFTC Alarmed Failures**.
 - b. If only MPM or digital facility failures are recorded, perform isolation and repair steps detailed in **MPM or Digital Facility Alarmed Failures**.
3. When both ADFTC and MPM or digital facility failures are recorded, perform isolation and repair steps for ADFTC failures before performing isolation and repair steps for MPM or digital facility failures.

When user reported troubles associated with modem pooling members are reported, perform isolation and repair steps detailed in **User Reported Troubles**.

To assist in fault isolation, **PROC 620** may be used before or after **PROC 646** to test specific GPPs, data ports, or ADFTCs. Equipment locations are automatically passed from **PROC 620** to **PROC 646** or from **PROC 646** to **PROC 620**.

ADFTC Alarmed Failures

1. Display the failing ADFTC circuit in Test 1 of **PROC 600**.
2. Enter **PROC 646**, Test 1.

Note: The alarmed ADFTC circuit that was displayed in Test 1 of **PROC 600** is the default equipment location displayed in Test 1 of **PROC 646**.

Record the specific fault code displayed in Field 14 (data) which was detected by on-line periodic software tests and logged in PMIDS.

3. Enter test type number 0 in Field 2 and depress **ENTER**.

Note: If the ADFTC circuit is tested with a test type of 0 (all ADFTC self tests) and no failure occurs, any alarm on the ADFTC circuit is automatically resolved in PMIDS.

4. Depress **EXECUTE**.

If the ADFTC circuit passes (indicated by a 0 in Field 12), proceed to Step 9.

If the ADFTC circuit fails (indicated by a 1 in Field 12), proceed to Step 5.

5. Depress **NEXT CIRCUIT** and record the specific fault code displayed in Field 14 (data).
6. Replace the CKT1 component or perform corrective action listed in Table BB, PROC 646 - Component Replacements, for the specific fault code displayed in Field 14.

TABLE BB.

PROC 646 - COMPONENT REPLACEMENTS					
FAULT CODE	COMPONENT REPLACEMENT OR CORRECTIVE ACTION				
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5
12	Repeat test when switch is less busy. If failure continues with a fault code of 12, use PROC 620 to test time slots (i.e., range on PDIs).				
218	Run PROC 620 on module processor (unit type 7).				
454	Run PROC 646 Test 1.				
455 through 458	Run PROC 646 Test 1 and PROC 620 GPP test by specifying ADFTC unit type 62.				
1000	Run PROC 620 on module processor (unit type 7).				
1001	Run PROC 646 on unit.				
1002	Run PROC 646 on trunk group.				
1003	TDM/2	SN270			
1004	MODEM	SN243			
1005 through 1025	SN261				
1026 through 1029	SN261	Run PROC 620 on IOBI (unit type 12) and PCI (unit type 14).			
1030, 1038, 1045, 1052, 1059, 1066, 1073, 1080, 1087, 1094, 1101, 1108, 1115, 1122, 1129, 1136, 1143, 1150, 1157, 1164, 1171, 1178, 1185, 1192, 1199, 1207, 1214, 1221, 1228, 1235, 1242, 1249, 1256, 1263, 1270, 1277	MODEM	TDM/2	SN261		
1031, 1039, 1046, 1053, 1060, 1067, 1074, 1081, 1088, 1095, 1102, 1109, 1116, 1123, 1130, 1137, 1144, 1151, 1158, 1165, 1172, 1179, 1186, 1193, 1200, 1208, 1215, 1222, 1229, 1236, 1243, 1250, 1257, 1264, 1271, 1278	MODEM	TDM/2	SN261		
1032, 1040, 1047, 1054, 1061, 1068, 1075, 1082, 1089, 1096, 1103, 1110, 1117, 1124, 1131, 1138, 1145, 1152, 1159, 1166, 1173, 1180, 1187, 1194, 1201, 1209, 1216, 1223, 1230, 1237, 1244, 1251, 1258, 1265, 1272, 1279	MODEM	TDM/2	SN270	SN243	SN261
1034, 1041, 1048, 1055, 1062, 1069, 1076, 1083, 1090, 1097, 1104, 1111, 1118, 1125, 1132, 1139, 1146, 1153, 1160, 1167, 1174, 1181, 1188, 1195, 1202, 1210, 1217, 1224, 1231, 1238, 1245, 1252, 1259, 1266, 1273, 1280	MODEM	TDM/2	SN270	SN243	SN261

TABLE BB. (Contd)

PROC 646 - COMPONENT REPLACEMENTS					
FAULT CODE	COMPONENT REPLACEMENT OR CORRECTIVE ACTION				
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5
1035, 1042, 1049, 1056, 1063, 1070, 1077, 1084, 1091, 1098, 1105, 1112, 1119, 1126, 1133, 1140, 1147, 1154, 1161, 1168, 1175, 1182, 1189, 1196, 1203, 1211, 1218, 1225, 1232, 1239, 1246, 1253, 1260, 1267, 1274, 1281	TDM/2	SN270	SN261		
1036, 1043, 1050, 1057, 1064, 1071, 1078, 1085, 1092, 1099, 1106, 1113, 1120, 1127, 1134, 1141, 1148, 1155, 1162, 1169, 1176, 1183, 1190, 1197, 1204, 1212, 1219, 1226, 1233, 1240, 1247, 1254, 1261, 1268, 1275, 1282	MODEM	TDM/2	SN270	SN243	SN261
1037, 1044, 1051, 1058, 1065, 1072, 1079, 1086, 1093, 1100, 1107, 1114, 1121, 1128, 1135, 1142, 1149, 1156, 1163, 1170, 1177, 1184, 1191, 1198, 1206, 1213, 1220, 1227, 1234, 1241, 1248, 1255, 1262, 1269, 1276, 1283	SN261				
1284	TDM/2	SN270	SN261		
1285	TDM/2	SN270	SN261		
1286, 1293, 1300, 1307, 1314, 1321, 1328, 1335, 1342, 1349, 1356, 1363, 1370, 1377, 1384, 1391, 1398, 1405, 1412	MODEM	TDM/2	SN261		
1287, 1294, 1301, 1308, 1315, 1322, 1329, 1336, 1343, 1350, 1357, 1364, 1371, 1378, 1385, 1392, 1399, 1406, 1413	MODEM	TDM/2	SN261		
1288, 1295, 1302, 1309, 1316, 1323, 1330, 1337, 1344, 1351, 1358, 1365, 1372, 1379, 1386, 1393, 1400, 1407, 1414	MODEM	TDM/2	SN270	SN243	SN261
1289, 1296, 1303, 1310, 1317, 1324, 1331, 1338, 1345, 1352, 1359, 1366, 1373, 1380, 1387, 1394, 1401, 1408, 1415	MODEM	TDM/2	SN270	SN243	SN261
1290, 1297, 1304, 1311, 1318, 1325, 1332, 1339, 1346, 1353, 1360, 1367, 1374, 1381, 1388, 1395, 1402, 1409, 1416	TDM/2	SN270	SN261		

TABLE BB. (Contd)

PROC 646 - COMPONENT REPLACEMENTS					
FAULT CODE	COMPONENT REPLACEMENT OR CORRECTIVE ACTION				
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5
1291, 1298, 1305, 1312, 1319, 1326, 1333, 1340, 1347, 1354, 1361, 1368, 1375, 1382, 1389, 1396, 1403, 1410, 1417	MODEM	TDM/2	SN270	SN243	SN261
1292, 1299, 1306, 1313, 1320, 1327, 1334, 1341, 1348, 1355, 1362, 1369, 1376, 1383, 1390, 1397, 1404, 1411, 1418	SN261				
1419 through 1421	If call can be dropped, use BUSY OUT, then RELEASE BUSY, and retest.				
1422 and 1423	Use BUSY OUT, then RELEASE BUSY, and retest.				
1424	Wait for member to become available or use BUSY OUT, then RELEASE BUSY to drop customer call on a busy member.				
1425 and 1426	SN261				
1427	Ensure ADFTC is administered.				
1428	Use BUSY OUT, then RELEASE BUSY if call using ADFTC can be dropped.				
1429	RELEASE BUSY and retest.				
1430	MODEM	SN243			
1431	TDM/2	SN270			

7. Repeat Test 1.

If the ADFTC passes Test 1, proceed to Step 11.

8. If the ADFTC fails Test 1, replace CKT2 or perform any additional corrective action listed in Table BB, PROC 646 - Component Replacements for the specific fault code recorded.

If no additional corrective action is listed in Table BB, PROC 646 - Component Replacements, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

9. When alarmed ADFTC circuits pass Test 1 without corrective action being performed (i.e., replacing a circuit pack), further analysis of the problem should be performed by using **PROC 620**, Test 4 and testing unit type 62 (ADFTC).

If Test 4 of **PROC 620** passes, check the backplane wiring associated with the ADFTC circuit pack.

If Test 4 of **PROC 620** fails, take the appropriate corrective action.

10. When Test 4 of **PROC 620** passes after taking corrective action, repeat Test 1 of **PROC 646** to retire the cause of the **OTHER FAILS** fault indicator.

11. Test 1 must be run for each alarmed ADFTC circuit recorded in Test 1 of **PROC 600**.
 - a. Use the **CHANGE FIELD** sequence to enter the next recorded ADFTC failure in Fields 7 through 11 (equipment location).
 - b. Repeat Steps 3 through 11 (as appropriate).
12. If all alarmed ADFTC circuits pass Test 1, the **OTHER FAILS** fault indicator is automatically turned off if no other sources (including MPM or digital facility failures) are affecting the fault indicator.

MPM or Digital Facility Alarmed Failures

1. Display the failing MPM or digital facility in Test 1 of **PROC 600**.
2. Enter **PROC 646**, Test 3.

Note: The alarmed MPM or digital facility that was displayed in Test 1 of **PROC 600** is the default equipment location displayed in Test 3 of **PROC 646**.

Record the specific fault code displayed in Field 14 (data) which was detected by on-line periodic software tests and logged in PMIDS.

3. Enter test type number 0 in Field 2 and depress **ENTER**.
4. Enter the test length in Field 12 or depress **ENTER** for a default test length. The MPM or digital facility can be tested from **1 to 4 minutes for each test type selected** by entering the time (in minutes) in Field 12.

(1 through 4 - maximum of 4 minutes); ENTER.

Note: The actual test length executed for each test type selected is determined by whether the test for the test type passes or fails. If the test passes, either the default test length or the time entered in Field 12 is used for the test performed. If the test fails, the time of the test is the default test length no matter what time is entered in Field 12.

5. Enter the data rate in Field 14 or depress **ENTER** for a default data rate.

(Data rate); ENTER.

6. Depress **EXECUTE**.

If the MPM or digital facility passes (indicated by a 0 in Field 12), proceed to Step 18.

If the MPM or digital facility fails (indicated by a 1 in Field 12), proceed to Step 7.

7. Depress **NEXT CIRCUIT** and record the test type (first test type failed) displayed in Field 2, the equipment location displayed in Fields 7 through 11, and the specific fault code displayed in Field 14 (data).
8. Component replacements for the specific fault code displayed in Field 14 are listed in Table BB, PROC 646 - Component Replacements.
9. For modem pooling, the priority order of component replacement is listed in Table BC, PROC 646, Test 3 Failure Groups for Modem Pooling.

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10. For digital facilities, the priority order of component replacement is listed in Table BD, PROC 646, Test 3 Failure Groups for Digital Facilities.
11. The order of component replacement depends on the first test type failed (displayed in Field 2) and the type of facility tested.
12. Determine from the specific fault code, the first test type failed, and the facility tested, the first component to replace based on Table BB, and Table BC, or Table BD.
Replace the component.
13. Repeat Test 3.
If the facility passes Test 3, proceed to Step 22.
14. If the facility fails Test 3, replace the next component listed in Table BB, and Table BC, or Table BD based on the specific fault code and the type of facility tested.

TABLE BC.

PROC 646, TEST 3 FAILURE GROUPS FOR MODEM POOLING			
FIRST TEST TYPE FAILED	FAILURE GROUP FOR FAILING MEMBER IDENTIFIED (IN PRIORITY ORDER)		
	MEMBER A	MEMBER B [2]	ADFTC
4 or 5 [1]	Modem B [2]; modem A; SN243 member A; SN243 member B [2]; TDM/2 member A; TDM/2 member B [2]; SN270/SN271 member A; SN261.	Modem B [2]; TDM/2 member B [2]; SN270/SN271 member B [2]; SN261.	SN261
3	Modem A; TDM/2 member A; SN270/SN271 member A; SN261.		SN261
2	TDM member A; SN270/SN271 member A; SN261.		SN261
[1]	This failure group is also applicable with members which cannot use test types 4 or 5, but pass test types 2 and 3 in Test 3 and fail test type 0 in Test 2.		
[2]	For originating and terminating modem pool members only.		
[3]	Run PROC 620 on individual SN270/TDM/2 or SN271/TDM/2, SN243, or ADFTC if further isolation of trouble is required.		

15. Depressing **NEXT DATA** displays in Field 6 (type) the member A GPP, member A data port, member B GPP, and member B data port equipment locations in Fields 7 through 11.

Note: The equipment location displayed in Fields 7 through 11 for data ports determines the location of the modem to be replaced for modem pooling failures. The equipment location displayed in Fields 7 through 11 for member A GPP determines the location of the digital facility to be replaced for digital facility failures.

16. Repeat Steps 13 through 15 until all components listed in Table BB, and Table BC, or Table BD based on the specific fault code and the type of facility are replaced or the problem is corrected.
17. If the facility still fails after all components are replaced, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.
18. When alarmed MPM or digital facilities pass Test 3 without corrective action being performed (i.e., replacing a circuit pack), further analysis of the problem should be performed by changing the length of the test and repeating Test 3 to ensure that the alarmed failure is not intermittent.

TABLE BD.

FIRST TEST TYPE FAILED	PROC 646, TEST 3 FAILURE GROUPS FOR DIGITAL FACILITIES	
	FAILURE GROUP FOR FAILING MEMBER IDENTIFIED (IN PRIORITY ORDER)	
	MEMBER A [1] [2]	ADFTC [2]
4	Digital facility; TIE/DSU/private line modem; TDM/2; SN270/SN271; SN261.	SN261
3	TIE/DSU/private line modem; TDM/2; SN270/SN271; SN261.	SN261
2	[3] TDM/2 or PDM; SN270/SN271; SN261	SN261
[1]	Components included in a particular failure group depend on the specific application.	
[2]	Run PROC 620 on individual SN270/TDM/2 or SN271/TDM/2 or SN261 if further isolation of trouble is required.	
[3]	When the digital facility uses an EIA port, replace SN238 instead of TDM/2 or PDM and SN270 or SN271.	

19. Four minutes is recommended for the length of the test to ensure no intermittent failures exist.

Proceed to Step 20.

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20. Change the length of the test by performing.
CHANGE FIELD; 12; ENTER; (4); ENTER.
21. Depress **EXECUTE**.
If the MPM or digital facility passes (indicated by a 0 in Field 12), proceed to Step 21.
If the MPM or digital facility fails (indicated by a 1 in Field 12), perform Steps 7 through 17 (as appropriate).
22. Test 3 must be run for each alarmed MPM or digital facility recorded in Test 1 of **PROC 600**.
 - a. Use the **CHANGE FIELD** sequence to enter the next recorded MPM or digital facility failure in Fields 6 through 11 (equipment type and equipment location).
 - b. Repeat Steps 3 through 21 (as appropriate).
23. If all alarmed failures pass Test 3, perform Test 2 to turn off the **OTHER FAILS** fault indicator.

User Reported Troubles

When user troubles associated with modem pooling members are reported, perform the following steps (as appropriate). Isolation of user reported troubles consist of:

1. General isolation techniques.
2. Isolation of a suspected failing trunk group.
3. Isolation of an unknown modem pool path.

General Isolation Techniques:

Typical user information may include data rate, asynchronous or synchronous, or dial code used which may help to isolate the failing trunk group.

1. For example, if the user dialed **9** and then a remote computer port, the PDM used was set at 1200 bps, asynchronous, full duplex. A modem pool trunk group with matching characteristics would be suspect.
2. On the other hand, if a user dialed a local host computer, then a host access type of trunk group with that dial code is suspect.
3. Incoming calls may also chose a specific trunk group.

To determine the data rate on a data module associated with a modem, **PROC 070** or **PROC 100** can be used.

1. Examine Test 1 of **PROC 600** to determine if any alarmed entries exist for unit type 62 (ADFTC), unit type 65 (modem pooling), and unit type 35 (digital facilities).
2. If alarmed ADFTC circuits exist, perform isolation and repair step **ADFTC Alarmed Failures** above for all alarmed ADFTC circuits in **PROC 600**, Test 1 to isolate the trouble.
3. If alarmed modem pooling or digital facility circuits exist, perform isolation and repair step **MPM or Digital Facility Alarmed Failures** above for all alarmed modem pooling or digital facility circuits in **PROC 600**, Test 1 to isolate the trouble.

4. Examine Test 2 of **PROC 600** to determine if any entries with recorded errors exist for unit type 62 (ADFTC), unit type 65 (modem pooling), or unit type 35 (digital facilities).
5. If entries with recorded errors exist for ADFTC circuits, perform isolation and repair step **ADFTC Alarmed Failures** above for all ADFTC entries with recorded errors in **PROC 600**, Test 2 to isolate the trouble.
6. If entries with recorded errors exist for modem pooling or digital facilities, perform isolation and repair step **MPM or Digital Facility Alarmed Failures** above for all modem pooling or digital facility entries with recorded errors in **PROC 600**, Test 2 to isolate the trouble.

Isolation of a Suspected Failing Trunk Group

1. Determine from the user the type of modem, data rate, and dial access code used to initiate the call.
Modem types consist of 103J, 113C, 113D, 202S, 201C, 208B, and 212A.
2. Characteristics (i.e., modem type, loop back control, etc.) of digital trunks used in modem pooling are provided in **PROC 100**, Words 1 and 2.
3. Perform Test 2 of **PROC 646** on the trunk group suspected of failing by entering the trunk group number in Field 3.

Note: If the trunk group has a data rate of 300 or 1200 bps, set the test length to only 1 minute to identify severe problems quickly.

4. If any members of the trunk group fail, perform isolation and repair step **MPM or Digital Facility Alarmed Failures** above for each failing member of the trunk group to isolate the trouble.
5. If no members of the trunk group fail, use **NEXT FAULT** to determine the bit and block error rate for each member of the trunk group.
6. The bit and block error rate is determined by multiplying the first digit (left most side) in Field 14 by 10 raised to the negative of the second digit in Field 14.
The number of bits or blocks sent is determined by multiplying the third digit in Field 14 by 10 raised to the fourth digit in Field 14.
7. The threshold for bit and block error rates is 1×10^{-5} (or 15 displayed in the first 2 digits of Field 14).
8. Determine which member of the trunk group has the poorest bit and block error rate.
9. Depress **NEXT DATA** and record the equipment location of the GPPs and data ports used in the testing of the MPM with the poorest bit and block error rate.

Note: Field 6 = 1, Fields 7 through 11 displays the equipment location of member A GPP; Field 6 = 2, Fields 7 through 11 displays the equipment location of member A data port; Field 6 = 3, Fields 7 through 11 displays the equipment location of member B GPP; Field 6 = 4, Fields 7 through 11 displays the equipment location of member B data port.

10. Display the member A GPP equipment location in Fields 7 through 11 of **PROC 646**, Test 2.

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11. Use **PROC 620**, Test 4 to test the member A GPP.

Note: The circuit that was displayed in Test 2 of **PROC 646** is the default equipment location displayed in Test 4 of **PROC 620**.

12. If Test 4 of **PROC 620** fails, take the appropriate corrective action and proceed to Step 14.

Note: Some failures detected by the GPP test in **PROC 620** are repaired by replacing the associated TDM/2 or PDM.

If Test 4 of **PROC 620** passes, proceed to Step 13.

13. Repeat Test 4 of **PROC 620** for the member A data port, member B GPP, and member B data port using the **CHANGE FIELD** method to enter the equipment locations recorded in Step 9 above.

If Test 4 of **PROC 620** fails, take the appropriate corrective action and proceed to Step 14.

If Test 4 of **PROC 620** passes for all circuits tested (member A GPP; member A data port; member B GPP; member B data port), proceed to Step 16.

14. When **PROC 620** passes after taking corrective action, repeat Test 2 of **PROC 646** to ensure that the failure is corrected.
15. Check the bit and block error rate.

If the bit and block error rate is acceptable, no further corrective action is required.

16. Enter Test 2 of **PROC 646** and display the member of the trunk group with the poorest bit and block error rate.
17. Replace the modem associated with the member with the poorest bit and block error rate.

Repeat Test 2.

18. Check the bit and block error rate.

If the bit and block error rate is acceptable, no further corrective action is required.

19. If the bit and block error rate is the same or worse, replace the data module associated with the member with the poorest bit and block error rate.

Repeat Test 2.

20. Check the bit and block error rate.

If the bit and block error rate is acceptable, no further corrective action is required.

21. If the bit and block error rate is the same or worse, check the wiring associated with the ADFTC, MPM or digital facility, modem, and data module.

Isolation of an Unknown Modem Pool Path:

When a modem pooling trouble is reported by the user **that** cannot be isolated using **PROC 646**, **and** no entries (alarmed or error) are displayed in **PROC 600**, Tests 1 and 2 that correspond to the reported trouble, the problem is probably an intermittent trouble that cannot be isolated utilizing the normal techniques.

If this type of trouble persists for the user, the specific modem pool path for the troublesome connection must be determined and the trunk verification feature used to isolate the faulty component.

Note: When this type of trouble occurs again, the user must not hang up. The modem pool path would be disconnected if the user hangs up and no further action can be accomplished. Inform the user that on the next occurrence of this type of trouble to maintain the connection and to notify the technician that this trouble has occurred again.

Determining Modem Pool Connection Path:

The specific modem pool connection path for the troublesome connection can be determined while the connection is still up (refer to Figure 14) as follows:

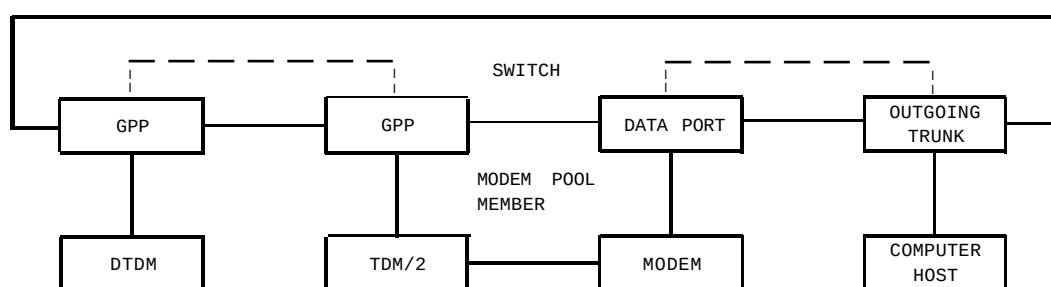


Figure 14. Modem Pooling Connection Path

1. Use **PROC 962**, Test 3 to enter the initiating circuit equipment location of the DTDM in Fields 2 through 6 and depress **EXECUTE**.

The corresponding TDM facility equipment location is displayed in Fields 11 through 15.

2. Use **PROC 178** to enter the TDM equipment location displayed in Step 1 and display the corresponding TDM trunk group and trunk number in the group.
3. Use **PROC 180** to enter the TDM trunk group number displayed in Step 2.
 - a. Depress **NEXT DATA** to search for the TDM digital equipment location.
 - b. When the TDM equipment location is displayed, the corresponding modem analog equipment location is also displayed.

4. Use **PROC 962**, Test 2 to enter the modem initiating circuit equipment location (in Fields 2 through 6) displayed in Step 3 and depress **EXECUTE**.

The corresponding outgoing trunk facility equipment location is displayed in Fields 11 through 15.

5. Use **PROC 178** to enter the outgoing trunk equipment location displayed in Step 4 and display the corresponding outgoing trunk group and trunk number in the group.
6. The connection is no longer needed since the connection path has been established.
Notify the user that he may disconnect by going on-hook.

Isolating Faulty Component:

To isolate the faulty component (if any), the TVS feature is utilized to reproduce the same troublesome connection path, using the trunk group and trunk numbers obtained above for the TDM and the outgoing trunk.

An extension and data button must be administered on a multifunction telephone set and this extension must be administered for trunk verification in **PROC 285** Field 8.

Note: Isolating the faulty component should be performed at a convenient time to the customer, possibly during normal out-of-hours.

1. Using **PROC 350**, Word 2 enter TVS feature 44 and depress **EXECUTE**.
The TVS dial access code is displayed.
2. Using the TVS administered extension, dial the TVS dial access code.
Wait for dial tone.
3. Dial the TDM trunk group and trunk number as two consecutive 3-digit numbers.

Note: Example, for trunk number 1 in trunk group 80, dial 080001.

- Wait for dial tone.
4. Dial the TVS dial access code again.
Wait for dial tone.
 5. Dial the outgoing trunk group and trunk number as two consecutive 3-digit numbers the same way as in Step 3.
Wait for dial tone.
 6. Dial the 7 or 10 digit number of the computer host.
The troublesome connection path is now active.
 7. Determine the type of reception.
If the reception is good, proceed to Step 8.
If the reception is not good, proceed to Step 9.
 8. Repeat steps 1 through 6 using the DTDM the user reported as a problem.
If the reception is good, suspect the computer host as the problem.
If the reception is not good, replace the DTDM.

9. Substitute the DTDM, TDM/modem, or outgoing trunk in the connection path by using the TVS feature to determine which component is faulty. Substitution is performed as follows:
 - a. Trunk - Repeat Steps 1 through 6 using a different number in Step 5.
 - b. TDM/modem - Repeat Steps 1 through 6 using a different number in Step 3.
 - c. DTDM - Administer a new DTDM and perform Steps 1 through 6 using the same numbers.
10. When the reception is good, replace the component that was substituted.

Specific Fault Codes

A specific fault code is a number used to provide a description of a failure.

1. This description provides more detail about the failure associated with a circuit.
2. Specific fault codes are recorded during periodic or time available testing in PMIDS. Demand testing specific fault codes are recorded in DMIDS.
3. Both the PMIDS and DMIDS specific fault codes (normally the same) are available for display during testing.

Table BE, PROC 646 - Specific Fault Code Definitions, lists the specific fault codes in numerical sequence with a definition for each specific fault code.

Further isolation of a failure may be accomplished as follows:

1. Analyze the specific fault codes recorded from PMIDS (first specific fault code recorded before executing Test 1 or 3) and DMIDS (second specific fault code recorded after Test 1 or 3 failed).
2. Determine from the specific fault codes recorded (using Table BE, PROC 646 - Specific Fault Code Definitions), if any additional corrective action can be performed (i.e., cabling, connectors, etc.).
3. Check the wiring associated with the circuit pack(s) and/or components replaced (point to point depending upon specific fault code(s) recorded).

TABLE BE.

PROC 646—SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
12	TIME SLOT UNAVAILABLE
218	NETWORK ORDER FAILED
454	DTLF FAULT ON ADFTC (DIGITAL SELF-TEST)
455	48-VOL FAULT ON ADFTC (ANALOG SELF-TEST)
456	48-VOL AND DTLF FAULTS TOGETHER ON ADFTC
457	PROTOCOL ERROR ON ADFTC
458	DTL IDLE ON ADFTC
1000	COULD NOT SEND AN S MESSAGE
1001	FACILITY NOT TESTED FOR MORE THAN X CYCLES
1002	TRUNK GROUP NOT TESTED FOR MORE THAN X CYCLES
1003	DID NOT RECEIVE AN OFF-HOOK FROM THE MPM (DTIM/2)
1004	DID NOT RECEIVE A "DATA SET READY" FROM THE MPM (MODEM)
1005	NO BITS RECEIVED ON A 1-PORT ADFTC SELF-TEST
1006	DATA TRANSMISSION INTERRUPTED: 1-PORT ADFTC SELF-TEST
1007	BIT ERROR RATE EXCEEDED FOR 1-PORT ADFTC SELF-TEST
1008	BLOCK ERROR RATE EXCEEDED FOR 1-PORT ADFTC SELF-TEST
1009	EIA UPDATE FAILURE DURING A 1-PORT ADFTC SELF-TEST
1010	ERROR OVERFLOW DURING A 1-PORT ADFTC SELF-TEST
1011	UNDEFINED ERROR DURING A 1-PORT ADFTC SELF-TEST
1012	NO BITS RECEIVED ON A 2-PORT NORMAL ADFTC SELF-TEST
1013	DATA TRANSMISSION INTERRUPTED: 2-PORT NORMAL ADFTC SELF-TEST
1014	BIT ERROR RATE EXCEEDED FOR 2-PORT NORMAL ADFTC SELF-TEST
1015	BLOCK ERROR RATE EXCEEDED FOR 2-PORT NORMAL ADFTC SELF-TEST
1016	EIA UPDATE FAILURE DURING A 2-PORT NORMAL ADFTC SELF-TEST
1017	ERROR OVERFLOW DURING A 2-PORT NORMAL ADFTC SELF-TEST
1018	UNDEFINED ERROR DURING A 2-PORT NORMAL ADFTC SELF-TEST
1019	NO BITS RECEIVED ON A 2-PORT REVERSE ADFTC SELF-TEST
1020	DATA TRANSMISSION INTERRUPTED: 2-PORT REVERSE ADFTC SELF-TEST
1021	BIT ERROR RATE EXCEEDED FOR 2-PORT REVERSE ADFTC SELF-TEST
1022	BLOCK ERROR RATE EXCEEDED FOR 2-PORT REVERSE ADFTC SELF-TEST

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1023	EIA UPDATE FAILURE DURING A 2-PORT REVERSE ADFTC SELF-TEST
1024	ERROR OVERFLOW DURING A 2-PORT REVERSE ADFTC SELF-TEST
1025	UNDEFINED ERROR DURING A 2-PORT REVERSE ADFTC SELF-TEST
1026	UNSENT STOP MESSAGE RECEIVED BY ADFTC
1027	DID NOT RECEIVE EXPECTED: TEST ABORTED S MESSAGE
1028	DID NOT RECEIVE EXPECTED: TEST COMPLETED S MESSAGE
1029	THE BIT AND/OR BLOCK ERROR RATES WERE NOT RECEIVED
1030	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE
1031	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE
1032	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE
1034	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE
1035	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST
1036	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST
1037	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE
1038	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 300 BAUD
1039	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 300 BAUD
1040	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 300 BAUD
1041	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 300 BAUD
1042	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 300 BAUD
1043	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 300 BAUD
1044	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 300 BAUD
1045	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 1200 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1046	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 1200 BAUD
1047	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 1200 BAUD
1048	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 1200 BAUD
1049	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 1200 BAUD
1050	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 1200 BAUD
1051	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 1200 BAUD
1052	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 2400 BAUD
1053	DATA TRANSMISSION INTERERUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 2400 BAUD
1054	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 2400 BAUD
1055	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 2400 BAUD
1056	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 2400 BAUD
1057	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 2400 BAUD
1058	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING NORMAL MODE AT 2400 BAUD
1059	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 4800 BAUD
1060	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 4800 BAUD
1061	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 4800 BAUD
1062	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 4800 BAUD
1063	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING, NORMAL MODE TEST AT 4800 BAUD
1064	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING, NORMAL MODE TEST AT 4800 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1065	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 4800 BAUD
1066	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 9600 BAUD
1067	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 9600 BAUD
1068	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 9600 BAUD
1069	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 9600 BAUD
1070	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING, NORMAL MODE TEST AT 9600 BAUD
1071	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING, NORMAL MODE TEST AT 9600 BAUD
1072	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 9600 BAUD
1073	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 19.2 KILOBAUD
1074	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 19.2 KILOBAUD
1075	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 19.2 KILOBAUD
1076	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 19.2 KILOBAUD
1077	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 19.2 KILOBAUD
1078	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 19.2 KILOBAUD
1079	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 19.2 KILOBAUD
1080	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 56 KILOBAUD
1081	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 56 KILOBAUD
1082	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 56 KILOBAUD
1083	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 56 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1084	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 56 KILOBAUD
1085	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 56 KILOBAUD
1086	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 56 KILOBAUD
1087	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 64 KILOBAUD
1088	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 64 KILOBAUD
1089	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 64 KILOBAUD
1090	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 64 KILOBAUD
1091	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 64 KILOBAUD
1092	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING NORMAL MODE TEST AT 64 KILOBAUD
1093	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, NORMAL MODE AT 64 KILOBAUD
1094	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE
1095	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE
1096	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE
1097	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE
1098	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST
1099	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST
1100	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE
1101	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 300 BAUD
1102	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 300 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1103	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 300 BAUD
1104	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 300 BAUD
1105	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 300 BAUD
1106	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 300 BAUD
1107	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 300 BAUD
1108	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 1200 BAUD
1109	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 1200 BAUD
1110	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 1200 BAUD
1111	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 1200 BAUD
1112	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 1200 BAUD
1113	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 1200 BAUD
1114	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 1200 BAUD
1115	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 2400 BAUD
1116	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 2400 BAUD
1117	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 2400 BAUD
1118	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 2400 BAUD
1119	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING, REVERSE MODE TEST AT 2400 BAUD
1120	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING, REVERSE MODE TEST AT 2400 BAUD
1121	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 2400 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1122	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 4800 BAUD
1123	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 4800 BAUD
1124	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 4800 BAUD
1125	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 4800 BAUD
1126	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 4800 BAUD
1127	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 4800 BAUD
1128	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 4800 BAUD
1129	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 9600 BAUD
1130	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 9600 BAUD
1131	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 9600 BAUD
1132	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 9600 BAUD
1133	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 9600 BAUD
1134	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 9600 BAUD
1135	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 9600 BAUD
1136	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE TEST AT 19.2 KILOBAUD
1137	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 19.2 KILOBAUD
1138	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 19.2 KILOBAUD
1139	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 19.2 KILOBAUD
1140	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 19.2 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1141	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 19.2 KILOBAUD
1142	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 19.2 KILOBAUD
1143	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 56 KILOBAUD
1144	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 56 KILOBAUD
1145	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 56 KILOBAUD
1146	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 56 KILOBAUD
1147	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 56 KILOBAUD
1148	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 56 KILOBAUD
1149	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 56 KILOBAUD
1150	NO BITS RECEIVED ON A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 64 KILOBAUD
1151	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 64 KILOBAUD
1152	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 64 KILOBAUD
1153	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 64 KILOBAUD
1154	EIA UPDATE FAILURE DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 64 KILOBAUD
1155	ERROR OVERFLOW DURING A HALF DUPLEX ORIGINATING REVERSE MODE TEST AT 64 KILOBAUD
1156	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN ORIGINATING, REVERSE MODE AT 64 KILOBAUD
1157	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE
1158	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE
1159	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1160	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE
1161	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST
1162	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST
1163	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE
1164	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 300 BAUD
1165	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 300 BAUD
1166	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 300 BAUD
1167	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 300 BAUD
1168	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 300 BAUD
1169	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 300 BAUD
1170	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 300 BAUD
1171	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 1200 BAUD
1172	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 1200 BAUD
1173	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 1200 BAUD
1174	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 1200 BAUD
1175	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 1200 BAUD
1176	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 1200 BAUD
1177	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 1200 BAUD
1178	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 2400 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1179	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 2400 BAUD
1180	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 2400 BAUD
1181	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 2400 BAUD
1182	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 2400 BAUD
1183	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 2400 BAUD
1184	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 2400 BAUD
1185	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 4800 BAUD
1186	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 4800 BAUD
1187	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 4800 BAUD
1188	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 4800 BAUD
1189	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 4800 BAUD
1190	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 4800 BAUD
1191	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 4800 BAUD
1192	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 9600 BAUD
1193	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 9600 BAUD
1194	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 9600 BAUD
1195	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 9600 BAUD
1196	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 9600 BAUD
1197	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE MODE TEST AT 9600 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1198	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 9600 BAUD
1199	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 19.2 KILOBAUD
1200	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 19.2 KILOBAUD
1201	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 19.2 KILOBAUD
1202	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 19.2 KILOBAUD
1203	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 19.2 KILOBAUD
1204	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 19.2 KILOBAUD
1206	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 19.2 KILOBAUD
1207	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 56 KILOBAUD
1208	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 56 KILOBAUD
1209	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 56 KILOBAUD
1210	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 56 KILOBAUD
1211	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 56 KILOBAUD
1212	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 56 KILOBAUD
1213	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 56 KILOBAUD
1214	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 64 KILOBAUD
1215	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 64 KILOBAUD
1216	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 64 KILOBAUD
1217	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 64 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1218	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 64 KILOBAUD
1219	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING NORMAL MODE TEST AT 64 KILOBAUD
1220	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, NORMAL MODE AT 64 KILOBAUD
1221	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE
1222	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE
1223	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE
1224	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE
1225	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST
1226	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST
1227	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE
1228	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 300 BAUD
1229	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 300 BAUD
1230	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 300 BAUD
1231	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 300 BAUD
1232	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 300 BAUD
1233	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 300 BAUD
1234	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 300 BAUD
1235	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 1200 BAUD
1236	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 1200 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS [Contd]	
FAULT CODE	DEFINITION
1237	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 1200 BAUD
1238	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 1200 BAUD
1239	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 1200 BAUD
1240	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 1200 BAUD
1241	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 1200 BAUD
1242	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 2400 BAUD
1243	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 2400 BAUD
1244	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 2400 BAUD
1245	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 2400 BAUD
1246	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 2400 BAUD
1247	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 2400 BAUD
1248	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 2400 BAUD
1249	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 4800 BAUD
1250	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 4800 BAUD
1251	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 4800 BAUD
1252	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 4800 BAUD
1253	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 4800 BAUD
1254	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 4800 BAUD
1255	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 4800 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1256	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 9600 BAUD
1257	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 9600 BAUD
1258	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 9600 BAUD
1259	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 9600 BAUD
1260	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 9600 BAUD
1261	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 9600 BAUD
1262	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 9600 BAUD
1263	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 19.2 KILOBAUD
1264	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 19.2 KILOBAUD
1265	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 19.2 KILOBAUD
1266	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 19.2 KILOBAUD
1267	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING, REVERSE MODE TEST AT 19.2 KILOBAUD
1268	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 19.2 KILOBAUD
1269	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 19.2 KILOBAUD
1270	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 56 KILOBAUD
1271	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 56 KILOBAUD
1272	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 56 KILOBAUD
1273	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 56 KILOBAUD
1274	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 56 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1275	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 56 KILOBAUD
1276	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 56 KILOBAUD
1277	NO BITS RECEIVED ON A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 64 KILOBAUD
1278	DATA TRANSMISSION INTERRUPTED: HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 64 KILOBAUD
1279	BIT ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 64 KILOBAUD
1280	BLOCK ERROR RATE EXCEEDED FOR HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 64 KILOBAUD
1281	EIA UPDATE FAILURE DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 64 KILOBAUD
1282	ERROR OVERFLOW DURING A HALF DUPLEX TERMINATING REVERSE MODE TEST AT 64 KILOBAUD
1283	UNDEFINED ERROR DURING A HALF DUPLEX TEST IN TERMINATING, REVERSE MODE AT 64 KILOBAUD
1284	DID NOT RECEIVE A HANDSHAKE MESSAGE
1285	HANDSHAKE FAILURE MESSAGE RECEIVED
1286	NO BITS RECEIVED ON A FULL DUPLEX TEST
1287	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST
1288	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST
1289	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST
1290	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST
1291	ERROR OVERFLOW DURING A FULL DUPLEX TEST
1292	UNDEFINED ERROR DURING A FULL DUPLEX TEST
1293	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE
1294	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE
1295	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE
1296	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE
1297	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1298	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE
1299	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE
1300	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1301	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1302	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1303	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1304	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1305	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1306	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 300 BAUD
1307	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1308	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1309	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1310	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1311	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1312	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1313	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 1200 BAUD
1314	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1315	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1316	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1317	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1318	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1319	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1320	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 2400 BAUD
1321	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1322	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1323	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1324	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1325	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1326	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1327	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 4800 BAUD
1328	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1329	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1330	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1331	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1332	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1333	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1334	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 9600 BAUD
1335	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1336	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1337	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1338	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1339	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1340	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1341	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 19.2 KILOBAUD
1342	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1343	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1344	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1345	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1346	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1347	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1348	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 56 KILOBAUD
1349	NO BITS RECEIVED ON A FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1350	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1351	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1352	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1353	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1354	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1355	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN ORIGINATING MODE AT 64 KILOBAUD
1356	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE
1357	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE
1358	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE
1359	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE
1360	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE
1361	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE
1362	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE
1363	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1364	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1365	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1366	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1367	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1368	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1369	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 300 BAUD
1370	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1371	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1372	BIT ERROR RATE EXCEEDED FOR DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1373	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1374	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1375	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1376	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 1200 BAUD
1377	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1378	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1379	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1380	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1381	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1382	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1383	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 2400 BAUD
1384	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1385	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1386	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1387	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1388	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1389	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1390	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 4800 BAUD
1391	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1392	DATA TRANSMISSION INTERERUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1393	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1394	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1395	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1396	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1397	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 9600 BAUD
1398	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1399	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1400	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1401	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1402	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1403	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1404	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 19.2 KILOBAUD
1405	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1406	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1407	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1408	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1409	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1410	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD
1411	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 56 KILOBAUD

TABLE BE. (Contd)

PROC 646—SPECIFIC FAULT CODE DEFINITIONS (Contd)	
FAULT CODE	DEFINITION
1412	NO BITS RECEIVED ON A FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1413	DATA TRANSMISSION INTERRUPTED: FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1414	BIT ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1415	BLOCK ERROR RATE EXCEEDED FOR FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1416	EIA UPDATE FAILURE DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1417	ERROR OVERFLOW DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1418	UNDEFINED ERROR DURING A FULL DUPLEX TEST IN TERMINATING MODE AT 64 KILOBAUD
1419	MEMBER A IN USE
1420	MEMBER B IN USE
1421	MEMBER A AND B IN USE
1422	MEMBER A COULD NOT BE SEIZED
1423	MEMBER B COULD NOT BE SEIZED
1424	NO MEMBER AVAILABLE FOR TESTING
1425	ADFTC DID NOT RETURN A SETUP (HANDSHAKE) RESULT MESSAGE
1426	ADFTC DID NOT RECEIVE A SET TEST (START HANDSHAKE) MESSAGE
1427	NO ADFTC AVAILABLE FOR TESTING
1428	ADFTC IN USE
1429	ADFTC MAINTENANCE BUSY
1430	NO ON-HOOK RECEIVED FROM MODEM
1431	TDM/2 DID NOT GO ON-HOOK AFTER TEST WAS COMPLETED

PROC 647 - AUTOMATIC TRANSMISSION MEASUREMENT SYSTEM (ATMS) TESTS

FLIPCHART		AUTOMATIC TRANSMISSION MEASUREMENT						845552223				
ISSUE 1		SYSTEM (ATMS) TESTS										
MEASUREMENTS ORIENTED BY INDEX										NOTE: MEASUREMENT RESULTS OF 90-99 REPRESENT -0 TO -.9		
WORD DC	MEASUREMENT INDEX	FIELD	MEASUREMENT				MEASUREMENT INDEX	FIELD	MEASUREMENT			
	10	13	404 HZ LOSS FAR END TO NEAR END MEASUREMENT				40	13	C - MESSAGE NOISE WITHOUT TONE - FAR END MEASUREMENT			
		14	0 DBM LOSS FAR END TO NEAR END MEASUREMENT					14	C - MESSAGE NOISE W/TONE-NEAR END MEASUREMENT			
		15	2804 HZ LOSS FAR END TO NEAR END MEASUREMENT					15	C - MESSAGE NOISE W/TONE-FAR END MEASUREMENT			
	20	13	404 HZ LOSS NEAR END TO FAR END MEASUREMENT				50	13	SRL LOW - NEAR END MEASUREMENT			
		14	0 DM LOSS NEAR END TO FAR END MEASUREMENT					14	ERL - NEAR END MEASUREMENT			
		15	2804 HZ LOSS NEAR END TO FAR END MEASUREMENT					15	SRL HIGH - NEAR END MEASUREMENT			
	30	13	1004 HZ LOSS FAR END TO NEAR END MEASUREMENT				60	13	SRL LOW - FAR END MEASUREMENT			
		14	1004 HZ LOSS NEAR END TO FAR END MEASUREMENT					14	ERL - FAR END MEASUREMENT			
		15	C - MESSAGE NOISE WITHOUT TONE - NEAR END MEASUREMENT					15	SRL HIGH - FAR END MEASUREMENT			
											NETWORK ATMS TESTS	
											647	

NOTE:
MEASUREMENT
RESULTS OF 90-99
REPRESENT -0 TO -9.

FLIPCHART		AUTOMATIC TRANSMISSION MEASUREMENT				845552223	
ISSUE 4		+	+	SYSTEM (ATMS) TESTS		+	+
WORD DB	FAULT CODES (FIELD 12) CONTINUED FROM WORD DA.	ASSOCIATED WITH TEST STATE 5 & 6:				TEST LINE TYPES (FIELD 11):	
		0-PASSED ALL TESTS				1-102 OR OLD 100-TYPE	
		11-FAILED 404HZ FAR END TO NEAR END DEVIATION THRESHOLD				2-NEW 100-TYPE	
		12-FAILED 0 DBM LOSS FAR END TO NEAR END LOSS THRESHOLD				3-LC-145 OR SN-260A	
		13-FAILED 2804HZ FAR END TO NEAR END DEVIATION THRESHOLD				4-SN-260B	
		21-FAILED 404HZ NEAR END TO FAR END DEVIATION THRESHOLD				5-56A OR 105 W/O RETURN LOSS	
		22-FAILED 0 DBM LOSS NEAR END TO FAR END LOSS THRESHOLD				6-SN-261, ZLC-12, OR 105	
		23-FAILED 2804HZ NEAR END TO FAR END DEVIATION THRESHOLD				WITH RETURN LOSS	
		31-FAILED 1004HZ FAR END - NEAR END LEVEL LOSS THRESHOLD					
		32-FAILED 1004HZ NEAR END - FAR END LEVEL LOSS THRESHOLD					
		33-FAILED NEAR END C-MESSAGE WITHOUT TONE NOISE THRESHOLD					
		41-FAILED FAR END C-MESSAGE WITHOUT TONE NOISE THRESHOLD					
		42-FAILED NEAR END C-MESSAGE WITH TONE THRESHOLD					
		43-FAILED FAR END C-MESSAGE WITH TONE THRESHOLD					
		51-FAILED NEAR END SINGING RETURN LOSS LOW THRESHOLD					
		52-FAILED NEAR END ECHO RETURN LOSS THRESHOLD					
		53-FAILED NEAR END SINGING RETURN LOSS THRESHOLD					
61-FAILED FAR END SINGING RETURN LOSS LOW THRESHOLD							
62-FAILED FAR END ECHO RETURN LOSS THRESHOLD							
63-FAILED FAR END SINGING RETURN LOSS THRESHOLD							
TRUNK TYPE (FIELD 15):							
SAME AS USED IN PROC 100							
(MEASUREMENT INDEX CONTINUED ON WORD DC)							

NETWORK
ATMS
TESTS

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FLIPCHART		AUTOMATIC TRANSMISSION MEASUREMENT					
ISSUE 1		+	+	SYSTEM (ATMS) TESTS	+	+	845552223
WORD DA	MEASUREMENT INDEX: (FIELD 12):		ASSOCIATED WITH TEST STATE 4:		82-UNIDENTIFIABLE INTERRUPTED TONE		98-FAR END LOSS SELF TEST AT-16DBM 2804 HZ FAILED
	10-FIRST SET OF MEASUREMENTS		1-ADFTC IN USE (SUBSEQUENT TO STATE 2)		83-BUSY FROM FAR END		99-FAR END NOISE WITH TONE SELF-TEST FAILED
	20-SECOND SET OF MEASUREMENTS		67-NO TEST TONE FROM FAR END		84-FAR END RELEASE		(FAULT CODES CONTINUED ON WORD DB)
	30-THIRD SET OF MEASUREMENTS		68-OTL NOT ASSIGNED AS ROTARY		85-NO RESPONSE FROM FAR END		
	40-FOURTH SET OF MEASUREMENTS		69-ADFTC RECEIVED UNSENT STOP TEST MESSAGE		86-NO DATA RETURNED FROM FAR END		TRUNK TYPE: SAME AS USED IN PROCEDURE
	50-FIFTH SET OF MEASUREMENTS		70-ADFTC SELF-TEST FAILS		87-STEADY UNIDENTIFIABLE TONE FROM FAR END		100.
	60-SIXTH SET OF MEASUREMENTS		71-BAD I/O TO/FROM OTL		88-BROADBAND ENERGY FROM FAR END (NOISE,		
	FAULT CODES:		72-CANNOT SEIZE OR		VOICE, OR RECORDED ANNOUNCEMENT)		
	ASSOCIATED WITH (FIELD 12) TEST		73-DIALING OF TVS FEATURE FAILED		89-FAR END TEST LINE UNAVAILABLE		
	STATE 2:		74-CODE DIALED DID NOT MATCH TVS FEATURE		90-NEAR-END SELF-TEST FAILED		
	1-ADFTC IN USE		75-TRUNK GROUP D.A.C. INAPPROPRIATE		91-FAR END LOSS SELF-TEST AT 0 DBM 1004 HZ FAILED		
	2-ADFTC NOT AVAILABLE		76-SOFTWARE RECORD INCORRECT		92-FAR END NOISE SELF-TEST FAILED		
	3-ADFTC MAINTENANCE BUSIED		77-ADFTC AND TRUNK CANNOT BE CONNECTED		93-FAR END HIGH FREQ. SINGING RETURN LOSS SELF-TEST FAILED		
	ASSOCIATED WITH TEST STATE 3:		78-INTERCEPT TONE		94-FAR END ECHO RETURN LOSS SELF-TEST FAILED		
	4-NO TTL ADMINISTERED		79-REORDER TONE		95-FAR END SINGING RETURN LOSS SELF-TEST FAILED		
	5-TRUNK IN USE		80-OTHER UNEXPECTED TONE		96-FAR END LOSS SELF-TEST AT-16DBM 1004 HZ FAILED		
6-CANT RELEASE BUSY THE TRUNK		81-RING NO ANSWER FROM FAR END		97-FAR END LOSS SELF-TEST AT-16DBM 404 HZ FAILED			
							NETWORK ATMS TESTS
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NETWORK
ATMS
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FLIPCHART		AUTOMATIC TRANSMISSION MEASUREMENT										845552223							
ISSUE 1		SYSTEM (ATMS) TESTS																	
TEST 1: DISPLAYS FAILURE HISTORY. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILED CIRCUIT. USE 'CLEAR DATA', 'EXECUTE' TO CLEAR FAILURE HISTORY FOR FAILED CIRCUIT.		TEST 2: TESTS SELECTED CIRCUIT(S) AND COMPARES TRANSMISSION MEASUREMENTS TO ADMINISTERED THRESHOLDS. USE 'NEXT CIRCUIT' TO DISPLAY NEXT TESTED CIRCUIT USE 'NEXT FAULT' TO DISPLAY ADDITIONAL FAULTS. USE 'NEXT DATA' TO DISPLAY MEASUREMENTS.				TEST 3: RUNS A SUPERVISION ONLY TEST ON SELECTED CIRCUIT(S) USE 'NEXT CIRCUIT' TO DISPLAY NEXT TESTED CIRCUIT.		OTHER CODES: (FIELD 9): 0-IDLE 1-IN USE 2-DEMAND MAINT BUSY 3-AUTOMATIC MAINT BUSY		ALARM STATUS: (FIELD 10): 1-MAJOR 2-MINOR 3-WARNING 4-ERRORS RECORDED 5-RESOLVED		TEST STATE: (FIELD 10): 1-RESOLVING 2-GETTING AFTC 3-SEIZING TRUNK 4-TEST IN PROGRESS 5-TEST COMPLETED		SPECIAL ERROR CODES: 81-MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED. 82-STDP USED - RANGE NOT COMPLETED 83-DMIDS OVERFLOW - RANGE NOT COMPLETED					
TEST NO	TRUNK GROUP	TESTS 2 & 3		TESTS 2 & 3		TESTS 2 & 3				CIRCUIT STATUS	ALARM STATUS	TEST STATE	TEST LINE TYPE	MEASUREMENT INDEX		MEASUREMENT RESULTS		TRUNK TYPE	NETWORK ATMS TESTS
														FAULT CODE		CIRCUITS TESTED			

NETWORK
ATMS
TESTS

647

Purpose

PROC 647 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from an Automatic Transmission Measurement System (ATMS) failure.

PROC 647 is also used to perform transmission tests between near-end and far-end facilities by measuring loss, noise, and echo impairments when the user suspects an intermittent trouble with analog trunks.

PROC 647 provides a trunk supervision test to determine if a test progress tone, or the ~1004 Hz tone from the terminating test line can be obtained.

PROC 647 is used to:

1. Display the failure history for trunk circuits failing ATMS scheduled tests.
2. Manually turn off any alarms activated because of a trunk circuit failing ATMS tests.
3. Perform a transmission measurement on selected circuits or a group of circuits.

Note: Measurement results are only displayed in Test 2.

4. Perform a supervision test on selected circuits or a group of circuits.

Field Definitions and Codes

Each field of **PROC 647** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BF, PROC 647 - Field Definitions and Codes.

Optional input fields are:

1. Field 2 - Select a specific trunk group to be tested (Tests 2 and 3 only).
2. Fields 2 and 3 - Select trunk group and trunk number of a specific trunk to be tested (Tests 2 and 3 only).
3. Fields 4 through 8 - Select equipment location of a specific circuit to be tested (Tests 2 and 3 only).

Operation of Procedure

Overview

PROC 647 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a trunk failure detected during ATMS scheduled tests.

To call in **PROC 647**, perform the following:

1. Depress **PROC NO; 647; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

TABLE BF.

PROC 647 FIELD DEFINITIONS AND CODES						
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION	
1	1-3	Test number.	10* (Tests 2&3) (Contd)	3	Seizing trunk.	
2	18-999	Trunk group number.		4	Test in progress.	
3	1-255	Trunk number.		5	Test completed.	
4-8		Equipment location:		6	Test completed with unacceptable trunk.	
4	0-99	Module number.		9	Test(s) terminated and summary information displayed.	
5	0-7	Cabinet number.				
6	0-3	Carrier number.		11	0-6	Test line type:
7	0-21	Slot number.			0	No terminating test line administered.
8	0-3	Circuit number.			1	102 or old 100-type.
9	0-2	Circuit status:			2	New 100-type.
	0	Idle.			3	LC145 or SN260A.
	1	In use.			4	SN260B.
	2	Demand maintenance busied.			5	56A or 105 without return loss.
	3	Automatic maintenance busied.			6	SN261, ZLC-12, or 105 with return loss.
10* (Test 1)	1-5	Alarm status:	12*	0-99	Fault code (Tests 1-3).	
	1	Major.		10-60	Measurement index (Test 2).	
	2	Minor.	13*		Failure index:	
	3	Warning.		0-60	Index into PMIDS failures (Test 1 only).	
	4	Errors recorded.		0-99	Index into fault codes for displayed circuit (Test 2 only).	
	5	Alarm resolved.				
10* (Tests 2&3)	1-6,9	Test state.				
	1	Resolving contention.				
	2	Getting ADFTC.				

TABLE BF. (Contd)

PROC 647 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
13*	0-99	Total number of circuits tested (Tests 2 and 3 only).	14*	0-99	Total number of faults for the displayed failing circuit (Test 2 only).
13*	0-74, 91-99	Measurement results (Test 2 only).	14*	0-74, 91-99	Measurement results (Test 2 only).
14*		Total number of failures.	15*	0-99	Trunk type - Same as used in PROC 100 (Prior to execution of Tests 2 and 3 only).
	0-60	Total number of PMIDS failures (Test 1 only).	15*	0-74, 91-99	Measurement results (Test 2 only).
	0-99	Total number of failed circuits (Tests 2 and 3 only).			
* = Fields 10, and 12 through 15 are multiple use fields depending on the test being performed and when the data is displayed.					

Three tests are available:

1. Test 1 - Displays failure history logged in PMIDS by on-line periodic testing. Up to 60 failures can be displayed.
Test 1 is also used to manually resolve all alarmed circuit failures associated with ATMS.
2. Test 2 - Performs demand tests on selected circuits or a group of circuits and compares transmission measurements to administered thresholds.
3. Test 3 - Performs a supervision test on selected circuits or a group of circuits.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

Test 1

Test 1 provides a failure history of the circuit failures detected by the on-line ATMS periodic software.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

Test 1 is also used to manually resolve the alarmed circuit failures associated with ATMS in PMIDS and to turn off the **OTHER FAILS** fault indicator if no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

PROC 647, Test 1

Note: Measurement results are not displayed in Test 1.

1. Test 1 is the default test when entering **PROC 647** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

2. When Test 1 is initially called in, Field 1 displays a 1 and all other fields are dashed.
3. To start Test 1, depress **EXECUTE**.
4. The failure history is sorted and a summary is displayed.
5. If no failures exist, the following summary is displayed:

Field 1 - 1.

Field 14 - 0 (Indicating no failures).

6. If any failures exist, the summary displays a 1 in Field 1 and the total number of circuits that failed in Field 14 (maximum of 60).
7. Depressing **NEXT CIRCUIT** displays the first failure as follows:

Field 1 - 1.

Field 2 - Trunk group.

Field 3 - Trunk number.

Fields 4 through 8 - Equipment location of failing circuit.

Field 9 - Circuit status of the displayed failure.

Field 10 - Alarm status of failing circuit.

Field 11 - Terminating test line type.

Field 12 - Fault code.

Note: Only one (first, or most severe) fault code is recorded for each failing circuit.

Field 13 - Failure index (equals number of failures displayed in Field 14).

Field 14 - Total number of failing circuits recorded in PMIDS.

Field 15 - Trunk type.

8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing circuits (if any).
Field 13 decrements by 1 each time **NEXT CIRCUIT** is depressed.
9. When all failing circuits are displayed (1 displayed in Field 13), depressing **NEXT CIRCUIT** dashes Fields 2 through 15.
Depressing **NEXT CIRCUIT** once more causes the summary to be displayed, and the failing circuits can be stepped through again by use of **NEXT CIRCUIT**.
10. The **CLEAR DATA; EXECUTE** sequence is used to manually resolve individual alarmed circuit failures after **EXECUTE** is used to initiate Test 1.
The failures which are resolved are those failures with an alarm status of 2 (minor) or 3 (warning) displayed in Field 10.

11. To resolve individual circuit failures with an alarm status of 2 or 3, perform Steps 12 and 13.
12. Use **NEXT CIRCUIT** to display the failing circuit with an alarm status of 2 or 3 on the **MAAP**.

Note: Individual circuit failures cannot be resolved unless the alarmed circuit is displayed on the **MAAP**.

13. Depress **CLEAR DATA; EXECUTE**.

Field 10 (alarm status) displays a 5 indicating that the alarmed circuit in PMIDS is marked as resolved.

14. Repeat Steps 12 and 13 for each alarmed circuit failure to turn off the **OTHER FAILS** fault indicator, assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Test 2

Test 2 is used to test one or more circuits once and compares transmission measurements to administered thresholds for the circuits tested.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

Circuits can be selected for testing by all circuits, trunk group, trunk group and trunk number, or by equipment location.

When a range of circuits are tested, failing circuits are displayed first and passing circuits are displayed after all failing circuits are displayed.

Measurement results can be obtained for failing **and** passing circuits.

Note: When test states 2 through 4 (indicates test not fully completed) are displayed in Field 10 for failing circuits, measurement results are not available. Fields 13 through 15 display dashes.

Measurement results are provided for further diagnosis (if required) to determine if the passing circuits are within marginal thresholds or if the thresholds need to be adjusted.

Test 2 Data Entry

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, a default trunk group, trunk number, and equipment location may be displayed in Fields 2 through 8. Field 9 displays the circuit status, Field 11 displays the terminating test line type, and Field 15 displays the trunk type.
3. The default circuit can be the last circuit displayed in Test 1 of **PROC 647** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

PROC 647, Test 2

4. The default equipment location can also be passed from **PROC 620** as long as the equipment location is a CO trunk or tie trunk equipment location and is still displayed in **PROC 620** when it is passed.
5. All circuits, a range of circuits, a specific circuit, or the default circuit can be tested.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

To test the default circuit, proceed to Step 14.

6. Selection of a range of circuits to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the range of circuits to be tested.
7. To test all circuits in the switch, Fields 2 through 8 must be dashed. Perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **ENTER.**
 - b. **CHANGE FIELD; 2; ENTER.**

Test 2 starts with trunk member 1 of the first trunk group (numerically) and runs until all circuits in the switch are tested.

Proceed to Step 1 of Test 2 Execution.

8. To select all trunks in a trunk group to be tested, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Trunk group number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group number); ENTER.**

Note: Field 11 displays the test line type and Field 15 displays the trunk type when the trunk group is entered in Field 2.

Test 2 starts with the first circuit in the trunk group selected and runs until all trunks in the trunk group are tested.

Proceed to Step 1 of Test 2 Execution.

9. A specific circuit can be selected for testing in one of three ways; i.e., by trunk group and trunk number, by equipment location, and by use of **NEXT CIRCUIT** and/or **NEXT UNIT**. (Refer to Steps 10 through 13.)
10. To select a specific circuit using trunk group and trunk number, perform one of the following depending on whether a default equipment location is displayed:
 - a. **(Trunk group); ENTER; (Trunk number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group); ENTER; (Trunk number); ENTER.**

Note: Fields 4 through 8 display the equipment location of the trunk circuit, Field 9 displays the circuit status of the trunk, Field 11 displays the terminating test line type, and Field 15 displays the trunk type when the trunk group and number are entered in Fields 2 and 3.

Proceed to Step 14.

11. To select a specific circuit using the equipment location, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
 - b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER; CHANGE FIELD; 8; ENTER; (Circuit number); ENTER.**

Note: Fields 2 and 3 display the trunk group and trunk number, Field 9 displays the circuit status of the trunk, Field 11 displays the terminating test line type, and Field 15 displays the trunk type when the equipment location is entered in Fields 4 through 8.

Proceed to Step 14.

12. Depressing **NEXT CIRCUIT** advances to the next trunk in the displayed trunk group or the first trunk in the next testable trunk group.
Depressing **NEXT UNIT** advances to the first trunk in the next testable trunk group.
13. To select a specific circuit using **NEXT CIRCUIT** and/or **NEXT UNIT**, perform the following:
 - a. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 2 through 8.
 - b. Depress **NEXT UNIT** until the trunk group is displayed in Field 2, then depress **NEXT CIRCUIT** (if necessary) until the circuit to be tested is displayed in Fields 3 through 8.

Note: Field 9 displays the circuit status, Field 11 displays the terminating test line type, and Field 15 displays the trunk type for the circuit to be tested.

Proceed to Step 14.

14. A specific circuit or the default circuit can be placed in maintenance busy out status for testing by performing the following:
 - a. Check the circuit status displayed in Field 9.
 - b. If the circuit status = 2 or 3, proceed to Step 1 of Test 2 Execution.
If the circuit status = 0 or 1, depress **BUSY OUT** and proceed to Step 1 of Test 2 Execution.
15. Busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.

PROC 647, Test 2

- a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk is busied out.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is busied out by checking the circuit status of the ISDN trunk.

The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Test 2 Execution

1. To start Test 2 after selecting the circuit(s) to be tested, depress **EXECUTE**.
The **WAIT** indicator on the **MAAP** is turned on.
2. During testing of a specific circuit or the default circuit, Field 10 (test state) is incremented to indicate progress of Test 2.
3. When the entire switch or an entire trunk group is tested, the following fields are incremented as a circuit is tested:
Fields 2 and 3 - Trunk group and number.
Fields 4 through 8 - Equipment location of circuit being tested.
Field 9 - Circuit status of circuit being tested.
Field 10 - Test state (encodes 1 through 5).
Field 11 - Terminating test line type.
Field 13 - Total number of circuits tested.
Field 14 - Total number of failures (if any).
Field 15 - Trunk type.
4. The failure information returned in Test 2 is stored in DMIDS.
If DMIDS becomes full at any time during the test, Test 2 is stopped and the **WAIT** indicator is turned off.

Note: Although Fields 13 and 14 only display 99 entries, DMIDS allows testing of at least 255 trunks prior to DMIDS overflowing occurring.

5. The original range of circuits selected is displayed in Fields 2 through 8, and special error code 83 (DMIDS overflow - range not completed) is displayed in the **MAAP** error code field.
6. Results of the test can be examined at this time (Refer to Test 2 Result Display below). Test 2 can be restarted from the original range of circuits entered by depressing **EXECUTE**.

Caution: *If Test 2 is restarted from the original range entered, any test results gathered to that point are lost and only new failure data is retained.*

Note: Before depressing **EXECUTE** to restart Test 2 from the original range entered, the failure data should be examined and recorded.

7. If Test 2 is halted because of a DMIDS overflow, a new range of circuits to be tested can be entered instead of testing the original range of circuits.

8. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested.
Refer to Step 7 of Test 2 Data Entry above to select all circuits in the switch to be tested or Step 8 of Test 2 Data Entry above to select all trunks in a trunk group to be tested.
9. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits entered or to start over from the original range of circuits.
10. **STOP** can be depressed when a specific circuit or a range of circuits is being tested.
The **WAIT** indicator is turned off, the original range of circuits selected is displayed in Fields 2 through 8, and test state 9 (test terminated) is displayed in Field 10.

Note: Special error code 82 (**STOP** used - range not completed) is displayed in the **MAAP** error code field.
11. Test result information can be stepped through as described in Test 2 Result Display below when Test 2 is halted using **STOP** even though the specific circuit or the entire range is not tested.
12. To restart the test when Test 2 is halted by use of **STOP** before the specific circuit or range of circuits are tested at least once, **EXECUTE** is depressed and Test 2 starts from the equipment location following the last equipment location fully tested.

Test 2 Result Display

1. When Test 2 is completed or **STOP** is depressed for a specific circuit, a default circuit, a trunk group, or the entire switch, the **WAIT** indicator is turned off and the following is displayed:

Fields 2 through 8 - Specific circuit, default circuit, or the range of circuits originally selected for testing.
Field 10 - Test state of 9 indicating test terminated.
Field 13 - Total number of circuits tested.
Field 14 - 0 or total number of failures (if any).
2. Depressing **NEXT CIRCUIT** displays the first, and then successive circuits tested.
Failing circuits are displayed first, followed by passing circuits. If STOP is depressed, circuits are displayed in the order tested.
3. The display of the first circuit tested consists of:
Field 1 - 2
Fields 2 and 3 - Trunk group and trunk number.
Fields 4 through 8 - Equipment location of the displayed circuit.
Field 9 - Current circuit status of the displayed circuit.
Field 10 - Test status (indicated by test states 2 through 6).
Field 11 - Terminating test line type.
Field 12 - Fault code.

PROC 647, Test 2

Field 13 - 0 or failure index (equaling Field 14).

Field 14 - 0 or total number of fault codes recorded for the circuit displayed.

Field 15 - Trunk type.

4. If Field 10 (test state) indicates a test abort encode (2 through 4), an abort cause fault code (1 through 6, or 67 through 99) is displayed in Field 12 and no further information (including measurement data) is available.
5. If Field 10 displays a test completed encode (5 or 6), Field 12 displays either 0 (passed all tests) or the first of one or more fault code(s) (11 through 63) indicating some threshold was exceeded.

If Field 12 displays a fault code other than 0, Field 13 displays an index (equal to Field 14) and Field 14 displays the total number of fault codes recorded for **the displayed circuit**.

6. If Field 12 displays a 0 or Field 13 displays a 1 (indicating only one fault code), proceed to Step 10 to display measurement results.

If Field 13 displays a number greater than 1, proceed to Step 7.

7. Depressing **NEXT FAULT** displays a different fault code in Field 12 for the same circuit.

Field 13 is decremented each time **NEXT FAULT** is depressed.

Field 10 (test state) either displays a 5 (marginal threshold) or 6 (unacceptable threshold was not passed) for the fault code displayed in Field 12.

8. If a circuit is in-use when testing is attempted (range or single circuit selected), test state 3 is displayed in Field 10, and fault code 5 is displayed in Field 12.

Field 9 (circuit status) indicates whether the circuit is still in use at time of display.

Note: Record each in-use circuit for later testing (see Step 18 below).

9. When all fault codes are displayed (Field 13 = 1), depressing **NEXT FAULT** once more dashes Fields 12 through 14.

Depressing **NEXT FAULT** again starts the sequence over.

10. Measurement results for the circuit tested, **whether the circuit passed or failed**, are displayed by depressing **NEXT DATA**.

Note: When tests states 2 through 4 are displayed in Field 10 for failing circuits, measurement results are not available. Fields 13 through 15 display dashes. Test states 5 and 6 indicate the test is completed and provide measurement data for passing and failing circuits.

11. Six sets of measurements (total of 18 measurements) are always displayed for each tested circuit by repeatedly depressing **NEXT DATA**.
 - a. Measurement results are displayed in sets of three (displayed in Fields 13 through 15) and Field 12 (measurement index) is used to indicate which set is being displayed.
 - b. Field 12 (measurement index) increments from 10 to 60; i.e., 10, 20, 30, 40, 50, and 60 indicating the six sets of measurements for the circuit tested.

12. The values displayed in Fields 13 through 15 refer to thresholds exceeded for measurements of each set. The definition for each measurement is indicated in Table BG, PROC 647 - Measurement Results.

Values range from 0 through 74, and 91 through 99. A value of 91 through 99 indicates negative numbers 1 through 9.

Note: Dashes displayed in any of the three fields (13 through 15) indicate that the measurement is not applicable to the terminating test line (TTL) displayed in Field 11.

13. The order of measurements is the same as that implied by fault codes 11 through 63.
- Fault codes 11 through 13 refer to thresholds exceeded for measurements of the first set (Field 12 = 10) and are displayed in Fields 13 through 15.
 - Fault codes 21 through 23 refer to thresholds exceeded for measurements of the second set (Field 12 = 20) and are displayed in Fields 13 through 15.
 - Fault codes 31 through 33 refer to thresholds exceeded for measurements of the third set (Field 12 = 30) and are displayed in Fields 13 through 15.
 - Fault codes 41 through 43 refer to thresholds exceeded for measurements of the fourth set (Field 12 = 40) and are displayed in Fields 13 through 15.
 - Fault codes 51 through 53 refer to thresholds exceeded for measurements of the fifth set (Field 12 = 50) and are displayed in Fields 13 through 15.
 - Fault codes 61 through 63 refer to thresholds exceeded for measurements of the sixth set (Field 12 = 60) and are displayed in Fields 13 through 15.
14. Depressing **NEXT DATA** after the sixth set of measurements is displayed (Field 12 = 60) dashes Fields 12 through 15.
- Depressing **NEXT DATA** once more starts the sequence over with the first set of measurements displayed.
15. When a range of circuits are tested (all circuits in the switch or a trunk group), depressing **NEXT CIRCUIT** advances to the next circuit tested.

Caution: *Depressing NEXT UNIT advances to the first trunk in the next trunk group and erases all data stored in DMIDS; i.e., circuits tested, fault codes, and measurement data are erased. Do not depress NEXT UNIT while displaying the tested circuits.*

16. When a range of circuits are tested, **NEXT FAULT** is used to display all fault codes (if any) for the displayed circuit.

Note: Record all in-use circuits with a 3 displayed in Field 10 (test state) and a 5 displayed in Field 12 (fault code) for later testing. Refer to Step 18 for testing of in-use circuits.

NEXT DATA is used to display measurement results for the displayed circuit.

17. When all tested circuits are displayed, depressing **NEXT CIRCUIT** dashes all fields except Field 1.
- Depressing **NEXT CIRCUIT** once more displays the summary information.
 - Depressing **NEXT CIRCUIT** again starts the sequence over.

TABLE BG.

PROC 647—MEASUREMENT RESULTS		
FIELD 12 MEASUREMENT INDEX =	FIELD NUMBER =	DEFINITION OF MEASUREMENT VALUES DISPLAYED IN FIELDS 13 THROUGH 15
10	13	Far to near end 404 Hz loss measurement
	14	Far to near end 0 dBm loss measurement
	15	Far to near end 2804 Hz loss measurement
20	13	Near to far end 404 Hz loss measurement
	14	Near to far end 0 dBm loss measurement
	15	Near to far end 2804 Hz loss measurement
30	13	Far to near end 1004 Hz loss measurement
	14	Near to far end 1004 Hz loss measurement
	15	Near end C-message noise without tone measurement
40	13	Far end C-message noise without tone measurement
	14	Near end C-message noise with tone measurement
	15	Far end C-message noise with tone measurement
50	13	Low frequency near end singing return loss measurement
	14	Near end echo return loss measurement
	15	High frequency near end singing return loss measurement
60	13	Low frequency far end singing return loss measurement
	14	Far end echo return loss measurement
	15	High frequency far end singing return loss measurement

18. When in-use fault encodes are recorded, **EXECUTE** may be depressed for an additional test attempt on the in-use circuit.

Caution: *Retesting of in-use circuits should occur only after all Test 2 failure history is examined, since the retesting of an in-use circuit erases all prior test results.*

19. To test a circuit recorded as in-use (Step 8 or Step 16 above), use **NEXT CIRCUIT** to display the circuit in Fields 2 through 8.

Note: Note that the circuit status field indicates the current status as idle, in-use, or maintenance busied (0, 1, 2, or 3) displayed in Field 9.

If Field 9 (circuit status) displays a 1, the circuit is in use.

20. Depress **EXECUTE**.

If the circuit is still in use **and** Field 12 (fault code) displays a 5 indicating prior in-use failure, a camp-on procedure is used. Field 10 (test state) remains in state 3 until the circuit becomes available.

21. When an in-use circuit is tested, use **NEXT FAULT** and **NEXT DATA** as appropriate to determine the status of the circuit and the measurement results recorded.
22. To test other in-use circuits, perform the **CHANGE FIELD** sequence to select the in-use circuit recorded in Step 16 above.
Refer to Steps 10 and 11 of Test 2 Data Entry above to select an in-use circuit using the trunk group and trunk number or the equipment location of the in-use circuit.
23. When a circuit was busied out and the test passed, or the trouble was corrected, the circuit should be released from busy using **RLS BUSY OUT**.
24. Releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.
 - a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.
The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.
25. When another specific circuit is to be tested, refer to Steps 10 through 13 of Test 2 Data Entry above to select the specific circuit.
EXECUTE must be depressed to test the specific circuit selected for testing.
26. To select another range of circuits to test, the **CHANGE FIELD** sequence must be used.
Refer to Step 7 of Test 2 Data Entry above to select all circuits in the switch to test, or refer to Step 8 of Test 2 Data Entry above to select all circuits in a trunk group to test.
27. **EXECUTE** must be depressed to test the range of circuits selected for testing.
28. When all circuits that raised an alarm pass Test 2, perform the **CLEAR DATA; EXECUTE** sequence in Test 1 of **PROC 647** for each alarmed circuit to resolve the alarmed circuits and to turn off the **OTHER FAILS** fault indicator assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Note: Alarmed circuits in PMIDS are marked as resolved when the **CLEAR DATA; EXECUTE** sequence is used in Test 1 for each alarmed circuit.

Test 3

Test 3 provides a trunk supervision test on one or more circuits. Test execution causes an attempt to obtain either the test progress tone or the 1004 Hz tone from the terminating test line.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

Circuits can be selected for testing by all circuits, trunk group, trunk group and trunk number, or by equipment location.

Note: Measurement results are not displayed in Test 3.

PROC 647, Test 3

Test 3 Data Entry

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. When Test 3 is initially called in, a default trunk group, trunk number, and equipment location may be displayed in Fields 2 through 8. Field 9 displays the circuit status, Field 11 displays the terminating test line type, and Field 15 displays the trunk type.
3. The default circuit can be the last circuit displayed in Test 1 or 2 of **PROC 647** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. The default equipment location can also be passed from **PROC 620** as long as the equipment location is a CO trunk or tie trunk equipment location and is still displayed in **PROC 620** when it is passed.
5. All circuits, a range of circuits, a specific circuit, or the default circuit can be tested.

Note: Circuit(s) indicates all trunks with translations allowing access to a terminating test line which are associated with ATMS.

To test the default circuit, proceed to Step 14.

6. Selection of a range of circuits to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence **must** be used.
 - b. If no default equipment location is displayed, either **ENTER** or the **CHANGE FIELD** sequence can be performed to select the range of circuits to be tested.
7. To test all circuits in the switch, Fields 2 through 8 must be dashed. Perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **ENTER**.
 - b. **CHANGE FIELD; 2; ENTER**.

Test 3 starts with trunk member 1 of the first trunk group (numerically) and runs until all circuits in the switch are tested.

Proceed to Step 1 of Test 3 Execution.

8. To select all trunks in a trunk group to be tested, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Trunk group number); ENTER**.
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group number); ENTER**.

Note: Field 11 displays the test line type and Field 15 displays the trunk type when the trunk group is entered in Field 2.

Test 3 starts with the first circuit in the trunk group selected and runs until all trunks in the trunk group are tested.

Proceed to Step 1 of Test 3 Execution.

9. A specific circuit can be selected for testing in one of three ways; i.e., by trunk group and trunk number, by equipment location, and by use of **NEXT CIRCUIT** and/or **NEXT UNIT**. (Refer to Steps 10 through 13.)
10. To select a specific circuit using trunk group and trunk number, perform one of the following depending on whether a default equipment location is displayed.
 - a. **(Trunk group); ENTER; (Trunk number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group); ENTER; (Trunk number); ENTER.**

Note: Fields 4 through 8 display the equipment location of the trunk circuit, Field 9 displays the circuit status of the trunk, Field 11 displays the terminating test line type, and Field 15 displays the trunk type when the trunk group and number are entered in Fields 2 and 3.

Proceed to Step 14.

11. To select a specific circuit using the equipment location, perform one of the following depending on whether or not a default equipment location is displayed:
 - a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
 - b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER; CHANGE FIELD; 8; ENTER; (Circuit number); ENTER.**

Note: Fields 2 and 3 display the trunk group and trunk number, Field 9 displays the circuit status of the trunk, Field 11 displays the terminating test line type, and Field 15 displays the trunk type when the equipment location is entered in Fields 4 through 8.

Proceed to Step 14.

12. Depressing **NEXT CIRCUIT** advances to the next trunk in the displayed trunk group or the first trunk in the next testable trunk group.
Depressing **NEXT UNIT** advances to the first trunk in the next testable trunk group.
13. To select a specific circuit using **NEXT CIRCUIT** and/or **NEXT UNIT**, perform one of the following:
 - a. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 2 through 8.
 - b. Depress **NEXT UNIT** until the trunk group is displayed in Field 2, then depress **NEXT CIRCUIT** (if necessary) until the circuit to be tested is displayed in Fields 3 through 8.

Note: Field 9 displays the circuit status, Field 11 displays the terminating test line type, and Field 15 displays the trunk type for the circuit to be tested.

Proceed to Step 14.

PROC 647, Test 3

14. A specific circuit or the default circuit can be placed in maintenance busy out status for testing by performing the following:
 - a. Check the circuit status displayed in Field 9.
 - b. If the circuit status = 2 or 3, proceed to Step 1 of Test 3 Execution.
If the circuit status = 0 or 1, depress **BUSY OUT** and proceed to Step 1 of Test 3 Execution.
15. Busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.
 - a. Depressing **BUSY OUT** does **not** mean that both sides of the ISDN trunk is busied out.
 - b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk is busied out by checking the circuit status of the ISDN trunk.
The circuit status of the ISDN trunk is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Test 3 Execution

1. To start Test 3 after selecting the circuit(s) to be tested, depress **EXECUTE**.
The **WAIT** indicator on the **MAAP** is turned on.
2. During testing of a specific circuit or the default circuit, Field 10 (test state) is incremented to indicate progress of Test 3.
3. When the entire switch or an entire trunk group is tested, the following fields are incremented as a circuit is tested:
Fields 2 and 3 - Trunk group and number.
Fields 4 through 8 - Equipment location of circuit being tested.
Field 9 - Circuit status of circuit being tested.
Field 10 - Test state (encodes 1 through 5).
Field 11 - Terminating test line type.
Field 14 - Total number of failures (if any).
Field 15 - Trunk type.
4. The failure information returned in Test 3 is stored in DMIDS.
If DMIDS becomes full at any time during the test, Test 3 is stopped and the **WAIT** indicator is turned off.

Note: Although Fields 13 and 14 only display 99 entries, DMIDS allows testing of at least 255 trunks prior to DMIDS overflowing occurring.
5. The original range of circuits selected is displayed in Fields 2 through 8, and special error code 83 (DMIDS overflow - range not completed) is displayed in the **MAAP** error code field.

6. Results of the test can be examined at this time (refer to Test 3 Result Display below). Test 3 can be restarted from the original range of circuits entered by depressing **EXECUTE**.

Caution: *If Test 3 is restarted from the original range entered, any test results gathered to that point are lost and only new failure data is retained.*

Note: Before depressing **EXECUTE** to restart Test 3 from the original range entered, the failure data should be examined and recorded.

7. If Test 3 is halted because of a DMIDS overflow, a new range of circuits to be tested can be entered instead of testing the original range of circuits.
8. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested.
Refer to Step 7 of Test 3 Data Entry above to select all circuits in the switch to be tested or Step 8 of Test 3 Data Entry above to select all trunks in a trunk group to be tested.
9. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits entered or to start over from the original range of circuits.
10. **STOP** can be depressed when a specific circuit or a range of circuits is being tested.
The **WAIT** indicator is turned off, the original range of circuits selected is displayed in Fields 2 through 8, and test state 9 (test terminated) is displayed in Field 10.

Note: Special error code 82 (**STOP** used - range not completed) is displayed in the **MAAP** error code field.

11. Test result information can be stepped through as described in Test 3 Result Display below when Test 3 is halted using **STOP** even though the specific circuit or the entire range is not tested.
12. To restart the test when Test 3 is halted by use of **STOP** before the specific circuit or range of circuits are tested at least once, **EXECUTE** is depressed and Test 3 starts at the equipment location following the last equipment location fully tested.

Test 3 Result Display

1. When Test 3 is completed or **STOP** is depressed for a specific circuit, a default circuit, a trunk group, or the entire switch, the **WAIT** indicator is turned off and the following is displayed:

Fields 2 through 8 - Specific circuit, default circuit, or the range of circuits originally selected for testing.

Field 10 - Test state of 9 indicating test terminated.

Field 13 - Total number of circuits tested.

Field 14 - 0 or total number of failures (if any).

2. Depressing **NEXT CIRCUIT** displays the first and then successive circuits tested.

Failing circuits are displayed first, followed by passing circuits. If STOP is depressed, circuits are displayed in the order tested.

PROC 647, Test 3

3. The display of the first circuit tested consists of:

Field 1 - 3

Fields 2 and 3 - Trunk group and trunk number.

Fields 4 through 8 - Equipment location of the displayed circuit.

Field 9 - Current circuit status of the displayed circuit.

Field 10 - Test status (indicated by test states 2 through 6).

Field 11 - Terminating test line type.

Field 12 - Fault code.

Field 13 - 0 or failure index (equaling Field 14).

Field 14 - 0 or total number of fault codes recorded for the circuit displayed.

Field 15 - Trunk type.

4. Field 10 (test state) displays either a test completed encode of 5 or a test abort encode of 2 through 4.
If Field 10 displays a test completed encode of 5, Field 12 (fault code) displays a 0 indicating successful completion of Test 3.
5. If Field 10 indicates a test abort encode (2 through 4), an abort cause fault code (1 through 6, or 67 through 99) is displayed in Field 12 and no further information is available.

Note: Only one (first, or most severe) fault code is recorded for each failing circuit.

6. If a circuit is in-use when testing is attempted (range or single circuit selected), test state 3 is displayed in Field 10, and fault code 5 is displayed in Field 12.
Field 9 (circuit status) indicates whether the circuit is still in use at time of display.

Note: Record each in-use circuit for later testing (see Step 10 below).

7. When a range of circuits are tested (all circuits in the switch or a trunk group), depressing **NEXT CIRCUIT** advances to the next circuit tested.
8. Record all in-use circuits with a 3 displayed in Field 10 (test state) and a 5 displayed in Field 12 (fault code) for later testing. Refer to Step 10 for testing of in-use circuits.

Caution: *Depressing NEXT UNIT advances to the first trunk in the next trunk group and erases all data stored in DMIDS; i.e., circuits tested and fault codes are erased. Do not depress NEXT UNIT while displaying the tested circuits.*

9. When all tested circuits are displayed, depressing **NEXT CIRCUIT** dashes all fields except Field 1.
 - a. Depressing **NEXT CIRCUIT** once more displays the summary information.
 - b. Depressing **NEXT CIRCUIT** once more starts the sequence over with the first tested circuit.

10. When in-use fault encodes are recorded, **EXECUTE** may be depressed for an additional test attempt on the in-use circuit.

Caution: *Retesting of in-use circuits should occur only after all Test 3 failure history is examined, since the retesting of an in-use circuit erases all prior test results.*

11. To test a circuit recorded as in-use (Steps 6 or 8 above), use **NEXT CIRCUIT** to display the circuit in Fields 2 through 8.

Note: Note that the circuit status field indicates the current status as idle, in-use, or maintenance busied (0, 1, or 2) displayed in Field 9.

If Field 9 (circuit status) displays a 1, the circuit is in use.

12. Depress **EXECUTE**.

When an in-use circuit is tested, use **NEXT CIRCUIT** to determine the status of the circuit.

13. If the circuit is still in use **and** Field 12 (fault code) displays a 5 indicating prior in-use failure, a camp-on procedure is used. Field 10 (test state) remains in state 3 until the circuit becomes available.

14. To test other in-use circuits, perform the **CHANGE FIELD** sequence to select the in-use circuit recorded in Step 7 above.

Refer to Steps 10 and 11 of Test 3 Data Entry above to select an in-use circuit using the trunk group and trunk number or the equipment location of the in-use circuit.

15. When a circuit was busied out and the test passed, or the trouble was corrected, the circuit should be released from busy using **RLS BUSY OUT**.

16. Releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the ISDN trunk(s) will stay in T_Limbo (trunk is in a limbo state). If the far end switch has the ISDN trunk(s) in a maintenance busy state the ISDN trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunks are available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunks are released from busy by checking the circuit status of the ISDN trunks.

The circuit status of the ISDN trunks is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

17. When another specific circuit is to be tested, refer to Steps 10 through 13 of Test 3 Data Entry above to select the specific circuit.

EXECUTE must be depressed to test the specific circuit selected for testing.

18. To select another range of circuits to test, the **CHANGE FIELD** sequence must be used.

Refer to Step 7 of Test 3 Data Entry above to select all circuits in the switch to test, or Step 8 of Test 2 Data Entry above to select all circuits in a trunk group to test.

19. **EXECUTE** must be depressed to test the range of circuits selected for testing.

PROC 647

Repair Guide

General

When a trunk circuit failing ATMS scheduled tests is indicated (**PROC 647** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed to isolate and repair the faulty unit.

The starting point for isolation and repair of alarmed trunk circuits failing ATMS scheduled tests is Test 1 of **PROC 600** or Test 1 of **PROC 647**.

To isolate an alarmed trunk circuit failing ATMS scheduled tests displayed in Test 1 of **PROC 600** or Test 1 of **PROC 647**, Test 2 of **PROC 647** is executed to determine the extent of the trouble.

1. Execute Test 1 of **PROC 600** or Test 1 of **PROC 647** to determine which circuits are alarmed (indicated by a 2 (minor) or 3 (warning) displayed in the alarm status field).

Record the alarmed circuits displayed in Test 1 of **PROC 600** or Test 1 of **PROC 647**.

2. Display the alarmed circuit in Test 1 of **PROC 600** or Test 1 of **PROC 647**.
3. Enter **PROC 647** Test 2.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 600** or Test 1 of **PROC 647** is the default equipment location displayed in Test 2 of **PROC 647**.

4. Depress **EXECUTE**.

If Test 2 passes, proceed to Step 12.

5. If Test 2 fails, depress **NEXT CIRCUIT**.

Field 10 indicates the test state and Field 12 displays a fault code. Field 14 displays the number of fault codes for the failing circuit and Field 13 displays the index into the fault codes (equaling Field 14).

6. Record the test state displayed in Field 10 and the fault code displayed in Field 12 and proceed to Step 7.

7. If Field 13 (failure index) displays a 1, proceed to Step 10.

If Field 13 displays more than 1, proceed to Step 8.

8. Depressing **NEXT FAULT** repeatedly displays the remaining fault codes for the failing circuit.

Record each test state displayed in Field 10 and the associated fault code displayed in Field 12.

9. When all fault codes are displayed (Field 13 = 1) depressing **NEXT FAULT** once more dashes Fields 12 through 14.

Proceed to Step 10.

10. Refer to Table BH, PROC 647 - Fault Code Definitions, for a list of the test state, fault codes, and definitions associated with each test state and fault code.

Proceed to Step 11 to perform corrective action.

TABLE BH.

PROC 647—FAULT CODE DEFINITIONS		
FIELD 10 TEST STATE	FIELD 12 FAULT CODE	DEFINITION
2	1	ADFTC in use
	2	ADFTC not available
	3	ADFTC maintenance busied
3	4	No terminating test line (TTL) administered
	5	Trunk in use
	6	Cannot release busy the trunk
4	1	ADFTC in use (after Test State 2)
	67	No test tone returned from far end (105 type only)
	68	Originating test line (OTL) not assigned as rotary
	69	ADFTC received stop test message
	70	ADFTC self-test fails
	71	Bad I/O to or from OTL
	72	Cannot seize originating register
	73	Dialing of Trunk Verification by Station (TVS) feature failed
	74	Code dialed did not match TVS feature access
	75	Trunk group dial access code inappropriate
	76	Software record incorrect
	77	ADFTC and trunk cannot be connected
	78	Intercept tone detected
	79	Reorder tone detected
	80	Other unexpected tone detected
	81	Ring no answer from far end
	82	Unidentifiable interrupted tone detected
	83	Busy from far end
	84	Far end release
	85	No response from far end
	86	No data returned from far end
	87	Steady unidentifiable tone detected
	88	Broadband energy from far end (noise, voice, or recorded announcement)
	89	Far end test line unavailable, timeout after waiting for test progress tone removal
	90	Near end self-test failed
	91	Far end loss self-test at 0 dBm 1004 Hz failed
	92	Far end noise self-test failed
	93	Far end high frequency singing return loss self-test failed
	94	Far end echo return loss self-test failed

TABLE BH. (Contd)

PROC 647—FAULT CODE DEFINITIONS		
FIELD 10 TEST STATE	FIELD 12 FAULT CODE	DEFINITION
4 (Contd)	95	Far end singing return loss self-test failed
	96	Far end loss self-test at -16 dBm 1004 Hz failed
	97	Far end loss self-test at -16 dBm 404 Hz failed
	98	Far end loss self-test at -16 dBm 2804 Hz failed
	99	Far end noise with tone self-test failed
5 and 6	0	Passed all tests
	11	Failed 404 Hz far end to near end deviation threshold
	12	Failed 0 dBm loss far end to near end loss threshold
	13	Failed 2804 Hz far end to near end deviation threshold
	21	Failed 404 Hz near end to far end deviation threshold
	22	Failed 0 dBm loss near end to far end loss threshold
	23	Failed 2804 Hz near end to far end deviation threshold
	31	Failed 1004 Hz far end to near end level loss threshold
	32	Failed 1004 Hz near end to far end level loss threshold
	33	Failed near end C-message noise threshold
	41	Failed far end C-message without tone noise threshold
	42	Failed near end C-message with tone threshold
	43	Failed far end C-message with tone threshold
	51	Failed near end singing return loss low threshold
	52	Failed near end echo return loss threshold
	53	Failed near end singing return loss high threshold
	61	Failed far end singing return loss low threshold
	62	Failed far end echo return loss threshold
	63	Failed far end singing return loss high threshold

11. Perform the corrective action listed below associated with the test state and fault code displayed in Fields 10 and 12 for the failing circuit.
12. Test 2 must be run for each alarmed circuit failure recorded in Test 1 of **PROC 600** or Test 1 of **PROC 647**.
Repeat Steps 2 through 12 for each recorded alarmed circuit failure.
13. If all alarmed circuit failures pass Test 2, perform the **CLEAR DATA; EXECUTE** sequence in Test 1 of **PROC 647** for each alarmed circuit to resolve the alarmed circuits and to turn off the **OTHER FAILS** fault indicator assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Test state 2 - Fault codes 1 and 2

Repeat Test 2 on the same circuit.

Test state 2 - Fault code 3

1. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
 - a. If the ADFTC passes both tests, proceed to Step 2.
 - b. If the ADFTC fails either test, perform corrective action as required.
Release the ADFTC from maintenance busy and proceed to Step 3.
2. If the ADFTC passes **PROC 646** and **PROC 620**, release the ADFTC from maintenance busy and proceed to Step 3.
3. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Test state 3 - Fault code 4

Administer the TTL.

Test state 3 - Fault code 5

Repeat Test 2 to camp-on the circuit until the circuit is available for testing.

Test state 3 - Fault code 6

1. Perform Test 4 of **PROC 620** to test the busy circuit.

Note: The circuit that was displayed in Test 2 of **PROC 647** is the default equipment location displayed in Test 4 of **PROC 620**.
2. If Test 4 passes, release the circuit from maintenance busy and proceed to Step 4.
3. If Test 4 fails, take corrective action as appropriate.
Release the circuit from maintenance busy and proceed to Step 4.
4. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Test state 4 - Fault code 1

Repeat Test 2 on the same circuit.

Test state 4 - Fault codes 67, 78 through 82, and 85 through 88

1. Perform Test 4 of **PROC 620** to test the failing circuit.

Note: The circuit that was displayed in Test 2 of **PROC 647** is the default equipment location displayed in Test 4 of **PROC 620**.
2. If Test 4 passes, proceed to Step 3.
 - a. If Test 4 fails, take corrective action as appropriate.

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- b. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Proceed to Step 8.

3. Use Test 2 of **PROC 642** (terminal-to-trunk test call) to test the failing circuit.
4. Analyze how far the call went to the far end.

If the test call completely passes, repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status and proceed to Step 8.

5. If the test call is stuck at state 2, proceed to Step 14.
6. If the test call fails (test call aborted - state 6), take corrective action as appropriate and repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Proceed to Step 8.

7. If the test call is answered by someone other than the intended party, i.e., recorded announcement, proceed to Step 13.
8. If Test 2 fails again with the same test state and fault code (test state 4, fault code 67, 78 through 82, or 85 through 88), proceed to Step 9.

If Test 2 fails again with a different test state and/or fault code, perform corrective action as listed for the test state and fault code.

9. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
 - a. If the ADFTC passes both tests, proceed to Step 10.
 - b. If the ADFTC fails either test, perform corrective action as required and proceed to Step 10.
10. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Proceed to Step 11.
11. If Test 2 fails again with the same test state and fault code (test state 4, fault code 67, 78 through 82, or 85 through 88), proceed to Step 12.

If Test 2 fails again with a different test state and/or fault code, perform corrective action as listed for the test state and fault code.
12. Perform the following step in accordance with the fault code displayed.
 - a. Perform Step 13 for fault codes 67 and 78 through 80.
 - b. Perform Step 14 for fault codes 81, 82, and 85 through 88.
13. Some type of translation trouble is indicated. Use translation procedure **PROC 107** to correct the trouble.
14. A trouble with the far end terminating test line is indicated. Refer the trouble to the far end maintenance organization for further diagnosis.

Test state 4 - Fault codes 68 and 72 through 75

When fault codes 68 and 72 through 75 are recorded with a test state of 4, some type of translation trouble is indicated.

Fault code 68:

1. For fault code 68 (OTL not assigned as rotary), use translation procedures **PROC 000** and **PROC 010** to determine the assignment of the OTL.
2. If translation is correct, refer the trouble to switch engineers for further diagnosis.
3. If translation is not correct, administer the OTL and repeat Test 2 for the same circuit to determine the status.

Fault code 72:

1. For fault code 72 (cannot seize originating register), use translation procedure **PROC 254** to determine if originating registers are assigned.
2. If originating registers are assigned, refer the trouble to switch engineers for further diagnosis.

Note: Additional originating registers may be required.

3. If translation is not correct, administer the originating registers (as necessary) and repeat Test 2 for the same circuit to determine the status.

Fault code 73:

1. For fault code 73 (dialing of TVS feature failed), repeat Test 2.
2. If Test 2 fails again with the same test state and fault code (test state 4, fault code 73), use translation procedures **PROC 350 Word 2**, **PROC 285**, and **PROC 103** to determine the dial code assignment and trunk type of the TVS feature and proceed to Step 3.

Note: Refer to AT&T System 85, Release 2, Version 4, Feature Translations Service Manual, 555-103-107, Issue 1 for definition and operation of **PROC 350 Word 2**, **PROC 285**, and **PROC 103**.

3. If Test 2 fails again with a different test state and/or fault code, perform corrective action as listed for the test state and fault code.
4. If translation is correct, refer the trouble to switch engineers for further diagnosis.
5. If translation is not correct, administer the dial code assignment of the TVS feature and repeat Test 2 for the same circuit to determine the status.

Fault code 74:

1. For fault code 74 (code dialed did not match TVS feature), repeat Test 2.
2. If Test 2 fails again with the same test state and fault code (test state 4, fault code 74), use translation procedure **PROC 350, Word 2** to determine the dial access code assignment of the TVS and proceed to Step 3.

Note: Refer to AT&T System 85, Release 2, Version 4, Feature Translations Service Manual, 555-103-107, Issue 1 for definition and operation of **PROC 350, Word 2**.

3. If Test 2 fails again with a different test state and/or fault code, perform corrective action as listed for the test state and fault code.

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4. If translation is correct, refer the trouble to switch engineers for further diagnosis.
5. If translation is not correct, administer the dial access code assignment of the TVS feature and repeat Test 2 for the same circuit to determine the status.

Fault code 75:

1. For fault code 75 (trunk group dial access code inappropriate), use translation procedures **PROC 100 Word 1**, **PROC 175**, **PROC 010 Word 3**, and **PROC 350, Words 1 and 2** to determine trunk type, trunk group translations, and restrictions.

Note: Refer to AT&T System 85, Release 2, Version 4, Feature Translations Service Manual, 555-103-107, Issue 1 for definition and operation of **PROC 100 Word 1**, **PROC 175**, **PROC 010 Word 3**, and **PROC 350, Words 1 and 2**.

2. If translation is correct, refer the trouble to switch engineers for further diagnosis.
3. If translation is not correct, administer the trunk group dial access code and repeat Test 2 for the same circuit to determine the status.

Test state 4 - Fault code 69

1. Repeat Test 2 of **PROC 647** on the same circuit.

Determine the status of the circuit tested.

2. If Test 2 passes, corrective action is complete.

If Test 2 fails again with the same test state and fault code (test state 4, fault code 69), escalate the trouble.

Note: The trouble can be associated with the near end or far end.

3. If Test 2 fails again with a different test state and/or fault code, perform corrective action as listed for the test state and fault code.

Test state 4 - Fault codes 70, 71, and 90

1. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
 - a. If the ADFTC passes both tests, proceed to Step 2.
 - b. If the ADFTC fails either test, perform corrective action as required and proceed to Step 2.
2. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Test state 4 - Fault codes 76 and 77

1. Record the information displayed in Fields 2 through 15 for each circuit with a fault code of 76 or 77.
2. When excessive entries (based on experience) are noted, refer the trouble to the switch engineers for further diagnosis.

Test state 4 - Fault codes 83 and 89

1. Record the information displayed in Fields 2 through 15 for each circuit with a fault code of 83 or 89.
2. When excessive entries (based on experience) are noted, refer the trouble to the far end maintenance organization for further diagnosis.

Note: If fault codes 83 (busy from far end) and 89 (far end test line unavailable) occur often enough, more equipment may be needed to perform transmission measurements between the near end and far end.

Test state 4 - Fault codes 84, and 91 through 99

Refer the trouble to the far end maintenance organization for further diagnosis.

Test state 5 or 6 - Fault codes 11 through 63

1. Perform Test 4 Of **PROC 620** to test the appropriate circuit.

Note: The circuit that was displayed in Test 2 of **PROC 647** is the default equipment location displayed in Test 4 of **PROC 620**.

2. If Test 4 passes, refer the trouble to the facility responsible for connections between the near and far end.
If Test 4 fails, take corrective action as appropriate and proceed to Step 3.
3. Repeat Test 2 of **PROC 647** on the same circuit that was failing to determine the status.

Transmission Measurements

Measurement results include contributions from 3 sources:

1. The System 85 (near-end) switch.
2. The trunk circuit.
3. The switch at the location of the terminating test line (far-end).

Table BI, PROC 647, Measurement Conversion Factors, provides the contributions of DIMENSION PBX's and System 85 switches used as OTL or TTL to the measurement results.

For example, for a CO trunk measurement, facility loss is determined by adding the measured loss on the **MAAP** display to the OTL conversion factor listed in Table BI plus the CO gain.

An example of computing facility loss is to add the following:

1. The measured loss on the **MAAP** display.
2. Table BI OTL listing.
3. CO gain (determined from far end switch) which is the location of the far end.

TABLE BI.

PROC 647 - MEASUREMENT CONVERSION FACTORS					
SYSTEM TYPE	TEST CIRCUIT CONNECTED	TRUNK TYPE	MEASUREMENT TYPE		
			LOSS	NOISE	RETURN LOSS
SYSTEM 85 R2V4 (NEAR END)	ADFTC OTL (SN-261)	CO F-N	-0.125	0	0
		CO N-F	-0.125	+ 0.125	-0.25
		TT F-N	-1.875	0	0
		TT N-F	-1.875	+ 1.875	-3.75
		D F-N	-6.0	0	0
		D N-F	0	+ 6.0	-6.0
"DIMENSION" (FAR END)	ANY TTL (ZLC-12) (56A) (LC-145)	CO F-N	-0.3	+ 0.3	-0.6
		CO N-F	-0.3	0	0
		TT F-N	-2.3	+ 2.3	-4.6
		TT N-F	-2.3	0	0
		D F-N	-2.3	+ 2.3	-4.6
		D N-F	-2.3	0	0
SYSTEM 85 R2V4 (FAR END)	ADFTC TTL (SN-261)	CO F-N	-0.125	+ 0.125	-0.25
		CO N-F	-0.125	0	0
		TT F-N	-1.875	+ 1.875	-3.75
		TT N-F	-1.875	0	0
		D F-N	0	+ 6.0	-6.0
		D N-F	-6.0	0	0
SYSTEM 85 (FAR END)	FTC TTL (SN-260)	CO F-N	-0.125	NA	NA
		CO N-F	-0.125	0	0
		TT F-N	-1.875	NA	NA
		TT N-F	-1.875	0	0
		D F-N	0	NA	NA
		D N-F	-6.0	0	0

Abbreviations:
CO - Analog central office trunk circuit pack.
D - DS-1 interface circuit pack.
F-N - Far-to-near end measurement for loss where OTL end (MAAP display) is the near-end OR
- Far end measurement for noise and return loss where OTL end (MAAP display) is the near-end.
N-F - Near-to-far end measurement for loss where OTL end (MAAP display) is the near-end OR
- Near end measurement for noise and return loss where OTL end (MAAP display) is the near-end.
NA - Not applicable.
OTL - Originating test line.
TT - Analog tie trunk circuit pack.
TTL - Terminating test line.

PROC 648 - INTEGRATED SERVICES DIGITAL NETWORK (ISDN) FACILITIES TESTING

FLIPCHART		INTEGRATED SERVICES DIGITAL NETWORK		845552223	
ISSUE 3		(ISDN) FACILITIES TESTING			
WORD 1B	FAULT CODES (FIELD 14): ASSOCIATED WITH TEST STATE 1: 1 = ADFTC NOT AVAILABLE 2 = ADFTC IN USE 3 = ADFTC MAINTENANCE BUSIED 33 = ADFTC LINE MAINTENANCE BUSY OR ADFTC NOT ON-HOOK ASSOCIATED WITH TEST STATE 2: 4 = CURRENT TEST NOT TRANSLATED FOR THIS BOARD 5 = CAN'T PUT TRUNK IN ISDN MAINTENANCE STATE-QUEUE OCCUPANCY 6 = TRUNK WENT TO ISDN MAINTENANCE STATE-DID NOT RELEASE FROM BUSY 7 = MAINTENANCE SERVICE ACKNOWLEDGE NOT RECEIVED 8 = TRUNK IN-USE 9 = NO TTL ASSIGNED	ASSOCIATED WITH TEST STATE 3: 10 = INTERNAL ADFTC FAILURE 11 = OTL NOT ASSIGNED AS ROTARY 12 = ADFTC FAILED SELF TEST 13 = BAD I/O - NO ISDN LEVEL 3 RESPONSE IN SPECIFIED TEST TIME 14 = TVS DAC NOT ASSIGNED, OR 14 = ADFTC (OTL) NOT RESPONDING, OR 14 = KEYBOARD DIALING NOT ASSIGNED TO ADFTC 15 = CODE DIALED DID NOT MATCH TVS FEATURE 16 = TRUNK GROUP D.A.C. INAPPROPRIATE 17 = SOFTWARE RECORD INCORRECT 18 = TRUNK CANNOT BE CONNECTED 19 = OTL WENT ON-HOOK 20 = BAD I/O FROM OTL 21 = CANNOT SEIZE ORIGINATING REGISTER 22 = INVALID RESPONSE ON ISDN LEVEL 2 LINK	23 = NO RESPONSE ON ISDN LEVEL 2 LINK 24 = START HANDSHAKE NOT RECEIVED BY ADFTC 25 = ERROR OVERFLOW DETECTED BY ADFTC 26 = NO DATA RECEIVED BY ADFTC 27 = DATA TRANSMISSION TO ADFTC INTERRUPTED 28 = NO BIT ERROR RATE RESPONSE FROM ADFTC 29 = NO BLOCK ERROR RATE RESPONSE FROM ADFTC 30 = NO BIT OR BLOCK ERROR RATE RESPONSE FROM ADFTC 34 = BAD I/O TO ISDN LEVEL 2 LINK ON PRIMARY RATE INTERFACE BOARD ASSOCIATED WITH TEST STATE 4: 0 = PASS 31 = BIT ERROR RATE THRESHOLD EXCEEDED 32 = BLOCK ERROR RATE THRESHOLD EXCEEDED	NETWORK ISDN FACILITIES TESTING 648	

FLIPCHART		INTEGRATED SERVICES DIGITAL NETWORK		845552223	
ISSUE 4		(ISDN) FACILITIES TESTING			
WORD 1A	OTHER CODES: CIRCUIT STATUS (FIELD 9): 0=IDLE 1=IN USE 2=IN USE FAR END TEST CALL 3=DEMAND MAINT BUSY 4=AUTO MAIN BUSY 5=FAR END MAIN BUSY 6=TRUNK RECORDS IN INVALID OR TRANSITORY STATE ALARM STATUS (FIELD 10): 1=MAJOR 2=MINOR 3=WARNING 4=ERRORS RECORDED 5=ALARM RESOLVED	TEST STATE (FIELD 10): 1=GETTING ADFTC 2=SEIZING TRUNK 3=TEST IN PROGRESS 4=TEST COMPLETED 5=CHANGING ISDN LEVEL 3 STATUS 9=TEST TERMINATED/SUMMARY DISPLAY DATA TYPE (FIELD 13): 1=FAULT CODE 2=BIT ERROR RATE 3=BLOCK ERROR RATE 4=CIRCUITS TESTED 5=LENGTHS OF TEST 2, 3 & 5 ARE TEST 3 ONLY	SPECIAL ERROR CODES: 81=MESSAGE TRANSMISSION TO MODULE PROCESSOR FAILED. 82=STOP USED-RANGE NOT COMPLETED. 83=DMDIS OVERFLOW. FIELD LIMITS: FIELD 14 (BIT/BLOCK ERROR DATA OUTPUT): THE FIRST TWO DIGITS IN FIELD 14 ARE THE BIT OR BLOCK ERROR RATE; THE SECOND TWO DIGITS IN FIELD 14 ARE THE NUMBER OF BITS OR BLOCKS SENT. ZEROS (0'S) DISPLAYED IN FIELD 14 INDICATE THAT NO BITS OR BLOCKS WERE SENT. BLANKS DISPLAYED IN THE FIRST TWO DIGITS INDICATE A ZERO ERROR RATE. TO OBTAIN THE BIT OR BLOCK ERROR RATE, MULTIPLY THE FIRST (LEFT MOST) DIGIT BY 10 RAISED TO THE NEGATIVE POWER OF THE SECOND DIGIT. TO OBTAIN THE NUMBER OF BITS AND BLOCKS SENT, MULTIPLY THE THIRD DIGIT BY 10 RAISED TO THE POSITIVE POWER OF THE FOURTH DIGIT.	EXAMPLE: FIELD 14 = 3586 BIT OR BLOCK ERROR RATE = 3 X 10 ¹ BITS OR BLOCKS SENT = 8X10 ⁷	NETWORK ISDN FACILITIES TESTING 648

FLIPCHART ISSUE 3		+	INTEGRATED SERVICES DIGITAL NETWORK (ISDN) FACILITIES TESTING						+	+		845552223		
TEST 1: DISPLAY FAILURE HISTORY. USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILED CIRCUIT. USE 'CLEAR DATA' 'EXECUTE' TO RESOLVE ALARM FOR FAILED CIRCUITS.			TEST 2: TESTS SELECTED CIRCUIT(S) AT THE ISDN LEVEL 2 LAYER. USE 'NEXT CIRCUIT' TO DISPLAY NEXT TESTED CIRCUIT. USE 'BUSY' TO MAINTENANCE BUSY THE DISPLAYED CIRCUIT. USE 'RELEASE BUSY' TO RELEASE THE BUSIED TRUNK CIRCUIT FROM MAINTENANCE BUSY.			TEST 3: TESTS SELECTED CIRCUIT(S) AT THE ISDN LEVEL 3 LAYER. USE 'NEXT CIRCUIT' TO DISPLAY NEXT TESTED CIRCUIT. USE 'NEXT DATA' TO CYCLE THROUGH DATA TYPES AND ASSOCIATED FAULT/DATA INFORMATION. USE 'BUSY' TO MAINTENANCE BUSY THE DISPLAYED TRUNK CIRCUIT. USE 'RELEASE BUSY' TO RELEASE THE DISPLAYED TRUNK CIRCUIT FROM MAINTENANCE BUSY.			THE LENGTH OF TEST IS ASSIGNED WITH THE 'CHANGE FIELD 14' SEQUENCE AS FOLLOWS: 1. DASH-8 SECONDS (DEFAULT)-READS 127 ON 'NEXT DATA' 2. 0-SEND ONE BLOCK OF DATA 3. 1-126-MINUTES OF TEST EACH CIRCUIT TESTED IS TESTED FOR THIS LENGTH OF TIME.					
												(CONTINUED ON WORD 1A)		
TEST NO	TESTS 2 & 3		TESTS 2 & 3		TESTS 2 & 3			CIRCUIT STATUS	ALARM STAT (TEST) 1 TEST STAT (TEST 2-3) 10	FAILURE INDEX	NUMBER FAILED	TESTS 1, 2 & 3		NETWORK ISDN FACILITIES TESTING
	TRUNK GROUP	TRUNK GROUP MEMBER	EQUIPMENT LOCATION									DATA TYPE	TEST 3	
			MODULE	CABINET	CARRIER	SLOT	CIRCUIT						LENGTH OF TEST	
													TESTS 2 & 3	
													NUMBER OF CIRCUITS TESTED	
													FAULT CODES/DATA 14	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	648

Purpose

PROC 648 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from an Integrated Services Digital Network (ISDN) failure.

PROC 648 is used to:

1. Send a test frame to the far end via a selected signaling (D) channel interface and to verify the response.

PROC 648

2. To make a test call from the outgoing test line (OTL) which is an Analog/Digital Facilities Test Circuit (ADFTC) to a terminating test line (TTL) on the far end via the ISDN trunk to be tested and the associated bearer (B) channel.

A digital stream is sent from the ADFTC to the far end where it is looped back to the ADFTC for bit and block error rate analysis.

Note: Bit and block error rates are only displayed in Test 3.

3. Manually turn off the **OTHER FAILS** fault indicator when all ISDN circuits that caused an alarm to be raised are tested as good (assuming no other sources are affecting the **OTHER FAILS** fault indicator).

Note: Alarmed ISDN circuits in PMIDS are marked as resolved.

Primary rate refers to the ISDN primary rate interface (PRI) which supports twenty-three B channels and one D (signaling) channel.

A B channel refers to one of the 23 primary rate (64K bit per second) channels (or ISDN trunks) on the ANN35 circuit pack that carries voice or data.

A D channel refers to the primary rate signaling (64K bit per second) channel on the ANN35 circuit pack.

Levels 1, 2, and 3 refer to the first three layers of the ISDN protocol. Level 1 is the physical layer, level 2 is the data link layer, and level 3 is the network layer.

Link access procedure on the D channel (LAPD) is the protocol used on the ISDN primary rate interface data link layer (level 2).

The ADFTC (circuit pack SN261C) is used in testing ISDN trunks.

A terminating test line (TTL) refers to the equipment providing the loop back needed at the far end during network loop back testing.

Note: If the far end is a System 85, the TTL is an ADFTC.

Field Definitions and Codes

Each field of **PROC 648** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BJ, PROC 648 - Field Definitions and Codes.

Optional input fields are:

1. Dashes in Fields 2 through 8 - Select all ISDN circuits in the switch to be tested (Tests 2 and 3 only).
2. Field 2 - Select a specific trunk group to be tested (Tests 2 and 3 only).
3. Fields 2 and 3 - Select trunk group and trunk number to be tested (Tests 2 and 3 only).

4. Fields 4 through 7 - Select all circuits on a PRI circuit pack to be tested (Tests 2 and 3 only).
5. Fields 4 through 8 - Select equipment location of a specific circuit to be tested (Tests 2 and 3 only).
6. Field 14 - Select test length (i.e., one block of data, default of 8 seconds, or 1 through 126 minutes) to be performed (Test 3 only).

Note: Field 14 is a multiple use field; however, for optional input Field 14 is used to select the test length.

Operation of Procedure

Overview

PROC 648 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from an ISDN failure.

To call in **PROC 648**, perform the following:

1. Depress **PROC NO; 648; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays failure history logged in PMIDS by the on-line periodic testing.

Note: Up to 30 failures can be displayed.

Test 1 is also used to manually resolve any or all ISDN alarmed circuit failures.

2. Test 2 - Performs an ISDN level 2 test on selected circuits or a range of circuits.
3. Test 3 - Performs an ISDN level 3 loop back test on selected circuits or a range of circuits.
Test 3 also provides bit and block error rate analysis.

Test 1

Test 1 provides a failure history of the ISDN circuit failures detected by the on-line ISDN periodic software.

Test 1 is also used to manually resolve the alarmed circuit failures associated with ISDN in PMIDS and to turn off the **OTHER FAILS** fault indicator if no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

1. Test 1 is the default test when entering **PROC 648** or is selected by using **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 1.

TABLE BJ.

PROC 648 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	10* (Test 1)	1-5	Alarm status:
2	18-999	Trunk group.		1	Major.
3	1-255	Trunk number.		2	Minor.
4-8		Equipment location:		3	Warning.
4	0-30	Network module number.		4	Errors recorded.
	0-7	Cabinet number.	10*	5	Alarm resolved.
6	0-3	Carrier number.		1-5,9	Test state:
7	0,1,2, 5,6,7, 13,14, 15,18, 19,20	Slot number.		1	Getting ADFTC.
				2	Seizing trunk.
				3	Test in progress.
8	0-3	Circuit number.		4	Test completed.
9	0-6	Circuit status:		5	ISDN level 3 status change.
	0	Idle.		9	Test terminated and summary information displayed.
	1	In use.	11	0-99	Failure index:
	2	In use, far end test call.		0-30	Index into PMIDS failures (Test 1 only).
	3	Demand maintenance busied.		0-99	Index into DMIDS failures (Test 2 and 3 only).
	4	Automatic maintenance busied.			
	5	Far end maintenance busied.	12	0-99	Total number of circuits failed.
	6	Trunk records invalid or in transitory state.			

TABLE BJ. (Contd)

PROC 648					
FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
13	1-5	Data type:	14*		Data: The type of information displayed in Field 14 after test execution depends on which encode is displayed in Field 13: Field 13 = Field 14 = 1 Fault code. 2 Bit error rate. 3 Block error rate. 4 Number of circuits tested. 5 Length of test.
	1	Fault code.			
	2	Bit error rate.			
	3	Block error rate.			
	4	Number of circuits tested.		0-34	
	5	Length of test.		[1]	
				[1]	
				1-9999	
				0-127	
* = Fields 10 and 14 are multiple use fields depending on the test being performed and when the data is displayed. [1] The first 2 digits in Field 14 are the bit or block error rate; the second 2 digits in Field 14 are the number of bits or blocks sent. Zeroes (0's) displayed in Field 14 indicate no bits or blocks were sent. Blanks displayed in the first 2 digits indicate a zero error rate. To obtain the bit or block error rate, multiply the first digit (left most side) by 10 raised to the negative power of the second digit. To obtain the number of bits or blocks sent, multiply the third digit by 10 raised, to the positive power of the fourth digit. Example: Field 14 = 3586. Bit or block error rate = 3×10 to the negative 5th. Bits or blocks sent = 8×10 to the positive 6th.					

2. When Test 1 is initially called in, Field 1 displays a 1 and all other fields are dashed.
3. To start Test 1, depress **EXECUTE**.
4. The failure history is sorted and a summary is displayed.
5. If no failures exist, the following summary is displayed:
Field 1 - 1.
Field 12 - 0 (indicating no failures).
6. If any failures exist, the summary displays a 1 in Field 1 and the total number of circuits that failed in Field 12 (maximum of 30).
7. Depressing **NEXT CIRCUIT** displays the first failure as follows:
Field 1 - 1.
Field 2 - Trunk group.
Field 3 - Trunk group member.
Fields 4 through 8 - Equipment location of the failing circuit.
Field 9 - Dashed.
Field 10 - Alarm status of the failing circuit.
Field 11 - Failure index (equals number of failures displayed in Field 12).
Field 12 - Total number of failing circuits recorded in PMIDS.
Field 13 - Data type 1 (indicating that the data in Field 14 is the specific fault code logged against the failing circuit) by the on-line ISDN periodic software.
Field 14 - Specific fault code associated with the failing circuit.

Note: Specific fault codes that may be displayed in Field 14 consist of: 2000 (far end cannot enter multiple frame mode); 2001 (SABME transmitted N200 times with no response); 2002 (DISC transmitted N200 times with no response); 2003 (miscellaneous primary rate board level 2 errors); or 2004 (closed channel).

8. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failing circuits (if any).
Field 11 decrements by 1 each time **NEXT CIRCUIT** is depressed.
9. When all failing circuits are displayed (1 displayed in Field 11), depressing **NEXT CIRCUIT** dashes Fields 2 through 14.
Depressing **NEXT CIRCUIT** once more causes the summary to be displayed, and the failing circuits can be stepped through again by use of **NEXT CIRCUIT**.
10. The **CLEAR DATA; EXECUTE** sequence can be used to manually resolve individual ISDN alarmed failures or all ISDN alarmed failures after **EXECUTE** is used to initiate Test 1.
The failures which are resolved are those failures with an alarm status of 1 (major), 2 (minor), or 3 (warning) displayed in Field 10.
11. To resolve individual circuit failures with an alarm status of 1, 2, or 3, perform Steps 12 and 13.
Perform Steps 15 through 18 (as appropriate) to resolve all ISDN alarmed failures.

12. Use **NEXT CIRCUIT** to display the failing circuit with an alarm status of 1, 2, or 3 on the **MAAP**.

Note: Individual circuit failures cannot be resolved unless the alarmed circuit is displayed on the **MAAP**.

13. Depress **CLEAR DATA; EXECUTE**.

Field 10 (alarm status) displays a 5 indicating that the alarmed circuit in PMIDS is marked as resolved.

14. The **OTHER FAILS** fault indicator is turned off if no other ISDN alarmed failures exist, assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
15. If the **CLEAR DATA; EXECUTE** sequence is performed when Field 1 displays a 1 and Field 12 displays the number of failures (summary display) or when all fields except Field 1 are dashed, all ISDN failures with an alarm status of 1, 2, or 3 are resolved and the **OTHER FAILS** fault indicator is turned off if no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
16. All ISDN failures with an alarm status of 1, 2, or 3 can be resolved upon entry to **PROC 648**, Test 1 and after displaying and recording all ISDN failures and then using **NEXT CIRCUIT** to dash all fields except Field 1 or to display a 1 in Field 1 and the number of failures in Field 12 (summary display).

Caution: *The ISDN alarmed failures should be displayed and recorded as stated in Step 18 in order that a record of the equipment location and specific fault code of each alarmed failure is available for maintenance personnel prior to manually resolving alarmed entries.*

17. After initial entry to Test 1 and depressing **EXECUTE**, depress **CLEAR DATA; EXECUTE**.

18. Field 12 (total number of failures) changes to reflect the number of entries still remaining (indicating the remaining entries are not alarmed entries).

All ISDN failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **OTHER FAILS** fault indicator is turned off if no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

19. After the summary is displayed, depress **NEXT CIRCUIT** to display and record all alarmed ISDN failures, then depress **NEXT CIRCUIT** until all fields except Field 1 are dashed or until the summary (Field 1 = 1, Field 12 = total number of failures, with all other fields dashed) is displayed, then depress **CLEAR DATA; EXECUTE**.

Field 12 (total number of failures) changes to reflect the number of entries still remaining (indicating the remaining entries are not alarmed entries).

All ISDN failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **OTHER FAILS** fault indicator is turned off if no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

20. The **MAJOR**, **MINOR**, or **WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

PROC 648, Test 2

Test 2

Test 2 provides an ISDN level 2 test. The primary function of Test 2 is to send a test frame to the far end via the signaling (D) channel interface associated with the selected trunk and to verify the response.

Test 2 only tests the D channel associated with the specified primary rate interface(s).

Test 2 does not provide bit and block error rate analysis.

Test 2 Data Entry

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, Fields 2 through 14 are dashed or a default equipment location may be displayed in Fields 4 through 8. Fields 2 and 3 display the trunk group number and trunk group member and Field 9 displays the circuit status associated with the default equipment location displayed in Fields 4 through 8.
3. The default equipment location can be the last equipment location or trunk group and trunk group member displayed in Test 1 or 3 of **PROC 648** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. The default equipment location can also be passed from **PROC 620**, **PROC 625**, or **PROC 647** as long as the equipment location is a valid ISDN trunk facility that **PROC 648** can test and is still displayed in **PROC 620**, **PROC 625**, or **PROC 647** when it is passed.
5. All ISDN circuits in the switch, all ISDN circuits within a trunk group, all ISDN circuits on a specific PRI circuit pack, a specific ISDN circuit, or the default equipment location can be selected for testing.
6. Selection of circuits to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence or **CLEAR ENTRY** sequence **must** be used.
 - b. If no default equipment location is displayed, either **ENTER**, the **CHANGE FIELD** sequence, or the **CLEAR ENTRY** sequence can be performed to select the range of circuits to be tested.
7. To select all ISDN circuits in the switch to be tested, proceed to Step 8.
 - a. To select all ISDN circuits in a trunk group to be tested, proceed to Step 9.
 - b. To select all ISDN circuits on a primary rate interface circuit pack to be tested, proceed to Step 10.
 - c. To select a specific ISDN circuit to be tested, proceed to Step 11.
 - d. To test the default equipment location, proceed to Step 1 of Test 2 execution.
8. To test all ISDN circuits in the switch, Fields 2 through 8 must be dashed. Perform one of the following depending on whether or not a default equipment location is displayed.

- a. **ENTER.**
- b. **CHANGE FIELD; 2; ENTER.**
- c. **CLEAR ENTRY; 2; ENTER.**

Test 2 starts with trunk member 1 of the first testable trunk group (numerically) and runs until all ISDN circuits in the switch are tested.

Proceed to Step 1 of Test 2 Execution.

- 9. To select all ISDN circuits in a trunk group to be tested, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Trunk group number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group number); ENTER.**
 - c. **CLEAR ENTRY; 2; ENTER; (Trunk group number); ENTER.**

Test 2 starts with the first ISDN circuit in the trunk group selected and runs until all ISDN circuits in the trunk group are tested.

Proceed to Step 1 of Test 2 Execution.

- 10. A specific PRI circuit pack can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.**
 - b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER.**

Test 2 starts with the first ISDN circuit on the PRI circuit pack selected and runs until all ISDN circuits on the circuit pack are tested.

Proceed to Step 1 of Test 2 Execution.

- 11. A specific circuit can be selected for testing in one of three ways; i.e., by trunk group and trunk group member, by equipment location, and by use of **NEXT CIRCUIT** and/or **NEXT UNIT**. (Refer to Steps 12 through 15.)
- 12. To select a specific circuit using trunk group and trunk group member, perform one of the following depending on whether a default equipment location is displayed.
 - a. **(Trunk group); ENTER; (Trunk group member); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group); ENTER; (Trunk group member); ENTER.**

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status when the trunk group and trunk group member are entered in Fields 2 and 3.

Proceed to Step 1 of Test 2 Execution.

- 13. To select a specific circuit using the equipment location, perform one of the following depending on whether or not a default equipment location is displayed.

- a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
- b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER; CHANGE FIELD; 8; ENTER; (Circuit number); ENTER.**

Note: Fields 2 and 3 display the trunk group and trunk group member and Field 9 displays the circuit status when the equipment location is entered in Fields 4 through 8.

Proceed to Step 1 of Test 2 Execution.

14. Depressing **NEXT CIRCUIT** advances to the next trunk member in the displayed trunk group or the first trunk member in the next testable trunk group.

Depressing **NEXT UNIT** advances to the first trunk member in the next testable trunk group.

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status of the first or next trunk member when **NEXT CIRCUIT** or **NEXT UNIT** is depressed.

15. To select a specific circuit using **NEXT CIRCUIT** and/or **NEXT UNIT**, perform the following:
 - a. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 2 through 8.
 - b. Depress **NEXT UNIT** until the trunk group is displayed in Field 2, then depress **NEXT CIRCUIT** (if necessary) until the circuit to be tested is displayed in Fields 3 through 8.

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status of the specific circuit to be tested when **NEXT CIRCUIT** or **NEXT UNIT** and **NEXT CIRCUIT** (if necessary) is depressed.

Proceed to Step 1 of Test 2 Execution.

Test 2 Execution

1. To start Test 2 after selecting the ISDN circuit(s) to be tested, depress **EXECUTE**.
The **WAIT** indicator on the **MAAP** is turned on.
2. During testing of a specific circuit or the default equipment location, Field 10 (test state) is incremented to indicate progress of Test 2.
3. When the entire switch, an entire trunk group, or an PRI circuit pack is being tested, the following fields are incremented as a circuit is tested:
Fields 2 and 3 - Trunk group and trunk group member.
Fields 4 through 8 - Equipment location of circuit being tested.

Field 10 - Test state (encodes 1 through 4).

Field 12 - Total number of failures (if any).

4. The failure information returned in Test 2 is stored in DMIDS.

If DMIDS becomes full at any time during range testing, Test 2 is stopped and the **WAIT** indicator is turned off.

Note: Although Field 12 only displays 99 entries, DMIDS allows testing of at least 255 trunks prior to DMIDS overflowing occurring.

5. The original range of circuits selected is displayed in Fields 2 through 8, and special error code 83 (DMIDS overflow) is displayed in the **MAAP** error code field.
6. Results of the test can be examined at this time (Refer to Test 2 Result Display below). Test 2 can be restarted from the original range of circuits entered by depressing **EXECUTE**.

Caution: *If Test 2 is continued from where it was stopped by a DMIDS overflow, any test results gathered to that point are lost and only new failure data is retained.*

7. If Test 2 is halted because of a DMIDS overflow, a new range of circuits to be tested can be entered instead of testing the original range of circuits.
8. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested. Refer to Step 8 of Test 2 Data Entry above to select all circuits in the switch to be tested, Step 9 of Test 2 Data Entry above to select all circuits in a trunk group to be tested, or Step 10 of Test 2 Data Entry above to select all ISDN circuits on an PRI circuit pack to be tested.

Note: Before depressing **EXECUTE** to continue Test 2 from where it was stopped because of a DMIDS overflow or from the new range of ISDN circuits selected for testing, the failure data should be examined and recorded for future maintenance activities.

9. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits entered or to start over from the original range of circuits.
10. **STOP** can be depressed when a range of circuits is being tested. The **WAIT** indicator is turned off and a summary is displayed.

Note: Special error code 82 (**STOP** used - range not completed) is displayed in the **MAAP** error code field.

11. If no failures exist, the following summary is displayed:

Field 2 - 1.

Field 12 - 0 (indicating no failures).

12. If any failures exist, the summary displays a 1 in Field 1 and the total number of circuits that failed in Field 12.

PROC 648, Test 2

13. If any failures are displayed in Field 12 (number failed), test result information can be stepped through as described in Test 2 Result Display below when Test 2 is halted using **STOP** for the circuits already tested even through the entire range of circuits is not tested.
14. If Test 2 is halted because **STOP** was depressed, a new range of circuits to be tested can be entered instead of continuing Test 2 from the circuit under test.
15. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested.
Refer to Step 8 of Test 2 Data Entry above to select all circuits in the switch to be tested, Step 9 of Test 2 Data Entry above to select all circuits in a trunk group to be tested, or Step 10 of Test 2 Data Entry above to select all ISDN circuits on an PRI circuit pack to be tested.

Note: Before depressing **EXECUTE** to continue Test 2 from the new range of ISDN circuits selected for testing, the failure data (if any) for the previous range of ISDN circuits should be examined and recorded for future maintenance activities.

16. **EXECUTE** must be depressed to begin Test 2 from the new range of circuits entered or to continue from the circuit under test when **STOP** was depressed.
17. Test results gathered after continuing from the circuit under test for the original range of circuits being tested are added to the results previously stored in DMIDS.

Test 2 Result Display

1. When Test 2 is completed for a specific circuit or a default equipment location, the **WAIT** indicator is turned off and the following is displayed:
Fields 2 and 3 - Trunk group and trunk group member of the tested ISDN circuit.
Fields 4 through 8 - Equipment location of the tested ISDN circuit.
Field 9 - Current circuit status of the displayed circuit.
Field 10 - Test status (test states 1 through 4 - indicates where test was when Test 2 is completed).
Field 12 - 0 (indicating no failures were found for the ISDN circuit tested) or 1 (indicating the ISDN circuit failed the test).
Field 13 - Data type of 1 (indicating that Field 14 displays the fault code).
Field 14 - 0 (if the ISDN circuit passed) or the fault code associated with the failing ISDN circuit.
2. When Test 2 is completed or **STOP** is depressed for a range of circuits (i.e., all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on an PRI circuit pack), the **WAIT** indicator is turned off and the following summary is displayed:
Field 12 - 0 or total number of failures.
Field 13 - Data type of 4 (indicating that Field 14 displays the number of circuits tested).
Field 14 - Number of ISDN circuits tested.
3. If Field 12 indicates that ISDN circuits failed Test 2, depressing **NEXT CIRCUIT** displays the following information.

Field 1 - 2

Fields 2 and 3 - Trunk group and trunk group member.

Fields 4 through 8 - Equipment location of the failing circuit.

Field 9 - Current circuit status of the failing circuit.

Field 10 - Dashed.

Field 11 - 1 (indicating that the first failure is being displayed).

Field 12 - Total number of failures.

Field 13 - Data type of 1 (indicating that Field 14 is displaying the fault code associated with the failing circuit).

Field 14 - Fault code logged in DMIDS against the failing circuit.

4. When a range of circuits are tested (all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on a PRI circuit pack) and Field 12 (number of failures) indicates more than one failure, depressing **NEXT CIRCUIT** advances to the next failing circuit.

Fields 2 through 9 are updated with the trunk group, trunk group member, equipment location, and circuit status of the next failing circuit. Field 11 (failure index) is incremented and Field 14 (fault code associated with the failing circuit) is updated.

Note: Bit and block error rates are not displayed in Test 2.

5. When all failing ISDN circuits are displayed indicated by Field 11 (failure index) equaling Field 12 (number failed), depressing **NEXT CIRCUIT** dashes all fields except Field 1.
 - a. Depressing **NEXT CIRCUIT** once more displays the summary information.
 - b. Depressing **NEXT CIRCUIT** again starts the sequence over.
6. When another specific ISDN circuit is to be tested, refer to Steps 12 through 15 of Test 2 Data Entry above to select the specific circuit.

EXECUTE must be depressed to test the specific circuit selected for testing.

7. To select another range of circuits to test, the **CHANGE FIELD** sequence must be used.

Refer to Step 8 of Test 2 Data Entry above to select all circuits in the switch to test, refer to Step 9 of Test 2 Data Entry above to select all circuits in a trunk group to test, or refer to Step 10 to select all ISDN circuits on an PRI circuit pack to test.

8. **EXECUTE** must be depressed to test the range of circuits selected for testing.

Test 3

Test 3 provides an ISDN level 3 loop back test. The primary function of Test 3 is to make a test call to the far end for bit and block error rate analysis.

A test call is made from the ADFTC to a terminating test line (TTL) on the far end through the ISDN trunk to be tested and the associated bearer (B) channel.

When the connection is made, a digital stream is sent from the ADFTC for bit and block error rate analysis.

PROC 648, Test 3

Test 3 provides bit and block error rate analysis for **both** passing and failing ISDN circuits.

Test 3 Data Entry

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. When Test 3 is initially called in, Fields 2 through 14 are dashed or a default equipment location may be displayed in Fields 4 through 8. Fields 2 and 3 display the trunk group number and trunk group member and Field 9 displays the circuit status associated with the default equipment location displayed in Fields 4 through 8.
3. The default equipment location can be the last equipment location or trunk group and trunk group member displayed in Test 1 or 2 of **PROC 648** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.
4. The default equipment location can also be passed from **PROC 620**, **PROC 625**, or **PROC 647** as long as the equipment location is a valid ISDN trunk facility that **PROC 648** can test and is still displayed in **PROC 620**, **PROC 625**, or **PROC 647** when it is passed.
5. All ISDN circuits in the switch, all ISDN circuits within a trunk group, all ISDN circuits on a specific PRI circuit pack, a specific ISDN circuit, or the default equipment location can be selected for testing.
6. Selection of circuit(s) to be tested depends on whether or not a default equipment location is displayed.
 - a. If a default equipment location is displayed, the **CHANGE FIELD** sequence or **CLEAR ENTRY** sequence **must** be used.
 - b. If no default equipment location is displayed, either **ENTER**, the **CHANGE FIELD** sequence, or the **CLEAR ENTRY** sequence can be performed to select the range of circuits to be tested.
7. To select all ISDN circuits in the switch to be tested, proceed to Step 8.
 - a. To select all ISDN circuits in a trunk group to be tested, proceed to Step 9.
 - b. To select all ISDN circuits on a primary rate interface circuit pack to be tested, proceed to Step 10.
 - c. To select a specific ISDN circuit to be tested, proceed to Step 11.
 - d. To test the default equipment location, proceed to Step 16.
8. To test all ISDN circuits in the switch, Fields 2 through 8 must be dashed. Perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **ENTER**.
 - b. **CHANGE FIELD; 2; ENTER**.
 - c. **CLEAR ENTRY; 2; ENTER**.

Test 3 starts with trunk member 1 of the first testable trunk group (numerically) and runs until all ISDN circuits in the switch are tested.

Proceed to Step 17.

9. To select all ISDN circuits in a trunk group to be tested, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Trunk group number); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group number); ENTER.**
 - c. **CLEAR ENTRY; 2; ENTER; (Trunk group number); ENTER.**

Test 3 starts with the first ISDN circuit in the trunk group selected and runs until all ISDN circuits in the trunk group are tested.

Proceed to Step 17.

10. A specific PRI circuit pack can be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER.**
 - b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER.**

Test 3 starts with the first ISDN circuit on the PRI circuit pack selected and runs until all ISDN circuits on the circuit pack are tested.

Proceed to Step 17.

11. A specific circuit can be selected for testing in one of three ways; i.e., by trunk group and trunk group member, by equipment location, and by use of **NEXT CIRCUIT** and/or **NEXT UNIT**. (Refer to Steps 12 through 15.)
12. To select a specific circuit using trunk group and trunk group member, perform one of the following depending on whether a default equipment location is displayed.
 - a. **(Trunk group); ENTER; (Trunk group member); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Trunk group); ENTER; (Trunk group member); ENTER.**

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status when the trunk group and trunk group member are entered in Fields 2 and 3.

Proceed to Step 16.

13. To select a specific circuit using the equipment location, perform one of the following depending on whether or not a default equipment location is displayed.
 - a. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
 - b. **CHANGE FIELD; 4; ENTER; (Module number); ENTER; CHANGE FIELD; 5; ENTER; (Cabinet number); ENTER; CHANGE FIELD; 6; ENTER; (Carrier number); ENTER; CHANGE FIELD; 7; ENTER; (Slot number); ENTER; CHANGE FIELD; 8; ENTER; (Circuit number); ENTER.**

Note: Fields 2 and 3 display the trunk group and trunk group member and Field 9 displays the circuit status when the equipment location is entered in Fields 4 through 8.

Proceed to Step 16.

14. Depressing **NEXT CIRCUIT** advances to the next trunk member in the displayed trunk group or the first trunk in the next testable trunk group.

Depressing **NEXT UNIT** advances to the first trunk member in the next testable trunk group.

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status of the first or next trunk member when **NEXT CIRCUIT** or **NEXT UNIT** is depressed.

15. To select a specific circuit using **NEXT CIRCUIT** and/or **NEXT UNIT**, perform the following:
 - a. Depress **NEXT CIRCUIT** until the circuit to be tested is displayed in Fields 2 through 8.
 - b. Depress **NEXT UNIT** until the trunk group is displayed in Field 2, then depress **NEXT CIRCUIT** (if necessary) until the circuit to be tested is displayed in Fields 3 through 8.

Note: Fields 4 through 8 display the equipment location and Field 9 displays the circuit status of the specific circuit to be tested when **NEXT CIRCUIT** or **NEXT UNIT** and **NEXT CIRCUIT** (if necessary) is depressed.

Proceed to Step 16.

16. It is not necessary to busy out a circuit for testing, however a specific circuit or the the default equipment location can optionally be placed in maintenance busy out status for testing by performing the following:
 - a. Check the circuit status displayed in Field 9.

Caution: *If the circuit status equals 1 or 2, depressing **BUSY OUT** aborts any calls, data, or test call in progress.*

- b. If the circuit status = 0, 3, or 4, proceed to Step 17.
- c. If the circuit status = 1 (in-use), proceed to Step 17.

If the circuit is still in-use when Test 3 is executed, the circuit is **not** tested.

After Test 3 is performed and the circuit is still in-use, depressing **EXECUTE** while the circuit is still displayed starts a camp-on procedure. Test 3 camps on the circuit until the circuit is released from being in-use and then tests the circuit.

Note: If the circuit has to be tested right away, depressing **BUSY OUT** aborts any calls or data in progress and the circuit is tested as soon as **EXECUTE** is depressed.

- d. If the circuit status = 2 or 5, do not test. The far end is either in use (by a test call) or maintenance busied.
 - e. If the circuit status = 6, wait 2 minutes, depress **BUSY OUT** and proceed to Step 17.
17. The length of the test for each ISDN circuit to be tested can be entered in Field 14 or a default test length can be selected.
- a. The default test length equals 8 seconds for test execution and is indicated by a dash in Field 14.
 - b. If a default test length is desired, proceed to Step 1 of Test 3 Execution.
18. A 0 entered in Field 14 sends one block of data for each circuit selected for testing.
A number between 1 and 126 entered in Field 14 indicates the number of minutes that each circuit selected for testing is tested.
19. To select the desired test length, the **CHANGE FIELD** sequence must be used:
CHANGE FIELD; 14; ENTER.
20. Select the desired test length by entering the number (in minutes) in Field 14:
(0 through 126 - maximum of 126 minutes); ENTER.

Note: A 0 entered in Field 14 sends one block of data for each circuit selected for testing. Entering a number between 1 and 126 indicates that each circuit selected for testing is tested for the number of **minutes** entered; i.e., 25 equals 25 minutes of testing for **each** circuit selected.

Test 3 Execution

1. To start Test 3 after selecting the ISDN circuits to be tested and the test length, depress **EXECUTE**.
The **WAIT** indicator on the **MAAP** is turned on.
2. If an ISDN circuit is maintenance busied out, it is released from busy while under test and restored to maintenance busied when the test is completed.
3. When Test 3 encounters a specific circuit or the default equipment location in use, a camp-on procedure is used by Test 3. The specific circuit or default equipment location is tested when it is no longer in use.
4. When testing a range of circuits (i.e., all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on a PRI circuit pack) and Test 3 encounters an ISDN circuit in use, an in-use fault code is logged in DMIDS records for that circuit and the test continues with the next circuit to be tested.
5. When testing a range of circuits, **STOP** can be depressed to halt Test 3 at anytime.
The **WAIT** indicator is turned off and a summary is displayed.

Note: Special error code 82 (**STOP** used - range not completed) is displayed in the **MAAP** error code field.

PROC 648, Test 3

6. If no failures exist, the following summary is displayed:
Field 1 - 3
Field 12 - 0 (indicating no failures).
7. If any failures exist, the summary displays a 1 in Field 1 and the total number of circuits that failed in Field 12.
8. If any failures are displayed in Field 12, test result information can be stepped through as described in Step 12 below when Test 3 is halted using **STOP** for the circuits already tested even through the entire range of circuits is not tested.
9. If Test 3 is halted because **STOP** was depressed, a new range of circuits to be tested can be entered instead of continuing Test 3 from the circuit under test.
10. The **CHANGE FIELD** sequence must be used to enter the new range of circuits to be tested.
Refer to Step 8 of Test 3 Data Entry above to select all circuits in the switch to be tested, Step 9 of Test 3 Data Entry above to select all circuits in a trunk group to be tested, or Step 10 of Test 3 Data Entry above to select all ISDN circuits on an PRI circuit pack to be tested.

Note: Before depressing **EXECUTE** to continue Test 3 from the new range of ISDN circuits selected for testing, the failure data (if any) for the previous range of ISDN circuits should be examined and recorded for future maintenance activities.

11. **EXECUTE** must be depressed to begin Test 3 from the new range of circuits entered or to continue from the circuit under test when **STOP** was depressed.
Test results gathered after continuing from the circuit under test for the original range of circuits being tested are added to the results previously stored in DMIDS.
12. Test 3 operation and display of test results are different when a specific ISDN circuit or default equipment location is tested and when a range of ISDN circuits (i.e, all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on a PRI circuit pack) are tested.
 - a. For test operation and display of test results for a specific ISDN circuit or a default equipment location, proceed to Step 1 of Test 3 Result Display for a Single Circuit.
 - b. For test operation and display of test results for a range of ISDN circuits, proceed to Step 1 of Test 3 Execution and Test Result Display for a Range of Circuits.

Test 3 Result Display for a Single Circuit

1. During testing of a default equipment location or a specific ISDN circuit, Field 10 (test state) is incremented to indicate progress of Test 3.
2. When Test 3 is completed for a default equipment location or a specific ISDN circuit, the **WAIT** indicator is turned off and the following is displayed:
Field 1 - 3.
Fields 2 and 3 - Trunk group number and trunk group member number of the tested ISDN circuit.
Fields 4 through 8 - Equipment location of the tested ISDN circuit.
Field 9 - Current circuit status of the tested circuit.

Field 10 - Test status (indicated by test states 1 through 4).

Field 11 - Dashed or 1 (depending on the display in Field 12).

Field 12 - 0 (indicating no failures were found for the ISDN circuit tested) or 1 (indicating the ISDN circuit failed the test).

Field 13 - Data type of 4 (indicating that Field 14 indicates the number of circuits tested).

Field 14 - 1 (indicating 1 ISDN circuit was tested).

3. If the default equipment location or specific ISDN circuit **passed or failed** Test 3, depressing **NEXT CIRCUIT** changes the display in the data type and data fields (Fields 13 and 14).

Field 13 displays a 1 indicating that the data in Field 14 is a fault code. Either a 0 (test passed) or a fault code logged against the failing ISDN circuit in DMIDS is displayed in Field 14.

4. If Field 10 (test state) displays a test abort fault encode, an abort test state (1 through 3) is displayed in Field 14 and no further information (including bit error rate and block error rate) is available.
5. If test state 4 (test completed) is displayed in Field 0, depressing **NEXT DATA** displays a 2 in Field 13 and the bit error rate/bits sent in Field 14 for a failing or non-failing default equipment location or specific ISDN circuit tested.

Depressing **NEXT DATA** once more displays a 3 in Field 13 and the block error rate/blocks sent in Field 14.

Note: Refer to Table BJ, PROC 648 - Field Definitions and Codes, to determine how to interpret bit error rate/bits sent and block error rate/blocks sent.

6. Depressing **NEXT DATA** again displays a 4 in Field 13 and the number of circuits tested in Field 14.

Depressing **NEXT DATA** once more displays a 5 in Field 13 and the test length selected in Field 14.

Note: A 0 displayed in Field 14 indicates that one block of data was sent for the circuit tested. One through 126 displayed in Field 14 indicates that the circuit was tested for the number of minutes displayed, i.e., 25 displayed in Field 14 indicates the circuit was tested for 25 minutes. 127 displayed in Field 14 indicates the circuit was tested for 8 seconds (the default test length).

7. Depressing **NEXT DATA** again starts the cycle over with a 1 displayed in Field 13 and a fault code displayed in Field 14 for the same tested circuit.
8. If a specific circuit or the default equipment location was busied out for testing, depress **RLS BUSY OUT** after Test 3 has passed (before or after corrective action is performed).

Note: Check the circuit status displayed in Field 9 to ensure that both sides (local and far end) of the ISDN trunk have been released from busy.

9. When another specific ISDN circuit is to be tested, the **CHANGE FIELD** sequence may be used to select the specific ISDN circuit to be tested.

PROC 648, Test 3

- a. Refer to Step 12 of Test 3 Data Entry above to select a specific ISDN circuit to be tested using the trunk group number and trunk group member number (Fields 2 and 3).
 - b. Refer to Step 13 of Test 3 Data Entry above to select a specific ISDN circuit to be tested using the equipment location (Fields 4 through 8).
10. **EXECUTE** must be depressed to test the specific ISDN circuit selected for testing.

Test 3 Execution and Test Result Display for a Range of Circuits

1. When a range of ISDN circuits (i.e., all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on a PRI circuit pack) are being tested, the **WAIT** indicator is turned on and the following fields are incremented as each ISDN circuit is tested:

Fields 2 and 3 - Trunk group number and trunk group member number of the ISDN circuit being tested.

Fields 4 through 8 - Equipment location of the ISDN circuit being tested.

Field 9 - Current circuit status of the ISDN circuit being tested.

Field 10 - Test state (encodes 1 through 5).

Field 12 - Total number of failures.

Field 13 - Data type 2 (indicating that bit error rate/bits sent is displayed in Field 14).

Field 14 - Bit error rate/bits sent.

Note: Fields 13 and 14 are updated every 5 seconds.

2. When testing is completed for an ISDN circuit (**determined by the test length entered in Field 14**), the trunk group number, trunk group member number, equipment location, any fault code, and the bit and block error rates are stored in DMIDS.
3. If DMIDS becomes full at any time during the test, Test 3 is stopped and the **WAIT** indicator is turned off.

Note: Although Field 12 only displays 99 entries, DMIDS allows testing of at least 255 trunks prior to DMIDS overflow occurring.

4. The original range of ISDN circuits selected for testing is displayed in Fields 2 through 8 (as appropriate) and special error code 83 (DMIDS overflow) is displayed in the **MAAP** error code field.
5. Results of the test can be examined at this time for **failing and passing ISDN circuits** (see Steps 9 through 25 below) and Test 3 can be continued from where it was stopped because of a DMIDS overflow.

Caution: *If Test 3 is continued from where it was stopped by a DMIDS overflow, any test results gathered to that point are lost and only new failure data is retained.*

6. If Test 3 is halted because of a DMIDS overflow, a new range of ISDN circuits can be selected instead of continuing the test from where it was stopped.

7. The **CHANGE FIELD** sequence must be used to enter the new range of ISDN circuits to be tested.

Refer to Step 8 of Test 2 Data Entry above to select all circuits in the switch to be tested, Step 9 of Test 2 Data Entry above to select all circuits in a trunk group to be tested, or Step 10 of Test 2 Data Entry above to select all ISDN circuits on an PRI circuit pack to be tested.

Note: Before depressing **EXECUTE** to continue Test 3 from where it was stopped because of a DMIDS overflow or from the new range of ISDN circuits selected for testing, the data for failing and passing circuits should be examined and recorded for future maintenance activities.

8. **EXECUTE** must be depressed to begin Test 3 from the new range of ISDN circuits selected or from where the test was stopped.
9. When a range of ISDN circuits (i.e., all ISDN circuits in the switch, all ISDN circuits in a trunk group, or all ISDN circuits on a PRI circuit pack) has completed testing (**determined by the test length entered in Field 14**), or **STOP** is depressed, the **WAIT** indicator is turned off and the following summary is displayed:

Field 12 - 0 or total number of failures.

Field 13 - Data type of 4 (indicating that Field 14 displays the number of circuits tested).

Field 14 - Number of ISDN circuits tested.

10. Depressing **NEXT CIRCUIT** displays the first, and then successive circuits tested.

Failing circuits are displayed first, followed by passing circuits. If STOP is depressed, circuits are displayed in the order tested.

11. The display of the first circuit tested consists of the following:

Field 1 - 3.

Fields 2 and 3 - Trunk group number and trunk group member number of the tested ISDN circuit.

Fields 4 through 8 - Equipment location of the tested ISDN circuit.

Field 9 - Current circuit status of the tested circuit.

Field 10 - Test status (indicated by test states 1 through 4).

Field 11 - Dashed or 1 (depending on the display in Field 12).

Field 12 - 0 (indicating no failures were found for the range of ISDN circuits tested) or total number of ISDN circuits that failed the range test.

Field 13 - Data type of 1 (indicating that the data in Field 14 is a fault code).

Field 14 - 0 (indicating that the circuit passed the test) or a fault code logged against the ISDN circuit in DMIDS when the circuit failed the test.

12. If a circuit is in-use when testing is attempted, test state 2 is displayed in Field 10, and fault code 8 is displayed in Field 14.

Field 9 (circuit status) indicates whether the circuit is still in use at time of display.

Note: Record each in-use circuit for later testing (see Step 22 below).

PROC 648, Test 3

13. If Field 10 (test state) displays a test abort fault encode, an abort test state (1 through 3) is displayed in Field 14 and no further information (including bit error rate and block error rate) is available.
14. If Field 10 does not display a test abort fault encode, bit error rates and block error rates for the tested circuit (**whether the circuit passed or failed**), are displayed by depressing **NEXT DATA**.

A 2 (indicating the bit error rate is being displayed in Field 14) is displayed in Field 13 and the bit error rate/bits sent are displayed in Field 14.

15. Depressing **NEXT DATA** once more displays a 3 (indicating the block error rate is being displayed in Field 14) in Field 13 and the block error rate/blocks sent are displayed in Field 14.

Note: Refer to Table BJ, PROC 648 - Field Definitions and Codes, to determine how to interpret bit error rate/bits sent and block error rate/blocks sent.

16. Depressing **NEXT DATA** again displays a 4 in Field 13 and the number of circuits tested in Field 14.

Depressing **NEXT DATA** once more displays a 5 in Field 13 and the test length selected in Field 14.

Note: A 0 displayed in Field 14 indicates that one block of data was sent for the circuit tested. One through 126 displayed in Field 14 indicates that the circuit was tested for the number of minutes displayed, i.e., 25 displayed in Field 14 indicates the circuit was tested for 25 minutes. 127 displayed in Field 14 indicates the circuit was tested for 8 seconds (the default test length).

17. Depressing **NEXT DATA** again starts the cycle over with a 1 displayed in Field 13 and a fault code displayed in Field 14 for the same tested circuit.
18. Depressing **NEXT CIRCUIT** displays the remaining tested circuits with a 1 displayed in Field 13 and a fault code displayed in Field 14.

Note: Field 11 (failure index) is incremented each time **NEXT CIRCUIT** is depressed.

- a. **NEXT DATA** is used to obtain the bit error rate/bits sent, block error rate/blocks sent, number of circuits tested, and length of test selected for each tested circuit.
- b. **NEXT CIRCUIT** can be depressed after any of the **NEXT DATA** depressions.
19. Record all in-use circuits with a 2 displayed in Field 10 (test state) and a 8 displayed in Field 14 (fault code) for later testing. Refer to Step 22 for testing of in-use circuits.
20. When all tested circuits are displayed indicated by Field 11 (failure index) equaling Field 12 (number failed), depressing **NEXT CIRCUIT** dashes all fields except Field 1.
 - a. Depressing **NEXT CIRCUIT** once more displays the summary information.
 - b. Depressing **NEXT CIRCUIT** again starts the sequence over.
21. When in-use fault codes are recorded in Step 12 or 19 above, **EXECUTE** may be depressed for an additional test attempt on the in-use ISDN circuit.

Caution: *Retesting of in-use ISDN circuits should occur only after all Test 3 failure history and bit/block error rate information for passing circuits is examined, since the retesting of an in-use circuit erases all prior test results.*

22. To test a circuit recorded as in-use (Step 12 or 19 above), use **NEXT CIRCUIT** to display the circuit information in Fields 2 through 8.

Note: Note that the circuit status field indicates the current status as idle, in-use, maintenance busied, or trunk records in invalid or transitory state.

If Field 9 (circuit status) displays a 1, the circuit is in-use.

23. Depress **EXECUTE**.

If the circuit is still in-use **and** Field 14 (fault code) displays an 8 indicating prior in-use failure, a camp-on procedure is used. Field 10 (test state) remains in state 2 (seizing trunk) until the circuit becomes available.

24. When an in-use circuit is tested, use **NEXT CIRCUIT** and **NEXT DATA** as appropriate to determine the status of the circuit and the bit and block error rates.
25. To test other in-use circuits, perform the **CHANGE FIELD** sequence to select the in-use circuit recorded above.

Refer to Steps 12 and 13 of Test 3 Data Entry above to select an in-use circuit using the trunk group and trunk group member or the equipment location of the in-use circuit.

26. To select another range of circuits to test, the **CHANGE FIELD** sequence must be used.

Refer to Step 8 of Test 2 Data Entry above to select all circuits in the switch to test, refer to Step 9 of Test 2 Data Entry above to select all circuits in a trunk group to test, or refer to Step 10 to select all ISDN circuits on an PRI circuit pack to test.

27. **EXECUTE** must be depressed to test the range of circuits selected for testing.

Repair Guide

Overview:

When a trunk circuit failing ISDN scheduled tests is indicated (**PROC 648** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following repair steps in the order listed to isolate and repair the faulty unit. The repair steps are divided into general repair steps and repair steps based on fault codes.

General:

The starting point for isolation and repair of alarmed trunk circuits failing ISDN scheduled tests is Test 1 of **PROC 600** or Test 1 of **PROC 648**.

To isolate an alarmed trunk circuit failing ISDN scheduled tests displayed in Test 1 of **PROC 600** or Test 1 of **PROC 648**, Tests 2 and 3 of **PROC 648** are executed to determine the extent of the trouble.

PROC 648

1. Execute Test 1 of **PROC 648** to determine which circuits are alarmed (indicated by a 1 (major), 2 (minor), or 3 (warning) displayed in the alarm status field).

Record each alarmed circuit and associated specific fault code displayed in Test 1 of **PROC 648**.

2. Determine if the alarmed circuits are all on the same circuit pack (same slot number), all in the same trunk group, or different circuit packs (different slot numbers) with different trunk groups.
3. Display the first alarmed circuit in Test 1 of **PROC 648**.
4. Enter **PROC 648**, Test 2.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 648** is the default equipment location displayed in Test 2 of **PROC 648**.

Table BK provides information on the PRI channel versus trunk assignments.

5. Depress **EXECUTE**.
6. If Test 2 passes, indicated by a 0 displayed in Field 12 and a 0 displayed in Field 14, proceed to Step 10 to analyze bit and error rates.
If Test 2 fails, indicated by a 1 displayed in Field 12 and a fault code displayed in Field 14, proceed to Step 7.
7. Check the fault code displayed in Field 14.
 - a. If the fault code displayed in Field 14 is 4, 22, 23, or 34, perform the corrective action listed under **Fault Codes** associated with the fault code displayed in Field 14.
 - b. If fault code 4, 22, 23, or 34 is not displayed in Field 14, proceed to Step 8.

TABLE BK.

PRI CHANNEL VERSUS TRUNK ASSIGNMENTS			
CHANNEL	SLOT/CIRCUIT	CHANNEL	SLOT/CIRCUIT
1	5/0 or 18/0	13	0/0 or 13/0
2	6/0 or 19/0	14	1/0 or 14/0
3	7/0 or 20/0	15	2/0 or 15/0
4	5/1 or 18/1	16	0/1 or 13/1
5	6/1 or 19/1	17	1/1 or 14/1
6	7/1 or 20/1	18	2/1 or 15/1
7	5/2 or 18/2	19	0/2 or 13/2
8	6/2 or 19/2	20	1/2 or 14/2
9	7/2 or 20/2	21	2/2 or 15/2
10	5/3 or 18/3	22	0/3 or 13/3
11	6/3 or 19/3	23	1/3 or 14/3
12	7/3 or 20/3	24	2/3 or 15/3

8. Use **PROC 620**, Test 4 to test the circuit displayed in Fields 4 through 8 of **PROC 648**, Test 2.

Note: The alarmed circuit that was displayed in Test 2 of **PROC 648** is the default equipment location displayed in Test 4 of **PROC 620**.

9. If **PROC 620**, Test 4 fails, take the appropriate corrective action.
 - a. When **PROC 620**, Test 4 passes before or after taking corrective action, repeat Test 2 of **PROC 648** to ensure that the failure is corrected.
 - b. If the failure is corrected, proceed to Step 10 to analyze the bit and error rates.

If the failure is not corrected, check the wiring associated with PRI circuit pack (ANN35).

10. Enter **PROC 648**, Test 3.

Note: The alarmed circuit that was displayed in Test 2 of **PROC 648** is the default equipment location displayed in Test 3 of **PROC 648**.

11. It is not necessary to busy out a circuit for testing, however the alarmed circuit to be tested can optionally be placed in maintenance busy out status by performing the following:

Check the circuit status displayed in Field 9.

Caution: *If the circuit status equals 1 or 2, depressing **BUSY OUT** aborts any calls, data, or test calling progress.*

12. If the circuit status = 0, 3, or 4, proceed to Step 13.

- a. If the circuit status = 1 (in-use), proceed to Step 13.

If the circuit is still in-use when Test 3 is executed, the circuit is **not** tested.

After Test 3 is performed and the circuit is still in-use, depressing **EXECUTE** while the circuit is still displayed starts a camp-on procedure. Test 3 camps on the circuit until the circuit is released from being in-use and then tests the circuit.

Note: If the circuit has to be tested right away, depressing **BUSY OUT** aborts any calls or data in progress and the circuit is tested as soon as **EXECUTE** is depressed.

- b. If the circuit status = 2 or 5, do not test. The far end is either in use (by a test call) or maintenance busied.
 - c. If the circuit status = 6, wait 2 minutes, depress **BUSY OUT** and proceed to Step 13.

13. The length of the test for the ISDN circuit to be tested can be entered in Field 14 or a default test length can be selected.

- a. The default test length equals 8 seconds for test execution and is indicated by a dash in Field 14.
 - b. If a default test length is desired, proceed to Step 17.

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14. A 0 entered in Field 14 sends one block of data for the circuit selected for testing.
A number between 1 and 126 entered in Field 14 indicates the number of minutes that the circuit selected for testing is tested.
15. To select the desired test length, the **CHANGE FIELD** sequence must be used:
CHANGE FIELD; 14; ENTER.
16. Select the desired test length by entering the number (in minutes) in Field 14:
(0 through 126 - maximum of 126 minutes); ENTER.
17. Depress **EXECUTE**.
If Test 3 passes, depress **NEXT DATA** to obtain the bit error rate/bits sent and block error rate/blocks sent.
Record the bit and block error rates and proceed to Step 24.
18. If Test 3 fails, depress **NEXT CIRCUIT**.
Field 14 displays a fault code. Depress **NEXT DATA** and record the bit and block error rates.
19. Record the test state displayed in Field 10 and the fault code displayed in Field 14.
 - a. If a test state of 2 is displayed in Field 10 and a fault code of 8 is displayed in Field 14, proceed to Step 20.
The circuit selected for testing is in-use and has **not** been tested.
 - b. If test state 2 and fault code 8 is **not** displayed in Field 14, proceed to Step 22.
20. Depress **EXECUTE**.
If the circuit is still in-use **and** Field 14 (fault code) displays an 8 indicating prior in-use failure, a camp-on procedure is executed. Field 10 (test state) remains in state 2 (seizing trunk) until the circuit becomes available.
21. When an in-use circuit is tested, use **NEXT CIRCUIT** and **NEXT DATA** as appropriate to determine the status of the circuit and the bit and block error rates.
If the circuit fails, perform corrective action beginning with Step 18.
22. Refer to Table BL, PROC 648 - Fault Code Definitions, for a list of the test state, fault codes, and definition associated with each fault code.
Proceed to Step 23 to perform corrective action.
23. Perform the corrective action listed under **Fault Codes** associated with the fault code displayed in Field 14 for the failing ISDN circuit.
24. Test 2 and Test 3 must be run for each ISDN alarmed circuit failure recorded in Test 1 of **PROC 648**.
25. If the circuit was busied-out for testing, release the circuit from busy out by depressing **RLS BUSY OUT**.

Note: Check the circuit status displayed in Field 9 to ensure that both sides (local and far end) of the ISDN trunk have been released from busy.
26. Repeat Steps 3 through 23 (as appropriate) for each recorded alarmed circuit failure.

27. Enter **PROC 648**, Test 2.
28. Based on the range as determined by the alarmed circuits recorded in Step 2, execute a range test on a specific PRI circuit pack, a trunk group, or all ISDN circuits in the switch.
If any circuits fail, perform Steps 6 through 9 as appropriate.
29. Enter **PROC 648**, Test 3.
30. Execute a range test for the same circuits as in Step 28 using 0 (one block of data) for the test length.
If any circuits fail, perform Steps 18 through 23 as appropriate.
31. If all alarmed circuit failures pass Test 2 and Test 3, perform the **CLEAR DATA; EXECUTE** sequence in Test 1 of **PROC 648** for each ISDN alarmed circuit or all ISDN alarmed circuits to resolve the alarmed circuits and to turn off the **OTHER FAILS** fault indicator assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

TABLE BL.

PROC 648—FAULT CODE DEFINITIONS		
FIELD 10 TEST STATE	FIELD 14 FAULT CODE	DEFINITION
1	1	ADFTC not available.
	2	ADFTC in use.
	3	ADFTC maintenance busied.
	33	ADFTC line maintenance busy or ADFTC not on-hook.
2	4	Current test not translated for this board.
	5	Cannot put trunk in ISDN maintenance state - Queue occupancy.
	6	Trunk went to ISDN maintenance state - did not release from busy.
	7	Maintenance service acknowledge not received.
	8	Trunk in use.
	9	No TTL assigned.
3	10	Internal ADFTC failure.
	11	OTL not assigned as rotary.
	12	ADFTC failed self-test.
	13	Bad I/O - No ISDN level 3 response in specified test time.
	14	TVS DAC not assigned, ADFTC (OTL) not responding, keyboard dialing not assigned to ADFTC, or origination restriction on OTL.
	15	Code dialed did not match TVS feature.
	16	Trunk group DAC inappropriate.

TABLE BL. (Contd)

PROC 648—FAULT CODE DEFINITIONS		
FIELD 10 TEST STATE	FIELD 14 FAULT CODE	DEFINITION
3 (Contd)	17	Software record incorrect.
	18	Trunk cannot be connected.
	19	OTL went on-hook.
	20	Bad I/O from OTL.
	21	Cannot seize originating register.
	22	Invalid response on ISDN level 2 link.
	23	No response on ISDN level 2 link.
	24	Start handshake not received by ADFTC.
	25	Error overflow detected by ADFTC.
	26	No data received by ADFTC.
	27	Data transmission to ADFTC interrupted.
	28	No bit error rate response from ADFTC.
	29	No block error rate response from ADFTC.
	30	No bit or block error rate response from ADFTC.
	34	Bad I/O to ISDN level 2 link on primary rate interface board.
4	0	Pass.
	31	Bit error rate threshold exceeded.
	32	Block error rate threshold exceeded.

Fault Codes:

Most fault codes are displayed when performing Test 3. Fault code 4 (current test not translated for this board) can be displayed in both Test 2 and Test 3. Fault codes 22, 23, and 34 are only displayed in Test 2.

When translation procedures are referenced to be performed, refer to **AT&T System 85, Release 2 Version 4 Feature Translations Service Manual, 555-103-107 Issue 1** for a definition and operation of the translation procedure.

Whenever possible, additional information is provided when the trouble is escalated. All corrective action is performed at the local switch before indicting the far end and escalating the trouble.

Fault Code 1 (ADFTC not available)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

2. If Test 3 fails again with the same fault code (fault code 1) and the trouble is persistent, use the following translation procedures to determine if the ADFTC is administered:
 - a. **PROC 010**, Word 1 for the class of service (Field 15 = 0).
 - b. **PROC 010**, Word 3 for data protection (Field 15 = 1).
 - c. **PROC 051**, Word 1 for the equipment location (Field 6 = 5).
 - d. **PROC 052**, Word 1 for assignment of the extension number to the equipment location.
3. If translation is correct, escalate the trouble.
4. If translation is not correct, administer the ADFTC and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 2 (ADFTC in use)

Repeat Test 3 on the same circuit.

Fault Code 3 (ADFTC maintenance busied)

1. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 2.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 2 when the ADFTC passes both tests.
2. Release the ADFTC from maintenance busy status and proceed to Step 3.
3. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 4 (Current test not translated for this board)

1. Use translation procedure **PROC 262**, Field 6 to determine if Test 2 (level 2), Test 3 (level 3), or both tests (level 2 and level 3) of **PROC 648** are enabled.
2. If translation is correct, escalate the trouble.
3. If translation is not correct, enable Test 2 (level 2), Test 3 (level 3) or both tests (level 2 and level 3) (as appropriate). and proceed to Step 4.
4. Repeat Test 2 or Test 3 (as applicable) of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 5 (Cannot put trunk in ISDN maintenance state - Queue occupancy)

1. Use translation procedure **PROC 275**, Word 4 Field 14 to determine if ISDN is activated.
2. If translation is correct, escalate the trouble.
If translation is not correct, activate ISDN and proceed to Step 3.
3. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Note: High switch occupancy may be causing high primitive queue occupancy.

Fault Code 6 (Trunk went to ISDN maintenance state - did not release from busy)

1. Depress **BUSY OUT** and **RLS BUSY OUT**.
2. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
3. If fault code 6 is displayed again, proceed to Step 4.
4. Perform Test 2 of **PROC 611** to test the I/O channels.
If Test 2 passes, proceed to Step 5.
If Test 2 fails, take corrective action and proceed to Step 5 after Test 2 passes.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If the same failure (fault code 6) occurs, escalate the problem.

Note: Provide as additional information the specific fault code that was recorded for this failing circuit in Step 1 of **General** repair steps.

Fault Code 7 (Maintenance service acknowledge not received)

1. Check the circuit status displayed in Field 9.

***Caution:** If the circuit status equals 1, depressing **BUSY OUT** aborts any calls, data, or test call in progress.*
2. If the circuit status = 0 or 1, proceed to Step 3.
 - a. If the circuit status = 3 or 4, proceed to Step 5.
 - b. If the circuit status = 5, proceed to Step 7.
 - c. If the circuit status = 6, proceed to Step 8.
3. Repeat Test 3.

Note: If the circuit status is 1, a camp on procedure will take place and will test the circuit when it is idle.

If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
4. If the same fault code (fault code 7) is displayed, escalate the problem.

Note: Provide as additional information any specific fault code recorded in Step 1 of **General** repair steps.

5. Depress **RLS BUSY OUT**.
6. Check the circuit status displayed in Field 9.
If the circuit status changed, proceed to Step 2 and take the appropriate action depending on the displayed circuit status.
If the circuit status did not change, proceed to Step 11.
7. The far end is maintenance busied. If you must test, contact the other end to determine if the far end is maintenance busied from their side.
8. Wait 2 minutes, then check the circuit status displayed in Field 9.
If the circuit status changed, proceed to Step 2 and take the appropriate action depending on the displayed circuit status.
If the circuit status did not change, depress **BUSY OUT** and repeat the test.
9. If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
10. If the same fault code (fault code 7) is displayed, proceed to Step 11.
11. Escalate the problem.
Provide as additional information that level 3 is suspected of being broken. The far end should check the status of the trunk on their end including translation.

Fault Code 8 (Trunk in use)

Repeat Test 3 to camp-on the circuit until the circuit is available for testing.

Fault Code 9 (No TTL assigned)

Administer the TTL using **PROC 108**.

Fault Code 10 (Internal ADFTC failure)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If the same fault code is displayed again, proceed to Step 3.
3. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 4.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 4 when the ADFTC passes both tests.
4. Release the ADFTC from maintenance busy status and proceed to Step 5.

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5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

6. If the same fault code is displayed again, replace ADFTC circuit pack (SN261C) if not already replaced in Step 3.

Fault Code 11 (OTL not assigned as rotary)

1. Use translation procedures **PROC 000** and **PROC 010** to determine the assignment of the OTL.
2. If translation is correct, escalate the trouble.
3. If translation is not correct, administer the OTL and proceed to Step 4.
4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 12 (ADFTC failed self-test)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

2. If the same fault code is displayed again, proceed to Step 3.
3. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.

If the ADFTC passes both tests, proceed to Step 4.

If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 4 when the ADFTC passes both tests.

4. Release the ADFTC from maintenance busy status and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

6. If the same fault code is displayed again, replace ADFTC circuit pack (SN261C) if not already replaced in Step 3.

Fault Code 13 (Bad I/O - No ISDN level 3 response unspecified test time)

1. Perform Test 2 of **PROC 620** to test the failing circuit.

Note: The circuit that was displayed in Test 2 of **PROC 648** is the default equipment location displayed in Test 2 of **PROC 620**. Test 2 performs a non-destructive test on the failing ISDN circuit.

2. If Test 2 passes, proceed to Step 3.
If Test 2 fails, take corrective action as appropriate and after Test 2 passes, proceed to Step 3.
3. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
4. If Test 3 fails again with the same fault code (fault code 13), proceed to Step 5.
5. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 6.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 6 when the ADFTC passes both tests.
6. Release the ADFTC from maintenance busy status and proceed to Step 7.
7. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
8. If Test 3 fails again with the same fault code (fault code 13), escalate the trouble.

Fault Code 14 (TVS DAC not assigned, ADFTC (OTL) not responding, keyboard dialing not assigned to ADFTC, or origination restriction on OTL)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If Test 3 fails again with the same fault code (fault code 14), use translation procedures to determine if the features are administered correctly:
 - a. **PROC 350 Word 2**, **PROC 285**, and **PROC 103** to determine the dial code assignment and trunk type of the TVS feature.
 - b. **PROC 051** for keyboard dialing (Field 13 = 1).
 - c. **PROC 010** Word 3 for class of service (Field 18 is not set for origination restriction).
3. If translation is correct, escalate the trouble.
4. If translation is not correct, administer (as appropriate) the dial code assignment of the TVS feature, keyboard dialing, and/or class of service and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 15 (Code dialed did not match TVS feature)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If Test 3 fails again with the same fault code (fault code 15), use translation procedure **PROC 350, Word 2** to determine the dial access code assigned to TVS by entering TVS feature code 44.
3. If translation is correct, escalate the trouble.
4. If translation is not correct, administer the dial access code assignment of the TVS feature and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 16 (Trunk group DAC inappropriate)

1. Use translation procedures **PROC 100 Word 1, PROC 175, PROC 010 Word 3, and PROC 350 Words 1 and 2** to determine trunk type, trunk group translations, and restrictions.
2. If translation is correct, escalate the trouble.
3. If translation is not correct, administer the trunk group dial access code and proceed to Step 4.
4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 17 (Software record incorrect)

1. Record the information displayed in Fields 2 through 14 for each circuit with a fault code of 17.
2. When excessive entries (based on experience) are noted, refer the trouble to the switch engineers for further diagnosis.

Fault Code 18 (Trunk cannot be connected)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If Test 3 fails again with the same fault code (fault code 18), proceed to Step 3.
3. Use **PROC 620, Test 4** to test the failing circuit displayed in **PROC 648, Test 3**.

Note: The alarmed circuit that was displayed in Test 3 of **PROC 648** is the default equipment location displayed in Test 4 of **PROC 620**.

4. If **PROC 620**, Test 4 fails, take the appropriate corrective action.
When **PROC 620**, Test 4 passes before or after taking corrective action, proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If Test 3 fails again with the same fault code (fault code 18), proceed to Step 7.
7. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 8.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 8 when the ADFTC passes both tests.
8. Release the ADFTC from maintenance busy status and proceed to Step 9.
9. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
10. If Test 3 fails again with the same fault code (fault code 18), proceed to Step 11.
11. Use translation procedure **PROC 100, Word 1** to determine the ISDN trunk type for the near end.

Note: Fault code 18 can be displayed when the ISDN trunk type is not translated correctly for the near end or far end.
12. If translation is correct (outgoing trunk type), trouble with the far end ISDN trunk type may be indicated.
Refer the trouble to the far end maintenance organization for further diagnosis.
13. If translation is not correct, administer the correct trunk type and proceed to Step 14.
14. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
15. If Test 3 fails again with the same fault code (fault code 18), escalate the trouble.

Fault Code 19 (OTL went on-hook)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

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2. If the same fault code is displayed again, proceed to Step 3.
3. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 4.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 4 when the ADFTC passes both tests.
4. Release the ADFTC from maintenance busy status and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If the same fault code is displayed again, replace ADFTC circuit pack (SN261C) if not already replaced in Step 3.

Fault Code 20 (Bad I/O from OTL)

1. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 2.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 2 when the ADFTC passes both tests.
2. Release the ADFTC from maintenance busy status and proceed to Step 3.
3. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 21 (Cannot seize originating register)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If fault code 21 is displayed again, proceed to Step 3.
3. Repeat Steps 1 and 2 several times.
If fault code 21 is still displayed, proceed to Step 4.
4. Use **PROC 635** and perform a **BUSY OUT** and **RLS BUSY OUT** sequence on the ADFTC circuit.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If fault code 21 is displayed again, proceed to Step 7.

7. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 8.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 8 when the ADFTC passes both tests.
8. Release the ADFTC from maintenance busy status and proceed to Step 9.
9. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
10. If fault code 21 is displayed again, proceed to Step 11.
11. Use translation procedure **PROC 254** to determine if originating registers are assigned.
12. If originating registers are assigned, escalate the trouble.

Note: Provide as additional information that more originating registers may be required.
13. If translation is not correct, administer the originating registers (as necessary) and proceed to Step 14.
14. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

Fault Code 22 (Invalid response on ISDN level 2 link)

LEDs on the PRI circuit pack (ANN35) indicate framing information and signaling channel activity. The green LED in position 7 indicates local framing status. If lighted, the local primary rate port is framing properly. The green LED in position 8 indicates remote framing status. If lighted, both the local primary rate port and the remote end are framing properly. The yellow LED in position 9 indicates that the signaling channel is active. The yellow LED is flashing at a rate of 100 ms when on board diagnostics are failing.

1. Check the **YELLOW** LED on the PRI circuit pack.
If the **YELLOW** LED is on steady, proceed to Step 2.
If the **YELLOW** LED is flashing at a rate of 100 ms, replace the PRI circuit pack (ANN35) and proceed to Step 2.
2. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
3. If fault code 22 is displayed again, proceed to Step 4.
4. Check the near end transmit cable to ensure that it is connected to the far end **receive** cable.
 - a. If the near end transmit cable is connected to the far end receive cable, proceed to Step 7.

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- b. If the near end transmit cable is not connected to the far end receive cable, connect the cables properly and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If fault code 22 is displayed again, proceed to Step 7.
7. Check all interconnecting cables, then use the repair procedure in **PROC 620** entitled **DS-1 (Unit Type 68) or PRI (Unit Type 75) Failures** to test the failing circuit and to try and isolate the trouble.

Isolation of PRI troubles consists of interface and facility type failures.

Note: Even though the failing ISDN circuit passes **PROC 620**, Test 4 it may be helpful to try and use the techniques listed under **DS-1 (Unit Type 68) or PRI (Unit Type 75) Failures** before assuming that the ISDN circuit is performing correctly.

8. When you are satisfied that the ISDN trunk is performing correctly, repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
9. If fault code 22 is displayed again, proceed to Step 10.
10. Escalate the trouble.
Provide as additional information that the far end primary rate interface may not be equipped or could be inoperative. In addition, the far end transmit cable should be checked to ensure that it is connected to the near end receive cable.

Fault Code 23 (No response on ISDN level 2 link)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If fault code 23 is displayed again, proceed to Step 3.
3. Check that the PRI circuit pack (ANN35) is plugged into the correct slot (5 or 18 as applicable) in the DS-1 carrier.
If the circuit pack is in the correct slot, proceed to Step 6.
If the circuit pack is not in the correct slot, place the ANN35 circuit pack in the correct slot and proceed to Step 4.
4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

5. If Test 3 fails again with the same fault code (fault code 23), proceed to Step 6.
6. Use **PROC 620**, Test 4 to test the failing circuit displayed in **PROC 648**, Test 3.

Note: The alarmed circuit that was displayed in Test 3 of **PROC 648** is the default equipment location displayed in Test 4 of **PROC 620**.

7. If **PROC 620**, Test 4 fails, take the appropriate corrective action.

When **PROC 620**, Test 4 passes before or after taking corrective action, proceed to Step 8.

8. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

9. If Test 3 fails again with the same fault code (fault code 23), proceed to Step 10.
10. Determine if the PRI circuit pack is translated correctly.

Note: Read the section entitled Feature Translations in the Feature Translations Service Manual, 555-103-107, Issue 1 to determine how to administer ISDN.

11. If translation is correct, proceed to Step 14.

If translation is not correct, administer the ISDN feature and proceed to Step 12.

12. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

13. If Test 3 fails again with the same fault code (fault code 23), proceed to Step 14.
14. Any circuit involved with the PRI circuit pack's clock signal can cause Fault Code 23 (no response on ISDN level 2 link).
Some of these circuit packs are SCS, PDS, and PDI.
15. Prior to escalating the trouble, **PROC 600**, Test 1 and Test 2 should be investigated to determine if any alarms or recorded errors could be contributing to this trouble. **PROC 620** can be used to test these type of circuit packs.

Fault Code 24 (Start handshake not received by ADFTC)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

PROC 648

2. If fault code 24 is displayed again, proceed to Step 3.
3. Perform Test 2 of **PROC 611** to test the I/O channels.
If Test 2 passes, proceed to Step 4.
If Test 2 fails, take corrective action and proceed to Step 4 after Test 2 passes.
4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
5. If the same failure (fault code 24) occurs, proceed to Step 6.
6. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 7.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 7 when the ADFTC passes both tests.
7. Release the ADFTC from maintenance busy status and proceed to Step 8.
8. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
9. If fault code 24 is displayed again, replace ADFTC circuit pack (SN261C) if not already replaced in Step 6.

Fault Code 25 (Error overflow detected by ADFTC), Fault Code 26 (No data received by ADFTC), and Fault Code 27 (Data transmission to ADFTC interrupted)

1. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
2. If the same fault code is displayed again, proceed to Step 3.
3. Check all interconnecting cables, then use **PROC 620**, Test 4 to test the failing circuit displayed in **PROC 648**, Test 3.

Note: The alarmed circuit that was displayed in Test 3 of **PROC 648** is the default equipment location displayed in Test 4 of **PROC 620**.
4. If **PROC 620**, Test 4 fails, take the appropriate corrective action.
When **PROC 620**, Test 4 passes before or after taking corrective action, proceed to Step 5.

5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
 If Test 3 passes, corrective action is complete.
 If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If Test 3 fails again with the same fault code, proceed to Step 7.
7. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
 If the ADFTC passes both tests, proceed to Step 8.
 If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 8 when the ADFTC passes both tests.
8. Release the ADFTC from maintenance busy status and proceed to Step 9.
9. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
 If Test 3 passes, corrective action is complete.
 If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
10. If fault code 25 or 26 is displayed again, proceed to Step 11.
 If fault code 27 is displayed again, proceed to Step 16.
11. Use translation procedure **PROC 100, Word 1** to determine the ISDN trunk type for the near end.

Note: Fault code 25 or 26 can be displayed when the ISDN trunk type is not translated correctly for the near end or far end; especially if the near end is translated as an outgoing or 2 way trunk type and the far end is translated as an auto in trunk type.
12. If translation is correct (outgoing or 2-way trunk type), trouble with the far end ISDN trunk type may be indicated.
 Refer the trouble to the far end maintenance organization for further diagnosis.
13. If translation is not correct, administer the correct trunk type and proceed to Step 14.
14. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
 If Test 3 passes, corrective action is complete.
 If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
15. If Test 3 fails again with the same fault code (fault code 25 or fault code 26), proceed to Step 16.
16. Anything in the test connection can cause Fault Code 25 (Error overflow detected by ADFTC), Fault Code 26 (No data received by ADFTC), or Fault Code 27 (Data transmission to ADFTC interrupted) to occur.
 Escalate the trouble and advise the far end that cabling, far end PRI, and the TTL should be checked.

Fault Code 28 (No bit error rate response from ADFTC), Fault Code 29 (No block error rate response from ADFTC), and Fault Code 30 (No bit or block error rate response from ADFTC)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

2. If the same fault code is displayed again, proceed to Step 3.
3. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.

If the ADFTC passes both tests, proceed to Step 4.

If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 4 when the ADFTC passes both tests.

4. Release the ADFTC from maintenance busy status and proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
6. If the same fault code is displayed again, replace ADFTC circuit pack (SN261C) if not already replaced in Step 3.

Fault Code 31 (Bit error rate threshold exceeded) and Fault Code 32 (Block error rate threshold exceeded)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

2. If the same fault code is displayed again, proceed to Step 3.
3. Check all interconnecting cables, then use **PROC 620**, Test 4 to test the failing circuit displayed in **PROC 648**, Test 3.

Note: The alarmed circuit that was displayed in Test 3 of **PROC 648** is the default equipment location displayed in Test 4 of **PROC 620**.

4. If **PROC 620**, Test 4 fails, take the appropriate corrective action.
When **PROC 620**, Test 4 passes before or after taking corrective action, proceed to Step 5.
5. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

6. If Test 3 fails again with the same fault code, proceed to Step 7.
7. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 8.
If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 8 when the ADFTC passes both tests.
8. Release the ADFTC from maintenance busy status and proceed to Step 9.
9. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
10. If the same fault code is displayed again, proceed to Step 11.
11. Anything in the test connection can cause Fault Code 31 (Bit error rate threshold exceeded) or Fault Code 32 (Block error rate threshold exceeded) to occur.
Escalate the trouble and advise the far end that cabling, far end PRI, and the TTL should be checked.

Fault Code 33 (ADFTC line maintenance busy or ADFTC not on-hook)

1. Perform Test 1 of **PROC 646** and Test 4 of **PROC 620** (unit type 62) to test the ADFTC.
If the ADFTC passes both tests, proceed to Step 3.
2. If the ADFTC fails either test, perform corrective action as specified in **PROC 646** and/or **PROC 620** and proceed to Step 3 when the ADFTC passes both tests.
3. Release the ADFTC from maintenance busy status and proceed to Step 4.
4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
5. If fault code 33 is displayed again, depress **BUSY OUT** and **RLS BUSY OUT**.
6. Repeat Test 3.
If Test 3 passes, corrective action is complete.
If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.
7. If fault code 33 is displayed again, reseal ADFTC circuit pack (SN261C).

Note: A lighted **YELLOW** LED on circuit pack SN261C indicates if the ADFTC is busy (off-hook state).
8. Repeat Test 3 to determine the status of the circuit.

PROC 648

Fault Code 34 (Bad I/O to ISDN level 2 link on primary rate interface board)

1. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

2. If fault code 34 is displayed again, proceed to Step 3.

3. Perform Test 2 of **PROC 611** to test the I/O channels.

If Test 2 passes, proceed to Step 4.

If Test 2 fails, take corrective action and proceed to Step 4 after Test 2 passes.

4. Repeat Test 3 of **PROC 648** on the same circuit that was failing to determine the status.

If Test 3 passes, corrective action is complete.

If Test 3 fails again with a different fault code, perform corrective action as listed for the fault code.

5. If the same failure (fault code 34) occurs, escalate the problem.

Note: Provide as additional information the specific fault code that was recorded for this failing circuit in Step 1 of **General** repair steps.

PROC 650 - DCIU TESTS

FLIPCHART ISSUE 4		+	+	DCIU TESTS		+	+	845552223	
WORD 0	NOTES: 1. DATA LINK MUST BE MAINTENANCE BUSIED TO RUN TEST 3. 2. BUSY-OUT AND RELEASE BUSY-OUT NOT VALID FOR UNTRANSLATED DATA LINKS IN TEST 3. 3. ONLY INTERNAL DCIU LOOPBACK TESTING IS ALLOWED ON THE OFF-LINE COMMON CONTROL. 4. PROPER INTERNAL DCIU LOOPBACK TESTING FOR AN ON-LINE UNASSIGNED DATA LINK MAY REQUIRE A LOOP-AROUND CONNECTOR.			5. FAILURE RATE (FIELD 13, TEST 3) SHOULD BE LESS THAN 1 PER 100,000 BITS SENT (I.E. PER 100 IN FIELD 14). IF FIELD 14 LESS THAN 1000, RESULTS ARE NOT CONCLUSIVE IF FIELD 13 LESS THAN 10. IF AN XRAY TAPE IS AVAILABLE, A SHORTENED TEST TO DETERMINE THE DCIU HARDWARE INTEGRITY UP TO THE LOCAL END CAN BE USED WITH A LOCAL LOOPBACK PLUG (GROUP 9, ED-1E422). THIS TEST LASTS APPROXIMATELY 32 SECONDS AND WILL LIGHT THE GREEN LED ON THE UN156 IF THE DCIU PASSES. HOWEVER, THE CIRCUIT PACK WILL CONTINUE TO BE TESTED UNTIL THE "STOP" BUTTON IS PUSHED. IF THE LINK IS LOOPED BACK AT ITS REMOTE END, THE TEST MUST BE RUN AS SPECIFIED IN THE MAINTENANCE MANUAL.			FIELD LIMITS: DATE LINK (FIELD 6): 1-8 LOOPBACK TYPE (FIELD 7): 0 = INTERNAL 1 = EXTERNAL MANUAL 2 = EXTERNAL AUTOMATIC ALARM STATUS (FIELD 8): 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED DCIU STATUS (FIELD 9): 0 = ONLINE AND OPERATIONAL 1 = OFFLINE AND OPERATIONAL 2 = ONLINE AND OUT OF SERVICE 3 = OFFLINE AND OUT OF SERVICE DATA LINK STATUS (FIELD 10): 0 = TRANSLATED AND OPERATIONAL 1 = TRANSLATED AND BUSIED OUT 2 = UNTRANSLATED		
							COMMON CONTROL PERIPHERALS 650		

FLIPCHART ISSUE 1		+		+		DCIU TESTS				+		+		845552223			
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARM(S).						USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILING CIRCUIT (TEST 1). USE 'NEXT FAULT' TO DISPLAY NEXT FAULT CODE (TEST 2). USE 'NEXT CIRCUIT' TO DISPLAY SECONDARY AND TERTIARY INDICTMENTS (TEST 2). USE 'BUSYOUT' OR 'RELEASE BUSYOUT' TO CHANGE DCIU BUSY STATUS (TEST 2). USE 'NEXT CIRCUIT' TO SELECT DATA LINK FOR TESTING (TEST 3). USE 'BUSYOUT' OR 'RELEASE BUSYOUT' TO CHANGE DATA LINK STATUS (TEST 3).						SPECIAL ERROR CODES: 80-BUSY OUT KEY PRESSED ONCE 81-SEE NOTE 1 82-SEE NOTE 2 83-SEE NOTE 3 84-NO ALARMS PRESENT 85-DCIU REINIT FAILED				86- COULD NOT COMMUNICATE WITH DCIU 87-RESTORE MAINTENANCE BUSY DATA LINKS FAILED	
TEST 2: DCIU CIRCUIT PACK VERIFICATION TEST.																	
TEST 3: DCIU DATA LINK LOOP-AROUND TEST.																	

Purpose

PROC 650 is used when referenced from PROC 600 (alarm causes/error) or when the APPL PROCR AP INTER and MAJOR, MINOR, or WARNING fault indicators on the alarm panel are lighted.

PROC 650 is used to:

1. Display the failure history for the DCIU.
2. Allow manual resolving of the alarms activated because of a DCIU failure (which turns off the APPL PROCR AP INTER fault indicator).

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

3. Perform a DCIU circuit pack verification test, testing all circuits once and displaying the test results.
4. Detect failures in the DCIU link to the Applications Processor (AP) and isolate the failure to the DCIU or to the interface between the DCIU and the AP by performing internal and external loop back tests.
5. Automatically turn off the APPL PROCR AP INTER fault indicator when all circuits that caused an alarm are tested as good.

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

PROC 650

When performing an external manual looparound test, maintenance personnel **must** be at the customer's premises to further isolate failures associated with the data link between the DCIU and the AP.

Requirement: During external manual looparound testing, the data set must be set in analog loop back (AL), local loop back, or an ED1E422-10 Group 6 loop back plug **must** be connected to the back of the common control cabinet in order to determine if the DCIU or the interface to the AP is failing.

Field Definitions and Codes

Each field of **PROC 650** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BM, PROC 650 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Field 6 - Select specific data link (1 through 8) to be tested (Test 3 only).
3. Field 7 - Select type of loop back test to be performed (Test 3 only).

Test Equipment Required

An ED1E422-10 Group 6 loop back plug is required to perform the manual external loop back test in Test 3.

The looparound test determines if an interface problem exists between the AP or data set which interfaces with the DCIU.

Operation of Procedure

Overview

PROC 650 is used to determine the cause of the **APPL PROCR AP INTER** fault indicator being lighted resulting from a DCIU failure.

To call in **PROC 650**, perform the following:

1. Depress **PROC NO; 650; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Field 9 indicates the status of the DCIU and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays DCIU failure history.
2. Test 2 - Performs a verification test on all DCIU circuit packs.
3. Test 3 - Performs a DCIU data link looparound test.

TABLE BM.

PROC 650 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	9	0-3	DCIU status.
2-6		Equipment location.		0	On-line and operational.
2	0-99	Module number.		1	Off-line and operational.
3	0-7	Cabinet number.		2	On-line and out of service.
4	0-3	Carrier number.		3	Off-line and out of service.
5	16-18	Slot number.	10	0-2	Data link status.
6	1-8	Data link number.		0	Translated and operational.
7	0-2	Loop back test type.		1	Translated and busied out.
	0	Internal loop back.		2	Not translated.
	1	External manual loop back.	11	0-15	Failure index.
	2	External automatic loop back.		0-6	Index into PMIDS failures (Test 1 only).
8	1-5	Alarm status.		0-15	Index into DMIDS failures (Test 2 only).
	1	Major.	12	0-99	Fault code.
	2	Minor.	13	0-99	Number of frames with failures (1000 bits per frame).
	3	Warning.	14	0-9999	Thousands of loop back test bits sent.
	4	Errors recorded.			
	5	Alarm resolved.			

Test 1

Test 1 displays the failure history, in order of alarm severity, of the DCIU failures recorded by periodic on-line software. The failure history includes equipment location, alarm status, DCIU status and fault code information for each recorded failure.

Test 1 is also used to manually turn off the **APPL PROCR AP INTER** fault indicator when all alarmed failures are resolved.

1. Test 1 is the default test when entering **PROC 650** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. Upon initial entry to Test 1, Field 1 displays a 1, Field 9 displays the DCIU status and all other fields are dashed.
3. To start Test 1, depress **EXECUTE**.

PROC 650, Test 1

4. If no DCIU failures exist, Field 11 (failure index) displays a 0.
5. If any DCIU failures exist, the first failure is displayed as follows:

Field 1 - 1.

Field 2 - Module number of displayed failure.

Field 3 - Cabinet number of displayed failure.

Field 4 - Carrier number of displayed failure.

Field 5 - Dashed or slot number of displayed failure.

Field 6 - Dashed or data link number of displayed failure.

Note: Fields 5 and 6 are dashed if a specific DCIU circuit pack or data link cannot be identified for the fault code displayed in Field 12.

Field 7 - Dashed.

Field 8 - Alarm status (1 = major, 2 = minor, 3 = warning, or 4 = errors recorded) of displayed failure.

Field 9 - DCIU status.

Field 10 - Dashed.

Field 11 - Failure index (total number of DCIU failing circuits; maximum of 6).

Field 12 - Fault code associated with the displayed failure.

Fields 13 and 14 - Dashed.

6. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures. Field 11 (failure index) is decremented each time **NEXT CIRCUIT** is depressed.
 - a. When all failures are displayed, depressing **NEXT CIRCUIT** once more dashes all fields except Fields 1 and 9.
 - b. Depressing **NEXT CIRCUIT** again causes the first failure to be displayed.
7. The **CLEAR DATA, EXECUTE** sequence can be used to manually resolve individual DCIU failures or all DCIU failures after **EXECUTE** is used to initiate Test 1.

The failures that are resolved are those failures with an alarm status of 1, 2, or 3 displayed in Field 8.
8. To resolve individual DCIU failures with an alarm status of 1, 2, or 3, perform the following:
 - a. Use **NEXT CIRCUIT** to display the failing circuit with an alarm status of 1, 2, or 3 on the **MAAP**.

Requirement: Individual DCIU failures cannot be resolved unless the failing circuit is displayed on the **MAAP**.

- b. Depress **CLEAR DATA; EXECUTE**.

9. Field 8 (alarm status) displays a 5 indicating that the failing circuit is resolved.

The **APPL PROCR AP INTER** fault indicator is turned off if no other DCIU failures exist.

10. If the **CLEAR DATA; EXECUTE** sequence is performed when Field 1 displays a 1 and Field 9 displays the DCIU status with all other fields dashed (initial display), all DCIU failures with an alarm status of 1, 2, or 3 are resolved and the **APPL PROCR AP INTER** fault indicator is turned off.
11. All DCIU failures with an alarm status of 1, 2, or 3 can be resolved upon entry to **PROC 650, Test 1**, and after displaying and recording all DCIU failures and then using **NEXT CIRCUIT** to display a 1 in Field 1, the DCIU status in Field 9 and all other fields dashed (initial display).

Caution: The DCIU failures should be displayed and recorded in order that a record of the equipment location and fault code of each failure is available for maintenance personnel prior to manually resolving alarmed entries.

12. After initial entry to Test 1 and depressing **EXECUTE**, depress **CLEAR DATA; EXECUTE**.
All DCIU failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **APPL PROCR AP INTER** fault indicator is turned off.
13. After displaying and recording all DCIU failures, depress **NEXT CIRCUIT** until the initial display (Field 1 = 1, Field 9 = DCIU status, with all other fields dashed) is displayed, then depress **CLEAR DATA; EXECUTE**.
All DCIU failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **APPL PROCR AP INTER** fault indicator is turned off.
14. The **MAJOR, MINOR, or WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

Test 2

Test 2 is used to test the entire DCIU. Test 2 performs the following:

1. Displays the current status of the DCIU.
2. Reads the Get-Off-The-Bus (GOTB) register to determine if the DCIU is operational or shutdown, and whether the RAM status is valid.
 - a. If RAM status is valid, reads RAM status words and stores any failures (as indicated by DCIU hardware) in DMIDS.
 - b. If RAM status is not valid, reads maintenance status register and stores circuit pack indictments in DMIDS.
3. Checks counters and mailbox entries for threshold failures recorded by hardware.
4. Performs an ID chip function test on each circuit pack.
5. Tests the parity checker/generator function.
6. Controls circuit pack LEDs for pass/fail indication.

Test 2 provides visual feedback to maintenance personnel on whether a problem is corrected by the use of RED and GREEN LEDs on the faceplate of the circuit pack that is reseated or replaced.

PROC 650, Test 2

Test 2 provides alternate circuit pack replacements (if any) when the first circuit pack replaced does not correct the problem.

Test 2 allows for demand reinitialization of the DCIU (when required) by use of **BUSY OUT** and **RELEASE BUSY OUT**

Test 2 automatically turns off the **APPL PROCR AP INTER** fault indicator when all circuits that raised an alarm pass Test 2.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. Upon initial entry to Test 2, Field 1 displays a 2, Field 9 displays the DCIU status and all other fields are dashed.
3. To start Test 2, depress **EXECUTE**.

The **WAIT** lamp on the **MAAP** is turned on while Test 2 is running.

4. When Test 2 is completed, the **WAIT** lamp is turned off.
5. If no failures are detected, Field 1 displays a 2, Field 8 (alarm status) displays a 5 if alarmed entries existed in PMIDS indicating the alarm entries are resolved, or a dash if there were no alarmed entries and Field 11 (failure index) displays a 0.

Note: The **GREEN** LEDs on TN406, TN405, and UN156 are turned on when no failures exist.

6. If any failures are detected, the first failure is displayed as follows:

Field 1 - 2.

Fields 2 through 6 - Equipment location of failed circuit.

Note: Fields 5 and/or 6 are dashed if a specific DCIU circuit pack or data link cannot be identified for the fault code displayed in Field 12.

Fields 7 and 8 - Dashed.

Field 9 - DCIU status.

Field 10 - Dashed or 0 through 2 (data link status).

Note: Field 10 (data link status) is dashed if Field 6 (data link) is dashed.

Field 11 - Failure index (total number of failures recorded in DMIDS).

Field 12 - Fault code associated with the failed circuit.

Fields 13 and 14 - Dashed.

Note: The **RED** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack failed Test 2.

7. Depressing **NEXT CIRCUIT** displays an alternate circuit pack (if any) to be replaced.

The **RED** LED on the original circuit pack is turned off and the **RED** LED on the displayed circuit pack in Fields 2 through 6 is turned on.

8. Depressing **NEXT CIRCUIT** again displays the last alternate circuit pack (if any) to be replaced.

The **RED** LED on the first alternate circuit pack is turned off and the **RED** LED on the displayed circuit pack in Fields 2 through 6 is turned on.

9. When all alternate circuit packs are displayed, depressing **NEXT CIRCUIT** once more dashes Fields 2 through 6.

Depressing **NEXT CIRCUIT** again displays the first circuit pack in the replacement sequence.

10. Depressing **NEXT FAULT** repeatedly displays the remaining failures. Field 11 (failure index) is decremented each time **NEXT FAULT** is depressed.
 - a. When all failures are displayed, depressing **NEXT FAULT** again dashes all fields except Fields 1 and 9.
 - b. Depressing **NEXT FAULT** once more displays the first failure again.
11. The **APPL PROCR AP INTER** fault indicator is automatically turned off when Test 2 completes with no failures detected for all DCIU circuits that raised an alarm.

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

12. The **MAJOR**, **MINOR**, or **WARNING** alarm indicator is also turned off if no other sources are affecting the major, minor, or warning alarm indicator.

When required, a demand reinitialization of the DCIU can be performed by use of **BUSY OUT** and **RELEASE BUSY OUT**.

Reinitialization of the DCIU is performed as follows:

1. Enter **PROC 650**, Test 2, and depress **EXECUTE**.
2. Depress **BUSY OUT**.
3. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice to reinitialize the DCIU. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Field 9 (DCIU status) changes to 2 (on-line and out-of-service) when **BUSY OUT** is depressed the second time.

4. Depress **RLS BUSY OUT**

Field 9 (DCIU status) changes to 0 (on-line and operational) when **RLS BUSY OUT** is depressed.

5. If special error code 85 (DCIU reinit failed) is displayed in the **MAAP** error code field, demand reinitialization of the DCIU failed.
6. If special error code 87 (restore maintenance busy; data links failed) is displayed in the **MAAP** error code field, depress **BUSY OUT** to place the DCIU in maintenance busy status.

Perform Test 3 to determine the reason for the data link failures.

PROC 650, Test 3

Test 3

Test 3 is used to test a data link continuously.

Test 3 executes three types of looparound testing and allows for busying out individual data links.

1. Internal looparound testing is performed to test the data link interface hardware (UN156 circuit pack).
2. External looparound testing is performed to test the data link cabling between the backplane and the connector; and between the connector and the data set.

The three types of looparound testing are:

1. Internal: For either an on-line or off-line DCIU, data link loops the test vector defined by the DCIU firmware at the High Level Data Link (HDLC) interface.
2. External manual: For an on-line DCIU, data link loops the test vector defined by the DCIU firmware at an external looparound such as a local area data set AL key operation, external loop back plug, etc.
3. External automatic: For an on-line DCIU, data link loops the test vector defined by the DCIU firmware at an external looparound activated by the RS449 EIA loop back signal.

Note: External automatic loop back testing cannot currently be performed. An RS449 compatible data set must be used in order for external automatic loop back testing to work correctly. At present, compatible RS449 data sets are not available.

Maintenance personnel **must** be on the customer's premises to perform the external manual looparound test. Equipment must be disconnected and a looparound adapter installed, or the AL key on the data set depressed.

The external manual looparound test is described in the Repair Guide part of **PROC 650**.

Test 3 monitors the looparound testing at a rate of about 10,000 bits sent per 90 seconds. At least 100,000 bits, requiring 15 minutes should be monitored without error prioring to halting Test 3.

To determine the DCIU hardware integrity up to the local end, a local loopback plug (ED1E422-10 Group 6) can be used. The test should be run for approximately 4000 bits (approximately 32 seconds) and the errors should be 1 or less. If the link is looped back at its remote end, the test must be run as specified in the repair guide section.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. Upon initial entry to Test 3, Field 1 displays a 3, Fields 2 through 6 display the default data link, Field 7 displays a 0 (default loop back test type), Field 9 displays the DCIU status, Field 10 displays the data link status, and all other fields are dashed.
3. To test the default data link, proceed to Step 5.
4. To select another data link to be tested, depress **NEXT CIRCUIT** until the data link to be tested is displayed in Field 6 and proceed to Step 5.

Note: Depressing **NEXT CIRCUIT** cycles Field 6 from 1 through 8 and back to 1.

5. Prior to starting Test 3, it must be determined which type of loop back test is to be performed.

The loop back field defaults to 0 which indicates that an internal loop back test is performed without further input by maintenance personnel.

Note: An internal loop back test is used to test the UN156 circuit pack. An external loop back test is used to test the data link cabling.

6. The internal loop back test should be performed first, and if required, the external loop back test(s) should be performed when it is necessary to further isolate a problem with the HDLC.

Note: Only an internal loop back test can be performed on the off-line DCIU data link.

7. When compatible RS449 data sets are available, the external automatic loop back test is performed without connecting any equipment by setting Field 7 to 2 as follows:

CHANGE FIELD; 7; ENTER; 2; ENTER.

Note: At present, compatible RS449 data sets are not available and the external automatic loop back test cannot be performed.

Proceed to Step 9.

8. The external manual loop back test assists in isolating a problem between the DCIU and the AP.
 - a. The external manual loop back test requires that the loop be closed manually.
 - b. The external manual loop back test must be performed when maintenance personnel are on the customer's premises as equipment must be disconnected and a looparound adapter installed or the AL key depressed.
 - c. The external manual loop back test is described in the Repair Guide part of **PROC 650**.

9. Prior to starting Test 3, the data link must be busied out or untranslated.

Check the data link status displayed in Field 10.

10. If the data link is busied out (1 displayed in Field 10), proceed to Step 13.

If the data link is untranslated (2 displayed in Field 12), proceed to Step 13.

11. If the data link is translated and operational (0 displayed in Field 10), depress **BUSY OUT**.

Note: Special error code 82 (see Note 2) indicating that **BUSY OUT** is not valid for untranslated data links may be displayed in the **MAAP** error code field.

12. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice to perform looparound testing. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Proceed to Step 13.

PROC 650, Test 3

13. To start Test 3 after selecting the data link to be tested and the type of loop back, depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

14. The following special error codes may be displayed in the **MAAP** error code field when **EXECUTE** is depressed.
 - a. Special error code 81 (see Note 1) indicates that the data link must be busied out prior to performing Test 3.
 - b. Special error code 83 (see Note 3) indicates that only internal loop back testing of the data link is allowed on the off-line side of the common control.

15. During execution of Test 3, the following fields are displayed:

Field 1 - 3.

Fields 2 through 6 - Equipment location of data link being tested.

Field 7 - 0, 1, or 2 (type of loop back test).

Field 8 - Dashed.

Field 9 - DCIU status.

Field 10 - Data link status (1 = translated and busied out, 2 = untranslated).

Fields 11 and 12 - Dashed.

Field 13 - 0 through 99 (number of frames with failures, 1000 bits per frame).

Field 14 - 1 through 9999 (thousands of bits sent).

16. During execution of Test 3, the following fields are updated after every 2000 (2 frames) bits are sent:

Field 13 - Number of frames with failures, 1000 bits per frame (if any).

Field 14 - Thousands of bits sent.

Note: Test 3 monitors loop back testing at a rate of about 10,000 bits sent per 90 seconds. (Multiples of 10 displayed in Field 14.)

17. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.
18. The testing time required to determine if the data link is functioning properly is approximately 15 minutes. (At least 100,000 bits sent.)

It is recommended that 1 million bits (approximately 2 and 1/2 hours) be monitored when performing Test 3 in the off-line common control.

Note: Failure rate (Field 13) should be less than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14). If Field 14 is less than 1000, results are not conclusive if Field 13 is less than 10.

19. A local loopback plug (ED1E422-10 Group 6) can be used to determine the DCIU hardware integrity up to the local end.

20. The testing time required to determine if the DCIU hardware up to the local end is functioning properly is approximately 32 seconds. (At least 4000 bits sent.)

Note: Failure rate (Field 13) should be 1 or less per 4,000 bits sent (i.e., 4 displayed in Field 14).

21. If no failures occur after 10,000 bits are sent (10 displayed in Field 14), the **GREEN** LED on UN156 is turned on. As soon as a failure is detected (before or after 10,000 bits are sent), the **RED** LED on UN156 is turned on and the **GREEN** LED (if lighted) is turned off.
22. When Test 3 is stopped, the results of the loop back test are displayed in Fields 13 and 14 and the **RED** or **GREEN** LED is lighted on UN156.
 - a. If the failure rate displayed in Field 13 is more than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14), the data link failed the loop back test.
 - b. If the **RED** LED on UN156 is lighted, at least 1 failure occurred. If the threshold is not exceeded (indicated by Fields 13 and 14), Test 3 passed. If the threshold is exceeded, Test 3 failed.
23. When Test 3 is completed for the data link being tested, the data link should be released from busy. To release busy the data link, perform the following:

Depress **RLS BUSY OUT**

Note: Special error code 82 (see Note 2) indicating that **RLS BUSY OUT** is not valid for untranslated data links may be displayed in the **MAAP** error code field. Untranslated data links cannot be released from busy.

24. If special error code 87 (restore maintenance busy; data links failed) is displayed in the **MAAP** error code field, depress **BUSY OUT** to place the DCIU in maintenance busy status. Perform corrective action as required to restore the failed data links.
25. When another data link is to be continuously tested, the **CHANGE FIELD** sequence must be used to select the data link:
CHANGE FIELD; 6; ENTER; (Data link 1 through 8); ENTER.
26. Repeat Steps 5 through 23 to test the new data link.

Repair Guide

When the **APPL PROCR AP INTER** and **MAJOR, MINOR, or WARNING** fault indicators on the alarm panel are lighted (indicating a DCIU failure) or when **PROC 650** is referenced from **PROC 600** (alarm causes/error log) as a potential problem, the following steps should be performed in the order listed to isolate and repair the faulty unit.

General

1. Execute Test 1.

Step through the failure history and record the equipment location and fault codes associated with each failure.

Note: Fields 5 and 6 are dashed if a specific DCIU circuit pack or data link cannot be identified for the fault code displayed in Field 12.

2. Execute Test 2.

If all circuits pass Test 2, the **APPL PROCR AP INTER** fault indicator is turned off.

Note: The **GREEN** LED on each DCIU circuit pack (TN406, TN405, and UN156) are turned on when no failures exist.

3. If all circuits pass Test 2, perform **Looparound Testing** (below) for those failures recorded in Test 1 with a fault code of 6, or 31 through 34 and an alarm status of major, minor, or warning (1, 2, or 3) to ensure that no intermittent problems exist with data links.
4. If any failures are detected in Test 2, display the failure on the **MAAP**.
5. Record the equipment location displayed in Fields 2 through 6 and the fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.

Note: The **RED** LED is lighted on the circuit pack to indicate to maintenance personnel that the circuit pack failed Test 2.

6. Determine if fault code 20 through 35 is displayed in Field 12.
7. If fault code 20 through 35 is **not** displayed in Field 12, proceed to Step 10.
8. If fault code 20 through 35 is displayed in Field 12, repeat Test 2.

Note: Fault codes 20 through 35 may not be solid failures because the accumulated count needs to be cleared.

9. If fault code 20 through 25 is still displayed in Field 12 after repeating Test 2, proceed to Step 10.
10. At the equipment location displayed in Fields 2 through 5, replace the circuit pack with the **RED** LED lighted.

Caution: *Reseating or replacing TN406 without use of the GO/HALT switch causes a partial reload. Replace TN406 in the common control carrier as detailed in SWITCH COMPONENT REPLACEMENT - CIRCUIT PACK REPLACEMENTS.*

11. Repeat Test 2.

If Test 2 passes, the **APPL PROCR AP INTER** fault indicator is turned off.

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

Perform **Demand Reinitialization** (below), if required.

12. If Test 2 fails, step through the failures to determine if the same failure exists.
If different failures exist, proceed to Step 25.
13. If the same failure exists, display the failure on the **MAAP**.

- a. Depress **NEXT CIRCUIT** to determine if an alternate circuit pack replacement is available.
- b. If all fields except Fields 1 and 9 are dashed, no alternate circuit pack is available for replacement.

Proceed to Step 24.

- 14. If an alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 2 through 5.
 - a. Record the equipment location displayed in Fields 2 through 6 and the fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.
 - b. The **RED** LED on the original circuit pack is turned off, and the **RED** LED on the alternate circuit pack is turned on.
- 15. At the equipment location displayed in Fields 2 through 5, replace the alternate circuit pack.

Caution: *Reseating or replacing TN406 without use of the GO/HALT switch causes a partial reload. Replace TN406 in the common control carrier as detailed in SWITCH COMPONENT REPLACEMENT - CIRCUIT PACK REPLACEMENTS.*

- 16. Repeat Test 2.
- 17. If Test 2 passes, the **APPL PROCR AP INTER** fault indicator is turned off.

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

Perform **Demand Reinitialization** (below), if required.

- 18. If Test 2 fails, step through the failures to determine if the same failure exists.
If different failures exist, proceed to Step 25.
- 19. If the same failure exists, display the failure on the **MAAP**.
 - a. Depress **NEXT CIRCUIT** to determine if another alternate circuit pack replacement is available.
 - b. If all fields except Fields 1 and 9 are dashed, no alternate circuit pack is available for replacement.

Proceed to Step 24.
- 20. If another alternate circuit pack exists, the equipment location of the circuit pack is displayed in Fields 2 through 5.
 - a. Record the equipment location displayed in Fields 2 through 6 and the fault code displayed in Field 12 which is detected by the demand diagnostic test and logged in DMIDS.
 - b. The **RED** LED on the first alternate circuit pack is turned off, and the **RED** LED on the second alternate circuit pack is turned on.
- 21. At the equipment location displayed in Fields 2 through 5, replace the second alternate circuit pack.

Caution: Reseating or replacing TN406 without use of the GO/HALT switch causes a partial reload. Replace TN406 in the common control carrier as detailed in SWITCH COMPONENT REPLACEMENT - CIRCUIT PACK REPLACEMENTS.

22. Repeat Test 2.

If Test 2 passes, the **APPL PROCR AP INTER** fault indicator is turned off.

Note: DCIU alarmed circuit entries in PMIDS are marked as resolved.

Perform **Demand Reinitialization** (below), if required.

23. If Test 2 fails, step through the failures to determine if the same failure exists.

If different failures exist, proceed to Step 25.

24. If the same failure exists, determine if fault codes 6, 15, or 31 through 35 were recorded.
- If fault code 15 was recorded, perform **PROC 614** (Memory read/memory match tests) to isolate the cause of the problem.
 - If fault code 6, or 31 through 35 was recorded, perform **Looparound Testing External Manual** (below) to isolate the cause of the problem.
 - If fault codes 6, 15, or 31 through 35 were not recorded, refer to **Fault Codes** (below) for further isolation techniques.
25. If the same failure is not displayed, but Test 2 fails with other failures, repeat Steps 4 through 25 as appropriate.

Demand Reinitialization

When required, a demand reinitialization of the DCIU can be performed by use of **BUSY OUT** and **RELEASE BUSY OUT**.

Reinitialization of the DCIU is performed as follows:

- Enter **PROC 650**, Test 2 and depress **EXECUTE**.
- Depress **BUSY OUT**.
- When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice to reinitialize the DCIU. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Field 9 (DCIU status) changes to 2 (on-line and out-of-service) when **BUSY OUT** is depressed the second time.

4. Depress **RLS BUSY OUT**

Field 9 (DCIU status) changes to 0 (on-line and operational) when **RLS BUSY OUT** is depressed.

5. If special error code 85 (DCIU reinit failed) is displayed in the **MAAP** error code field, demand reinitialization of the DCIU failed.
 6. If special error code 87 (restore maintenance busy; data links failed) is displayed in the **MAAP** error code field, depress **BUSY OUT** to place the DCIU in maintenance busy status.
- Perform **Looparound Testing** (below) to determine the reason for the data link failures.

Looparound Testing

Overview

The three types of looparound testing are internal, external manual, and external automatic.

1. Internal looparound testing is performed to test the data link interface hardware (UN156 circuit pack).
2. External looparound testing is performed to test the data link cabling between the backplane and the connector; and between the connector and the data set.

Note: External automatic looparound testing cannot currently be performed. An RS449 compatible data set must be used in order for external automatic looparound testing to work correctly. At present, compatible RS449 data sets are not available.

3. When failures are recorded in Test 1 but pass Test 2 without corrective action being taken (i.e., replacing a circuit pack), looparound testing should be performed on those failures with a fault code of 6, or 31 through 34 and an alarm status of major, minor, or warning.
4. The internal loop back test should be performed first; and if required, the external loop back test(s) should be performed when it is necessary to further isolate a problem with the HDLC.
5. Only an internal loop back test can be performed on the off-line DCIU data link.

Internal

Internal loop back testing of an on-line or off-line DCIU data link is performed as follows:

1. Enter Test 3 of **PROC 650** and select the data link to be tested.
2. Busy out the data link to be tested.

Requirement: **BUSY OUT** must be depressed twice to perform looparound testing.

3. Internal loop back testing encode 0 is displayed by default in Field 7.
4. Depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

5. During execution of Test 3, the following fields are incremented:

Field 13 - Failures per thousands of bits sent.

Field 14 - Thousands of bits sent.

Note: Test 3 monitors loop back testing at a rate of about 10,000 bits sent per 90 seconds. (Multiples of 10 displayed in Field 14.)

6. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.
7. The testing time required to determine if the data link is functioning properly is approximately 15 minutes. (At least 100,000 bits sent.)

It is recommended that 1 million bits (approximately 2 and 1/2 hours) be monitored when performing Test 3 in the off-line common control.

8. If no failures occur after 10,000 bits are sent (10 displayed in Field 14), the **GREEN** LED on UN156 is turned on. As soon as a failure is detected (before or after 10,000 bits are sent), the **RED** LED on UN156 is turned on and the **GREEN** LED (if lighted) is turned off.
9. When Test 3 is stopped, the results of the loop back test is displayed in Fields 13 and 14.
The LED on UN156 is off if 10,000 bits were not sent or the **RED** or **GREEN** LED is lighted on UN156.
10. If the failure rate displayed in Field 13 is more than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14), the data link failed the loop back test.
11. If the **RED** LED on UN156 is lighted, at least 1 failure occurred. If the threshold is not exceeded (indicated by Fields 13 and 14), Test 3 passed. If the threshold is exceeded, Test 3 failed.

Note: Failure rate (Field 13) should be less than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14). If Field 14 is less than 1000, results are not conclusive if Field 13 is less than 10.

12. If Test 3 passes and a data link problem is still suspected, perform **External Manual Looparound Testing** (below) to isolate the trouble.

If Test 3 passes and no data link problem is suspected, repeat Test 2 to resolve the alarm cause and turn off the **APPL PROCR AP INTER** fault indicator.

13. If Test 3 fails, replace UN156.

Repeat Test 3.

14. If Test 3 passes, repeat Test 2 to resolve the alarm cause and turn off the **APPL PROCR AP INTER** fault indicator.

15. If Test 3 fails again and a data link problem is still suspected, perform external manual **Looparound Testing** (below) to isolate the trouble.

If Test 3 fails again and a data link problem is not suspected, refer to **Fault Codes** (below) for further isolation techniques.

16. When Test 3 is completed for the data link being tested, release the data link from busy out.

External Manual

Performing the external manual loop back test to isolate an interface problem between the DCIU and the AP results in message handling being suspended for the data link being tested.

External manual loop back test is initiated with the AL key (or local loop back button) on a data set, or connecting an ED1E422-10 Group 6 loop back plug to the back of the common control. Both methods are presented below.

An abbreviated external manual loop back test can be performed to determine the DCIU hardware integrity **only** up to the local end. The local loopback plug (ED1E422-10 Group 6) **must** be used for this abbreviated test. The testing time required to determine if the DCIU hardware up to the local end is functioning properly is approximately 32 seconds. (At least 4000 bits sent.) When 4000 bits have been sent maintenance personnel end the abbreviated test by depressing **STOP**.

External manual loop back testing of an **on-line only** DCIU data link is performed as follows:

1. Enter Test 3 of **PROC 650** and select the data link to be tested.
2. Busy out the data link to be tested.

Requirement: BUSY OUT must be depressed twice to perform looparound testing.

3. Determine if a data set is the interface between the AP and the DCIU data link.
 - a. If a data set is the interface, proceed to Step 4.
 - b. If a data set is not the interface, proceed to Step 5.
4. Depress the **AL** key (or local loop back button) on the data set.
 - a. When **AL** is depressed, the **MB**, **TR**, **MR**, and **TM** LEDs on the data set are turned on.
 - b. The **TR** LED indicates that the data set detects the terminal ready signal from the switch.

Proceed to Step 7.

5. At the rear of the common control cabinet, disconnect the cable from the common control connector (F*) corresponding to the UN156 slot and data link that is failing.
Cable designations are: F0 through F7 = Data link 1 through 8; i.e., F3 = Data link 4.
6. Connect the ED1E422-10 Group 6 loop back plug to the F* connector corresponding to the UN156 slot and data link that is failing and proceed to Step 7.
7. The external manual loop back test is performed by setting Field 7 to 1 as follows:
CHANGE FIELD; 7; ENTER; 1; ENTER.
8. Depress **EXECUTE**.

The **WAIT** indicator is not turned on during Test 3 execution.

9. During execution of Test 3, the following fields are incremented:
Field 13 - Failures per thousands of bits sent.
Field 14 - Thousands of bits sent.

Note: Test 3 monitors loop back testing at a rate of about 10,000 bits sent per 90 seconds. (Multiples of 10 displayed in Field 14.)

10. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.
11. The testing time required to determine if the data link is functioning properly is approximately 15 minutes. (At least 100,000 bits sent.)

The testing time required to perform an abbreviated test using a local loopback plug (ED1E422-10 Group 6) to determine the DCIU hardware integrity **only** up to the local end is approximately 32 seconds. (At least 4000 bits sent.)

12. If no failures occur after 10,000 bits are sent (10 displayed in Field 14), the **GREEN** LED on UN156 is turned on. As soon as a failure is detected (before or after 10,000 bits are sent), the **RED** LED on UN156 is turned on and the **GREEN** LED (if lighted) is turned off.
13. When Test 3 is stopped, the results of the loop back test is displayed in Fields 13 and 14, and the **RED** or **GREEN** LED is lighted on UN156.
 - a. If the failure rate displayed in Field 13 is more than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14), the data link failed the loop back test.
 - b. If the **RED** LED on UN156 is lighted, at least 1 failure occurred. If the threshold is not exceeded (indicated by Fields 13 and 14), Test 3 passed. If the threshold is exceeded, Test 3 failed.

Note: Failure rate (Field 13) should be less than 1 per 100,000 bits sent (i.e., 100 displayed in Field 14). If Field 14 is less than 1000, results are not conclusive if Field 13 is less than 10.

14. If an abbreviated external manual loop back test was performed, the failure rate (Field 13) should be 1 or less per 4000 bits sent (i.e., 4 displayed in Field 14).
15. If Test 3 passes, determine which method of external manual looparound testing was performed.
 - a. If the **AL** key (or local loop back button) was depressed, repeat Test 2 to resolve the alarm cause and turn off the **APPL PROCR AP INTER** fault indicator.
 - b. If an ED1E422-10 Group 6 loop back plug was used, refer the data set problem to the appropriate personnel.
16. If Test 3 fails, determine which method of external manual looparound testing was performed.
 - a. If the **AL** key (or local loop back button) was depressed, repeat Steps 5 through 12 using an ED1E422-10 Group 6 loop back plug and proceed to Step 15.
 - b. If an ED1E422-10 Group 6 loop back plug was used, refer to **Fault Codes** (below) for further isolation techniques.
17. If Test 3 now passes using the ED1E422-10 Group 6 loop back plug, refer the data set problem to the appropriate personnel.

If Test 3 fails again, refer to **Fault Codes** (below) for further isolation techniques.
18. Release the **AL** key (or local loop back button) or connect the cable to the connector on the back of the common control carrier as appropriate.
19. When Test 3 is completed for the data link being tested, release the data link from busy out.

Fault Codes

Further isolation of a DCIU failure may be accomplished by analyzing the fault codes recorded from Test 1 (PMIDS) and Test 2 (DMIDS).

1. Determine from Table BN, PROC 650 - Fault Code Definitions, if any additional corrective action can be performed (i.e., cabling, connectors, etc.).
2. Check the wiring associated with the circuit pack(s) replaced (point to point depending upon specific fault code recorded).

TABLE BN.

PROC 650 - FAULT CODE DEFINITIONS					
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION	ALARM TYPE
1	TN406	TN405		SHUTDOWN BIT DETECTED MAINTENANCE REGISTER	MAJOR
2	TN406			RED LED ON TN406 MAINTENANCE REGISTER	MAJOR
3	TN405	TN406	UN156	TN405 UNHEALTHY MAINTENANCE REGISTER	MAJOR
4	UN156	TN406	TN405	UN156 UNHEALTHY MAINTENANCE REGISTER	MAJOR
5	TN406			NO FAILURES IN MAINTENANCE REGISTER BUT STATUS CONTROL RAM NOT GOOD	MAJOR
6	DL [1]	UN156		STATUS CONTROL RAM INDICTS ASSIGNED DL	MAJOR
7	UN156	LB [2]		STATUS CONTROL RAM INDICTS UNASSIGNED DL	WARN
8	TN406			STATUS CONTROL RAM INDICTS 8086, DPROM, MEMORY MAPPER, OR FIRMWARE	MAJOR
9	TN405	TN406	LB [2]	STATUS CONTROL RAM INDICTS LOCAL RAM	MAJOR
10	TN406			STATUS CONTROL RAM INDICTS 501CC INTERFACE	MAJOR
11	TN405	TN406	UN156	STATUS CONTROL RAM INDICTS DCIU I/O	MAJOR
12	TN406			GOTB INDICATES SHUTDOWN BY NOTHING ELSE	MAJOR
13	S/H [3]	TN406		SYSTEM BUS TIME-OUT	MINOR

TABLE BN. (Contd)

PROC 650 - FAULT CODE DEFINITIONS					
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION	ALARM TYPE
14	S/H [3]	TN406		SINGLE BYTE PARITY ERRORS	MINOR
15	MEM [4]	TN406		DOUBLE BYTE PARITY ERRORS	MINOR
16	S/H [3]	TN406		WRITE PROTECT VIOLATIONS	MINOR
17	TN405	LB [2]		RAM PARITY ERRORS	MAJOR
18	TN406			SANITY TIME-OUTS	MAJOR
19	TN405	TN406	UN156	LOCAL BUS TIME-OUT	MAJOR
20	TN406	S/H [3]		OCCUPANCY LESS THAN 9000	WARN
21	TN406	S/H [3]		OCCUPANCY LESS THAN 4500	MINOR
22	TN406			PRIMARY QUEUE ERRORS	MINOR
23	TN406			SECONDARY QUEUE ERRORS	MINOR
24	TN406			TRANSLATION ERRORS	MINOR
25	TN406			MEMORY MAPPER ERRORS	MINOR
26	TN405	TN406		PROTOCOL TIMER AUDITS	MINOR
27	TN405			RAM PARITY CHECKER/GENERATOR	MAJOR
28	TN405	TN406		MEMORY ACCESS	MAJOR
29	S/H [3]	TN406		WRITE PROTECT REGISTER AUDIT	MAJOR
30	S/H [3]	TN406		WRITE PROTECT REGISTER TEST	MAJOR
31	DL [1]	UN156		HDLC (RECEIVE)	MAJOR
32	DL [1]	UN156		HDLC (TRANSMIT)	MAJOR
33	DL [1]	UN156		SET ASYNCHRONOUS BALANCED MODE (SABM'S)	MAJOR
34	DL [1]	UN156		FRAMES RETRANSMITTED	MINOR
35	UN156	DL [1]		LOOPBACK TEST ERROR RATE (OFF-LINE ONLY)	MINOR
36	TN406	TN405	UN156	RE-INITIALIZATION FAILED	MAJOR
37	TN406			MAILBOX REQUEST FAILED	MINOR
38	TN406			INIT B SHUTDOWN DCIU	MAJOR

TABLE BN. (Contd)

PROC 650 - FAULT CODE DEFINITIONS					
FAULT CODE	CKT 1	CKT 2	CKT 3	DEFINITION	ALARM TYPE
39				PROC 650 EXITED WITH DCIU BUSY	MAJOR
40	TN406			SYSTEM I/O ERROR	MINOR
41	TN406			COUNTER REQUEST FAILED	WARN
42	TN406	TN405	UN156	RE-INITIALIZATION FAILED AND STOPPING DT TESTS FAILED ALSO	MAJOR
43	TN406	TN405	UN156	STATE VECTOR SEND FAILED	MAJOR
44	TN406			STATE OF HEALTH BAD, NO FAILURES IN STATUS CONTROL RAM	WARN
45				PROC 650 ID CHIP FAILURE	NONE
46	TN406			PROC 650 PARITY CMD FAILURE	NONE
[1] DL = DATA LINK [2] LB = LOCAL BUS [3] S/H = SOFTWARE/HARDWARE [4] MEM = MAIN MEMORY					

PROC 651

PROC 651 - PROCESSOR COMMUNICATION CIRCUIT (PCC) TESTS

FLIPCHART ISSUE 4		+ + PROCESSOR COMMUNICATION CIRCUIT (PCC) TESTS + +		845552223	
NOTES: 1. TEST NUMBER CAN ONLY BE CHANGED BY 'NEXT TEST'.		FIELD LIMITS: FIELD 2 (CARRIER): 0-1 FIELD 3 (SLOT): 24-26 FIELD 4 (CIRCUIT): 0-1		FIELD 5 (CONTINUOUS FLAG): 0 = SINGLE ITERATION TEST 1 = RUN TEST CONTINUOUSLY	
		FIELD 6 (ALARM STATUS): 1 = MAJOR 2 = MINOR 3 = WARNING 4 = ERRORS RECORDED 5 = ALARM RESOLVED		FIELD 7 (CIRCUIT STATUS): 0 = CIRCUIT NOT TRANSLATED 1 = CIRCUIT BUSIED 2 = CIRCUIT TRANSLATED AND IN-SERVICE 3 = CIRCUIT CURRENTLY IN TEST 4 = CIRCUIT NON-OPERATIONAL	
WORD 0		COMMON CONTROL PERIPHERALS			
		651			

FLIPCHART ISSUE 4		+ + PROCESSOR COMMUNICATION CIRCUIT (PCC) TESTS + +		845552223	
TEST 1: DISPLAYS FAILURE HISTORY. TEST 2: PCC SELF TEST AND INTERNAL LOOP AROUND TEST. TEST 3: PCC END-TO-END LOOP AROUND TEST.		USE 'CLEAR DATA' EXECUTE TO RESOLVE ALARM(S). (TEST 1) USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILING CIRCUIT (TEST 1). USE 'NEXT FAULT' TO DISPLAY NEXT SPECIFIC FAULT CODE (TEST 2). USE 'BUSY OUT' TWICE TO MAINTENANCE BUSY DISPLAYED CIRCUIT (TEST 2 OR 3). USE 'RLS BUSYOUT' TO RELEASE CIRCUIT FROM MAINTENANCE BUSY STATUS (TEST 2 OR 3). USE 'NEXT CIRCUIT' TO SELECT PCC CIRCUIT FOR TESTING (TEST 2 OR 3). USE 'STOP' TO TERMINATE TEST 3.		SPECIAL ERROR CODES: 80-BUSY OUT KEY PRESSED ONCE. 81-CIRCUIT MUST BE BUSIED OUT TO EXECUTE THIS TEST. 82-CIRCUIT NOT TRANSLATED AS USING THE BTC PROTOCOL 83-TEST 3 CANNOT BE EXECUTED ON THE OFF-LINE PROCESSOR 84-CANNOT COMMUNICATE WITH THE TN474-BUSY OUT FAILED (CONT ON WORD 0)	
TEST NUMBER	EQUIPMENT LOCATION	CARRIER	SLOT	CIRCUIT	CONTINUOUS FLAG
1	2	3	4	5	6
7	8	9	10	11	12
SPECIFIC FAULT CODE		NUMBER OF FAILED MESSAGES		NUMBER OF ATTEMPTED MESSAGES	
1		2		3	
4		5		6	
7		8		9	
10		11		12	
		COMMON CONTROL PERIPHERALS			
		651			

Purpose

PROC 651 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a processor communications circuit (PCC) failure.

PROC 651 is used to:

1. Display the failure history for the PCC.
2. Allow manual resolving of the alarm activated because of a PCC failure (which turns off the **OTHER FAILS** fault indicator (assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active).

Note: PCC alarmed circuit entries in PMIDS are marked as resolved.

3. Perform a PCC self-test, testing the individual components of the board.
4. Perform a PCC local looparound test to verify the send and receive circuitry.
5. Perform a continuous test.
6. Perform an end-to-end looparound test.

Maintenance personnel **must** be at the customer's premises to perform the end-to-end looparound test to determine link problems between the switch and the peripheral. Test equipment must be connected in order to determine link problems.

Note: The end-to-end looparound test can not be performed on the off-line common control.

7. Automatically turn off the **OTHER FAILS** fault indicator (assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active) when all PCC circuits that caused an alarm are tested as good.

Note: PCC alarmed circuit entries in PMIDS are marked as resolved.

Field Definitions and Codes

Each field of **PROC 651** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BO, PROC 651 - Field Definitions and Codes.

Optional input fields are:

1. Fields 2 through 4 - Select equipment location of PCC circuit to be tested (Test 2 and Test 3 only).
2. Field 5 - Select one iteration or continuous mode of testing to be performed (Test 3 only).

Test Equipment Required

The following test equipment is required to perform the end-to-end looparound test.

1. An EDIE422-Group 10, Group 11, or Group 12 loop back plug.
2. A 1-pair 5-foot patch cord (comcode 103908349 or equivalent).
3. An EDIE422-Group 7, RS232 loop back plug.
4. A 2012D transformer, comcode 102600517.
5. A 248D adapter, comcode 102802103.
6. A 7-foot 8-terminal modular cable (2725-16G or equivalent).

Operation of Procedure

Overview

PROC 651 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a PCC failure.

To call in **PROC 651**, perform the following:

1. Depress **PROC NO; 651; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

TABLE BO.

PROC 651						
FIELD DEFINITIONS AND CODES						
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION	
1	1-3	Test number.	7	0-4	Circuit status:	
2-4		Equipment location.		0	Circuit not translated.	
2	0,1	Carrier number.		1	Circuit busied out.	
3	24-26	Slot number.		2	Circuit translated and in-service.	
4	0,1	Circuit number.		3	Circuit currently in test.	
5	0,1	Continuous flag (Test 3 only).		4	Circuit non-operational.	
6	1-5	Alarm status:	8	0-9	Failure index:	
	1	Major.		0-6	Index into PMIDS failures (Test 1 only).	
	2	Minor.		0-9	Index into DMIDS failures (Test 2 only).	
	3	Warning.	9	2112-2171	Specific fault code.	
	4	Errors recorded.		10	0-999	Number of failed messages.
	5	Alarm resolved.		11	0-999	Number of attempted messages.

Three tests are available:

1. Test 1 - Displays PCC failure history.
2. Test 2 - Performs a PCC self-test and an internal looparound test.
3. Test 3 - Performs a PCC end-to-end looparound test.

Test 1

Test 1 displays the failure history of PCC failures recorded by periodic on-line maintenance software. The history includes the equipment location, alarm status, and specific fault code information for each recorded PCC failure.

Test 1 is also used to manually turn off the **OTHER FAILS** fault indicator when all alarmed failures are resolved assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

1. Test 1 is the default test when entering **PROC 651** or is selected by using **NEXT TEST**.
2. Upon initial entry to Test 1, Field 1 displays a 1 and all other fields are dashed.
3. To start Test 1, depress **EXECUTE**.
4. If no PCC failures exist, Field 8 (failure index) displays a 0.
5. If any PCC failures exist, a summary is displayed as follows:
 - Field 1 - 1.
 - Fields 2 through 7 - Dashed.
 - Field 8 - Failure index (1 through 6).
 - Fields 9 through 11 - Dashed.
6. Depressing **NEXT CIRCUIT** displays the first failure as follows:
 - Field 1 - 1.
 - Field 2 - Carrier number of displayed failure.
 - Field 3 - Slot number of displayed failure.
 - Field 4 - Circuit number of displayed failure.
 - Field 5 - Dashed.
 - Field 6 - Alarm status (1 = major, 2 = minor, 3 = warning, or 4 = errors recorded) of displayed failure.
 - Field 7 - Dashed.
 - Field 8 - Failure index (total number of PCC failing circuits; maximum of 6).
 - Field 9 - Specific fault code associated with the displayed failure.
 - Fields 10 and 11 - Dashed.
7. Depressing **NEXT CIRCUIT** repeatedly displays the remaining failures. Field 8 (failure index) is decremented each time **NEXT CIRCUIT** is depressed.
 - a. When all failures are displayed, depressing **NEXT CIRCUIT** once more dashes all fields except Field 1.
 - b. Depressing **NEXT CIRCUIT** again displays the failure summary.
8. The **CLEAR DATA, EXECUTE** sequence can be used to manually resolve individual PCC failures or all PCC failures after **EXECUTE** is used to initiate Test 1.

The failures that are resolved are those failures with an alarm status of 1, 2, or 3 displayed in Field 6.
9. To resolve individual PCC failures with an alarm status of 1, 2, or 3, perform the following:
 - a. Use **NEXT CIRCUIT** to display the failing circuit with an alarm status of 1, 2, or 3 on the **MAAP**.

Requirement: Individual PCC failures cannot be resolved unless the failing circuit is displayed on the **MAAP**.
 - b. Depress **CLEAR DATA; EXECUTE**.

PROC 651, Test 1 and Test 2

10. Field 6 (alarm status) displays a 5 indicating that the failing circuit is resolved.
The **OTHER FAILS** fault indicator is turned off if no other PCC failures exist assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
11. If the **CLEAR DATA; EXECUTE** sequence is performed when the summary is displayed (Field 1 = 1, Field 8 = failure index, and all other fields are dashed), all PCC failures with an alarm status of 1, 2, or 3 are resolved and the **OTHER FAILS** fault indicator is turned off assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
12. All PCC failures with an alarm status of 1, 2, or 3 can be resolved upon entry to **PROC 651, Test 1** and after displaying and recording all PCC failures and then using **NEXT CIRCUIT** to display a 1 in Field 1, the failure index in Field 8, with all other fields dashed (summary display).

Caution: The PCC failures should be displayed and recorded in order that a record of the equipment location and specific fault code of each failure is available for maintenance personnel prior to manually resolving alarmed entries.

13. After initial entry to Test 1 and depressing **EXECUTE**, and a number greater than 0 is displayed in Field 8, depress **CLEAR DATA; EXECUTE**.
 - a. All PCC failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **OTHER FAILS** fault indicator is turned off assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
 - b. Field 8 (failure index) changes to reflect the number of entries still remaining (indicating the remaining entries are not alarmed entries).
14. After displaying and recording all PCC failures, depress **NEXT CIRCUIT** until the summary display (Field 1 = 1, Field 8 = failure index greater than 0, with all other fields dashed) is displayed, then depress **CLEAR DATA; EXECUTE**.
 - a. All PCC failures with an alarm status of 1, 2, or 3 are marked as resolved in PMIDS and the **OTHER FAILS** fault indicator is turned off assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.
 - b. Field 8 (failure index) changes to reflect the number of entries still remaining (indicating the remaining entries are not alarmed entries).
15. The **MAJOR, MINOR, or WARNING** alarm indicator is also turned off if no other sources are affecting the alarm indicator.

Test 2

Test 2 is used to perform a PCC self-test. Test 2 tests the individual components of the board for the circuit specified.

Test 2 also provides an internal looparound test and is used to verify that the send and receive circuitry is functioning.

Test 2 is a destructive test. Test 2 will abort any message transmission currently in progress.

Test 2 provides visual feedback to maintenance personnel on whether a failure is corrected by the use of RED and GREEN LEDs on the faceplate of the circuit pack that is reseated or replaced.

Test 2 automatically turns off the **OTHER FAILS** fault indicator when all PCC circuits that raised an alarm pass Test 2 assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

1. Test 2 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 2.

2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 2 through 4.

The alarm status and circuit status associated with the default equipment location are displayed in Fields 6 and 7.

3. The default equipment location can be the last equipment location displayed in Tests 1 or 3 of **PROC 651** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

4. A specific PCC circuit or the default equipment location can be tested.

To test the default equipment location displayed in Fields 2 through 4, proceed to Step 7.

5. A specific PCC circuit can be selected for testing whether or not a default equipment location is displayed by use of **NEXT CIRCUIT**.

Depress **NEXT CIRCUIT** until the PCC circuit to be tested is displayed in Fields 2 through 4.

Proceed to Step 7.

6. A specific PCC circuit can also be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.

- a. **(Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER.**
- b. **CHANGE FIELD; 2; ENTER; (Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER.**

Proceed to Step 7.

7. Check the circuit status displayed in Field 7.

- a. Test 2 cannot be performed if the circuit status = 0, 3, or 4.
- b. If the circuit status = 1, proceed to Step 11.
- c. If the circuit status = 2, proceed to Step 8.

8. Depress **BUSY OUT**.

9. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice in order to test the PCC using Test 2. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

PROC 651, Test 2

10. Field 7 (circuit status) changes to 1 (circuit busied) moments after **BUSY OUT** is depressed the second time.
11. To start Test 2, depress **EXECUTE**.

The **WAIT** lamp on the **MAAP** is turned on while Test 2 is running.

Note: While Test 2 is executing, Field 7 (circuit status) changes from 1 (circuit busied) to 3 (circuit currently in test).

12. When Test 2 is completed, the **WAIT** lamp is turned off.

Note: Special error code 81 (circuit must be busied out to execute this test) is displayed in the **MAAP** error code field if the circuit is not busied out prior to performing Test 2.

13. If the PCC circuit passes Test 2, Field 1 displays a 2, Field 6 (alarm status) displays a 5 if the circuit was alarmed, and Field 8 (failure index) displays a 0.

Note: The **GREEN** LED is lighted on TN474 to indicate to maintenance personnel that the circuit passed Test 2.

14. If the PCC circuit fails Test 2, the following information is displayed:

Field 1 - 2.

Field 2 - Carrier number of displayed failure.

Field 3 - Slot number of displayed failure.

Field 4 - Circuit number of displayed failure.

Field 5 - Dashed.

Field 6 - Alarm status (1 = major, 2 = minor, 3 = warning, or 4 = errors recorded) of displayed failure.

Field 7 - 1 (circuit busied).

Field 8 - Number of specific fault codes associated with the displayed failure.

Fields 9 through 11 - Dashed.

Note: The **RED** LED is lighted on TN474 to indicate to maintenance personnel that the circuit failed Test 2.

15. Test 2 may log more than one specific fault code associated with the PCC circuit tested. The self-test portion of Test 2 is controlled by firmware and multiple specific fault codes could be logged against a PCC circuit being tested.
16. If Field 8 (failure index) is greater than 1, depress **NEXT FAULT**.
 - a. Depressing **NEXT FAULT** displays the first specific fault code in Field 9 associated with the displayed failure.
 - b. Depressing **NEXT FAULT** once more displays the next specific fault code in Field 9 and decrements Field 8 (failure index).

- c. When all specific fault codes are displayed for the failing PCC circuit, depressing **NEXT FAULT** again dashes Field 9 and Field 8 displays the number of specific fault codes associated with the displayed failure.
 - d. Depressing **NEXT FAULT** once more displays the original specific fault code in Field 9.
17. Prior to exiting **PROC 651**, release the PCC circuit from busy out by depressing **RLS BUSY OUT**.

Caution: When **BUSY OUT** is depressed in Test 2 of **PROC 651** the busy out status cannot be released by **PROC 630** (busy out/release busy out) or **PROC 635** (cause of busy out).

18. When another specific PCC circuit is to be tested, the **CHANGE FIELD** sequence must be used to select the specific PCC circuit: **CHANGE FIELD; 2; ENTER; (Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER**.
19. The PCC circuit **must** be busied out and **EXECUTE** depressed to test the specific PCC circuit selected.
20. The **OTHER FAILS** fault indicator is automatically turned off when Test 2 completes with no failures detected for all PCC circuits that raised an alarm assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Note: PCC alarmed circuit entries in PMIDS are marked as resolved.

21. The **MAJOR**, **MINOR**, or **WARNING** alarm indicator is also turned off if no other sources are affecting the major, minor, or warning alarm indicator.

Test 3

Test 3 is used to perform an external end-to-end looparound test out to the peripheral 3B2 Local Storage Unit (LSU).

Test 3 is a destructive test. Test 3 will abort any message transmission currently in progress.

Test 3 can be run either as a single test or on a continuous basis.

Test 3 cannot be run in the off-line common control.

Note: If Test 3 is attempted in the off-line common control, special error code 83 (test 3 cannot be executed on the off-line processor) is displayed in the **MAAP** error code field.

1. Test 3 is selected by use of **NEXT TEST**.

Note: Use of the **CHANGE FIELD** sequence is not valid to select Test 3.

2. When Test 3 is initially called in, a default equipment location may be displayed in Fields 2 through 4.

The alarm status and circuit status associated with the default equipment location are displayed in Fields 6 and 7.

PROC 651, Test 3

3. The default equipment location can be the last equipment location displayed in Tests 1 or 2 of **PROC 651** or can be passed from **PROC 600** while it is still displayed in Test 1 or 2 of **PROC 600** when it is passed.

4. A specific PCC circuit or the default equipment location can be tested.

To test the default equipment location displayed in Fields 2 through 4, proceed to Step 7.

5. A specific PCC circuit can be selected for testing whether or not a default equipment location is displayed by use of **NEXT CIRCUIT**.

Depress **NEXT CIRCUIT** until the PCC circuit to be tested is displayed in Fields 2 through 4.

Proceed to Step 7.

6. A specific PCC circuit can also be selected for testing by performing one of the following depending on whether or not a default equipment location is displayed.
 - a. **(Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER.**
 - b. **CHANGE FIELD; 2; ENTER; (Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER.**

Proceed to Step 7.

7. Check the circuit status displayed in Field 7.
 - a. Test 3 cannot be performed if the circuit status = 0, 3, or 4.
 - b. If the circuit status = 1, proceed to Step 11.
 - c. If the circuit status = 2, proceed to Step 8.
8. Depress **BUSY OUT**.
9. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice in order to test the PCC using Test 3. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Field 7 (circuit status) changes to 1 (circuit busied) moments after **BUSY OUT** is depressed the second time.

10. Determine the amount of testing to be performed.
 - a. To perform a single iteration test (test is performed once), depress **CHANGE FIELD; 5; ENTER; 0; ENTER.**
 - b. To perform a continuous test, depress **CHANGE FIELD; 5; ENTER; 1; ENTER.**
11. To start Test 3, depress **EXECUTE**.

The **WAIT** lamp on the **MAAP** is not turned on during Test 3 execution.

12. Special error code 81 (circuit must be busied out to execute this test) is displayed in the **MAAP** error code field if the circuit is not busied out prior to performing Test 3.

13. During execution of Test 3, the following fields are displayed:
Field 1 - 3.
Fields 2 through 4 - Equipment location of PCC circuit being tested.
Field 5 - 0 or 1 depending on the amount of testing selected.
Fields 6 through 9 - Dashed.
Field 10 - 0 through 999 (number of failed messages).
Field 11 - 1 through 999 (number of messages attempted).
14. When a PCC circuit is being tested continuously in Test 3, Fields 10 and 11 (number of failed messages and number of attempted messages) are updated approximately every second.

Note: While Test 3 is executing in a continuous mode, Field 7 (circuit status) changes from 1 (circuit busied) to 3 (circuit currently in test).
15. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.

Note: When Field 11 displays 999 during continuous testing, Fields 10 and 11 (number of failed messages and number of attempted messages) are frozen and Test 3 stops testing.
16. **STOP** can be depressed during single iteration testing or continuous testing.
Test 3 can be restarted for the same PCC circuit selected for testing by depressing **EXECUTE**.

Note: Test 3 will start over and Fields 10 and 11 (number of failed messages and number of attempted messages) are cleared and begin a new count when **EXECUTE** is depressed.
17. When Test 3 is completed for a single iteration test or is stopped by depressing the **STOP** key during continuous testing, the results of the test are displayed in Fields 10 and 11.
18. If the PCC circuit passes Test 3, Fields 8 and 10 display 0.
19. If the PCC circuit fails Test 3, the following information is displayed:
Field 1 - 2.
Field 2 - Carrier number of displayed failure.
Field 3 - Slot number of displayed failure.
Field 4 - Circuit number of displayed failure.
Field 5 - 0 or 1 (depending on the amount of testing selected).
Field 6 - Alarm status (1 = major, 2 = minor, 3 = warning, or 4 = errors recorded) of displayed failure.
Field 7 - 1 (circuit busied).
Fields 8 and 9 - Dashed.

PROC 651, Test 3

Field 10 - 1-999 (number of failed messages).

Field 11 - 1-999 (number of attempted messages).

20. Test 3 may log more than one specific fault code associated with the PCC circuit tested. The end-to-end looparound test out to the peripheral may have failed for different reasons depending on the period of time the attempted messages were sent.
21. Depressing **NEXT FAULT** updates Fields 8 and 9 displaying the number of different specific fault codes recorded during the testing interval in Field 8 (failure index) and the first specific fault code in Field 9.
 - a. Depressing **NEXT FAULT** once more displays the next specific fault code in Field 9 and decrements Field 8 (failure index).
 - b. When all specific fault codes are displayed for the failing PCC circuit, depressing **NEXT FAULT** again dashes Fields 8 and 9.
 - c. Depressing **NEXT FAULT** once more displays the first specific fault code in Field 9 and the failure index in Field 8.
22. Prior to exiting **PROC 651** release the PCC circuit from busy out by depressing **RLS BUSY OUT**.

Caution: When **BUSY OUT** is depressed in Test 3 of **PROC 651** the busy out status cannot be released by **PROC 630** (busy out/release busy out) or **PROC 635** (cause of busy out).

23. When another specific PCC circuit is to be tested, the **CHANGE FIELD** sequence must be used to select the specific PCC circuit: **CHANGE FIELD; 2; ENTER; (Carrier number); ENTER; (Slot number); ENTER; (PCC circuit to be tested); ENTER**.
24. The PCC circuit **must** be busied out, the continuous flag set in Field 5, and **EXECUTE** depressed to test the specific PCC circuit selected.

Repair Guide

When a PCC failure is indicated (**PROC 651** referenced from **PROC 600** (alarm causes/error log) as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed to isolate and repair the faulty unit.

General

1. Execute Test 1 of **PROC 600** or Test 1 of **PROC 651** to determine which PCC circuits are alarmed (indicated by a 1 (major), 2 (minor), or 3 (warning) displayed in the alarm status field).

Record the alarmed circuits displayed in Test 1 of **PROC 600** or Test 1 of **PROC 651**.

2. Display the alarmed circuit in Test 1 of **PROC 600** or Test 1 of **PROC 651**.
3. Enter **PROC 651**, Test 2.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 600** or Test 1 of **PROC 651** is the default equipment location displayed in Test 2 of **PROC 651**.

4. Check the circuit status displayed in Field 7.
 - a. Test 2 cannot be performed if the circuit status = 0, 3, or 4.
 - b. If the circuit status = 1, proceed to Step 7.
 - c. If the circuit status = 2, proceed to Step 5.
5. Depress **BUSY OUT**.
6. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice in order to test the PCC using Test 2. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Field 7 (circuit status) changes to 1 (circuit busied) moments after **BUSY OUT** is depressed the second time.

7. Depress **EXECUTE**.
If Test 2 passes, proceed to isolation and repair step **Continuous Testing** for further diagnosis of the alarmed failure.
8. If Test 2 fails, record the specific fault code(s) displayed in Field 9.

Note: The **RED** LED is lighted on circuit pack TN474 to indicate to maintenance personnel that the circuit failed Test 2.

9. At the equipment location displayed in Fields 2 through 4, replace circuit pack TN474.
Repeat Test 2.
10. If Test 2 passes, proceed to isolation and repair step **Continuous Testing** for further diagnosis of the alarmed failure.

Note: Test 2 and Test 3 must be run for each alarmed PCC circuit recorded in Test 1 of **PROC 600** or Test 1 of **PROC 651** to ensure that TN474 is working properly and to check the link between the switch and the peripheral.

If Test 2 fails, refer to isolation and repair step **Specific Fault Codes** for further isolation techniques.

11. If all alarmed PCC circuit failures pass Test 2, the **OTHER FAILS** fault indicator is turned off assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active.

Continuous Testing

When a PCC circuit was alarmed in Test 1 of **PROC 600** or Test 1 of **PROC 651** and passes Test 2 of **PROC 651**, with or without corrective action being taken (i.e., circuit pack replaced) further analysis of the problem should be performed by running a continuous test of the circuit in Test 3 of **PROC 651** to ensure that the failure is not intermittent and that the link between the switch and peripheral is functioning.

PROC 651

1. Display the alarmed circuit in Test 1 of **PROC 600** or Test 1 of **PROC 651**.
2. Enter **PROC 651**, Test 3.

Note: The alarmed circuit that was displayed in Test 1 of **PROC 600** or Test 1 of **PROC 651** is the default equipment location displayed in Test 3 of **PROC 651**.

3. Check the circuit status displayed in Field 7.
 - a. Test 3 cannot be performed if the circuit status = 0, 3, or 4.
 - b. If the circuit status = 1, proceed to Step 6.
 - c. If the circuit status = 2, proceed to Step 4.
4. Depress **BUSY OUT**.
5. When special error code 80 (busy out key pressed once) is displayed in the **MAAP** error code field, depress **BUSY OUT** again.

Requirement: **BUSY OUT** must be depressed twice in order to test the PCC using Test 3. Special error code 80 must be displayed in the **MAAP** error code field before **BUSY OUT** is depressed the second time.

Field 7 (circuit status) changes to 1 (circuit busied) moments after **BUSY OUT** is depressed the second time.

6. Depress **CHANGE FIELD; 5; ENTER; 1; ENTER**.
7. Depress **EXECUTE**.

Note: If Test 3 is attempted in the off-line common control, special error code 83 (test 3 cannot be executed on the off-line processor) is displayed in the **MAAP** error code field.

The **WAIT** indicator is not turned on during Test 3 execution.

8. The testing interval is determined by maintenance personnel performing the test, and is ended by depressing **STOP**.

It is recommended that at least 100 messages (Field 11) be attempted in the end-to-end looparound test to the peripheral.
9. When Test 3 is stopped, the results of the looparound test are displayed in Fields 10 and 11.
10. If no messages failed (0 displayed in Field 10), corrective action is complete.

Proceed to Step 12.
11. If any messages failed (greater than 0 displayed in Field 10), refer to isolation and repair step **End-to-End Looparound Test** for further isolation techniques.
12. Prior to exiting **PROC 651** release the PCC circuit(s) from busy out by depressing **RLS BUSY OUT** when the PCC circuit is displayed in Fields 2 through 4 and **EXECUTE** is depressed.

Caution: When **BUSY OUT** is depressed in Test 3 of **PROC 651** the busy out status cannot be released by **PROC 630** (busy out/release busy out) or **PROC 635** (cause of busy out).

13. Test 2 and Test 3 must be run for each alarmed PCC circuit recorded in Test 1 of **PROC 600** or Test 1 of **PROC 651** to ensure that TN474 is working properly and to check the link between the switch and the peripheral.

Proceed to **General** isolation techniques and begin with Step 2 displaying the next alarmed PCC circuit.

14. Perform all steps listed under **General**, **Continuous Testing**, and **End-to-End Looparound Test** (as appropriate) for each alarmed PCC circuit recorded in Test 1 of **PROC 600** or Test 1 of **PROC 651**.

End-to-End Looparound Test

The end-to-end looparound test is performed to isolate failures between the PCC circuit pack and the 3B2 LSU peripheral.

The following test equipment is required to perform the end-to-end looparound test.

1. An ED1E422-Group 10, Group 11, or Group 12 loop back plug.
2. A 1-pair 5-foot patch cord (comcode 103908349 or equivalent).
3. An ED1E422-Group 7, RS232 loop back plug.
4. A 2012D transformer, comcode 102600517.
5. A 248D adapter, comcode 102802103.
6. A 7-foot 8-terminal modular cable (2725-16G or equivalent).

The end-to-end looparound test should be performed at a convenient time to the customer, possibly during normal out-of-hours.

Each time Test 3 is repeated in the end-to-end looparound test, at least 100 messages (100 displayed in Field 11) should be attempted before Test 3 is stopped.

1. At the rear of the common control carrier, disconnect the cable from the D connector associated with the slot number displayed in Field 3.
2. Connect the appropriate ED1E422 loop back plug to the D connector associated with the slot number displayed in Field 3.

ED1E422-Group 10 loop back plug should be connected to slot 24 (D1); ED1E422-Group 11 loop back plug should be connected to slot 25 (D2); and ED1E422-Group 12 loop back plug should be connected to slot 26 (D4).

3. Repeat Test 3.

If Test 3 passes, proceed to Step 5.

If Test 3 fails, replace TN474 and proceed to Step 4.

4. Repeat Test 3.

If Test 3 passes, corrective action is complete.

If Test 3 fails, check the wiring between the backplane and the D connector.

5. Disconnect the ED1E422-Group 10, Group 11, or Group 12 loop back plug and connect the cable (disconnected in Step 1) to the appropriate slot (D connector).

PROC 651

6. At the cross-connect field, disconnect the send and receive wires associated with the circuit number displayed in Field 3 going toward the peripheral.

Note: Circuit 0 send and receive wires end in 0 (i.e., S10, R10, etc.); circuit 1 send and receive wires end in 1 (i.e., S11, R11, etc.).

7. Refer to Table BP, PROC 651 - Port Wiring Connections to determine the correct wires to be disconnected.

Note: Only send and receive wires S10, S20, R10, R20 (for circuit 0) or S11, S21, R11, R21 (for circuit 1) need to be disconnected.

8. Connect a 1-pair 5-foot patch cord between S10 to R10 and S20 to R20 for circuit 0 or between S11 to R11 and S21 to R21 for circuit 1.
9. Repeat Test 3.

If Test 3 passes, proceed to Step 10.

If Test 3 fails, check the wiring between the cross-connect field and the backplane and replace as necessary.

10. At the cross-connect field, disconnect the patch cord and reconnect the wires disconnected in Step 6.
11. At the far end (peripheral), disconnect Z3A4 from the 2750-C10 male modem connector comcode 2322125005.
12. Connect an EDIE422-Group 7, RS232 loop back plug to the Z3A4.
13. Connect a 2012D transformer comcode 102600517 and a 248D adapter comcode 102802103 to the Z3A4.
 - a. The 248D adapter is connected to the 2012D transformer terminals.
 - b. The 248D adapter is then connected to the **TELEPHONE** connector on the Z3A4 via an 7-foot 8-terminal modular cable (2725-16G or equivalent).
14. Plug the transformer into a 117V AC outlet.
15. Repeat Test 3.

If Test 3 passes, the problem is either the 3B2 LSU peripheral or the 3B2 serial port.
Refer the problem to the appropriate far end (peripheral) maintenance personnel.
16. If Test 3 fails, check the Z3A4 and/or the wiring between the cross-connect field, wall jack, 8-pin modular cord, and the Z3A4.

Specific Fault Codes

Further isolation of a PCC failure may be accomplished by analyzing the fault codes recorded from Test 1 (PMIDS) and Test 2 (DMIDS).

Determine from Table BQ, PROC 651 - Fault Code Definitions, if any additional corrective action can be performed (i.e., cabling, connectors, etc.). a link problem.

TABLE BP.

PROC 651 - PORT WIRING CONNECTIONS			
ON-LINE COMMON CONTROL SIGNAL	D CONNECTOR AND PIN NUMBER BY SLOT		
	SLOT 24	SLOT 25	SLOT 26
SEND LEADS			
S10	D1/34	D2/42	D4/26
S20	D1/9	D2/17	D4/1
S30	D1/36	D2/44	D4/28
S40	D1/11	D2/19	D4/3
S11	D1/38	D2/46	D4/30
S21	D1/13	D2/21	D4/5
S31	D1/40	D2/48	D4/32
S41	D1/15	D2/23	D4/7
RECEIVE LEADS			
R10	D1/35	D2/43	D4/27
R20	D1/10	D2/18	D4/2
R30	D1/37	D2/45	D4/29
R40	D1/12	D2/20	D4/4
R11	D1/39	D2/47	D4/31
R21	D1/14	D2/22	D4/6
R31	D1/41	D2/49	D4/33
R41	D1/16	D2/24	D4/8

TABLE BQ.

PROC 651 - SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
2112	ATTEMPTED READ OPERATION OF INCOMING FIFO FAILED
2113	ATTEMPTED READ OPERATION OF DUAL PORT RAM ADDRESS FAILED
2114	ATTEMPTED READ OPERATION OF DUAL PORT RAM DATA FAILED
2115	ATTEMPTED READ OPERATION OF STATUS REGISTER FAILED
2116	ATTEMPTED READ OPERATION OF IDENTIFICATION CHIP FAILED
2117	ATTEMPTED READ OPERATION OF INCOMING FIFO UNDERFLOWED
2119	LINK HALTED DUE TO AN EXCESSIVE NUMBER OF ERRORS DURING A RECEIVE

TABLE BQ. (Contd)

PROC 651 - SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
2120	LINK HALTED DUE TO AN EXCESSIVE NUMBER OF ERRORS DURING A TRANSMIT
2121	ATTEMPTED WRITE OPERATION TO OUTGOING FIFO FAILED
2123	ATTEMPTED WRITE OPERATION TO DUAL PORT RAM ADDRESS FAILED
2124	ATTEMPTED WRITE OPERATION TO DUAL PORT RAM DATA FAILED
2125	ATTEMPTED WRITE OPERATION TO STATUS REGISTER FAILED
2126	ATTEMPTED WRITE OPERATION TO IDENTIFICATION CHIP FAILED
2127	ATTEMPTED WRITE OPERATION TO OUTGOING FIFO OVERFLOWED
2128	I/O FAILURE
2131	MESSAGE PROTOCOL ERROR - OUTGOING BLOCK CHECK CODE ERROR
2132	MESSAGE PROTOCOL ERROR - OUTGOING MESSAGE SEQUENCE NUMBER ERROR
2133	MESSAGE PROTOCOL ERROR - OUTGOING MESSAGE LENGTH ERROR
2134	MESSAGE PROTOCOL ERROR - OUTGOING 3 NAK (NEGATIVE ACKNOWLEDGEMENT) ERROR
2135	MESSAGE PROTOCOL ERROR - OUTGOING 3 ENQ (ENQUIRY) ERROR
2136	MESSAGE PROTOCOL ERROR - INCOMING BLOCK CHECK CODE ERROR
2137	MESSAGE PROTOCOL ERROR - INCOMING MESSAGE SEQUENCE NUMBER ERROR
2138	MESSAGE PROTOCOL ERROR - INCOMING MESSAGE LENGTH ERROR
2139	MESSAGE PROTOCOL ERROR - INCOMING 3 NAK (NEGATIVE ACKNOWLEDGEMENT) ERROR
2141	SELF-TEST FOUND ERROR IN OUTGOING FIFO
2142	SELF-TEST FOUND ERROR IN INCOMING FIFO
2143	SELF-TEST FOUND ERROR IN DUAL PORT RAM
2144	SELF-TEST FOUND ERROR IN PCC DATA RAM
2145	SELF-TEST FOUND ERROR IN PCC PROGRAM ROM
2146	SELF-TEST FOUND ERROR IN 80186 PROCESSOR
2147	SELF-TEST FOUND ERROR IN LOOP AROUND TEST
2150	ATTEMPTED TO SEND MESSAGE BUT ALL MESSAGE SEQUENCE NUMBERS BUSY
2158	ATTEMPT TO SEND MESSAGE TO PCC FAILED. TRY AGAIN
2159	PCC IN SELF-TEST. TRY AGAIN AFTER SELF-TEST COMPLETES
2160	SANITY FAILURE ON THIS CIRCUIT
2161	PCC FAILED TO GO INTO INTERNAL LOOP MODE
2162	PCC FAILED TO DETECT BAD BLOCK CHECK CODE

TABLE BQ. (Contd)

PROC 651 - SPECIFIC FAULT CODE DEFINITIONS	
FAULT CODE	DEFINITION
2163	PCC RETURNED BAD ECHO OF MESSAGE IN INTERNAL LOOP MODE
2164	PCC FAILED TO DETECT NONSEQUENTIAL MESSAGE SEQUENCE NUMBER
2165	PERIPHERAL RETURNED BAD ECHO OF MESSAGE IN END-TO- END LOOP MODE
2166	PCC FAILED TO RUN REQUESTED SELF-TEST
2167	PCC FAILED TO FINISH SELF-TEST IN GIVEN TIME
2168	INTERNAL LOOP TIMED OUT
2169	END-TO-END LOOP TIMED OUT
2170	PCC BOARD EXPERIENCED POWER FAILURE
2171	LOST DATA TERMINAL READY (DTR)

PROC 652 - TIME-OF-DAY CLOCK SYNCHRONIZER

FLIPCHART ISSUE 5		TIME OF DAY CLOCK SYNCHRONIZER										845552223			
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA,' 'EXECUTE' TO RETIRE ALARMS.		TEST 2: TESTS TIME OF DAY CLOCK CONTINUOUSLY.		TEST 3: DISPLAYS AND SETS THE HARDWARE AND/OR SOFTWARE TIME OF DAY CLOCK (ON LINE SIDE ONLY). USE 'NEXT UNIT' TO SELECT CLOCK AND DISPLAY TIME. USE 'CLEAR DATA,' 'EXECUTE' TO SET CLOCKS TO DISPLAYED TIME.		MTCE BUSY STATUS (FIELD 4): 0 = NOT BUSIED OUT 1 = BUSIED OUT 2 = ALARMED, NOT BUSY (TEST 1) 3 = ALARMED, BUSY (TEST 1)		FAILURE CODES (FIELD 5): 1 = NO RESPONSE 2 = RESERVED FOR FUTURE USE 3 = RESERVED FOR FUTURE USE 4 = NO CHANGE SINCE LAST READ 5 = SOFTWARE UPDATE AFTER INIT 6 = SMALL CLOCK DIFF 7 = LARGE CLOCK DIFF		8 = BAD HARDWARE VALUES 9 = BAD SOFTWARE VALUES 10 = CLOCK SET FAILURE CLOCK TYPE (FIELD 6): 0 = SOFTWARE 1 = HARDWARE		SPECIAL ERROR CODES: 80-WARNING-AFTER SETTING CLOCK IN TEST 3, RUN TEST 2. 81-CANNOT SET CLOCK FROM OFF-LINE PROCESSOR			
USE 'NEXT DATA' TO DISPLAY ADDITIONAL FAILURE CODES.															
TEST NO	EQUIPMENT LOCATION		MTCE BUSY STAT	FAILURE CODE	CLOCK TYPE	TIME AND DATE						FAILURE HISTORY		COMMON CONTROL PERIPHERALS	
	CABINET	SLOT				TEST 3						FAILURE INDEX	FAILURES PER HOUR		FAILURES BEGAN (HOURS AGO)
						MONTH	DAY	SOFTWARE ONLY YEAR	HOURS	MINUTES	SECONDS				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	652

Purpose

PROC 652 is used when referenced from **PROC 600** (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a time-of-day clock synchronizer failure.

PROC 652 is used to:

1. Display the equipment location of the time-of-day clock synchronizer and related failures causing a failure indication.
2. Display the maintenance busy status and alarm status of the time-of-day clock synchronizer.
3. Set the time-of-day clock synchronizer to the correct time of day.

When the switch does not include a hardware clock, Test 3 of **PROC 652** may be used to set the software clock.

Field Definitions and Codes

Each field of **PROC 652** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BR, PROC 652 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 7 through 12 - Set time and date of software or hardware time-of-day clocks (Test 3 only).

Operation of Procedure**Overview**

PROC 652 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a time-of-day clock synchronizer failure.

TABLE BR.

PROC 652					
FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	5 (Contd)	8	Invalid time values from hardware.
2	0	Common control carrier.		9	Invalid time values from software.
3	32	Slot number.		10	Clock set failure.
4	0-3	Maintenance busy status:	6	0,1	Clock type (Tests 2 and 3):
	0	Not busied out, not alarmed.		0	Software clock.
	1	Busied out, not alarmed.		1	Hardware clock.
	2	Not busied out, alarmed.	7	1-12	Month.
	3	Busied out, alarmed.	8	1-31	Day.
5		Failure codes:	9	Dash	Not used with hardware clock display.
	1	No response.		1-99	Year for software clock time and date display.
	2	Reserved for future use.	10		Hours of the day:
	3	Reserved for future use.		0	Midnight.
	4	No change in time since last read.		1-11	1 through 11 am.
	5	Software time updated after initialization.		12	Noon.
	6	Small difference between software and hardware clock times.		13-23	1 through 11 pm.
	7	Large difference between software and hardware clock times. Software assumed correct.	11	0-59	Minutes.
			12	0-59	Seconds.
			13		Failure index:
				0	Failure summary.
				1-6	Index into failure history.

TABLE BR.

PROC 652 FIELD DEFINITIONS AND CODES (Contd)					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
14	1-99	Failure Summary: Sum of approximate number of failures per hour for all failures. Failure History: Approximate number of failures per hour for failure code being displayed.	15	1-17	Failure Summary: Number of hours since oldest individual failure code (to the nearest hour). Individual Failure History: Number of hours since failures started in failure code displayed (to the nearest hour).

To call in **PROC 652**, perform the following:

1. Depress **PROC NO; 652; ENTER.**
2. Test 1 is automatically selected.
Field 1 displays a 1, Fields 2 and 3 display the equipment location of the time-of-day clock synchronizer (if provided), and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Continuously tests the time-of-day clock circuit and software buffer.
3. Test 3 - Displays and allows either or both the hardware and software time-of-day clocks to be reset.

Test 1

Test 1 provides a failure history of hardware time-of-day clock synchronizer failures. The failure history is recorded by the on-line time-of-day clock program.

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 652** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.

Note: If the translation records indicate the switch is not equipped with a hardware time-of-day clock synchronizer, special error code 74 is displayed in the **MAAP** error code field when **EXECUTE** is depressed. Further key inputs related to the hardware time-of-day clock synchronizer are ignored by Test 1. However, Test 3 may be used to set the software clock.

3. If no failures occurred, the following is displayed:

Field 1 - 1.

Fields 2 and 3 - Equipment location of the hardware time-of-day clock synchronizer.

Fields 4, 13, and 14 - 0.

Field 15 - Dashed.

4. If one or more failures occurred, the following summary is displayed:

Field 1 - 1.

Fields 2 and 3 - Equipment location of the hardware time-of-day clock synchronizer.

Field 4 - 0.

Field 13 - 0 (indicating failure summary).

Fields 14 and 15 - Failure summary.

5. Depressing **NEXT DATA** displays the failure code with the highest peg count. The display is updated as follows:

Field 4 - Busy status of the hardware time-of-day clock synchronizer (indicating whether failures recorded were severe enough to cause an alarm).

Field 5 - First failure code.

Field 13 - Incremented to 1, indicating first failure code.

Fields 14 and 15 - Failure history of displayed failure code.

6. Depressing **NEXT DATA** repeatedly displays the remaining failure codes (if any) in descending order of peg count and updates Fields 4, 5, and 13 through 15.

- a. When all failure codes are displayed, depressing **NEXT DATA** once more dashes Fields 4, 5, and 13 through 15.

- b. Depressing **NEXT DATA** again executes Test 1 and an updated failure summary is displayed.

7. Performing Test 1 does not busy out the hardware time-of-day clock synchronizer.

8. To manually turn off the **OTHER FAILS** fault indicator (assuming no other sources affecting the **OTHER FAILS** fault indicator are active), after Test 1 is executed at least once, perform the following:

Depress **CLEAR DATA; EXECUTE**.

9. Field 14 displays a zero (0) and Field 15 is dashed.

Note: The hardware time-of-day clock synchronizer alarmed circuit entry in PMIDS is marked as resolved.

Test 2

During execution of Test 2, the following checks are performed:

1. Whether a hardware time-of-day clock synchronizer is provided and appears to be functional.
2. Whether the hardware time-of-day clock changed since last read (read once per second).
3. Whether time and date values are within obvious bounds; i.e., non- Binary-Coded Decimal (BCD) values.

Test 2 continuously tests a combination of the hardware time-of-day clock synchronizer and the software buffer.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. To start Test 2, depress **EXECUTE**.

Note: If the translation records indicate the switch is not equipped with a hardware time-of-day clock synchronizer, special error code 74 is displayed in the **MAAP** error code field when **EXECUTE** is depressed. Further key inputs related to the hardware time-of-day clock synchronizer are ignored by Test 2. However, Test 3 may be used to set the software clock.

3. A flashing digit in Field 5 indicates Test 2 is running.

Fields 7, 8, and 10 through 13 provide a transitional display of the actual time and date generated by the hardware time-of-day clock.

4. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

5. When **STOP** is depressed, the following is displayed:

Field 1 - 2.

Fields 2 and 3 - Equipment location of the hardware time-of-day clock synchronizer.

Field 4 - Busy/alarm status.

Field 5 - Failure code.

Field 6 - 1 (indicating hardware time-of-day clock).

Fields 7, 8, and 10 through 12 - The display of the actual time and data generated by the hardware time-of-day clock up to the time **STOP** was depressed is frozen.

Fields 13 through 15 - Dashed.

6. If no failures occurred during Test 2, a 0 is displayed in Field 5.
7. If a failure occurs, the failure code for the first failure is locked into Field 5.
8. **NEXT DATA** can be used to sequence through all the failure codes associated with the failing hardware time-of-day clock.
9. The **OTHER FAILS** fault indicator is automatically turned off by Test 2 (indicating the hardware time-of-day clock synchronizer alarm cause is resolved) when the following conditions are met.

- a. The hardware time-of-day clock synchronizer failure(s) is cleared.
- b. All other sources of the **OTHER FAILS** fault indicator are cleared.

Note: The hardware time-of-day clock synchronizer alarmed circuit entry in PMIDS is marked as resolved.

10. The hardware time-of-day clock synchronizer is automatically released from the busy-out condition if it was passing Test 2 when Test 2 was stopped.

Test 3

Test 3 enables maintenance personnel to set the software and/or hardware time-of-day clock.

If the switch does not include a hardware time-of-day clock, the software clock can be set using Test 3.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 3; ENTER.

2. To start Test 3, depress **EXECUTE**.

Note: If an attempt is made to set the clock from the off-line processor, special error code 81 (cannot set clock from off-line processor) is displayed in the **MAAP** error code field when **EXECUTE** is depressed.

3. When **EXECUTE** is depressed, the following is displayed:

Field 1 - 3.

Fields 2 and 3 - Equipment location of the hardware time-of-day clock.

Field 4 - Busy/alarm status.

Field 5 - Dashed.

Field 6 - 0 (indicating software clock).

Fields 7 through 12 - Transitional display providing a real-time readout of the actual time and date generated by the software clock.

Fields 13 through 15 - Dashed.

Note: If the switch does not include a hardware time-of-day clock, Fields 2 through 5 are dashed.

4. Depressing **NEXT UNIT** causes the hardware time-of-day clock (if provided) to be displayed as follows:

Fields 1 through 5 - Same as software clock display.

Field 6 - 1 (indicating hardware time-of-day clock).

Fields 7, 8, and 10 through 12 - Transitional display providing a real-time readout of the actual time and date generated by the hardware time-of-day clock.

Fields 9 and 13 through 15 - Dashed.

PROC 652, Test 3

5. When both clocks are provided, repeated use of **NEXT UNIT** toggles the display between the two clocks.

When the hardware time-of-day clock is replaced or the switch does not include a hardware time-of-day clock, the clock(s) should be set as follows:

1. Display the software clock in Fields 6 through 12.
2. Determine if the software clock time and date is correct.
3. If the software clock is correct:
 - a. If the switch does not include a hardware time-of-day clock, no further action is required.
 - b. If a hardware time-of-day clock is provided, depress **CLEAR DATA; EXECUTE**. Both clocks are set to equal each other.
4. If the software clock is not correct:
 - a. Determine which fields need to be corrected (i.e., month, day, year, hours, minutes, or seconds) and use the **CHANGE FIELD** sequence to change the required fields.
 - b. **CHANGE FIELD; (Field number to be changed); ENTER; (Enter correct data; i.e., month, day, year, hours, minutes, or seconds); ENTER.**
5. Repeat the **CHANGE FIELD** sequence as necessary for all fields requiring change, or depress **ENTER** until the field to be changed is indicated with a flashing decimal point.

Enter the correct data in the appropriate field.

6. When all required fields are corrected, depress **CLEAR DATA; EXECUTE**.

The software clock or both clocks (when a hardware time-of-day clock is provided) are set to the entered values.

When the clocks are being checked to determine any differences and the hardware time-of-day clock is not replaced, or failure code 6 is indicated, the clocks should be set as follows:

1. Use **NEXT UNIT** to toggle between the two clocks to determine which of the two are correct.
2. Leave the correct clock displayed.
3. Depress **CLEAR DATA; EXECUTE**.

Both clocks are set to equal each other.

4. If neither clock appears to be correct, toggle to the software clock and input new time and date values using the **CHANGE FIELD** sequence:

CHANGE FIELD; (Field number to be changed); ENTER; (Enter correct data); ENTER.

5. When other fields need to be changed, the **CHANGE FIELD** sequence or **ENTER** can be used to step to the new field and correct data can be entered.
6. When all required fields are corrected, depress **CLEAR DATA; EXECUTE**.

Both clocks are set to the entered values.

When the clocks are set and the switch includes a hardware time-of-day clock, Test 2 should be run to determine if the hardware time-of-day clock is functioning correctly.

Repair Guide

When a time-of-day clock synchronizer failure is indicated (**PROC 652** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1.
 - a. Step through the failure history and record the results.
 - b. Determine which failure codes are accompanied by an alarm-sent indication (encode 2 or 3 in Field 4).

2. Execute Test 2.

Record any failure codes.

3. If the circuit passes the test, the hardware time-of-day clock synchronizer alarmed entry in PMIDS is resolved.

If the circuit was busied out, it is released from the busy out state.

The **OTHER FAILS** fault indicator is turned off if no other sources affecting the **OTHER FAILS** fault indicator are active.

4. When failure codes are recorded, based on the results of Test 2, refer to Table BS, PROC 652 - Time-of-Day Clock Synchronizer Repair Procedure and perform the corrective action indicated for the failure code recorded.

Note: Prior to replacement of circuit pack TN492, insure that the battery (comcode 844665836) is connected (or connect) to the back side of the circuit pack.

- a. Mark the date of the next battery replacement (month and year) on the **Date Label** that is attached to the battery.

Note: The battery replacement date is established by adding 5 years to the date of installation of the TN492 circuit pack and associated battery. Example: TN492 circuit pack replaced July 1987; date to be written on the label is July 1992.

- b. Affix the **Date Label** to the faceplate of the TN492 circuit pack.

Note: If the YELLOW LED is lighted, after the circuit pack is replaced, the battery is **not** connected or wired correctly.

5. When multiple failure codes are indicated, perform the corrective action for the first failure code with an alarm-sent indication (encode 2 or 3 in Field 4).
6. If the hardware time-of-day clock synchronizer is replaced, execute Test 3 to set the time-of-day clock to the correct time and then repeat Test 2.
7. If a failure is still indicated, analyze the failure codes and perform any additional corrective action as required.

Repeat Test 3 as appropriate, and then Test 2.

8. If all corrective action is taken and the hardware time-of-day clock still fails, check the wiring associated with the replaced circuit pack.

Failure code 9 is a software problem that cannot be corrected by hardware.

TABLE BS.

PROC 652 TIME-OF-DAY CLOCK SYNCHRONIZER REPAIR PROCEDURE			
FAILURE CODE	CORRECTIVE ACTION	FAILURE CODE	CORRECTIVE ACTION
1	No Response. Replace TN492.	6 (Contd)	Some counts are expected and do not indicate a fault condition. If Field 4 indicates that an alarm has been sent: Replace TN492.
2	Reserved for future use.		
3	Reserved for future use.		
4	The hardware clock is not running. Replace TN492.	7	Large differences in the software and hardware clocks have resulted in the hardware clock being updated by the software clock. Replace TN492.
5	The software clock has been updated after initialization from a power up. This is not an alarmable condition and, therefore, does not require repair activity.	8	Invalid time values have been received from hardware. Replace TN492.
		9	Invalid time values have been received from the software. This is a software problem that cannot be corrected with hardware.
6	There are small differences in the software and hardware clocks resulting in the software clock being updated by the hardware clock.	10	Clock set failure. Replace TN492.

PROC 653 - ATTENDANT CONSOLE TESTS

FLIPCHART ISSUE 1														+ ATTENDANT CONSOLE TESTS +														845552223																																																
TEST 1: DISPLAYS FAILURE HISTORY. USE 'CLEAR DATA', 'EXECUTE' TO RETIRE ALARMS.				TEST 2: TESTS ALL CIRCUITS. TO ISOLATE I/O FAILURES USE PROC 611.				TEST 3: TESTS A PARTICULAR CIRCUIT CONTINUOUSLY. USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT CIRCUIT WITHIN DISPLAYED CARRIER.				NOTE: 1. HANDSET MUST BE PLUGGED INTO CONSOLE FOR TESTS 2 & 3.				REMOTE STATUS (FIELD 6): 0 = LOCAL 1 = REMOTE				FAILURE CODES (FIELD 7): 0 = PASS 1 = ON-LINE PERIODIC				CONSOLE: 4 = ADDRESSING 5 = MESSAGE ECHO																																																				
USE 'NEXT CIRCUIT' TO DISPLAY NEXT FAILED CONSOLE.																																																																												
<table border="1"> <tr> <td colspan="4">TEST 3</td> <td colspan="2" rowspan="2">CONSOLE NUMBER</td> <td rowspan="2">REMOTE STATUS</td> <td rowspan="2">FAIL CODE</td> <td rowspan="2">NUMBER OF CONSOLES</td> <td rowspan="2">NUMBER OF FAILED CHANNELS</td> <td rowspan="2">FAILED CONSOLE INDEX</td> <td colspan="4">FAILURE HISTORY</td> <td rowspan="2">COMMON CONTROL PERIPHERALS</td> </tr> <tr> <td colspan="4">EQUIPMENT LOCATION</td> <td rowspan="2">FAILURES PER HOUR</td> <td rowspan="2">FAILURES BEGAN (HOURS AGO)</td> <td colspan="2">MOST RECENT FAILURE</td> </tr> <tr> <td rowspan="2">TEST NO</td> <td rowspan="2">CARRIER</td> <td rowspan="2">SLOT</td> <td rowspan="2">CHANNEL</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td rowspan="2">653</td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> </tr> </table>														TEST 3				CONSOLE NUMBER		REMOTE STATUS	FAIL CODE	NUMBER OF CONSOLES	NUMBER OF FAILED CHANNELS	FAILED CONSOLE INDEX	FAILURE HISTORY				COMMON CONTROL PERIPHERALS	EQUIPMENT LOCATION				FAILURES PER HOUR	FAILURES BEGAN (HOURS AGO)	MOST RECENT FAILURE		TEST NO	CARRIER	SLOT	CHANNEL											653																								
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1	2	3	4	5	6	7	8	9	10	11	12	13	14																																																															

Purpose

PROC 653 is used when referenced from PROC 600 (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a console failure.

PROC 653 is used to:

1. Test all attendant consoles once or a particular console continuously.
2. Display attendant console failures.
3. Resolve the console alarm cause when all consoles pass Test 2.

Note: Dual-speed data channels associated with attendant consoles are tested in PROC 611.

Field Definitions And Codes

Each field of PROC 653 flipchart and the possible displays for the fields during execution of the different tests are defined in Table BT, PROC 653 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 4 - Select a specific console for testing (Test 3 only).

Operation of Procedure

Overview

PROC 653 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from a console failure.

TABLE BT.

PROC 653					
FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	11	*	Failure summary: Sum of approximate number of failures per hour for all failing circuits. Failure history: Approximate number of failures per hour for circuit being displayed.
2	0	Common control carrier.			
3	23-26	Slot number.			
4	0-15	Channel number.			
5	0-40	Failed console.			
6	0,1	Remote status:	12	0-17	Failure summary: Number of hours since the oldest individual failure started (to the nearest hour). Individual failure history: Number of hours since failures started in the displayed circuit (to the nearest hour).
	0	Local.			
	1	Remote.			
7	0	Failure codes: Pass.			
	1	On-line periodic.			
	4	Addressing.			
	5	Message echo.			
8	*	Number of consoles in system.	13-14		Number of hours plus minutes since: Failure summary: Most recent failure of any circuit. Failure history: Most recent failure of the displayed circuit.
9	*	Number of failed channels:			
		Test 1: Number of dual-speed data channels in the failure history.			
		Test 2: Number of dual-speed data channels that failed the test.			
10		Failed console index.			
	0	Failure summary.	13	0-136	Hours.
	1-6	Individual failures.	14	0-59	Minutes.
* = Number varies according to switch configuration.					

To call in **PROC 653**, perform the following:

1. Depress **PROC NO; 653; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Field 8 displays the number of consoles in the switch, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Tests all consoles.
3. Test 3 - Tests a specific console continuously.

Test 1

Test 1 displays the failure history of console failures. These failures are detected during call processing, not by periodic tests.

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 653** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 1; ENTER.
2. To start Test 1, depress **EXECUTE**.
3. The failure history is displayed in the form of a summary.
The failure summary displays the total number of console failures that occurred.
4. If no failures occurred, Fields 9 through 11 display a 0.
5. If one or more failures occurred, the following summary is displayed:
Field 1 - 1.
Field 8 - Total number of consoles in the switch.
Field 9 - Number of failed channels.
Field 10 - 0 (Indicating the first failure is not displayed).
Fields 10 through 13 - Failure summary.
6. Depressing **NEXT CIRCUIT** displays the first failing console in the failure history. The display includes the following:
Field 1 - 1.
Fields 2 through 4 - Equipment location of the dual-speed data channel associated with the failing console.
Field 5 - Console number.
Field 6 - Remote status (0 = local, 1 = remote).

PROC 653, Test 1 and Test 2

Field 7 - Failure code associated with the failing console.

Field 8 - Total number of consoles in the switch.

Field 9 - Number of failed channels.

Field 10 - 1 (indicating first failing console).

Fields 11 through 14 - Failure history for the displayed console.

7. Depressing **NEXT CIRCUIT** repeatedly displays the failure histories of the remaining failing consoles.

Fields 2 through 7, and 10 through 14 are updated.

8. Depressing **NEXT CIRCUIT** after all failure histories are displayed, dashes all fields except Fields 1 and 8.
9. Depressing **NEXT CIRCUIT** again causes Test 1 to be executed, starting the sequence over with an updated failure summary.
10. To manually turn off the **OTHER FAILS** fault indicator (assuming no other sources affecting the **OTHER FAILS** fault indicator are active), after Test 1 is executed at least once, perform the following:

Depress **CLEAR DATA; EXECUTE**.

Note: Alarmed console entries in PMIDS are marked as resolved.

Test 2

Test 2 tests all consoles to determine if any are failing.

Prior to executing Test 2, the handset or headset must be plugged into all consoles or the consoles fail the test.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** is turned on.

3. Upon completion of Test 2, the **WAIT** indicator is turned off.

If no failures are detected in Test 2, Field 9 displays a 0.

4. If a failure is detected, the first failed console is displayed as follows:

Field 1 - 2.

Fields 2 through 4 - Equipment location of the dual-speed data channel associated with the failing console.

Field 5 - Console number.

Field 6 - Remote status (0 = local, 1 = remote).

Field 7 - Failure code associated with the first failure.

Field 8 - Total number of consoles in the switch.

Field 9 - Number of failed channels.

Field 10 - Failed console index (1, indicating first failing console).

Fields 11 through 14 - Dashed.

5. **NEXT CIRCUIT** can be depressed repeatedly to display the remainder of the failing consoles.

Fields 2 through 7 and 10 are updated as appropriate.

6. Depressing **NEXT CIRCUIT** after all failing consoles are displayed, dashes all fields except Fields 1 and 7.

Depressing **NEXT CIRCUIT** again causes Test 2 to start over.

7. The console alarm cause is resolved when all attendant consoles pass Test 2.

Note: Alarmed console entries in PMIDS are marked as resolved.

The **OTHER FAILS** fault indicator is automatically turned off when the console alarm cause, and all other alarm sources affecting the **OTHER FAILS** fault indicator are cleared.

Test 3

Test 3 is used to continuously test a specific attendant console that is suspected of having intermittent failures or to trace wiring problems.

The handset or headset must be plugged into the console that is being tested in Test 3 or the console fails.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 3; ENTER.

2. A console to be tested must be selected prior to execution of Test 3.

Field 2 is flashing, indicating an optional entry field.

3. A default console may be displayed in Fields 2 through 4.

The default console is the last console failure displayed in Test 1 or 2.

4. Either the default console can be tested or another console can be selected for testing by entering the data in the flashing fields and depressing **ENTER** or by using the **CHANGE FIELD** sequence:

- a. **(Carrier number); ENTER; (Slot number); ENTER; (Channel number); ENTER.**

- b. **CHANGE FIELD; 2; ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Channel number); ENTER.**

5. If no failures occurred (none displayed in Test 1 or 2), Field 2 is blanked and the decimal point in that field flashed to indicate a mandatory entry field.

6. An equipment location must be entered in Fields 2 through 4 before Test 3 can be executed, as follows:

(Carrier number); ENTER; (Slot number); ENTER; (Channel number); ENTER.

PROC 653, Test 3

7. Console selection can also be made by using **NEXT CIRCUIT** and/or **NEXT UNIT** when a default console is displayed.
 - a. **NEXT CIRCUIT** is used to sequence through all consoles in a carrier.
 - b. **NEXT UNIT** is used to sequence through all appropriately equipped carriers which contain consoles.
8. When **NEXT UNIT** is depressed to sequence to the next equipped carrier, the first applicable console in that carrier is automatically displayed.

NEXT CIRCUIT steps through the consoles within the selected carrier.
9. To start Test 3, depress **EXECUTE**.

A flashing digit displayed in Field 6 (failure code) indicates Test 3 is running.
10. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
11. When **STOP** is depressed, a 0 displayed in Field 7 indicates Test 3 passed.

Any other digit displayed in Field 7 indicates Test 3 failed.
12. When another console is to be tested, perform the following:
 - a. Halt Test 3 by depressing **STOP**.
 - b. Select the console to be tested by using the **CHANGE FIELD** sequence or **NEXT CIRCUIT**, **NEXT UNIT**, etc.
 - c. Depress **EXECUTE** to start Test 3.
13. After corrective action is taken, Test 3 must be repeated to clear any previously displayed failure code. After Test 3 indicates a 0, Test 2 must be performed to resolve the console alarm cause of the **OTHER FAILS** fault indicator.

Repair Guide

When an attendant console failure is indicated (**PROC 653** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Verify that the handsets or headsets are plugged into the attendant consoles.

Note: If the handsets or headsets are not plugged into the attendant consoles, the console **will** fail Test 2.

2. Execute Test 1 and record the failure history.
3. Execute Test 2 and record the failing console number (Field 5), the associated dual-speed data channel equipment location (Fields 2 through 4), and the remote status (Field 6) for each failing console.

If Test 2 passes and a console failure is suspected, perform Test 3 to check for intermittent failures. Refer to isolation and repair step **Intermittent Failures**.

4. If Test 2 fails, use Test 4 of **PROC 620** (unit type 44) to test the attendant interface circuit pack (SN233) associated with the failing console.

5. After passing Test 4 of **PROC 620** (taking appropriate corrective action as required), enter **PROC 653** and repeat Test 2.
6. If Test 2 passes, the console alarm cause is resolved and the **OTHER FAILS** fault indicator is turned off if no other alarmed causes exist.
7. If the same console fails Test 2 again, determine the remote status displayed in Field 6.
 - a. If the remote status equals 0 (local), perform isolation and repair step **Local Console Failures**.
 - b. If the remote status equals 1 (remote), perform isolation and repair step **Remote Console Failures**.

Local Console Failures:

1. Check the voltages on the console power supply circuit pack MW-4 in the attendant console indicated in Field 5.
2. If the voltages are correct, replace console circuit pack AEEL and repeat Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of console circuit pack AEEL.

Proceed to Step 4.

3. If the voltages are incorrect, replace console circuit pack MW-4 and repeat Test 2.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of console circuit pack MW-4.

Proceed to Step 4.

4. If the same console fails Test 2 again, replace the console indicated in Field 5 and repeat Test 2.
5. If the same console fails Test 2 again, perform **PROC 611**, Test 3 entering the equipment location displayed in Fields 2 through 4 to determine if an I/O failure exists.
6. After passing Test 3 of **PROC 611** (taking appropriate corrective action as required), enter **PROC 653** and repeat Test 2.

If Test 2 passes, the console alarm cause is resolved and the **OTHER FAILS** fault indicator is turned off if no other alarmed causes exist.

7. If the same console fails Test 2 again, check the wiring associated with the failing console and the attendant interface circuit.

Remote Console Failures:

No diagnostic testing of the interfaces to a remote console exist at this time.

The interfaces include the dual-speed data channel (TN403) and Optically Remoted Peripheral Interface (ORPI) at the 501CC common control end, fiber-optic cable between the Lightguide Cable Interconnection Terminals (LCIT) which interface with the ORPIs at both ends, an ORPI and console at the remote module with cabling, wiring, and power provided by the remote module to the remote ORPI and remote attendant consoles.

Fault Isolation for Remote Console Failures

1. Execute **PROC 611**, Test 3 for the data channel displayed in Fields 2 through 4 associated with the remote console.

If Test 3 of **PROC 611** passes, proceed to Step 4.

2. If Test 3 of **PROC 611** fails, take corrective action (as appropriate) and repeat Test 3 of **PROC 611**.

After Test 3 of **PROC 611** passes, repeat Test 2 of **PROC 653** for the remote console.

3. If Test 2 of **PROC 653** passes, corrective action is complete.

If Test 2 of **PROC 653** fails, proceed to Step 4.

4. Check the cable connections from TN403 to the ORPI (local end) at the 501CC common control carrier.

- a. If the cable connections are good, proceed to Step 6.

- b. If the cable connections are loose or unplugged, correct the trouble and repeat Test 2 of **PROC 653**.

5. If Test 2 of **PROC 653** passes, corrective action is complete.

If Test 2 of **PROC 653** fails, proceed to step 6.

6. Check the two LEDs on the ORPI (local end) connected to the TN403 dual speed data channel associated with the remote failing console.

- a. If both LEDs are off, proceed to step 8.

- b. If the Fiber Receive Failure (FRF) **RED** LED is lighted and the Fiber Transmit Failure (FTF) **RED** LED is off, the problem is either the remote ORPI or the fiber. Proceed to Step 8.

- c. If the FTF **RED** LED is lighted, or both the FRF and FTF LEDs are lighted, replace the local ORPI connected to the TN403 dual-speed data channel and repeat Test 2 of **PROC 653**.

7. If Test 2 of **PROC 653** passes, corrective action is complete.

If Test 2 of **PROC 653** fails, check the wiring between the ORPI and the dual-speed data channel.

8. At the remote module, check the cable connections.

- a. If the cable connections are good, proceed to Step 10.

- b. If the cable connections are loose or unplugged, correct the trouble and repeat Test 2 of **PROC 653**.

9. If Test 2 of **PROC 653** passes, corrective action is complete.

If Test 2 of **PROC 653** fails, proceed to step 10.

10. Check the two LEDs on the ORPI at the remote module associated with the remote failing console.

- a. If both LEDs are off, proceed to step 12.

- b. If the FTR **RED** LED is lighted and the FTF **RED** LED is not lighted (off), refer to AT&T Installation Service Manual 555-101-104, Part 15.4 entitled "Remote Console" for isolation of the fiber problem.
 - c. If the FTF **RED** LED is lighted, or both the FRF and FTF LEDs are lighted, replace the remote ORPI and repeat Test 2 of **PROC 653**.
- 11. If Test 2 of **PROC 653** passes, corrective action is complete.
If Test 2 of **PROC 653** fails, check the wiring between the remote ORPI and the remote console.
- 12. Replace the remote console with a known good console and repeat Test 2 of **PROC 653**.
If Test 2 of **PROC 653** passes, proceed to Step 16.
- 13. If Test 2 of **PROC 653** fails, replace the remote ORPI and repeat Test 2 of **PROC 653**.
If Test 2 of **PROC 653** passes, corrective action is complete.
- 14. If Test 2 of **PROC 653** fails, replace the local ORPI at the 501CC common control and repeat Test 2 of **PROC 653**.
- 15. If Test 2 of **PROC 653** passes, corrective action is complete.
If Test 2 of **PROC 653** fails, escalate the problem to higher level maintenance.
- 16. Replace the known good console with the bad console removed in Step 12, and proceed to Step 17.
- 17. Check the voltages on the console power supply circuit pack MW-4 in the bad console.
- 18. If the voltages are correct, replace console circuit pack AEEL and repeat Test 2 of **PROC 653**.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of console circuit pack AEEL.

Proceed to Step 20.

- 19. If the voltages are incorrect, replace console circuit pack MW-4 and repeat Test 2 of **PROC 653**.

Note: Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of console circuit pack MW-4.

Proceed to Step 20.

- 20. If Test 2 of **PROC 653** passes, corrective action is complete.
If Test 2 of **PROC 653** fails, reinstall the known good console and return the bad console for higher level maintenance.

Intermittent Failures:

- 1. If intermittent console failures or wiring problems are suspected, execute Test 3 to continuously test the suspect consoles.

2. When a failure is indicated, check the remote status displayed in Field 6.
 - a. Perform corrective action listed in isolation and repair step **Local Console Failures** for a remote status of 0 (local) displayed in Field 6, repeating Test 3 after performing each corrective action.
 - b. Perform corrective action listed in isolation and repair step **Remote Console Failures** for a remote status of 1 (remote) displayed in Field 6, repeating Test 3 after performing each corrective action.
3. If Test 3 passes after taking corrective action, repeat Test 2 to resolve the console alarm cause.

If Test 3 fails after taking all corrective action, check the wiring associated with the failing console and the attendant interface circuit for a local console failure. For a remote console failure, check the wiring between all interfaces; i.e., console, attendant interface circuit, dual-speed data channel, and both ORPIs. In addition, check the fibers linking the ORPI at both ends.

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TABLE BU.

PROC 654 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	8 (Contd)	2	No data reply (echo) from terminal.
2	1 13	Calling number display. 102D terminal. CAS/FADS display. 102F or 102G terminal.		3	Failures 1 and 2.
3	Any 2-, 3-, or 4-digit number	Directory number of the called station associated with the selected terminal type.		4	Bad reply from terminal - echo data nonzero, but no data transmitted.
				5	Failures 1 and 4.
4	0	Common control carrier.	9	0-7	Failure code from the last transmission to a terminal before the test was terminated. Updated in real time for Test 3 showing current latest failure while test is running. Refer to Field 8 for encode definitions.
5	23-26	Slot number.	10	0-99	Total number of failed channels.
6	0-15	Channel number.			
7	0-9	Digits sequence 0 through 9, test character, and dash are alternated with blanks. They will correspond to all digits displayed on the terminal.	11-13		Time stamp. A time stamp showing the day of the month, hour, and minute when the alarm cause occurred.
8	0 1	Failure code representing the ORed collection of all failures since test started. Pass. Data channel address not acknowledged.	11	1-31	Day of the month.
			12	0-23	Hour of the day.
			13	0-59	Minutes.

To call in **PROC 654**, perform the following:

1. Depress **PROC NO; 654; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1 and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - Displays failure history and time of each failure.
2. Test 2 - Tests each display terminal with a short data test.
3. Test 3 - Tests a specific display terminal continuously.

Test 1

Test 1 displays a failure history of display terminal failures. The failure history is generated by on-line maintenance software.

Test 1 can also be used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 654** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. The total number of display terminal failures is displayed as a summary.
4. If no failures occurred, a 0 is displayed in Field 10.
5. If one or more failures occurred, the following is displayed:
Field 1 - 1.
Field 10 - Total number of failed channels.
Fields 11 through 13 - Day, hour, and minute when the first failure occurred.
6. Depressing **NEXT CIRCUIT** displays the first failing display terminal in the failure history.

Note: Calling number display failures are displayed before FADS terminal failures.

7. The display includes the following:
Field 1 - 1.
Field 2 - Terminal type.
Field 3 - Extension number for terminal type 1 or unit number for terminal type 13.
Fields 4 through 6 - Dual-speed data channel equipment location associated with the failing display terminal.
Field 10 - Total number of failed channels.
Fields 11 through 13 - Time stamp (day, hour, and minute) when the failure occurred.

PROC 654, Test 1 and Test 2

8. After the first failing display terminal is displayed, depressing **NEXT CIRCUIT** repeatedly displays the failure history of the remaining failing display terminals.
9. Fields 2 through 6, and 11 through 13 are updated.

Note: All calling number display failures are displayed before FADS terminal failures. Display terminals with more errors recorded are displayed before display terminals with less errors recorded.

10. Depressing **NEXT CIRCUIT** after all failures are displayed dashes Fields 2 through 13. Depressing **NEXT CIRCUIT** again causes Test 1 to be executed, starting the sequence over with an updated failure summary.
11. To manually turn off the **OTHER FAILS** fault indicator, assuming no other alarmed sources affecting the **OTHER FAILS** fault indicator are active, after Test 1 is executed at least once, perform the following:

Depress **CLEAR DATA; EXECUTE**.

Note: Display terminal alarmed circuit entries in PMIDS are marked as resolved.

Test 2

Test 2 tests all display terminals to determine if any are failing.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 2; ENTER.

2. To start Test 2, depress **EXECUTE**.

The **WAIT** indicator on the **MAAP** turns on and Test 2 starts from the lowest display terminal.

Note: When Test 2 encounters a FADS (type 102F or 102G) display terminal during testing, the **IN USE** lamp on the **MAAP** can remain on for up to 2 minutes while waiting for the FADS display terminal to be released from its normal function for testing.

3. If no failures are detected, Test 2 stops, the **WAIT** indicator is turned off, and a 0 is displayed in Field 10.
4. If a failure is detected, Test 2 stops and the **WAIT** indicator turns off. The display terminal that failed is displayed as follows:

Field 1 - 2.

Field 2 - Terminal type.

Field 3 - Extension number or unit number.

Fields 4 through 6 - Equipment location of dual-speed data channel circuit associated with the failing display terminal.

Fields 8 and 9 - Once and last failure code associated with first failing display terminal.

Field 10 - Circuit count of 1.

Fields 11 through 13 - Dashed.

5. To resume testing, **NEXT CIRCUIT** is depressed.
Depressing **NEXT CIRCUIT**, after all failing display terminals are displayed, dashes all fields except Fields 1 and 10 (test number and total failed channels).
6. Depressing **NEXT CIRCUIT** again causes Test 2 to be executed from the beginning of the test.
7. The display terminal alarm cause is automatically resolved if all display terminals pass Test 2.

Note: Display terminal alarmed circuit entries in PMIDS are marked as resolved.

8. The **OTHER FAILS** fault indicator is turned off when the display terminal alarm cause, and all other alarm sources affecting the **OTHER FAILS** fault indicator are cleared.

Test 3

Test 3 is used to continuously test a specific display terminal which is suspected of, having intermittent failures or to trace wiring problems.

In addition, Test 3 is used to verify that all digits are displayed correctly at each display terminal position.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. A display terminal to be tested must be selected prior to execution of Test 3.
Display terminal selection can be made as indicated in Steps 3 through 7.
3. If no failures occurred (none displayed in Test 1 or 2), which indicates that a default display terminal does not exist, the lowest featured display terminal type is displayed first in Field 2.
4. If a failure occurred, a default display terminal is displayed.
 - a. The default display terminal is the last failed display terminal displayed by Test 1 or 2.
 - b. Either the default display terminal can be tested or another display terminal can be selected for testing using **NEXT UNIT** and/or **NEXT CIRCUIT**.
5. **NEXT CIRCUIT** is used to display the first display terminal of the lowest display terminal type. Either this display terminal can be tested or another display terminal can be selected for testing.
6. To select another display terminal to be tested, use **NEXT UNIT** and/or **NEXT CIRCUIT** to locate the display terminal to be tested.
7. Depress **NEXT UNIT** repeatedly until the desired terminal type is displayed in Field 2.
 - a. Depress **NEXT CIRCUIT** repeatedly to advance the display to the display terminal location to be tested.
 - b. Dashes are displayed after the last display terminal location in the last terminal type is displayed.

PROC 654, Test 3

8. Depressing **NEXT CIRCUIT** again displays the first display terminal equipment location in the lowest terminal type.
9. To start Test 3, depress **EXECUTE**.
10. The digit displayed in Field 7 of the **MAAP** corresponds with the digit displayed at the terminal being tested.

The changing display in Field 7 indicates the test is running.

11. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

This allows maintenance personnel time to observe the digits displayed at the display terminal being tested in order to determine if all digits are correct and to verify existence of intermittent failures.

12. The failure codes detected are recorded by Test 3 and displayed in Fields 8 and 9.
13. To select another display terminal to be tested, perform the following:
 - a. Halt Test 3 by depressing **STOP**.
 - b. Select the new display terminal to be tested using **NEXT UNIT** and/or **NEXT CIRCUIT**.
 - c. Depress **EXECUTE** to start Test 3.

Repair Guide

When a display terminal failure is indicated (**PROC 654** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), the following steps should be performed in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and record the failure history.
2. Execute Test 2 and record the results.

If Test 2 passes and a display terminal failure is suspected, perform Test 3 and check for intermittent failures. (Refer to Step 9.)

3. When failures are recorded, based on the results of Test 2, refer to Table BV, PROC 654 - Display Terminals Repair Procedure, and perform the corrective action indicated.
4. Repeat Test 2 after each corrective action is performed.

If Test 2 passes, the display terminal alarm cause is resolved and the **OTHER FAILS** fault indicator is turned off when all other alarmed sources (if any) affecting the **OTHER FAILS** fault indicator are cleared.

5. If the same display terminal fails Test 2 again, perform **PROC 611** Test 3, entering the equipment location displayed in Fields 4 through 6 to determine if an I/O failure exists.
6. After passing Test 3 of **PROC 611** (taking appropriate corrective action as required), enter **PROC 654** and repeat Test 2.

If Test 2 passes, the display terminal alarm cause is resolved and the **OTHER FAILS** fault indicator is turned off if no other alarm causes exist.

7. If the same display terminal fails Test 2 again, check the wiring associated with the cabling between the 211A power unit, 102D, 102F, or 102G terminal, and the switch.

8. Repeat Steps 3 through 7 for each failing display terminal.
9. If an intermittent failure or wiring problems are suspected, execute Test 3 to continuously test the suspect terminal.

When a failure is indicated, perform Steps 3 through 7 above.

10. If a 0 is displayed in Field 8, allow Test 3 to run and check the display on the terminal being tested.

If bad data is displayed on the terminal, perform the corrective action listed in Table BV, PROC 654 - Display Terminals Repair Procedure.

11. If Test 3 passes after taking corrective action, repeat Test 2 to resolve the display terminal alarm cause.

TABLE BV.

PROC 654 DISPLAY TERMINALS REPAIR PROCEDURE	
FAILURE CODE	CORRECTIVE ACTION
0 (Test 3 only)	Bad data displayed on 102D, 102F, or 102G terminal: Replace the 102D, 102F, or 102G terminal. Replace the 211A Power unit for the 102D, 102F, or 102G terminal.
1 through 7	Replace the 102D, 102F, or 102G terminal. Check the 211A Power Unit for the 102D, 102F, or 102G terminal. Perform PROC 611 Test 2 to isolate dual speed data channel failures.

PROC 655 - SMDR TEST

FLIPCHART ISSUE 1										STATION MESSAGE DETAIL RECORDER TEST										845552223																			
TEST 1: DISPLAYS FAILURE HISTORY. USE 'NEXT DATA' TO SELECT ANOTHER FAILURE CODE (FIELD 13). USE 'CLEAR DATA','EXECUTE' TO RETRIEVE ALARM.										TEST 3: SENDS AND ALTERNATING ONE-ZERO PATTERN CONTINUOUSLY. USE PROC 275 TO DISABLE SMDR SERVICE.					TEST 4: SENDS A 16 MESSAGE PATTERN TO THE SMDR.					TEST 5: SENDS 1 TEST WORD. USE 'NEXT DATA' TO SELECT FROM LIST OF 10 TEST WORDS OR ENTER A TEST WORD. USE PROC 275 TO DISABLE SMDR SERVICE.					FAILURE CODES (FIELDS 7,8): 0 = PASS 1 = DATA CHANNEL ADDRESS 2 = BAD REPLY PARITY 3 = 1&2 4 = ECHO MISMATCH 5 = 1&4					FAILURE CODES (FIELD 13): 0 = SUMMARY DIS. 1 = NO REPLY OR ECHO MISMATCH 8 = SMDR EQUIPMENT					SPECIAL ERROR CODE: 80 = 'EXECUTE' OPERATED WITH SMDR SERVICE ENABLED FOR TEST 3 OR TEST 5.				
										TEST 2: ECHO TEST. TO ISOLATE I/O FAILURES USE PROC 611.										USE 'NEXT DATA' TO CHANGE MESSAGE LENGTH ENCODE: 0 = 12 WORDS, 1 = 15 WORDS, 2 = 18 WORDS																			
TEST NO	TEST WORD (TEST 5)				DATA CHANNEL EQPT LOCATION				FAILURE CODE		ALARM CAUSE	TIME STAMP			FAILURE CODE	TSTS 3 & 4	COMMON CONTROL PERIPHERALS																						
	OP CODE	DATA			CARR	SLOT	CHANNEL	ONCE	LAST	DAY		HOUR	MINUTE	FAILURE CODE				MSG. LENGTH ENC. CODE																					
1	2				3	4	5	6	7	8	9	10	11	12	13	14	655																						

Purpose

PROC 655 is used when referenced from PROC 600 (alarm causes/error log) to verify and turn off the **OTHER FAILS** fault indicator resulting from a SMDR failure.

Tests 3 through 5 of this maintenance procedure **must** be performed on the customer's premises. Successful test completion for Tests 3 through 5 is determined by observing printouts from the SMDR equipment.

PROC 655 is used to:

- 1. Display SMDR equipment failures.
- 2. Run an echo test with the SMDR equipment.
- 3. Resolve the SMDR alarm cause when all circuits pass Test 4.

Note: Dual-speed data channels associated with SMDR equipment are tested in **PROC 611**.

Field Definitions and Codes

Each field of PROC 655 flipchart and the possible displays for the fields during execution of the different tests are defined in Table BW, PROC 655 - Field Definitions and Codes.

Optional input fields are:

- 1. Field 1 - Change test number.
- 2. Fields 2 and 3 - Select operation code and data of test word to be transmitted to the SMDR equipment (Test 5 only).

Operation of Procedure

Overview

PROC 655 is used to determine the cause of the **OTHER FAILS** fault indicator being lighted resulting from an SMDR failure.

TABLE BW.

PROC 655 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-5	Test number.	8	0-8	Failure code-last: Failure code indicating one or more failures occurring during the last transmission to the SMDR equipment before the test ended or was stopped.
2	0 3 4 10 14	Operation code (octal): Normal data word. No operation. Retransmit normal data word. Last word in message. Retransmit last word in message.	9	0 1	Alarm cause status: None. SMDR failure.
3	0000-7777	Data word (octal).	10-12		Time stamp: A time stamp showing the day of the month, hour, and minute when the alarm cause occurred.
4	0	Common control carrier.	10	0-31	Day of the month.
5	23-26	Slot number.	11	0-23	Hour of the day.
6	0-15	Channel number.	12	0-59	Minute.
7	0 1 2 3 4 5 6 7 8	Failure code-once: Accumulative "OR"ing of all failure codes that occurred at least once during a test. Pass. Data channel address not acknowledged. No data reply (echo) from SMDR equipment. Failures 1 and 2. Echo mismatch. Failures 1 and 4. Failures 2 and 4. Failures 1, 2, and 4. SMDR equipment failure (reported by SMDR after 16-message buffer filled).	13	0 1 8	Failure codes: Logged in failure history table displayed in Test 1 only. Failure summary display. No reply or echo mismatch. SMDR equipment failure.
			14	0 1 2	Message length encode: Number of data words used in a call record. 12-word message. 15-word message. 18-word message.

PROC 655, Test 1

To call in **PROC 655**, perform the following:

1. Depress **PROC NO; 655; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Fields 4 through 6 display the data channel equipment location associated with the SMDR equipment, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Five tests are available:

1. Test 1 - Displays failure history.
2. Test 2 - Runs an echo test on the SMDR equipment.
3. Test 3 - Sends an alternating one-zero pattern continuously to the SMDR equipment.
4. Test 4 - Sends a 16-message pattern to the SMDR equipment, testing most digits in each digit's position.
5. Test 5 - Sends a single data word to the SMDR equipment allowing manual entry of operation codes and data words.

Test 1

Test 1 provides a failure history of the SMDR equipment.

Test 1 is also used to manually turn off the **OTHER FAILS** fault indicator.

1. Test 1 is the default test when entering **PROC 655** or is selected by using **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 1; ENTER.

2. To start Test 1, depress **EXECUTE**.
3. A summary of the failure history is displayed.
4. If no failures occurred, a 0 is displayed in Fields 9 and 13.
5. If one or more failures occurred, the summary displays a 1 in Field 1, the SMDR alarm cause in Field 9, a 1 or 8 in Field 13 (failure code), and dashes in all other fields.
6. Depressing **NEXT DATA** displays the first failing equipment location and associated failure code. The following information is displayed:

Field 1 - 1.

Fields 4 through 6 - Data channel equipment location associated with the SMDR equipment.

Field 9 - SMDR alarm cause.

Fields 10 through 12 - Time stamp (day, hour, and minute) when the failure code displayed in Field 13 occurred.

Field 13 - Failure code (1 or 8).

7. Depressing **NEXT DATA** repeatedly displays all failure codes (Field 13) associated with individual failures recorded in the failure history.

- a. Depressing **NEXT DATA** after all failures are displayed dashes Fields 9 through 13.
 - b. Depressing **NEXT DATA** again executes Test 1 and an updated failure summary is displayed.
8. To manually turn off the **OTHER FAILS** fault indicator (assuming no other alarm sources affecting the **OTHER FAILS** fault indicator are active), after Test 1 is executed at least once, perform the following:
- Depress **CLEAR DATA; EXECUTE**.
9. Field 9 (alarm status) displays a 0.

Note: SMDR alarmed entries in PMIDS are marked as resolved.

Test 2

Test 2 runs an echo test with the SMDR equipment.

Test 2 does not interfere with call processing recording of calls.

An alternating one-zero pattern is used for the first echo test. A complementing one-zero pattern is used for the second echo test.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. To start Test 2, depress **EXECUTE**.
3. If no failures are detected, Fields 7 and 8 display a 0.
4. If any failures are detected, the following is displayed:
Field 1 - 2.
Fields 4 through 6 - Data channel equipment location associated with the SMDR equipment.
Fields 7 and 8 - Failure codes (1 through 8).

Test 3

Test 3 sends a continuous alternating one-zero pattern in the format of a call record message to the SMDR equipment.

When Test 3 is performed, maintenance personnel **must** be on the customer's premises to operate SMDR equipment and to determine if the test is successful by observing the SMDR printout.

Caution: *Test 3 prevents normal call processing from recording call data using the SMDR equipment. SMDR equipment must be disabled using PROC 275, Word 1 before Test 3 is executed. After Test 3 is completed, SMDR service should be restored using PROC 275, Word 1.*

1. Change Field 12 of **PROC 275, Word 1** from 1 to 0 to disable SMDR service.

Note: Prior to using Test 3, the customer's tape should be unloaded (with customer's permission) and a spare tape loaded.

2. Enter **PROC 655** and select Test 3 by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 3; ENTER.

3. Upon entry to Test 3, the call record message length to be transmitted to the SMDR equipment is 12 words (indicated by a 0 in Field 14).
4. **NEXT DATA** is used to change the call record message length to be transmitted depending upon the type of SMDR equipment being tested.
 - a. A 1 in Field 14 indicates a 15 word message length; a 2 in Field 14 indicates a 18 word message length.
 - b. Depressing **NEXT DATA** repeatedly cycles Field 14 to 1, 2, and back to 0, etc.
5. To start Test 3, depress **EXECUTE**.

Note: Special error code 80 is displayed in the **MAAP** error code field if **EXECUTE** is depressed with the SMDR service enabled.

6. During execution of Test 3, the following fields are displayed:

Field 1 - 3.

Fields 2 and 3 - Operation code and data word currently being transmitted to the SMDR equipment.

Fields 4 through 6 - Data channel equipment location associated with the SMDR equipment.

Fields 7 and 8 - Once and last failure codes.

Field 14 - Message length encode.

7. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.

The one-zero pattern data word is complemented each time it is transmitted with 0.5 seconds between words.

Between the last word transmitted (normally word 12) and the start of the next message is a 2-second delay to allow stopping Test 3.

8. Successful test completion results in a 0 displayed in Fields 7 and 8, and a printout similar to that shown in Figure 15.

```
00:23 : .5 E 5 55 5 5-55 5-55 555 55
00:23 : .5 E 5 55 5 5-55 5-55 555 55
```

Figure 15. Sample Printout Generated From Test 3 (12-Word Format)

9. The printout shown was generated by the printer direct output option.
10. After Test 3 is successfully completed, the customer's tape should be loaded and SMDR service enabled.

To enable SMDR service, change Field 12 of **PROC 275, Word 1** from 0 to 1.

Test 4

Test 4 sends 16 messages in either 12, 15, or 18 word message formats to the SMDR equipment.

Test 4 is used to load memory in the SMDR equipment with a 16-message block. A 31-message block can be written on magnetic tape by executing Test 4 twice.

Four of the SMDR operation codes are exercised by Test 4; i.e., normal word transmission, last word of message transmission, retransmit normal word, and retransmit last word.

When Test 4 is performed, maintenance personnel **must** be on the customer's premises to operate SMDR equipment and to determine if the test is successful by observing the SMDR printouts.

1. Enter **PROC 655** if SMDR service was enabled in Test 3 or 5 of **PROC 655**.
2. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 4; ENTER.
3. Upon entry to Test 4, the call record message length to be transmitted to the SMDR equipment is 12 words (indicated by a 0 in Field 14).
4. **NEXT DATA** is used to change the call record message length to be transmitted depending upon the type of SMDR equipment being tested.
 - a. A 1 in Field 14 indicates a 15 word message length; a 2 in Field 14 indicates a 18 word message length.
 - b. Depressing **NEXT DATA** repeatedly cycles Field 14 to 1, 2, and back to 0, etc.
5. To start Test 4, depress **EXECUTE**.
6. If no failures are detected, Fields 7 and 8 display a 0. The printouts should be checked to ensure that the SMDR equipment is operating properly.
7. If any failures are detected, the following is displayed:
Field 1 - 4.
Fields 4 through 6 - Data channel equipment location associated with the SMDR equipment.
Fields 7 and 8 - Once and last failure codes.
Field 14 - Message length encode.
8. When using direct output SMDR equipment, successful completion of Test 4 results in a printout similar to that shown in Figure 16.
9. When using the 9-track magnetic tape SMDR equipment (12 or 15 word messages) only the numerical characters of the messages can be displayed as shown in Figure 17.
10. Hexadecimal dumps for Test 4 are shown in Figure 18 and Figure 19.

11. When Test 4 is successfully completed, the SMDR alarm cause is resolved and the **OTHER FAILS** fault indicator is turned off when all other alarm sources (if any) affecting the **OTHER FAILS** fault indicator are cleared.

Note: SMDR alarmed entries in PMIDS are marked as resolved.

12. The **MAJOR** and/or **MINOR** alarms are also turned off by Test 4 when all other major and/or minor alarm sources are cleared.

The 16 messages of Figure 16 completely fill and test the direct output SMDR memory buffer, testing each digit in each digit's position.

CORRECT TIME WILL BE PRINTED		EXTENSION		NUMBER		RETRANSMITTED NORMAL WORD	
07:25	0:12.3 D 567 89	<=>? -012-345-6789	1111	>?012			
07:25	1:23.4 E 678 9	<=>?0-123-456-789	2222	55523	←		
07:25	2:34.5 F 789	<=>?01-234-567-89	3333	01299	←		
07:25	3:45.6 G 89	<=>?012-345-678-9	4444	12345			
07:25	4:56.7 H 9	<=> ?0123-456-789- <=	5555	23456			
07:25	5:67.8 I	<=>? 01234-567-89 <=>	6666	34567			
07:25	6:78.9	<=>?0 12345-678-9 <=>?	7777	45678			
07:25	7:89.	<=> ?01 23456-789- <=>?0	8888	56789			
07:25	8:9 . L =>? 012 34567-89 <=->?01	9999	6789				
07:25	9: .< M >?0 123 45678-9 <=>-?012	1000	789				
07:25	:<.= N ?01 234 56789- <=>-?0123	011	89 <				
07:25	:<=.> 0 012 345 6789 <=>-?0-1234	012	9 <=				
07:25	<:=>.? @ 123 456 789 <=>-?01-2345	013	<=>				
07:25	=:>?0 A 234 567 89 <=>-?012-3456	014	<=>?				
07:25	>:?0.1 B 345 678 9 <=>-?0-123-4567	015	<=>?0				
07:25	?:01.2 C 456 789 <=>-?01-234-5678	016	=>?01				

RETRANSMITTED
END OF MESSAGE

NOTE

When call records are displayed on either the Type I or Type II displays, non-numeric characters, colons, and dashes are omitted and numeric digits are displayed in the "condition code" field.

Figure 16. 16-Message Test - Sample Printout From Test 4

When using the 9-track magnetic tape SMDR equipment, Test 4 should be executed four times to fill the two 9-track SMDR 31-message memory buffers.

1. Executing Test 4 four times allows displaying an individual call record from each magnetic tape SMDR memory buffer as each 31-message block is written on magnetic tape.
2. By specifying the **EXTENSION NUMBER**, with the thumb wheel switch on the 9-track magnetic tape control panel, a specific call record message from Figure 17 is displayed on the 9-track control panel.

TIME	DURATION	COND* CODE	CODE DIALED	CODE USED	DIALED NUMBER	STATION OR ORIG TRUNK	ACCOUNT NUMBER
07:23	0:12.3	4	567	89	-012-345-6789	1111	012
07:23	1:23.4	5	678	9	0-123-456-789	2222	<u>555</u> 23
07:23	2:34.5	6	789		01-234-567-89	3333	012 <u>99</u>
07:23	2:34.5	6	789		012-345-678-9	4444	12345
07:23	4:56.7	8	9		0123-456-789-	5555	23456
07:23	5:67.8	9			01234-567-89	6666	34567
07:23	6:78.9		0		12345-678-9	7777	45678
07:23	7:89.		01		23456-789- 0	8888	56789
07:23	8:9		012		34567-89 01	9999	6789

12-WORD MESSAGE FORMAT - TYPE I CONTROL PANEL DISPLAY

TIME	DURATION	COND CODE	CODE DIALED	CODE USED	DIALED NUMBER	STATION OR ORIG TRUNK	ACCOUNT NUMBER	AUTH CODE	TQ	FAC RSTCN LEV
00:26	0:12.3	4	567	89	-012-345-6789	1111	012	3456789		
00:26	1:23.4	5	678	9	0-123-456-789	2222	0123	4567 <u>555</u>		
00:26	2:34.5	6	789		01-234-567-89	3333	01234	56789 <u>99</u> <u>9</u>		
00:26	3:45.6	7	89		012-345-678-9	4444	12345	6789		
00:26	4:56.7	8	9		0123-456-789-	5555	23456	789		0
00:26	5:67:8	9			01234-567-89	6666	34567	89		0 1
00:26	6:78.9		0		12345-678-9	7777	45678	9		01 2
00:26	7:89.		01		23456-789- 0	8888	56789	0		12 3
00:26	8:9.		012		34567-89. 01	9999	6789	01		23 4

15-WORD MESSAGE FORMAT - TYPE II CONTROL PANEL DISPLAY

Figure 17. Displayable Characters on 9-Track SMDR Equipment (Note: Correct Time Is Displayed) From Test 4

When running Test 4 using the 9-track magnetic tape SMDR equipment, both the tape drive units' **ON-LINE** button and the 9-track control panels' **ON-LINE** button should be depressed.

PROC 655, Test 4 and Test 5

1. The mode **EXTENSION NUMBER/AUTO** switch should be set in the **EXTENSION NUMBER** mode, and the thumb wheel switch selected to the desired station or extension number to display a specific extension number call record.
2. Depressing **CLEAR DISPLAY** clears the control panel display prior to displaying a new call record.
3. Depressing **DUMP MEMORY** causes the data contained in the **ON-LINE** memory buffer to be written on tape.

Depressing **DUMP MEMORY** repeatedly causes the data from alternate **ON-LINE** memory to be written on tape.

Test 5

Test 5 sends a single data word to the SMDR equipment and is normally used in repair of SMDR equipment. Test 5 allows sending most words or messages to the SMDR by manually entering it into Fields 2 and 3.

	1	2	3	4	5	6	7	8	9	10	11	12	Word Number
	**** FILE 0001 RECORD 00005 LENGTH = 001024												4555 is Retransmitted
1	141720	122355	067829	AB0CDE	0F0122	342567	089101	1112EF	08123				Middle Word
2	141701	230456	27890A	BC2DEF	201203	450678	29A222	224555	A234				E999 is Retransmitted
3	141702	340557	289A0B	CD2EF0	212304	560789	2AB323	330012	E999				Last Word
4	141723	452658	09AB2C	DE0F01	202345	67289A	0BC404	444212	38456				
5	141704	560759	2ABC0D	EF2012	234506	7809AB	2CD525	550234	A567				
6	141725	67285A	0BCD2E	F00123	045627	892ABC	0DE606	662345	8678				
7	141726	78295B	0CDE2F	010234	056728	9A2BCD	0EF707	772456	8789				
8	141707	890A5C	2DEF00	122345	067809	AB0CDE	2F0828	880567	A89A				
9	141708	9A0B5D	2EF001	232456	27890A	BC0DEF	201929	990678	A9AB				
10	141729	AB2C5E	0F0122	340567	089A2B	CD2EF0	012A0A	AAA278	98ABC				
11	14172A	BC2D05	F00122	345067	809AB2	CDE2F0	1023B0	BBB289	A8BCD				
12	14170B	CD0E50	212304	562789	2ABC0D	EF0012	234C2C	CC09AB	ACDE				
13	14172C	DE2F51	023425	67089A	0BCD2E	F02123	045D0D	DD2ABC	8DEF				
14	14170D	EF0052	234506	7829AB	2CDE0F	010234	256E2E	EEE0BC	DAEF0				
15	14170E	F00153	245607	892ABC	2DEF00	120345	267E2F	FFF0CD	EAF01				
16	14172F	012254	056728	9A0BCD	0EF021	232456	078000	002DEF	8012				

Normal Word Op Code Condition Code Calling Station

Figure 18. Hexadecimal Dump for Test 4 Test Call (12-Word Format)

When Test 5 is performed, maintenance personnel **must** be on the customer's premises to operate SMDR equipment and to determine if Test 5 is successful by observing the SMDR printout.

Caution: Test 5 prevents normal call processing from recording call data using the SMDR equipment. SMDR equipment must be disabled using PROC 275, Word 1 before Test 5 is executed. After Test 5 is completed, SMDR service should be restored using PROC 275, Word 1.

1. Change Field 12 of **PROC 275, Word 1** from 1 to 0 to disable SMDR service.

Note: Prior to using Test 5, the customer's tape should be unloaded (with customer's permission) and a spare tape loaded.

2. Enter **PROC 655** and select Test 5 by use of **NEXT TEST** or the **CHANGE FIELD** sequence:

CHANGE FIELD; 1; ENTER; 5; ENTER.

3. When Test 5 is called in, a default test word (operation code and data word) is displayed in Fields 2 and 3.

To test the default test word, proceed to Step 7.

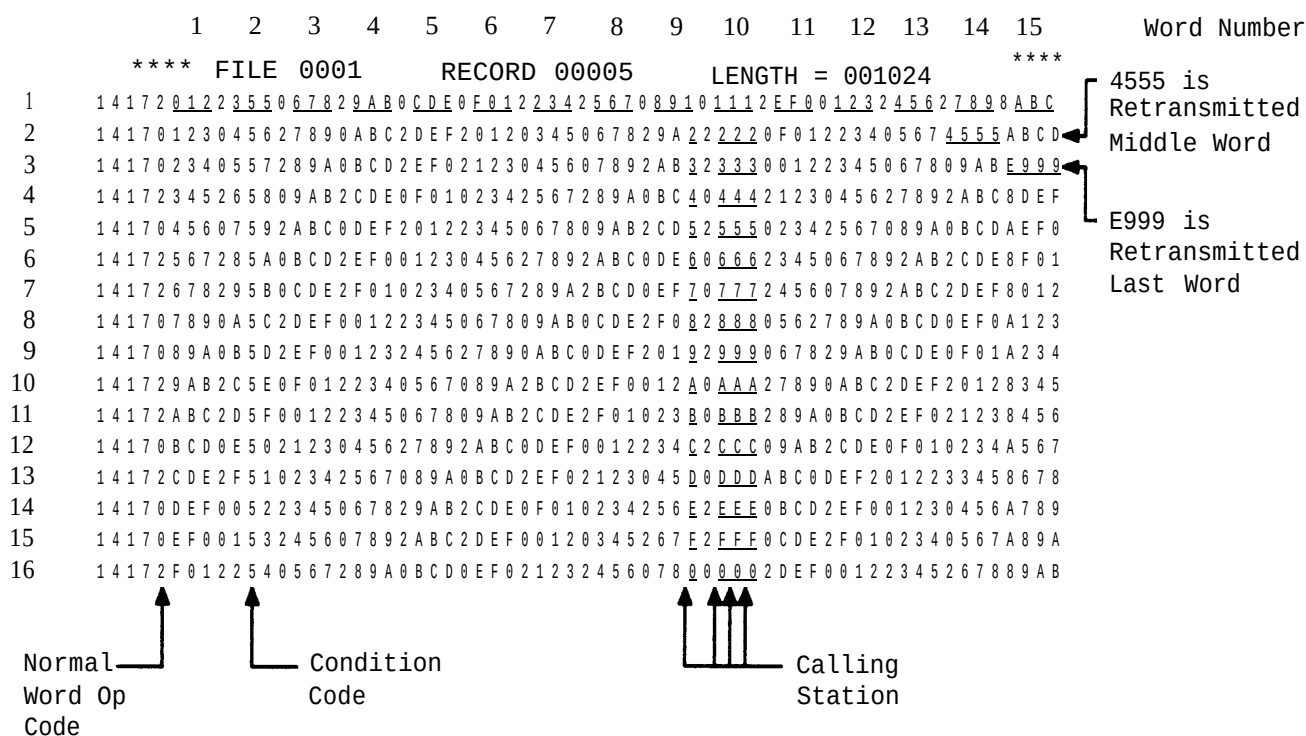


Figure 19. Hexadecimal Dump for Test 4 Test Call (15-Word Format)

PROC 655, Test 5

- Field 2 is blinking indicating an optional entry field. To select an operation code and data word different than the default test word, enter the following:

(Operation code); ENTER; (Data word); ENTER.

Proceed to Step 7.

- Operation codes and data words can also be selected for testing by using the **CHANGE FIELD** sequence:

CHANGE FIELD; 2; ENTER; (Operation code); ENTER; (Data word); ENTER.

Proceed to Step 7.

- In addition, operation codes and data words can also be selected for testing by use of **NEXT DATA**.
 - Depressing **NEXT DATA** selects the next of ten operation codes and data words that are available to be transmitted. (Refer to Figure 20.)
 - When the operation code and data word to be used is displayed in Fields 2 and 3 by depressing **NEXT DATA**, proceed to Step 7.

Field 2	Field 3
OP Code	Data
3.2525	- No operation op code with 01 pattern
3.5252	- No operation op code with 10 pattern
14.2525	- Retransmission, end of message with 01 pattern
14.5252	- Retransmission, end of message with 10 pattern
4.2525	- Retransmission with 01 pattern
4.5252	- Retransmission with 10 pattern
10.2525	- End of message op code with 01 pattern
10.5252	- End of message op code with 10 pattern
0.2525	- Normal data word op code with 01 pattern
0.5252	- Normal data word op code with 10 pattern

Figure 20. List of Operation Codes and Data Words Available Using the NEXT DATA Key in Test 5

- To start Test 5, depress **EXECUTE**.

Note: Special error code 80 is displayed in the **MAAP** error code field if **EXECUTE** is depressed with the SMDR service enabled.

- During execution of Test 5, the following is displayed:

Field 1 - 5.

Fields 2 and 3 - Operation code and data word currently being transmitted to the SMDR equipment.

Fields 4 through 6 - Data channel equipment location associated with the SMDR equipment.

Fields 7 and 8 - Once and last failure codes.

9. Each time **EXECUTE** is depressed, the operation code and data word displayed in Fields 2 and 3 are transmitted to the SMDR equipment.

NEXT DATA is used to select a different operation code and data word to be transmitted prior to depressing **EXECUTE**.

10. Successful test completion results in a 0 displayed in Fields 7 and 8 and a printout similar to that shown in Figure 21.

```
00:23 : .5 E 5 55 5 5-55 5-55 555 55
00:23 : .5 E 5 55 5 5-55 5-55 555 55
```

Figure 21. Sample Printout From Test 5, Using 11 Normal Data Word Operation Codes Followed by an End-of-Message Operation Code. The Data Word is an Alternating Ones-Zeros Pattern.

11. After Test 5 is successfully completed, the customer's tape should be loaded and SMDR service enabled.

To enable SMDR service, change Field 12 of **PROC 275, Word 1** from 0 to 1.

Repair Guide

Overview

When a SMDR failure is indicated (**PROC 655** referenced from **PROC 600** as the cause for the **OTHER FAILS** fault indicator being lighted), perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1, step through the failure history, and record the results.
2. Execute Test 2 and record the results.
3. Execute Test 4 for the direct output SMDR version or the 9-track magnetic tape SMDR version.

When the 9-track magnetic tape SMDR version is being tested, dump the memory so that when Test 4 is executed twice, the 16-message test completely fills one memory buffer and the corresponding tape record.

4. Execute Test 4 (twice for a 31-message tape buffer), record the failures, and compare several of the messages with Figures 16 and 17.

Repeat Test 4 for the alternate memory buffer for 9-track SMDR testing.

5. Based on the results of Tests 2 and 4, perform the corrective action indicated (in the order listed) in isolation and repair steps.

- a. **Repair procedure for direct output SMDR.**
 - b. **Repair procedure for 9-track SMDR.**
6. Test 3 can be used to determine if failures are intermittent or to use the logic probe at test points on the SMDR equipment to trace wiring problems.
 7. Test 5 can be used to transmit a single data word repeatedly (by depressing **EXECUTE** repeatedly) and to change the single data word transmitted to help isolate failures in the SMDR equipment.
 8. When I/O failures are suspected between the dual-speed data channel and the SMDR equipment, perform **PROC 611**, Test 3 entering the equipment location displayed in Fields 4 through 6.

Repair Procedure for Direct Output SMDR

Use the following steps to repair a printer or paper tape punch SMDR.

1. Perform the corrective action listed for the failure code recorded as a result of Test 2 and the type of message error or incorrect operation as a result of Test 4 (if appropriate).
2. Execute Test 3 for each corrective action taken until the final repair is made.
3. Verify correct operation of the SMDR equipment using Test 4.
4. Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of common control circuit packs.
5. Refer to SMDR COMPONENT REPLACEMENT for steps on:
 - a. Replacement of SMDR carrier circuit packs.
 - b. Replacement of SMDR clock/calendar display.

Failure code 0 - Time or date is incorrectly displayed:

At the SMDR carrier:

1. Replace LC66 (time).
2. Replace LC67 (date).
3. Check the wiring associated with the replaced circuit packs.
4. Replace the SMDR clock assembly.

Failure code 0 - No printout message:

1. Determine if HP-H05-10525T logic probe is provided or available:

If the logic probe is available, connect it to the SMDR carrier and proceed to Step 2.

If the logic probe is not available, proceed to Step 6.
2. At the SMDR carrier, insert the logic probe into test point **TP8** of LC63 or LC374 circuit pack for at least 5 seconds.

3. Execute Test 4.
 If the logic probe is not flashing, proceed to Step 4.
 If the logic probe is flashing, proceed to Step 5.
4. At the SMDR carrier, insert the logic probe into test point **TP1** of circuit pack LC62.
 If the logic probe is not flashing, replace LC62 at the SMDR carrier.
 If the logic probe is flashing, replace LC63 or LC374 at the SMDR carrier.
5. If the logic probe is flashing and no characters are being sent to the printer:
 If the date is not printed, replace LC65 at the SMDR carrier.
 If the date is printed, replace LC64 at the SMDR carrier.
6. When no logic probe is available, perform Steps 7 through 9 as appropriate.
7. At the SMDR carrier, replace LC62.
 At the SMDR carrier, replace LC63 or LC374.
8. Execute Test 4.
9. If no characters are being sent to the printer:
 If the date is not printed, replace LC65 at the SMDR carrier.
 If the date is printed, replace LC64 at the SMDR carrier.

Failure Code 0 - Invalid printout message:

At the SMDR carrier:

1. Replace LC63 or LC374.
2. Replace LC39.
3. Replace LC64.

Failure code 1, 3, 5, 7, or 8:

1. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
2. At the SMDR carrier, replace LC62.
3. Check the wiring associated with the replaced circuit packs.

Failure code 2:

1. Verify TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6 is set for high speed data.
2. At the SMDR carrier, replace LC62.

3. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
4. Check the wiring associated with the replaced circuit packs.

Failure code 4:

1. At the SMDR carrier, replace LC62.
2. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
3. Check the wiring associated with the replaced circuit packs.

Failure code 6:

1. At the SMDR carrier, check for a blown fuse.
2. At the SMDR carrier, replace LC62.
3. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
4. Check the wiring associated with the replaced circuit packs.

Repair Procedure for 9-Track SMDR

Use the following steps to repair magnetic tape SMDR equipment.

1. Perform the corrective action listed for the failure code recorded as a result of Test 2 and the type of message error or incorrect operation as a result of Test 4 (if appropriate).
2. Execute Test 2 and/or Test 4 for each corrective action taken until the final repair is made.
3. Verify correct operation of the SMDR equipment using Test 4.
4. Refer to SWITCH COMPONENT REPLACEMENT for steps on replacement of common control circuit packs.
5. Refer to SMDR COMPONENT REPLACEMENT for steps on:
 - a. Replacement of SMDR carrier circuit packs.
 - b. Replacement of SMDR formatter circuit packs.
 - c. Replacement of SMDR tape drive circuit packs.
 - d. Photosensors adjustment.
 - e. Tape speed and ramp time adjustments.
 - f. Capstan servo zero and tension arm travel adjustments.
 - g. Replacement of SMDR clock/calendar display.
 - h. Replacement of SMDR formatter.
 - i. Replacement of SMDR tape drive.

Failure code 0 - Time and/or date failure:

At the SMDR carrier:

1. Replace LC66 (time).
2. Replace LC67 (date).
3. Check the wiring associated with the replaced circuit packs.
4. Replace the SMDR clock assembly.

Failure code 0 - Data not recorded on tape:

1. Determine if HP-H05-10525T logic probe is provided or available:
 If the logic probe is available, connect it to the SMDR carrier and proceed to Step 2.
 If the logic probe is not available, proceed to Step 13.
2. Load a spare 9-track tape. Ensure the write-enable ring is installed on the tape and verify the tape is threaded correctly.
3. Connect the logic probe to test point **TP1** on the LC178 and execute Test 4 twice.
4. Determine the status of the logic probe.
 If the logic probe is not flashing, proceed to Step 5.
 If the logic probe is flashing, proceed to Step 6.
5. If the logic probe did not flash, perform the following at the SMDR carrier:
 - a. Check for a blown fuse.
 - b. Replace LC177.
 - c. Replace LC68.
 - d. Replace LC175.
 - e. Replace LC178.
 - f. Replace LC63 or LC374.
 - g. Replace LC40.
 - h. Check the wiring associated with the replaced circuit packs.
6. If the logic probe flashed, perform Steps 7 through 12 as appropriate.
7. At the SMDR carrier:
 - a. Replace LC175.
 - b. Replace LC176.
 - c. Replace LC177.
8. At the SMDR formatter:
 - a. Replace board 4062.
 - b. Replace board 4257.

9. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
 - c. Replace board 4207.
 - d. Replace board 4188.
 - e. Replace board 4209.
 - f. Replace board 3844 and adjust the photosensors.
10. Check the cabling between the formatter, tape drive, and SMDR carrier, and the wiring associated with the replaced SMDR circuit packs.
11. Replace the SMDR formatter.
12. Replace the SMDR tape drive.
13. When no logic probe is available, perform Steps 14 through 19 as appropriate.
14. At the SMDR carrier:
 - a. Check for a blown fuse.
 - b. Replace LC177.
 - c. Replace LC68.
 - d. Replace LC175.
 - e. Replace LC178.
 - f. Replace LC63 or LC374.
 - g. Replace LC40.
 - h. Replace LC176.
15. At the SMDR formatter:
 - a. Replace board 4062.
 - b. Replace board 4257.
16. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
 - c. Replace board 4207.
 - d. Replace board 4188.
 - e. Replace board 4209.
 - f. Replace board 3844 and adjust the photosensors.
17. Check the cabling between the formatter, tape drive, and SMDR carrier, and the wiring associated with the replaced SMDR circuit packs.
18. Replace the SMDR formatter.
19. Replace the SMDR tape drive.

Failure code 0 - Data not displayed at system control panel:

1. Determine if HP-H05-10525T logic probe is provided or available:
If the logic probe is available, connect it to the SMDR carrier and proceed to Step 2.
If the logic probe is not available, proceed to Step 17.
2. Ensure the write-enable ring is on the tape.
3. Connect the logic probe to test point **TP1** on the LC178 circuit pack.
4. Execute Test 4 twice.
5. Determine the status of the logic probe.
If the logic probe is not flashing, proceed to Step 6.
If the logic probe is flashing, proceed to Step 10.
6. If the logic probe did not flash, perform Steps 7 through 9 as appropriate.
7. At the SMDR carrier:
 - a. Check for a blown fuse.
 - b. Check output voltages on the 207B power supply.
8. At the SMDR carrier, replace the first circuit pack listed below. If the logic probe still does not flash, replace the next circuit pack and retest; etc.
 - a. LC177.
 - b. LC68.
 - c. LC175.
 - d. LC178.
 - e. LC63 or LC374.
 - f. LC40
9. Check the wiring associated with the replaced circuit packs.
10. If the logic probe flashed, perform Steps 11 through 16 as appropriate.
11. At the SMDR carrier:
 - a. Replace LC175.
 - b. Replace LC176.
 - c. Replace LC177.
12. At the SMDR formatter:
 - a. Replace board 4062.
 - b. Replace board 4257.
13. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
 - c. Replace board 4207.

- d. Replace board 4188.
 - e. Replace board 4209.
 - f. Replace board 3844 and adjust the photosensors.
14. Check the cabling between the formatter, tape drive, and SMDR carrier, and the wiring associated with the replaced SMDR circuit packs.
 15. Replace the SMDR formatter.
 16. Replace the SMDR tape drive.
 17. When no logic probe is available, perform Steps 18 through 23 as appropriate.
 18. At the SMDR carrier:
 - a. Check for a blown fuse.
 - b. Replace LC177.
 - c. Replace LC68.
 - d. Replace LC175.
 - e. Replace LC178.
 - f. Replace LC63 or LC374.
 - g. Replace LC40.
 - h. Replace LC176.
 19. At the SMDR formatter:
 - a. Replace board 4062.
 - b. Replace board 4257.
 20. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
 - c. Replace board 4207.
 - d. Replace board 4188.
 - e. Replace board 4209.
 - f. Replace board 3844 and adjust the photosensors.
 21. Check the cabling between the formatter, tape drive, and SMDR carrier, and the wiring associated with the replaced SMDR circuit packs.
 22. Replace the SMDR formatter.
 23. Replace the SMDR tape drive.

Failure code 0 - Incorrect data display at system control panel:

1. At the SMDR carrier:
 - a. Replace LC68.

- b. Replace LC63 or LC374.
 - c. Replace LC175.
 - d. Replace LC176.
 - e. Replace LC177.
 - f. Replace LC178.
2. Check for trouble in the System 85 software.

Failure code 0 - Tape fails to load:

1. Ensure the write-enable ring is installed.
The write-enable lamp lights if installed.
2. If the tape does not advance to the load point, perform Steps 3 through 8 (as appropriate) at the tape drive.
3. Adjust the photosensors on board 3844.
4. Replace board 3844.
5. Replace board 4843.
6. Replace board 3645 and adjust the tape speed and ramp time.
7. Replace board 4306 and adjust the capstan servo zero and tension arm travel.
8. Replace the SMDR tape drive.
9. If the tape does not stop at the load point, perform Steps 10 through 15 as appropriate.
10. Adjust the photosensors on board 3844 at the tape drive.
11. Replace board 3844 and adjust the photosensors at the tape drive.
12. Replace board 4062 at the formatter.
13. Check the cabling between the tape drive and formatter.
14. Replace the SMDR formatter.
15. Replace the SMDR tape drive.
16. If the **ON LINE** lamp on the tape drive does not light, refer to **Failure code 0 - ON LINE lamp does not light at the tape drive.**

Failure code 0 - Tape fails to rewind:

1. Verify that the tape is threaded correctly.
2. Adjust the photosensors on board 3844 at the tape drive.
3. If the tape fails to rewind completely onto the supply reel, perform Steps 4 and 5 as appropriate.
4. Replace board 4843 at the tape drive.
Replace board 3645 at the tape drive and adjust the tape speed and ramp time.

5. Replace the SMDR tape drive.
6. If the tape fails to rewind to the load point, perform Steps 7 through 13 as appropriate.
7. At the SMDR carrier, replace LC177.
If the **UNLOAD** lamp on LC177 does not light when the **TAPE UNLOAD** button is depressed, check the wiring between LC177 and the **TAPE UNLOAD** button.
8. At the SMDR carrier, replace LC175.
9. At the SMDR formatter, replace board 4062.
10. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
 - c. Replace board 3645 and adjust the tape speed and ramp time.
 - d. Replace board 4306 and adjust the capstan servo zero and tension arm travel.
11. Check the wiring associated with the replaced circuit packs and the cabling between the SMDR carrier, formatter, and tape drive.
12. Replace the SMDR formatter.
13. Replace the SMDR tape drive.

Failure code 0 - Tape fails to move when DUMP MEMORY button is depressed:

1. Determine if HP-H05-10525T logic probe is provided or available:
If the logic probe is available, connect it to the SMDR carrier and proceed to Step 2.
If the logic probe is not available, proceed to Step 17.
2. Connect the logic probe to test point **TP10** on the LC177 circuit pack and observe the logic probe when **DUMP MEMORY** is depressed.
3. Depress **DUMP MEMORY**.
4. Determine the status of the logic probe.
If the logic probe is not flashing, proceed to Step 5.
If the logic probe is flashing, proceed to Step 9.
5. If the logic probe did not flash, perform Steps 6 through 8 as appropriate.
6. At the SMDR carrier, replace LC68.
Depress **DUMP MEMORY**.
7. If the logic probe still does not flash, replace LC177 at the SMDR carrier.
8. Check the wiring associated with the replaced circuit packs.
9. If the logic probe flashed, perform Steps 10 through 16 as appropriate.
10. Verify that the tape is threaded correctly.

11. At the SMDR carrier, replace LC177.
12. At the SMDR formatter, replace board 4062.
13. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
14. Check the wiring between LC177 and the formatter and the cabling between the formatter and tape drive.
15. Replace the SMDR formatter.
16. Replace the SMDR tape drive.
17. When no logic probe is available, perform Steps 18 through 24 as appropriate.
18. Verify that the tape is threaded correctly.
19. At the SMDR carrier:
 - a. Replace LC68.
 - b. Replace LC177.
20. At the SMDR formatter, replace board 4062.
21. At the SMDR tape drive:
 - a. Replace board 3842.
 - b. Replace board 4843.
22. Check the wiring between LC177 and the formatter and the cabling between the formatter and tape drive.
23. Replace the SMDR formatter.
24. Replace the SMDR tape drive.

Failure code 0 - ON LINE lamp does not light at the tape drive:

1. At the SMDR tape drive, replace board 4843.
2. Check the cabling between the tape drive and the formatter.
3. Replace the SMDR tape drive.

Failure code 1, 3, 5, 7, or 8:

1. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
2. At the SMDR carrier, replace LC62.
3. Check the wiring associated with the replaced circuit packs.

Failure code 2, 4, or 6:

1. At the SMDR carrier, replace LC62.
2. Replace TN403 (dual-speed data channel associated with the SMDR) at the equipment location displayed in Fields 4 through 6.
3. Check the wiring associated with the replaced circuit packs.

Failure code 9:

1. Determine if HP-H05-10525T logic probe is provided or available:
If the logic probe is available, connect it to the SMDR carrier and proceed to Step 2.
If the logic probe is not available, proceed to Step 8.
2. Connect the logic probe to test point **TP8** on the LC68 circuit pack.
3. Determine the status of the logic probe.
If the logic probe is not flashing, perform Steps 4 and 5 as appropriate.
If the logic probe is flashing, perform Steps 6 and 7 as appropriate.
4. At the SMDR carrier, replace LC62.
5. Check the wiring associated with the replaced circuit pack.
6. At the SMDR carrier:
 - a. Replace LC62.
 - b. Replace LC68.
 - c. Replace LC63 or LC374.
 - d. Replace LC40.
 - e. Replace LC177.
 - f. Replace LC178.
7. Check the wiring associated with the replaced circuit packs.
8. When no logic probe is available, perform Steps 9 and 10 as appropriate.
9. At the SMDR carrier:
 - a. Replace LC62.
 - b. Replace LC68.
 - c. Replace LC63 or LC374.
 - d. Replace LC40.
 - e. Replace LC177.
 - f. Replace LC178.
10. Check the wiring associated with the replaced circuit packs.

PROC 656 - NCOSS TEST

FLIPCHART ISSUE 4		NETWORK CONTROL OPERATIONS SUPPORT SYSTEM PORT TEST						845552223	
TEST 1: ECHO TEST. TO ISOLATE I/O FAILURES USE PROC 611.		TEST 2: SENDS AN ALTERNATING ONE-ZERO PATTERN CONTINUOUSLY.		TEST 3: SENDS A 16 MESSAGE PATTERN.		TEST 4: SENDS 1 TEST WORD. USE 'NEXT DATA' TO SELECT FROM LIST OF 10 TEST WORDS OR ENTER A TEST WORD WITHIN DISPLAY CARRIER.		FAILURE CODES (FIELDS 7, 8): 0 = PASS 1 = DATA CHANNEL ADDRESS 2 = BAD REPLY PARITY 3 = 1&2 4 = ECHO MISMATCH 5 = 1&4 6 = 2&4	
USE 'NEXT CIRCUIT' TO DISPLAY NEXT CIRCUIT								NOTES: PROCESSOR COMMUNICATION CIRCUITS ASSOCIATED WITH THE 3B2 CDRU ARE TESTED IN PROC 651.	
TEST NO	TEST WORD (TEST 4)		DATA CHANNEL EQPT. LOCATION			FAILURE CODE		COMMON CONTROL PERIPHERALS 656	
	OP CODE	DATA	CARR	SLOT	CHANNEL	OKCT	LAST		
1	2	3	4	5	6	7	8		

Purpose

PROC 656 provides the capability to test NCOSS and/or 3B2 CDRU equipment when a trouble is reported or suspected.

Tests 2 through 4 of this maintenance procedure **must** be performed on the customer's premises. Successful test completion for Tests 2 through 4 is determined by observing printouts from the NCOSS equipment.

PROC 656 is used to:

1. Run an echo test with the NCOSS/3B2 CDRU equipment.

Note: Dual-speed data channels associated with NCOSS/3B2 CDRU equipment are tested in **PROC 611**. Processor communication circuits associated with the 3B2 CDRU are tested in **PROC 651**.

2. Send an alternating one-zero pattern continuously.
3. Send a 16-message pattern.
4. Send 1 test word at-a-time.

Field Definitions and Codes

Each field of **PROC 656** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BX, PROC 656 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 and 3 - Select operation code and data of test word to be transmitted to the NCOSS/3B2 CDRU equipment (Test 4 only).

TABLE BX.

PROC 656						
FIELD DEFINITIONS AND CODES						
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION	
1	1-4	Test number.	7		Failure code-once: Accumulative "OR" ing of all failure codes that occurred at least once during a test.	
2		Operation code (octal):				
	0	Normal data word.				
	3	No operation.		0		Pass.
	4	Retransmit normal data word.		1		Data channel address not acknowledged.
	10	Last word in message.		2		No data reply (echo) from NCOSS equipment in all cases.
	14	Retransmit last word in message.		3	Failures 1 and 2.	
				4	Echo mismatch.	
				5	Failures 1 and 4.	
				6	Failures 2 and 4.	
4	0	Common control carrier.		7	Failures 1, 2, and 4.	
				8	Equipment failure (reported by NCOSS).	
5	23-26	Slot Number.	8	0-8	Failure code-last: Failure code indicating one or more failures occurring during the last transmission to the NCOSS equipment before the test ended or was stopped.	
6	0-15	Channel number.				

Operation of Procedure

Overview

PROC 656 is used to test NCROSS/3B2 CDRU equipment.

To call in **PROC 656**, perform the following:

1. Depress **PROC NO; 656; ENTER.**
2. Test 1 is automatically selected.

Field 1 displays a 1, Fields 4 through 6 display the data channel equipment location associated with the NCOSS/3B2 CDRU equipment, and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Caution: *NCOSS/3B2 CDRU call recording is blocked under the following conditions - While Test 2, 3, and 4 are executing. In Test 3, the 16 message pattern is sent in less than 1 second. In Test 4, the blockage is extended for 2 minutes after EXECUTE is depressed.*

Four tests are available:

1. Test 1 - Runs an echo test on the NCOSS/3B2 CDRU equipment.
2. Test 2 - Sends an alternating one-zero pattern continuously to the NCOSS/3B2 CDRU equipment.
3. Test 3 - Sends 16 messages to the NCOSS/3B2 CDRU equipment testing most digits in each digit's position.
4. Test 4 - Sends a single data word to the NCOSS/3B2 CDRU equipment allowing manual entry of operation codes and data words.

Test 1

Test 1 runs an echo test with the NCOSS or 3B2 CDRU equipment.

Test 1 does not interfere with normal call processing recording of calls.

An alternating one-zero pattern is used for the first echo test transmission. A complementing one-zero pattern is used for the second echo test transmission.

1. Test 1 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 1; ENTER.
2. When Test 1 is initially called in, the data channel associated with the highest NCOSS/3B2 CDRU equipment location is displayed in Fields 4 through 6.
To test the displayed circuit, proceed to Step 4.
3. To select another NCOSS/3B2 CDRU circuit to be tested, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.
Proceed to Step 4.
4. To start Test 1, depress **EXECUTE**.
5. If no failures are detected, Fields 7 and 8 display a 0.
6. If any failures are detected, the following is displayed:
Field 1 - 1.
Fields 4 through 6 - Data channel equipment location associated with the NCOSS/3B2 CDRU equipment.
Fields 7 and 8 - Failure codes (1 through 8).
7. To test another NCOSS/3B2 CDRU circuit, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.
Repeat Steps 4 through 7 (as appropriate).

PROC 656, Test 2 and Test 3

Test 2

Test 2 sends a continuous alternating one-zero pattern in the format of a call record message to the NCOSS/3B2 CDRU equipment.

1. Test 2 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 2; ENTER.
2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 4 through 6.

Note: The default equipment location is the last equipment location displayed in Test 1.

To test the default equipment location, proceed to Step 4.

3. To select another NCOSS/3B2 CDRU circuit to be tested, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.
Proceed to Step 4.
4. To start Test 2, depress **EXECUTE**.

Caution: While Test 2 is executing, NCOSS/3B2 CDRU call recording is blocked.

5. During execution of Test 2, the following fields are displayed:

Field 1 - 2.

Fields 2 and 3 - Operation code and data word currently being transmitted to the NCOSS/3B2 CDRU equipment.

Fields 4 through 6 - Data channel equipment location associated with the NCOSS/3B2 CDRU equipment.

Fields 7 and 8 - Once and last failure codes (if any).

6. The testing interval is determined by maintenance personnel performing the test and is ended by depressing **STOP**.
7. The one-zero pattern data word is complemented each time it is transmitted with 0.5 seconds between words.
Between the last word transmitted (normally word 18) and the start of the next message is a 2-second delay to allow stopping Test 2.
8. Successful test completion results in a 0 displayed in Fields 7 and 8.
9. To test another NCOSS/3B2 CDRU circuit, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.
Repeat Steps 4 through 9 (as appropriate).

Test 3

Test 3 sends 16 messages in either 12, 15, or 18 word message formats to the NCOSS/3B2 CDRU equipment.

Four of the NCOSS/3B2 CDRU operation codes are exercised by Test 3; i.e., normal word transmission, last word of message transmission, retransmit normal word, and retransmit last word.

When Test 3 is performed, maintenance personnel **must** be on the customer's premises to determine if the test is successful by observing the NCOSS printout.

1. Test 3 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 3; ENTER.
2. When Test 3 is initially called in, a default equipment location may be displayed in Fields 4 through 6.

Note: The default equipment location is the last equipment location displayed in Test 1.

To test the default equipment location, proceed to Step 4.

3. To select another NCOSS/3B2 CDRU circuit to be tested, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.

Proceed to Step 4.

4. To start Test 3, depress **EXECUTE**.

Caution: While Test 3 is executing (16 message pattern sent in less than 1 second), NCOSS/3B2 CDRU call recording is blocked.

5. If no failures are detected, Fields 7 and 8 display a 0.

The printout (refer to Figure 22) should be checked to ensure that the NCOSS equipment is operating properly.

6. If any failures are detected, the following is displayed:

Field 1 - 3.

Fields 4 through 6 - Data channel equipment location associated with the NCOSS/3B2 CDRU equipment.

Fields 7 and 8 - Once and last failure codes.

7. To test another NCOSS/3B2 CDRU circuit, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.

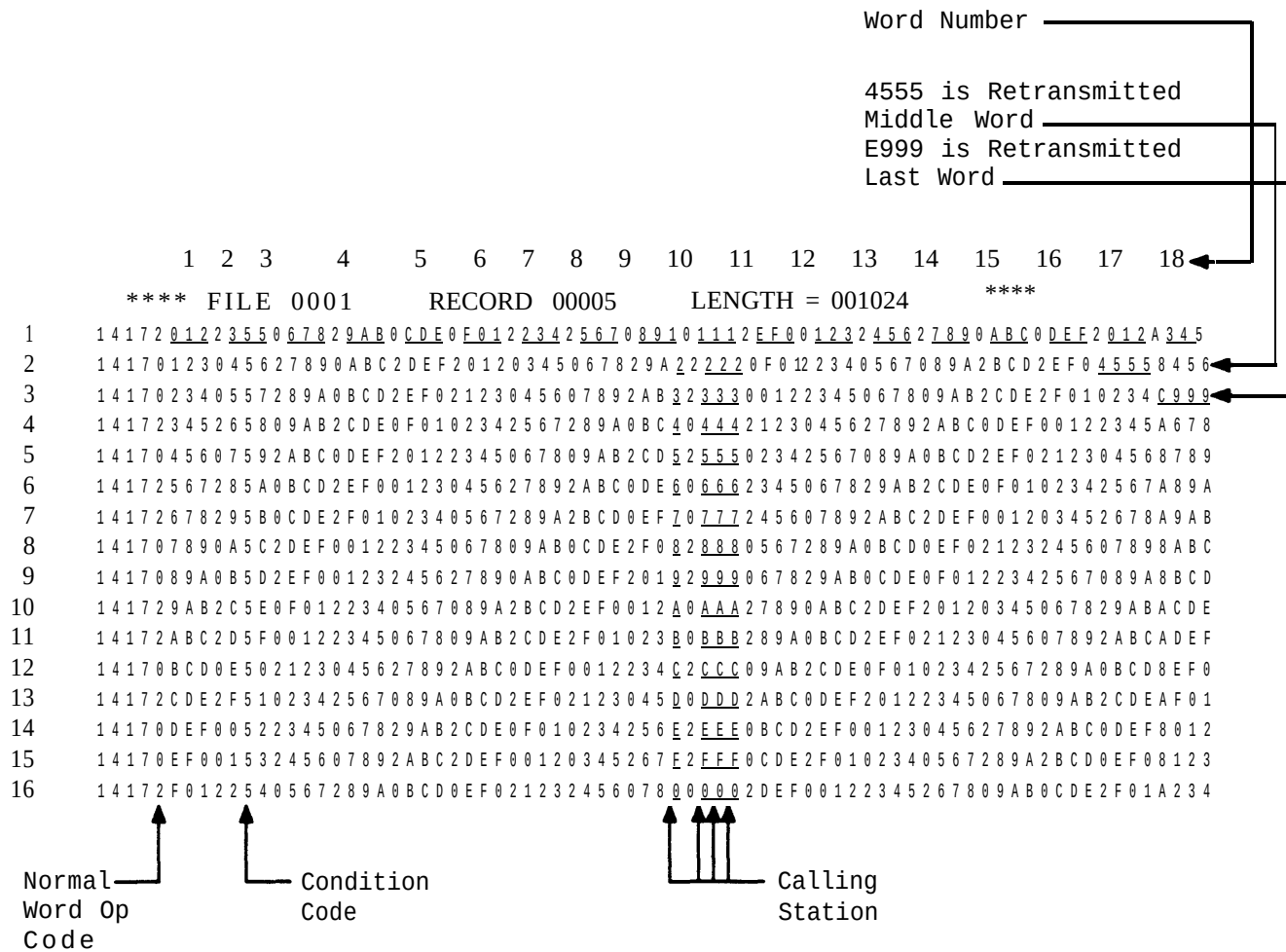
Repeat Steps 4 through 7 (as appropriate).

Test 4

Test 4 sends a single data word to the NCOSS/3B2 CDRU equipment and is normally used in repair of NCOSS/3B2 CDRU equipment. Test 4 allows sending most words or messages to the NCOSS/3B2 CDRU equipment by manually entering it into Fields 2 and 3.

When Test 4 is performed, maintenance personnel **must** be on the customer's premises to determine if the test is successful by observing the NCOSS/3B2 CDRU equipment.

1. Test 4 is selected by use of **NEXT TEST** or the **CHANGE FIELD** sequence:
CHANGE FIELD; 1; ENTER; 4; ENTER.



NOTE

Bit 2 of the Op Code (parity bit) may be incorrect in this table.

Figure 22. Hexadecimal Dump for Test 3 Test Call (18-Word Format)

- When Test 4 is initially called in, a default equipment location may be displayed in Fields 4 through 6.

Note: The default equipment location is the last equipment location displayed in Test 1.

To test the default equipment location, proceed to Step 4.

3. To select another NCOSS/3B2 CDRU circuit to be tested, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.

Proceed to Step 4.

4. When Test 4 is called in, a test word (operation code and data word) is displayed in Fields 2 and 3.
5. Depressing **NEXT DATA** selects the next of ten operation codes and data words that are available to be transmitted. (Refer to Figure 23.)
6. Operation codes and data words can be manually entered into Fields 2 and 3 using the **CHANGE FIELD** sequence:

CHANGE FIELD; 2; ENTER; (Operation code); ENTER; (Data word); ENTER.

7. To start Test 4, depress **EXECUTE**.

Caution: When Test 4 is executed, NCOSS/3B2 CDRU call recording is blocked for 2 minutes after EXECUTE is depressed.

Field 2	Field 3
OP Code	Data
3.2525	- No operation op code with 01 pattern
3.5252	- No operation op code with 10 pattern
14.2525	- Retransmission, end of message with 01 pattern
14.5252	- Retransmission, end of message with 10 pattern
4.2525	- Retransmission with 01 pattern
4.5252	- Retransmission with 10 pattern
10.2525	- End of message op code with 01 pattern
10.5252	- End of message op code with 10 pattern
0.2525	- Normal data word op code with 01 pattern
0.5252	- Normal data word op code with 10 pattern

Figure 23. List of Operation Codes and Data Words Available using the NEXT DATA Key in Test 4

8. During execution of Test 4, the following fields are displayed:

Field 1 - 4.

Fields 2 and 3 - Operation code and data word currently being transmitted to the NCOSS/3B2 CDRU equipment.

Fields 4 through 6 - Data channel equipment location associated with the NCOSS/3B2 CDRU equipment.

Fields 7 and 8 - Once and last failure codes (if any).

9. Each time **EXECUTE** is depressed, the operation code and data word displayed in Fields 2 and 3 are transmitted to the NCOSS/3B2 CDRU equipment.

NEXT DATA can be used to select a different operation code and data word to be transmitted prior to depressing **EXECUTE**.

10. To test another NCOSS/3B2 CDRU circuit, depress **NEXT CIRCUIT** until the data channel associated with the circuit to be tested is displayed in Fields 4 through 6.

Repeat Steps 5 through 10 (as appropriate).

Repair Guide

When an NCOSS/3B2 CDRU failure is reported or suspected, perform the following steps in the order listed to isolate and repair the faulty unit.

1. Execute Test 1 and record the results.
2. Execute Test 3, record the results, and look at the printout.
3. If Test 3 fails or the printout is not correct, the NCOSS or 3B2 CDRU equipment is faulty.
Refer the problem to the appropriate personnel.
4. Test 2 can be used to determine if failures are intermittent or to trace wiring problems.
5. Test 4 can be used to transmit a single data word repeatedly (by depressing **EXECUTE** repeatedly) and to change the single data word transmitted to help isolate failures in the NCOSS or 3B2 CDRU equipment.
6. Repeat Steps 1 through 5 for each NCOSS/3B2 CDRU failure.
7. When I/O failures are suspected between the dual-speed data channel and the NCOSS or 3B2 CDRU equipment, perform **PROC 611** Test 3, entering the equipment location displayed in Fields 4 through 6.
8. Processor communication circuits associated with the 3B2 CDRU are tested in **PROC 651**.

PROC 960 - QUEUE ACTIVITY

FLIPCHART ISSUE 1													+ + QUEUE ACTIVITY + +													845552223																																																																																																																																																											
TEST 1: DISP QUEUE INFO FOR AN ENTERED EQUIP LOC. FOR TESTS 1 & 2: FLDs 4-6 CONTAIN AN INTERNAL TRK NBR WHEN FLD 7 SAYS IT IS A PSEUDO TRK. INTERNAL TRK NBRs ARE NEVER ENTERED, THEY ARE ONLY DISPLAYED BY TEST 2. A DISPLAYED ITN MAY BE USED AS INPUT FOR TEST 1.													TEST 2: (STATIC QUEUE) DISPLAYS QUEUE INFO AND FIRST TRK IN QUEUE FOR AN ENTERED QUEUE NBR. A COPY OF THE QUEUE IS MADE WHEN 'EXECUTE' IS PUSHED. THIS COPY IS DISPLAYED. USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT TRK IN QUEUE USE 'NEXT UNIT' TO ADVANCE TO NEXT QUEUE OF NON-ZERO LENGTH													FLD 7: 0 EQUIPPED WITH HARDWARE AND NOT MAINTENANCE BUSY 1 UNEQUIPPED WITH HARDWARE OR MAINTENANCE BUSY 2 PSEUDO TRUNK FOR TEST 1 FLD 13: 0 NOT ON ANY QUEUE 1 ON IDLE QUEUE 2 ON A BUSY QUEUE WITHOUT Q BIT SET. (ERROR CONDITION) 3 ON BUSY QUEUE													SPECIAL ERROR CODES: 81-CIRCUIT ASSIGNED TO ATTENDANT INTERFACE.																																																																																																																																														
EQUIPMENT LOCATION													TEST 2																																																																																																																																																																								
TEST 1													TEST 2																																																																																																																																																																								
MODULE CAB CARR SLOT CKT													QUEUE NUMBER													TRUNK GROUP NUMBER													QUEUE INDEX													QUEUE LENGTH													TRUNK TYPE													UNIT													QUEUE ACTIVITY																																																																																										
1													2													3													4													5													6													7													8													9													10													11													12													13													960												

Purpose

PROC 960 is used to display queue information for a particular equipment location, or to display the equipment locations associated with a particular queue.

Field Definitions and Codes

Each field of **PROC 960** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BY, PROC 960 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Select a specific equipment location to determine the queue activity (Test 1 only).
3. Field 8 - Select a specific queue number to determine the equipment locations on the queue (Test 2 only).

Operation of Procedure**Overview**

PROC 960 is used to determine the queue activity.

To call in **PROC 960**, perform the following:

1. Depress **PROC NO; 960; ENTER**.
2. Test 1 is automatically selected.

Field 1 displays a 1, Field 2 is blanked and blinking, and all other fields are dashed.

3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

PROC 960, Test 1

Two tests are available:

1. Test 1 - Displays queue information for an entered equipment location.
The equipment location contains the internal trunk number for a pseudo trunk.
2. Test 2 - Displays queue information and the first trunk in queue for an entered queue number.

TABLE BY.

PROC 960 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1,2	Test number.	8	0-255	Queue number.
2-6		Equipment location:	9	0-255	Trunk group number.
2	0-30	Module number.	10	0-999	Queue index.
3	0-6	Cabinet number.			
4	0-3	Carrier number.	11	0-999	Queue length.
5	0-21	Slot number.			
6	0-7	Circuit number.	12	0-127	Trunk type.
7	0-2	Busied or unequipped:	13	0-3	QBIT (Queue status):
	0	Equipped with hardware and not maintenance busy.		0	Not on any queue.
	1	Unequipped with hardware or maintenance busy.		1	On idle queue.
				2	On a busy queue without QBIT set. (Error condition.)
	2	Pseudo trunk.		3	On a busy queue.

Test 1

Test 1 is used to display the queue information for an entered equipment location.

The equipment location fields (4 through 6) display the internal trunk record number when Field 7 displays a 2.

1. Test 1 is the default test when entering **PROC 960** or is selected by use of **NEXT TEST**.
2. When Test 1 is initially called in, Field 2 (module) is blanked and blinking to indicate that data must be entered.
3. The equipment location to be displayed is entered as follows:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER;
(Slot number); ENTER; (Circuit number); ENTER.

4. To start Test 1, depress **EXECUTE**.
5. The busied or unequipped status is displayed in Field 7 and the queue status is displayed in Field 13 when **EXECUTE** is depressed.
6. For a trunk equipment location that is not on a queue (0 displayed in Field 13), no further information is provided.
7. The following information is provided for trunk equipment locations that are in queue:
 - Field 1 - 1.
 - Fields 2 through 6 - Equipment location selected.
 - Field 7 - 0 or 2.
 - Field 8 - Queue number.
 - Field 9 - Trunk group number.
 - Field 10 - Dashed.
 - Field 11 - Queue length.
 - Field 12 - Trunk type.
 - Field 13 - QBIT (1 = on idle queue or 3 = on busy queue).
8. When another specific equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific equipment location.
 - Either all or any part of the equipment location fields can be changed.
9. **EXECUTE** must be depressed to display the queue information for the specific equipment location entered.

Test 2

Test 2 is used to display the queue information and first trunk in queue for an entered queue number.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is initially called in, a default equipment location from Test 1 may be displayed in Fields 2 through 6 and Field 8 (queue number) is blinking to indicate that data may be entered.
 - Either the default equipment location may be displayed or a specific queue number can be selected for display.
3. To select a specific queue number to be displayed, enter the following:
 - (Queue number); ENTER.**
4. To start Test 2, depress **EXECUTE**.
5. The following information for the first trunk equipment location of the queue number entered is displayed as follows:
 - Field 1 - 2.
 - Fields 2 through 6 - Trunk equipment location.

Field 7 - Busied or unequipped.

Note: If Field 7 equals 2 (pseudo trunk), Fields 4 through 6 display an internal trunk number and Fields 2 and 3 are dashed.

Field 8 - Queue number selected.

Field 9 - Trunk group number.

Field 10 - Queue index.

Field 11 - Queue length.

Field 12 - Trunk type.

Field 13 - Dashed.

6. Depressing **NEXT CIRCUIT** repeatedly displays the remaining trunks in the queue.
 - a. When all trunks in the queue are displayed, depressing **NEXT CIRCUIT** once more dashes Fields 2 through 7, 12 and 13.
 - b. Depressing **NEXT CIRCUIT** again displays the first trunk equipment location in the queue.

7. Depressing **NEXT UNIT** steps to the next queue number.

NEXT CIRCUIT can be used to step through the new queue number if Field 11 is greater than 0.

8. When all queues are displayed, depressing **NEXT UNIT** again dashes Fields 2 through 8, 12 and 13. Fields 9 through 11 display a 0.

Depressing **NEXT UNIT** once more displays the first queue number.

9. When another specific queue number is to be displayed without stepping through all queue numbers using **NEXT UNIT**, the **CHANGE FIELD** sequence must be used to select the specific queue number:

CHANGE FIELD; 8; ENTER; (Queue number); ENTER.

10. **EXECUTE** must be depressed to display the trunk equipment locations of the specific queue number entered.

PROC 961 - CONNECTION ACTIVITY

FLIPCHART ISSUE 3		+	+	CONNECTION ACTIVITY		+	+	845552223
NOTES (CONTINUED): TEST 5: DISPLAY CONSTAT TBL NBR, ACPORT TBL NBR, CONN NBR, TS-ID ACC NBR FOR AN ENTERED TDM EQUIPMENT LOCATION.								
WORD 0								CONNECTION ACTIVITY 961

FLIPCHART ISSUE 3		+	+	CONNECTION ACTIVITY		+	+	845552223
TEST 1: DISPLAYS EQUIP LOC, CONSTAT TBL NBR, ACPORT TBL NBR, AND TIME SLOT INFO FOR AN ENT CONN NBR.		TEST 2: DISPL CONN NBR AND CONSTAT TBL NBR FOR AN ENTERED, TS-ID ACCUM NUM		TEST 3: DISPL CONSTAT TBL NBR, ACPORT TBL NBR, CONN NBR, TS-ID ACCUM NUM FOR AN ENTERED EQUIP LOC.		TEST 4: DISPLAY THE CONNECTION NUMBER AND THE FIRST ACTIVE ACCUMULATOR ON A MODULE.		SPECIAL ERROR CODES: NONE
USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT PORT IN ACPORT TBL. USE 'NEXT UNIT' TO ADVANCE TO NEXT CONSTAT TBL. USE 'NEXT DATA' TO ADVANCE TO NEXT BUSY CONNECTION NUMBER.		NOTE: WHEN A MULTI MODULE CALL IS MADE, A TMS TIMESLOT IS DISPLAYED IN EQUIPMENT LOCATION FIELD. MOD/CAB/CKT IS DASHED. CARRIER/SLOT CONTAINS TMS TIMESLOT.		USE 'NEXT CIRCUIT' TO DISP NEXT ACTIVE TIME SLOT. USE 'NEXT UNIT' TO ADVANCE TO NEXT MODULE.		(CONTINUED ON WORD 0)		
TEST NO	CONNECTION NUMBER (OCTAL)	B/I BIT	CONSTAT TBL NO	IN USE (= 1)	TIME SLOT IDENTITY	ACPORT TBL NO	EQUIPMENT LOCATION	CONNECTION ACTIVITY
1	2	3	4	5	6	7	8	961
					MODULE	ACCUMULATOR NUMBER	MODULE CAB CARR SLOT CKT	
							NO OF PORTS IN CONN	PORT INDEX

Purpose

PROC 961 is used to display the connection status activity; i.e., connection number, module and accumulator number, and equipment location.

Field Definitions and Codes

Each field of **PROC 961** flipchart and the possible displays for the fields during execution of the different tests are defined in Table BZ, PROC 961 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Field 2 - Select a specific connection number to determine the equipment location, constat table number, acport table number, and time slot identity (Test 1 only).
3. Fields 6 and 7 - Select a specific time slot identity to determine the connection number and constat table number (Test 2 only).
4. Fields 9 through 13 - Select a specific equipment location to determine the constat table number, acport table number, connection number and time slot identity accumulator number (Test 3 and Test 5 only).

5. Field 6 - Select a specific module to determine the connection number and the first active accumulator on a module (Test 4 only).

TABLE BZ.

PROC 961					
FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-5	Test number.	8	1-6	ACPORT table number.
2	0-77777	Connection number (octal).	9-13	0-30 0-6 0-3 0-21 0-7	Equipment location: Module number. Cabinet number. Carrier number. Slot number. Circuit number.
3	0,1	Busy/idle bit.			
4	1-6	Constat table number.			
5	0,1	In-use status.			
6-7		Time slot identity:			
6	0-30	Module number.	14	0-6	Number of ports in connection.
7	1-255	Accumulator number.			
			15	1-6	Port Index.

Operation of Procedure

Overview

PROC 961 is used to determine the connection activity.

To call in **PROC 961**, perform the following:

1. Depress **PROC NO; 961; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Field 2 is blanked and blinking, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Five tests are available:

1. Test 1 - Displays equipment location, constat table number, acport table number, and time slot information for an entered connection number.
2. Test 2 - Displays connection number and constat table number for an entered time slot identity accumulator number.
3. Test 3 - Displays constat table number, acport table number, connection number, and time slot identity accumulator number for an entered equipment location (i.e., modem pool member).
4. Test 4 - Displays the connection number and the first active accumulator on a module.
5. Test 5 - Displays constat table number, acport table number, connection number, and time slot identity accumulator number for an entered DTDM equipment location.

Test 1

Test 1 displays the equipment location, constat table number, acport table number, and time slot identity for an entered connection number.

1. Test 1 is the default test when entering **PROC 961** or is selected by use of **NEXT TEST**.
2. When Test 1 is initially called in, a default connection number may be displayed in Field 2.
Field 2 (connection number) is blanked and blinking, indicating an optional entry field.
3. The default connection number can be the last connection number displayed in Tests 2 through 5 of **PROC 961**.
Either the default connection number may be displayed or a specific connection number can be selected for display.
4. A specific connection number can be selected for display by entering the connection number (in octal) in Field 2:
(Connection number); ENTER.
5. To start Test 1, depress **EXECUTE**.
6. The busy/idle status of the connection number is provided in Field 3 (0 = idle, 1 = busy) when **EXECUTE** is depressed.
7. For a connection number that is not busied (0 displayed in Field 3), no further information is provided.
8. For a busied connection (1 displayed in Field 3), the following information is provided.
Field 1 - 1.
Field 2 - Connection number selected.
Field 3 - 1.
Field 4 - Constat table number.
Fields 6 and 7 - Module and accumulator number.
Field 8 - Acport table number.
Fields 9 through 13 - Equipment location on the connection.
Field 14 - Number of ports in connection.
Field 15 - Port index.
9. Depressing **NEXT CIRCUIT** displays the next port in the acport tables.
Field 8 displays the number of the acport table and Field 14 displays the total number of acport tables being used for the current constat table number (Field 4).
10. Depressing **NEXT CIRCUIT** after all ports in the acport tables are displayed dashes Fields 2 through 15.
Depressing **NEXT CIRCUIT** once more causes the first entry to be displayed.
11. Depressing **NEXT UNIT** decrements the constat table number displayed in Field 4.
 - a. When all constat table numbers are displayed, depressing **NEXT UNIT** again dashes Fields 2 through 15.
 - b. Depressing **NEXT UNIT** once more causes the first entry to be displayed.

PROC 961, Test 1 and Test 2

12. Depressing **NEXT DATA** advances the display to the next busied connection number and displays the data for that connection number.
 - a. When all busied connection numbers are displayed, depressing **NEXT DATA** again dashes Fields 2 through 15.
 - b. Depressing **NEXT DATA** once more causes the first entry to be displayed.
13. When another specific connection number is to be displayed, the **CHANGE FIELD** sequence must be used to select the connection number:
CHANGE FIELD; 2; ENTER; (Connection number); ENTER.
14. **EXECUTE** must be depressed to display the equipment location, constat table number, acport table number, and time slot identity for the entered connection number.

Test 2

Test 2 displays the connection number and constat table number for an entered time slot identity accumulator number.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is initially called in, a default module and accumulator number may be displayed in Fields 6 and 7.

The default module and accumulator number can be the last and accumulator number displayed in Tests 1 or 3 through 5 of **PROC 961**.
3. Field 6 (module) is blinking, indicating an optional entry field.

Either the default module and accumulator number may be displayed or a specific module and accumulator number can be selected for display.
4. A specific module and accumulator number can be selected for display by performing one of the following depending on whether or not a default module and accumulator number are displayed:
 - a. **(Module number); ENTER; (Accumulator number); ENTER.**
 - b. **CHANGE FIELD; 6; ENTER; (Module number); ENTER; (Accumulator number); ENTER.**
5. To start Test 2, depress **EXECUTE**.
6. A search of all of the constat tables for the entered module and accumulator number is performed when **EXECUTE** is depressed.
7. If the module and accumulator number are not found, the constat table number is displayed in Field 4, a 0 is displayed in Field 5 and no other information is provided.
8. If the module and accumulator are found in the constat tables, the following information is provided.

Field 1 - 2.

Field 2 - Connection number.

Field 3 - 1.

Field 4 - Constat table number.

Field 5 - 1.

Field 6 - Module number selected.

Field 7 - Accumulator number selected.

9. When another specific module and accumulator number is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific module and accumulator number:

CHANGE FIELD; 6; ENTER; (Module number); ENTER; (Accumulator number); ENTER.

10. **EXECUTE** must be depressed to display the connection number and constat table number for the module and accumulator number entered.

Test 3

Test 3 displays the constat table number, acport table number, connection number, and time slot identity for an entered equipment location (i.e., modem pool member).

1. Test 3 is selected by use of **NEXT TEST**.
2. When Test 3 is initially called in, a default equipment location may be displayed in Fields 9 through 13.

Field 9 (module) is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Tests 1, 2, 4, or 5 of **PROC 961**.

Either the default equipment location may be displayed or a specific equipment location can be selected for display.

4. A specific equipment location can be selected for display by performing one of the following depending on whether or not a default equipment location is displayed:
 - a. **(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
 - b. **CHANGE FIELD; 9; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**

5. To start Test 3, depress **EXECUTE**.
6. A search of all of the acport tables for the entered equipment location is performed when **EXECUTE** is depressed.
7. If the equipment location is not found, a 0 is displayed in Field 5 and no other information is provided.
8. If the equipment location is found in the acport tables, the following information is provided.

Field 1 - 3.

Field 2 - Connection number.

Field 3 - 1.

Field 4 - Constat table number.

PROC 961, Test 3 and Test 4

Field 5 - 1.

Fields 6 and 7 - Time slot identity.

Field 8 - Acport table number.

Fields 9 through 13 - Equipment location selected.

9. When another specific equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific equipment location:

CHANGE FIELD; 9; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

10. **EXECUTE** must be depressed to display the constat table number, acport table number, connection number, and time slot identity for the entered equipment location.

Test 4

Test 4 displays the connection number and the first active accumulator for an entered module number.

1. Test 4 is selected by use of **NEXT TEST**.
2. When Test 4 is initially called in, a default module number may be displayed in Field 6.
Field 6 (module) is blinking, indicating an optional entry field.
3. The default module number can be the last module number displayed in Tests 1 through 3 or 5 of **PROC 961**.

Either the default module number can be displayed or a specific module number can be selected for display.

4. A specific module number can be selected for display by performing one of the following depending on whether or not a default module number is displayed:
 - a. **(Module number); ENTER.**
 - b. **CHANGE FIELD; 6; ENTER; (Module number); ENTER.**

5. To start Test 4, depress **EXECUTE**.
6. The following information is provided for the module entered:

Field 1 - 4.

Field 2 - Connection number.

Field 4 - Constat table number.

Field 5 - 1.

Field 6 - Module number selected.

Field 7 - First active accumulator in module.

7. Depressing **NEXT CIRCUIT** displays the next active accumulator in Field 7 for the module entered in Field 6.

Field 2 displays the connection number that the accumulator is on.

8. Depressing **NEXT CIRCUIT** after all active accumulators are displayed for the module entered in Field 6 dashes Fields 2 through 15.

Depressing **NEXT CIRCUIT** once more causes the first active accumulator for the module entered in Field 6 to be displayed.

9. Depressing **NEXT UNIT** increments the module number displayed in Field 6.
 - a. When all modules are displayed, depressing **NEXT UNIT** again dashes Fields 2 through 15.
 - b. Depressing **NEXT UNIT** once more causes the first entry to be displayed.

Test 5

Test 5 is used to assist in maintenance of modem pooling.

Test 5 displays the constat table number, acport table number, connection number, and time slot identity for an entered DTDM equipment location.

1. Test 5 is selected by use of **NEXT TEST**.
2. When Test 5 is initially called in, a default DTDM equipment location may be displayed in Fields 9 through 13.

Field 9 (module) is blinking, indicating an optional entry field.

3. The default DTDM equipment location can be the last DTDM equipment location displayed in Tests 1 through 4 of **PROC 961**.

Either the default DTDM equipment location may be displayed or a specific DTDM equipment location can be selected for display.

4. A specific DTDM equipment location can be selected for display by performing one of the following depending on whether or not a default DTDM equipment location is displayed:
 - a. **(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**
 - b. **CHANGE FIELD; 9; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.**

5. To start Test 5, depress **EXECUTE**.
6. A search of all of the acport tables for the entered DTDM equipment location is performed when **EXECUTE** is depressed.
7. If the DTDM equipment location is not found, a 0 is displayed in Field 5 and no other information is provided.
8. If the DTDM equipment location is found in the acport tables, the following information is provided.

Field 1 - 5.

Field 2 - Connection number.

Field 3 - 1.

PROC 961, Test 5

Field 4 - Constat table number.

Field 5 - 1.

Fields 6 and 7 - Time slot identity.

Field 8 - Acport table number.

Fields 9 through 13 - Equipment location selected.

9. When another specific DTDM equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific equipment location:

**CHANGE FIELD; 9; ENTER; (Module number); ENTER; (Cabinet number);
ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number);
ENTER.**

10. **EXECUTE** must be depressed to display the constat table number, acport table number, connection number, and time slot identity for the entered DTDM equipment location.

PROC 962 - FACILITY CONNECTIONS

FLIPCHART ISSUE 3		+		+		FACILITY CONNECTIONS		+		+		845552223	
FIELD LIMITS (CONTINUED): FLD 10: INTERNATIONAL NBR TYPE 1 = INTERNATIONAL NBR 2 = QUEUING TRK 3 = ICOM RECORD 4 = ATND SWITCH LOOP 5 = ATND OR 6 = DIAL PULSE OR FLD 16: HOW LINKED 1 = TRK-FAC1 2 = TRK-FAC2 3 = TRK-FAC3 4 = TERMINAL 6 = TERMINAL- CONFERENCE CFAC1-8													
WORD 0												FACILITY CONNECTION 962	

FLIPCHART ISSUE 3		+		+		FACILITY CONNECTIONS		+		+		845552223					
TEST 1 AND 2 ARE IDENTICAL-EXCEPT TEST 1 DISPLAYS A COPY OF THE CONNECTION INFO MADE WHEN 'EXECUTE' WAS PRESSED & TEST 2 DISPLAYS EXISTING CONNECTION INFO. USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT FACILITY OR CONFERENCE PORT. USE 'CLEAR DATA' 'EXECUTE' TO MOVE FAC OR CONF. PORT FLD TO INIT CIRCUIT FIELD. SEE NOTE 1. TEST 3 IS A SPECIAL CASE OF TEST 2. IT IS USED TO DISPLAY EXISTING CONNECTION INFORMATION FOR DTDM EQUIPMENT LOCATIONS.																	
NOTE 1. ALTHOUGH TEST 2 IS DYNAMIC, THE FACILITY OF CONFERENCE DISPLAY IS ONLY CURRENT WHEN THE EXECUTE BUTTON IS PUSHED. 2. WHEN A MULTI MODULE CALL IS MADE, A TMS TIMESLOT IS DISPLAYED IN EQUIPMENT LOCATION FIELD. MOD/CAB/CKT IS DASHED. CARRIER/SLOT CONTAINS TMS TIMESLOT.																	
FIELD LIMITS: FIELD 7 AND 17 CIRCUIT TYPE 0 = UNEQPT, 1 = TERMINAL, 2 = TRUNK, 3 = 72 SERIES TERMINAL: FOR TEST 1 A 2 DTDM: FOR TEST 3 4 = TMS 5 = PSEUDO TRK																	
FLD 8 STATUS 0 = NON-CONTROL, NON CONF 1 = IN-CONTROL, NON-CONF 2 = NON-CONTROL, IN CONF 3 = IN CONTROL, IN CONF 4 = NOT ON TIME SLOT 5 = INVALID LOCATION (CONTINUED) 6 = MAINTENANCE BUSY ON WORD 0) 7 = UNEQPT CIRCUIT																	
TEST NO	INITIATING CIRCUIT						INT NUM	FACILITY OR CONFERENCE PORT						FACILITY CONNECTION 962			
	EQUIPMENT LOCATION							EQUIPMENT LOCATION									
	MODULE	CAB	CARR	SLOT	CKT	CKT TYPE		STATUS	PROGRESS MARK (OCTAL)	MODULE	CAB	CARR	SLOT		CKT	HOW LINKED	CKT TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Purpose

PROC 962 is used to display the trunk number linkages for line records and the facility and conference facility linkages for trunk records.

PROC 962 also displays the progress mark and linkage information for an entered equipment location.

Field Definitions and Codes

Each field of **PROC 962** flipchart and the possible displays for the fields during execution of the different tests are defined in Table CA, PROC 962 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Select a specific equipment location to determine the facility connection information.

TABLE CA.

PROC 962 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	8 (Contd)	5	Invalid location.
2-6		Initiating circuit equipment location:		6	Maintenance busy.
				7	Unequipped circuit.
2	0-30	Module number.	9	0-2047	Progress mark (octal).
3	0-6	Cabinet number.			
4	0-3	Carrier number.	10	1-6	Internal number type:
5	0-21	Slot number.		1	Internal number.
6	0-7	Circuit number.		2	Queuing trunk.
7	0-5	Circuit type:		3	Intercom (ICOM) record.
	0	Unequipped.		4	Attendant switch loop.
	1	Line.		5	Attendant originating register.
	2	Trunk.		6	Dial pulse originating register.
	3	72 series terminal for Test 1 and Test 2; DTDM for Test 3.			
	4	TMS.	11-15		Facility or conference port equipment location:
	5	Pseudo trunk.		0-30	Module number.
				0-7	Cabinet number.
8	0-7	Status:	12		
	0	Noncontrol, nonconference.	13	1-3	Carrier number.
	1	In control, nonconference.	14	0-21	Slot number.
	2	Noncontrol, in conference.	15	0-7	Circuit number.
	3	In control, in conference.	11-15		TMS time slot number for a multi-module call:
	4	Not on time slot.		Dashed	Not applicable for TMS time slot.

TABLE CA. (Contd)

PROC 962						
FIELD DEFINITIONS AND CODES						
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION	
11-15 (Contd)		TMS time slot number for a multi-module call (Contd):	16 (Contd)	6	Station - Conference (Conference facility 1 through 8).	
13 and 14 15	1-511	TMS time slot number. (Fields 13 and 14 are read as one Field.)	17	0-5	Circuit type:	
	Dashed	Not applicable for TMS time slot.		0	Unequipped.	
				1	Line.	
16	1-6	How linked:		2	Trunk.	
				3	DTDM if initiating equipment location is a digital modem pool port; otherwise 72 series terminal.	
	1	Trunk - facility 1.		4		TMS.
	2	Trunk - facility 2.		5		Pseudo trunk.
	3	Trunk - facility 3.		18	1-8	Conference port number.
	4	Station.				
	5	Not used.				

Operation of Procedure

Overview

PROC 962 is used to determine the facility connections.

To call in **PROC 962**, perform the following:

1. Depress **PROC NO; 962; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Field 2 is blanked and blinking, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - A static test that displays a copy of the connection information for an initiating equipment location.

PROC 962, Test 1

2. Test 2 - A dynamic test that continually updates the progress mark of the initiating equipment location.
3. Test 3 - A dynamic test that continually updates the progress mark of the initiating DTDM equipment location.

Test 1

Test 1 is a static test that displays a copy of the connection information for an initiating circuit.

The connection information is not updated until **EXECUTE** is depressed again.

1. Test 1 is the default test when entering **PROC 962** or is selected by use of **NEXT TEST**.
2. When Test 1 is initially called in, a default equipment location may be displayed in Fields 2 through 6.
Field 2 (module) is blinking, indicating an optional entry field.
3. The default equipment location can be the last equipment location displayed in Test 2 or 3 of **PROC 962**.

To display the default equipment location, proceed to Step 5.

4. A specific equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

5. To start Test 1, depress **EXECUTE**.
6. The initiating circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed. A TMS time slot may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.
7. The following information is displayed for the initiating circuit and the facility or conference port linked to the initiating circuit:

Field 1 - 1.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 1.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. If the initiating circuit is a trunk record, depressing **NEXT CIRCUIT** repeatedly steps through all the facilities that are linked.
10. If the initiating circuit is a conference record, depressing **NEXT CIRCUIT** repeatedly steps through all equipment locations on the conference.
The conference port number is displayed in Field 18.
11. When all facilities or conference records are displayed, depressing **NEXT CIRCUIT** again dashes Fields 10 through 18.
Depressing **NEXT CIRCUIT** once more restores the display to its initial state.
12. When a facility or conference port equipment location is displayed, depressing **CLEAR DATA; EXECUTE** transfers the facility or conference port equipment location to the initiating circuit equipment location.

Note: A TMS time slot number **cannot** be transferred to the initiating circuit equipment location.

13. After transfer, depressing **EXECUTE** displays the new facility or conference port equipment location associated with the new initiating circuit equipment location.
14. When Fields 11 through 15 display an ICOM record (Field 10 = 3), depressing **CLEAR DATA; EXECUTE** is used to display the facilities on the connection.
15. The facilities on the connection are displayed by depressing **EXECUTE** and **NEXT CIRCUIT**.
16. When another initiating circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating circuit equipment location:
CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
17. **EXECUTE** must be depressed to display a copy of the connection information for the entered initiating circuit.

PROC 962, Test 2

Test 2

Test 2 is a dynamic test that continually updates the progress mark of the initiating circuit.

Test 2 is similar to Test 1 except that the connection information is displayed every time the progress mark changes, instead of only when depressing **EXECUTE**.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 2 through 6.

Field 2 (module) is blinking, indicating an optional entry field.

3. The default equipment location can be the last equipment location displayed in Test 1 or Test 3 of **PROC 962**.

To display the default equipment location, proceed to Step 5.

4. A specific equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER;
(Slot number); ENTER; (Circuit number); ENTER.
5. To start Test 2, depress **EXECUTE**.
6. The initiating circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed. A TMS time slot number may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.
7. The following information is displayed for the initiating circuit and the facility or conference port linked to the initiating circuit:

Field 1 - 2.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 2.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. If the initiating circuit is a trunk record, depressing **NEXT CIRCUIT** repeatedly steps through all the facilities that are linked.
10. If the initiating circuit is a conference record, depressing **NEXT CIRCUIT** repeatedly steps through all equipment locations on the conference.
The conference port number is displayed in Field 18.
11. When all facilities or conference records are displayed, depressing **NEXT CIRCUIT** again dashes Fields 10 through 18.
Depressing **NEXT CIRCUIT** once more restores the display to its initial state.
12. When a facility or conference port equipment location is displayed, depressing **CLEAR DATA; EXECUTE** transfers the facility or conference port equipment location to the initiating circuit equipment location.

Note: A TMS time slot number **cannot** be transferred to the initiating circuit equipment location.

13. After transfer, depressing **EXECUTE** displays the new facility or conference port equipment location associated with the new initiating circuit equipment location.
14. When Fields 11 through 15 display an ICOM record (Field 10 = 3), depressing **CLEAR DATA; EXECUTE** is used to display the facilities on the connection.
15. The facilities on the connection are displayed by depressing **EXECUTE** and **NEXT CIRCUIT**.
16. When a change occurs in the progress mark (Field 9) of the initiating circuit after **EXECUTE** is depressed, the display is updated as the change occurs. Refer to Table CB for definition of the octal encode.
17. When another initiating circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating circuit equipment location:
CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
18. **EXECUTE** must be depressed to display the connection information for the entered initiating circuit.

PROC 962, Test 3

Test 3

Test 3 is a dynamic test that continually updates the progress mark of the initiating DTDM circuit.

Test 3 is similar to Test 1 except that the connection information is displayed every time the progress mark changes, instead of only when depressing **EXECUTE**.

Note: A facility or conference port equipment location (Fields 11 through 15) **cannot** be transferred to the initiating DTDM circuit equipment location.

1. Test 3 is selected by use of **NEXT TEST**.
2. When Test 3 is initially called in, a default DTDM equipment location may be displayed in Fields 2 through 6.

Field 2 (module) is blinking, indicating an optional entry field.

3. The default DTDM equipment location can be the last DTDM equipment location displayed in Test 1 or Test 3 of **PROC 962**.

To display the default DTDM equipment location, proceed to Step 5.

4. A specific DTDM equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

5. To start Test 3, depress **EXECUTE**.

6. The initiating DTDM circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed.

A TMS time slot number may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.

7. The following information is displayed for the initiating DTDM circuit and the facility or conference port linked to the initiating DTDM circuit:

Field 1 - 3.

Fields 2 through 6 - Initiating DTDM circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 3.

Fields 2 through 6 - Initiating DTDM circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. When a change occurs in the progress mark (Field 9) of the initiating DTDM circuit after **EXECUTE** is depressed, the display is updated as the change occurs. Refer to Table CB for definition of the octal encode.
10. When another initiating DTDM circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating DTDM circuit equipment location:

CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
11. **EXECUTE** must be depressed to display the connection information for the entered initiating DTDM circuit.

TABLE CB.

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
00	TRUNK_IDLE	104	WAIT_TO_SETTLE_11
01	FIRST_DIGIT_DIAL	106	WAIT_TO_SETTLE_1
02	MULT_DIGIT_MATCH	110	TIME_STTR_DTONE
03	SEQ_WAIT_5	112	WAIT_TO_SETTLE_5
04	TIME_ICPT	114	TIME_FOR_CNCT
05	WAIT_TO_SETTLE_2	116	T LIMBO
06	FIRST_DIGIT_MATCH	120	RING_STA_TRUNK
07	SOFT_HOLD	122	SEQ_WAIT_22
10	INCOMING_CALL	124	SEQ_WAIT_23
11	MORE_DIGITS_DIAL	126	SEQ_WAIT_16
12	INSEIZE MATCH	130	TRK_WAIT_NET_1
13	DIAL_ICOM	132	TRK_WAIT_NET_2
14	DIAL_CO_ONE	134	NULL_TESTING
15	SEQ_WAIT_15	136	REJECT_TIMING
16	SEQ_WAIT_2	140	SEQ_WAIT_20
17	SEQ_WAIT_6	142	SEQ_WAIT_21
40	SEQ_WAIT_7	144	DID_DIAL
42	FLASH_TIME_3	146	DID_MATCH_STATE
44	DIAL_CO	150	DID_TONE
46	CO_WAIT_TSLOT	152	DID_WAIT_TSLOT
50	ICOM_RING	154	DID_WAIT_OR
52	SEQ_WAIT_3	156	3WAY_TALK_SST
54	TONE_STA_SOFT_HOLD	160	SEQ_WAIT_11
56	TONE_TRK_SOFT_HOLD	162	SEQ_WAIT_12
60	SEQ_WAIT_4	164	FLASH_TIME_6
62	FLASH_TIME_1	166	3WAY_TALK_SST
64	FLASH_TIME_2	170	SEQ_WAIT_13
66	TALK_ICOM	172	SEQ_WAIT_14
70	SEQ_WAIT_1	174	FLASH_TIME-8
72	TALK_STA_TRUNK	176	3WAY_TALK_SSS
74	FLASH_TIME_5	200	FLASH_TIME_7
76	SEQ_WAIT_17	202	XFER_TRUNK_STA
100	FLASH_TIME_9	204	WAIT_TO_SETTLE_9
102	SEQ_WAIT_18	206	WAIT_TO_SETTLE_7

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
210	FLASH_TIME_4	314	TIE_WAIT_4
212	SEQ_WAIT_10	316	FIRST_DIGIT_TIE
214	WAIT TO SETTLE 10	320	FIRST_MATCH_TIE
216	SEQ_WAIT_8	322	MULTI_DIGIT_TIE
220	SEQ_WAIT_9	324	MULTI_MATCH_TIE
222	DIAL_HOLD	326	TIME_TIE_SEIZE
224	HARD_HOLD	330	TIE_DIAL_ICOM
226	SEQ_WAIT_HOLD	332	TIE_WAIT_8
230	RING_STA_HELD_TK	334	TIE_WAIT_9
232	SEQ_WAIT_RING_TK	336	TIE_WAIT_10
234	TAAS_PM	340	TIE_DISC_1
236	TAAS_WAIT_1	342	TIE_DISC_2
240	G_CAMP_SEQ1	344	DIAL_TIE_TRK
242	G_CAMP_D_TONE3	346	TIE_WAIT_11
244	G_CAMP_D_QT3	350	TONE_FOR_TIE
246	G_CAMP_D_TONE2	352	TRK_WAIT_NET_5
250	G_CAMP_D_QT3	354	CFWD_COLLECT_DIGITS
252	G_CAMP_D_TONE	356	CFWD_ALL_RING
254	G_CAMP_D_TALK	360	CFWD_ATTND_ST1
256	FIRST_DIGIT_0_CWAIT	362	CFWD_ATTND_ST2
260	ORG_CWAIT	364	CFWD_CFIRM_TN_LINE
262	RSTR_CO_CK	366	SEQ_WAIT_DIC
264	RSTR_CO_ONE	370	TELDIC_DIAL_RCT
266	TIE_RSTR_CO_ONE	372	TELDIC_TALK_TT
270	TIE_RSTR_CO_CK	374	SDL_PAGE_DIAL_WAIT
272	TIE_WAIT_2	376	CFM_WAIT_DLPG
274	DR_WAIT_TSLOT	400	SDL_PAGING
276	TIE_WAIT_3	402	AZ_PAGE
300	DR_WAIT_OR	404	ANI_WAIT_1
302	TIME_DELAY_DIAL	406	ANIO_PM_CO
304	TIE_WAIT_5	410	ANIO_PM_CS
306	TIE_WAIT_6	412	TALK_TRUNK_TRUNK
310	TRK_WAIT_NET_4	414	TAND_WAIT_4
312	TIE_WAIT_1	416	TAND_WAIT_5

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
420	TAND_WAIT_6	524	SP_OGT_MATCH
422	CF_TALK	526	SPAD_DIAL
424	FIRST_DIGIT_EXEC	530	SPAD_FIRST_DIAL
426	EXEC_OVRIDE	532	SPAD_FIRST_MATCH
430	DIAL_EXEC	534	SPAD_STA_DIAL
432	EXEC_OVR_ALERT	536	SPAD_MULT_DIAL
434	SEQ_WAIT_ALERT	540	SPAD_MULT_MATCH
436	WAIT_CFIRM	542	SPAD_LAST_DIAL
440	CFWD_ICOM_RING	544	SPAD_TRK_DIAL
442	CFWD-RING_STA_TRK	546	SP_CFIRM
444	CFWD_RING_TIMING	550	SP_WAIT
446	CF_WAIT_1	552	SM_MATCH_8
450	FIRST_DIGIT_CB	554	SM_MATCH_10
452	AUTO_CB_CALLING	556	CTS_DICOM_DIG1
454	MORE_DIGITS_CB	560	CTS_DICOM_DIG2
456	CB_CONFIRM_TONE	562	DSS_BTN_WAIT
460	CB_AWAIT_CTL_DISC	564	DSS_WAIT
462	AUTO_CB_ENABLE_1	566	DSS_CHG_FIRST_DIG
464	AUTO_CB_ENABLE_2	570	DSS_CHG_FIRST_MTCH
466	RING_CB_WAIT_1	572	DSS_CHG_MULTI_DIAL
470	RING_CB_CLG_STA	574	ENT_OGT_1
472	RING_CB_WAIT_2	576	ENT_OGT_2
474	CI_DIAL	600	IN_OGTO
476	CIAD_FIRST_DIAL	602	OGT_ALRT_1
500	CIAD_FIRST_MATCH	604	TIME_RTRY
502	CIAD_MULT_DIAL	606	OGT_WAIT_1
504	CIAD_DIAL	610	OGT_MATCH
506	CI_CFIRM	612	RA_WAIT_TSLOT
510	CI_WAIT	614	RA_WAIT_1
512	SP_DIAL	616	RA_WAIT_2
514	SP_FIRST_MATCH	620	RA_WAIT_OR
516	SP_MULT_DIAL	622	RA_WAIT_3
520	SEQ_WAIT_SC	624	RA_DIAL_COMB
522	CCSA_SP_DIAL	626	REM_ACC_CALL

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
630	RA_WAIT_4	734	SM_MATCH_7
632	RA_WAIT_IDLE	736	TRK_WAIT_NET_11
634	ATTN_DIAL_AUTH	740	TRK_WAIT_NET_12
636	TIE_WAIT_7	742	TRK_WAIT_NET_13
640	TIE_TONE	744	TRK_WAIT_NET_14
642	DIAL_CCSA	746	TRK_WAIT_NET_15
644	TAND_WAIT_1	750	SM_DIAL_2
646	TAND_WAIT_2	752	SM_MATCH_2
650	TIE_DIAL_CCSA	754	SM_DIAL_3
652	TIE_DIAL_CO	756	SM_MATCH_3
654	TAND_WAIT_3	760	SM_DIAL_9
656	TIE_DIAL_CO_ONE	762	SM_MATCH_9
660	TAND_WAIT_7	764	TALK_STA_TRUNK_RCL
662	TAND_WAIT_8	766	3WAY_TALK_SST_RCL
664	TIE_DIAL_TIE	770	3WAY_TALK_SST_RCL
666	TAND_WAIT_9	772	TALK_TRUNK_TRUNK_RCL
670	TAND_DISC_1	774	TMRCL_TONE
672	TAND_DISC_2	776	TMRCL_WAIT
674	TAND_DISC_3	1000	DID_RC
676	TAND_DISC_4	1002	RC_PLAY
700	TRK_WAIT_NET_3	1004	SEQ_WAIT_RC
702	TRK_WAIT_NET_6	1006	SM_MATCH_11
704	TRK_WAIT_NET_7	1010	SM_MATCH_ARS
706	TRK_WAIT_NET_8	1012	ARS_DIAL
710	SM_ORDER_1	1014	ARS_OGT_MATCH
712	SM_ORDER_2	1016	ARS_WAIT_1
714	SM_DIAL_1	1020	ARS_DIAL_CO
716	SM_MATCH_1	1022	ARS_TIME_CNCT
720	SM_MATCH_4	1024	ARS_WARNING_TONE
722	SM_DIAL_5	1026	ARS_TIE_DIAL
724	SM_MATCH_5	1030	ARS_TIE_DIAL_CO
726	SM_DIAL_6	1032	SM_MATCH_TIE_ARS
730	SM_MATCH_6	1034	TTRS_INIT
732	SM_DIAL_7	1036	TTST_STATE_1

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1040	TTST_STATE_2	1144	ATT_TRK_WAIT
1042	DT_TEST_STATE	1146	P_HOLD_THRU_D
1044	MISC_TEST_STATE	1150	ATT_HOLD_OR1
1046	IN_QUE	1152	ATT_HOLD_OR2
1050	AT_ORIG	1154	ATT_HOLD_OR3
1052	ALERT_G	1156	P_HOLD_G_D_RNG
1054	ALERT_GD	1160	P_HOLD_G_D
1056	TALK_G_ONLY	1162	RECALL_GD
1060	G_PTY_DIAL_D1_REM	1164	F_TIME_GD_G_PTY
1062	A_ORIG_DIAL_D1_REM	1166	F_TIME_GD_D_PTY
1064	MATCH_G_ONLY	1170	F_TM_P_HOLD_GD_RNG
1066	MATCH_ORIG	1172	TRK_WAIT_NET_9
1070	TALK_G_D	1174	TRK_WAIT_NET_10
1072	TALK_D_ONLY	1176	G_CAMP_A_TONE
1074	RING_D_ONLY	1200	G_CAMP_A_TALK
1076	RING_G_D	1202	G_CAMP_D_UTONE_A_HLD
1100	TALK_D_TONE	1204	G_CAMP_A_HOLD
1102	TALK_G_D_TONE	1206	G_FLASH_A_HOLD
1104	P_HOLD_G_ONLY	1210	WAIT_FOR_BEEP
1106	F_TIME_G_ONLY	1212	G_CAMP_D_UTONE1_A_HD
1110	T_HOLD_G_D_RNG	1214	G_CAMP_D_UTONE2_A_HD
1112	F_TIME_G_D_RNG	1216	TALK_G_D_PRTY
1114	WAIT_ANS_1	1220	LISTEN_CONF_TONE
1116	CODE_MATCH_G_PTY	1222	TRK_CODE_ACT_TGA
1120	CODE_MATCH_A_ORIG	1224	TRK_CODE_CNL_TGA
1122	WAIT_SEIZE_2	1226	BV_START
1124	WAIT_SEIZE_3	1230	BV_DIAL
1126	DIAL_TRK_G_PRY	1232	BV_INIT_TONE
1130	DIAL_TRK_A_ORIG	1234	BV_TALK_NO_TONE
1132	DIAL_CODE_G_PPY	1236	BV_TALK_W_TONE
1134	DIAL_CODE_A_ORIG	1240	BV_ICOM
1136	ATTD_WAIT	1242	BV_ST_TR
1140	ATTD_DR_WAIT	1244	G_PTY_DIAL_TIE_D1
1142	ATT_CP_WAIT	1246	G_PTY_DIAL_TIE

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1250	A_ORIG_DIAL_TIE	1354	G_PPY_CCSA_D1
1252	WAIT_AUTO_TIE_1	1356	MERGE_CCSA
1254	WAIT_DIAL_TIE_1	1360	P_HOLD_DIAL_CCSA
1256	G_WAIT_DIAL_TIE_1	1362	HOLD_CCSA_1
1260	G_WAIT_AUTO_TIE_1	1364	HOLD_CCSA_2
1262	MERGE_TIE_ATT	1366	IPC_ALERT_G
1264	MONITOR_TIE_ANS	1370	IPC_ALERT_GD
1266	HOLD_DIAL_TIE_ATT	1372	IPC_ATT_DIAL
1270	HOLD_TIE_THRU	1374	IPC_ATT_DIAL_G
1272	HOLD_MERGE_TIE_ATT	1376	IPC_PHOLD_G_GA
1274	CTR_LN_1	1400	IPC_PHOLD-G_SA
1276	CTR_LN_2	1402	IPC_PHOLD_GA
1300	CTR_GP_1	1404	IPC_PHOLD_SA
1302	CTR_GP_2	1406	IPC_PHOLD_GD_GA
1304	CTR_GP_TIME	1410	IPC_PHOLD_GD_SA
1306	SDL_PAGE_FLASH	1420	IPC_RING_A
1310	ADL_PAGE_DIAL_WAIT	1422	IPC_RING_AG
1312	ADL_PAGE_DC	1424	IPC_STA_DIAL
1314	ADL_PAGING	1426	IPC_TALK_G_GA
1316	AB_DIAL_WAIT	1430	IPC_TALK_G_SA
1320	CFM_WAIT_AB	1432	IPC_TALK_GD_DA
1322	HOLD_AB_RING	1434	IPC_TALK_GD_GA
1324	AB_RING_D_ONLY	1436	PRIORITY_CALL
1326	SM_DIAL_4	1440	ALERT_CF
1330	TRK_WAIT_NET_16	1442	TALK_CF
1332	TRK_WAIT_NET_17	1444	DIAL_CF
1334	NT_STN_ST1	1446	TALK_CF_TONE
1336	NT_STA_ST2	1450	MATCH_CF
1340	CO_NITE_ST	1452	DIAL_CODE_CF
1342	TT_DIAL	1454	CODE_MATCH_CF
1344	TT_GOON	1456	WAIT_SEIZE_CF
1346	TT_ST_TR	1460	RING_CF
1350	TT_TR_TR	1462	RING_CF_TALK
1352	DIAL_CCSA_D1	1464	P_HOLD_RING_CF

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1466	TALK_D_CF	1506	CF_DIAL_TIE
1470	P_HOLD_D_CF	1510	SM_MATCH_12
1472	P_HOLD_CF	1512	SM_MATCH_13
1474	TALK_GD_CF_TONE	1514	CF_DIAL_SMDR
1476	DIAL_TRK_CF	1516	TALK_CF_RETON
1500	CF_WAIT_AUTO_TIE_1	1520	ALERT_TMRCL
1502	DIAL_CCSA_CF	1522	TALK_TMRCL
1504	CF_WAIT_DIAL_TIE_1	1524	HOLD_TMRCL

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PROC 999

5. Once a software table is accessed, the next word in sequence can be displayed by depressing **NEXT DATA**.

The address is automatically incremented by one, and the data contents of the new address are displayed.

To display the data contents of all memory addresses beginning with memory address **00000001**, perform the following:

1. Depress **PROC NO; 999; ENTER**.
2. Depress **NEXT DATA**.

The address and word contents are displayed in the address and data fields (Fields 1 and 2).

Note: The word has bad parity if 999999 is displayed in the data field (Field 2).

3. Depressing **NEXT DATA** repeatedly steps through all memory addresses and displays the data contents of each memory address.

SWITCH COMPONENT REPLACEMENT

GENERAL

This section provides a brief description of the switch cabinets and carriers and contains instructions for replacement of switch components.

Replacement of switch components and other maintenance tasks referenced from maintenance procedures consist of the following:

1. Circuit pack replacements for:
 - a. Unduplicated common control carrier circuit packs.
 - b. Duplicated common control carrier circuit packs.
 - c. TMS or module control carrier circuit packs.
 - d. Port carrier circuit packs.
 - e. Unduplicated common control DC/DC converter unit and duplicated common control power carrier circuit packs.
 - f. Remote carrier group housing unit.
2. Circuit pack switch option settings.
3. High Capacity Mini-recorder (HCMR) circuit pack replacement.
4. Cleaning HCMR tape head and capstan.
5. HCMR replacement.
6. 309A or 310A power supply replacement.
7. Bulk on-line switcher (OLS) power supply replacement.
8. 3965-2 battery charger replacement.
9. Frequency generator replacement.
10. DC fan and fan assembly replacement.
11. TMS/RMI cabinet AC distribution unit replacement.
12. Module control or port cabinet AC distribution unit replacement.
13. DC filter replacement.
14. Console component replacement.
15. Alarm panel replacement.
16. AEH4 alarm board replacement.

EQUIPMENT CONFIGURATION

Overview

The switch consists of various arrangements of the four basic cabinets. One or more auxiliary cabinets may be provided for mounting peripheral equipment. The Station Message Detail Recorder (SMDR) cabinet, when provided and connected to the switch, is also part of the switch.

A typical System 85 equipment configuration (refer to Figure 24) consists of a common control cabinet, one or more module control cabinets, a TMS/RMI cabinet, and one or more port cabinets.

Figure 25 illustrates a typical module/cabinet/carrier numbering scheme for an expanded duplicated multimodule system.

Common Control Cabinet

The common control cabinet can be either an unduplicated common control cabinet or a duplicated common control cabinet.

Unduplicated Common Control Cabinet

An unduplicated common control cabinet contains the common control carrier and up to three port carriers and/or DS-1/MFAT carriers. The common control carrier and a High Capacity Mini-recorder (HCMR) make up the control complex.

An unduplicated common control cabinet (refer to Figure 26) contains the following equipment:

1. An unduplicated alarm panel and thermal assembly (sensor).
2. Up to three port carriers and/or DS-1/MFAT carriers.
3. One common control carrier.
4. A fan assembly and alarm board.
5. One battery reserve unit.

Note: When equipped with extended power reserve, the battery reserve unit is not included.

6. A frequency generator.
7. One HCMR.
8. One DC/DC converter unit.
9. A DC filter.

PROC 962 - FACILITY CONNECTIONS

FLIPCHART ISSUE 3		+		+		FACILITY CONNECTIONS		+		+		845552223	
FIELD LIMITS (CONTINUED): FLD 10: INTERNATIONAL NBR TYPE 1 = INTERNATIONAL NBR 2 = QUEUING TRK 3 = ICOM RECORD 4 = ATND SWITCH LOOP 5 = ATND OR 6 = DIAL PULSE OR FLD 16: HOW LINKED 1 = TRK-FAC1 2 = TRK-FAC2 3 = TRK-FAC3 4 = TERMINAL 6 = TERMINAL-CONFERENCE CFAC1-8													
WORD 0												FACILITY CONNECTION 962	

FLIPCHART ISSUE 3		+		+		FACILITY CONNECTIONS		+		+		845552223						
TEST 1 AND 2 ARE IDENTICAL-EXCEPT TEST 1 DISPLAYS A COPY OF THE CONNECTION INFO MADE WHEN 'EXECUTE' WAS PRESSED & TEST 2 DISPLAYS EXISTING CONNECTION INFO. USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT FACILITY OR CONFERENCE PORT. USE 'CLEAR DATA' 'EXECUTE' TO MOVE FAC OR CONF. PORT FLD TO INIT CIRCUIT FIELD. SEE NOTE 1.						NOTE 1. ALTHOUGH TEST 2 IS DYNAMIC, THE FACILITY OF CONFERENCE DISPLAY IS ONLY CURRENT WHEN THE EXECUTE BUTTON IS PUSHED. 2. WHEN A MULTI MODULE CALL IS MADE, A TMS TIMESLOT IS DISPLAYED IN EQUIPMENT LOCATION FIELD. MOD/CAB/CKT IS DASHED. CARRIER/SLOT CONTAINS TMS TIMESLOT.						FIELD LIMITS: FIELD 7 AND 17 CIRCUIT TYPE 0 = UNEQPT, 1 = TERMINAL 2 = TRUNK, 3 = 72 SERIES TERMINAL: FOR TEST 1 A 2 DTD: M: FOR TEST 3 4 = TMS 5 = PSEUDO TRK		FLD 8 STATUS 0 = NON-CONTROL, NON CONF 1 = IN-CONTROL, NON-CONF 2 = NON-CONTROL, IN CONF 3 = IN CONTROL, IN CONF 4 = NOT ON TIME SLOT 5 = INVALID LOCATION 6 = MAINTENANCE BUSY 7 = UNEQPT CIRCUIT (CONTINUED ON WORD 0)				
TEST 3 IS A SPECIAL CASE OF TEST 2. IT IS USED TO DISPLAY EXISTING CONNECTION INFORMATION FOR DTD M EQUIPMENT LOCATIONS.																		
TEST NO	INITIATING CIRCUIT					STATUS	PROGRESS MARK (OCTAL)	INT NUM	TYPE	FACILITY OR CONFERENCE PORT								FACILITY CONNECTION 962
	EQUIPMENT LOCATION									EQUIPMENT LOCATION								
	MODULE	CAB	CARR	SLOT	CKT					MODULE	CAB	CARR	SLOT	CKT	HOW LINKED	CKT TYPE	CONF PORT NO	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

Purpose

PROC 962 is used to display the trunk number linkages for line records and the facility and conference facility linkages for trunk records.

PROC 962 also displays the progress mark and linkage information for an entered equipment location.

Field Definitions and Codes

Each field of **PROC 962** flipchart and the possible displays for the fields during execution of the different tests are defined in Table CA, PROC 962 - Field Definitions and Codes.

Optional input fields are:

1. Field 1 - Change test number.
2. Fields 2 through 6 - Select a specific equipment location to determine the facility connection information.

TABLE CA.

PROC 962 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
1	1-3	Test number.	8 (Contd)	5	Invalid location.
2-6		Initiating circuit equipment location:		6	Maintenance busy.
				7	Unequipped circuit.
2	0-30	Module number.	9	0-2047	Progress mark (octal).
3	0-6	Cabinet number.			
4	0-3	Carrier number.	10	1-6	Internal number type:
5	0-21	Slot number.		1	Internal number.
6	0-7	Circuit number.		2	Queuing trunk.
7	0-5	Circuit type:		3	Intercom (ICOM) record.
	0	Unequipped.		4	Attendant switch loop.
	1	Line.		5	Attendant originating register.
	2	Trunk.		6	Dial pulse originating register.
	3	72 series terminal for Test 1 and Test 2; DTDM for Test 3.			
	4	TMS.	11-15		Facility or conference port equipment location:
	5	Pseudo trunk.		0-30	Module number.
				0-7	Cabinet number.
8	0-7	Status:	12		
	0	Noncontrol, nonconference.	13	1-3	Carrier number.
	1	In control, nonconference.	14	0-21	Slot number.
	2	Noncontrol, in conference.	15	0-7	Circuit number.
	3	In control, in conference.	11-15		TMS time slot number for a multi-module call:
	4	Not on time slot.		Dashed	Not applicable for TMS time slot.

TABLE CA. (Contd)

PROC 962 FIELD DEFINITIONS AND CODES					
FIELD	CODE	DEFINITION	FIELD	CODE	DEFINITION
11-15 (Contd)		TMS time slot number for a multi-module call (Contd):	16 (Contd)	6	Station - Conference (Conference facility 1 through 8).
13 and 14 15	1-511	TMS time slot number. (Fields 13 and 14 are read as one Field.)	17	0-5	Circuit type:
	Dashed	Not applicable for TMS time slot.		0	Unequipped.
16				1	Line.
				2	Trunk.
	1-6	How linked:		3	DTDM if initiating equipment location is a digital modem pool port; otherwise 72 series terminal.
	1	Trunk - facility 1.		4	TMS.
	2	Trunk - facility 2.		5	Pseudo trunk.
	3	Trunk - facility 3.	18	1-8	Conference port number.
	4	Station.			
	5	Not used.			

Operation of Procedure

Overview

PROC 962 is used to determine the facility connections.

To call in **PROC 962**, perform the following:

1. Depress **PROC NO; 962; ENTER**.
2. Test 1 is automatically selected.
Field 1 displays a 1, Field 2 is blanked and blinking, and all other fields are dashed.
3. Depressing **NEXT TEST** repeatedly advances the procedure to the desired test.

Three tests are available:

1. Test 1 - A static test that displays a copy of the connection information for an initiating equipment location.

PROC 962, Test 1

2. Test 2 - A dynamic test that continually updates the progress mark of the initiating equipment location.
3. Test 3 - A dynamic test that continually updates the progress mark of the initiating DTDM equipment location.

Test 1

Test 1 is a static test that displays a copy of the connection information for an initiating circuit.

The connection information is not updated until **EXECUTE** is depressed again.

1. Test 1 is the default test when entering **PROC 962** or is selected by use of **NEXT TEST**.
2. When Test 1 is initially called in, a default equipment location may be displayed in Fields 2 through 6.
Field 2 (module) is blinking, indicating an optional entry field.
3. The default equipment location can be the last equipment location displayed in Test 2 or 3 of **PROC 962**.

To display the default equipment location, proceed to Step 5.

4. A specific equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
5. To start Test 1, depress **EXECUTE**.
6. The initiating circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed. A TMS time slot may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.
7. The following information is displayed for the initiating circuit and the facility or conference port linked to the initiating circuit:

Field 1 - 1.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 1.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. If the initiating circuit is a trunk record, depressing **NEXT CIRCUIT** repeatedly steps through all the facilities that are linked.
10. If the initiating circuit is a conference record, depressing **NEXT CIRCUIT** repeatedly steps through all equipment locations on the conference.
The conference port number is displayed in Field 18.
11. When all facilities or conference records are displayed, depressing **NEXT CIRCUIT** again dashes Fields 10 through 18.
Depressing **NEXT CIRCUIT** once more restores the display to its initial state.
12. When a facility or conference port equipment location is displayed, depressing **CLEAR DATA; EXECUTE** transfers the facility or conference port equipment location to the initiating circuit equipment location.

Note: A TMS time slot number **cannot** be transferred to the initiating circuit equipment location.

13. After transfer, depressing **EXECUTE** displays the new facility or conference port equipment location associated with the new initiating circuit equipment location.
14. When Fields 11 through 15 display an ICOM record (Field 10 = 3), depressing **CLEAR DATA; EXECUTE** is used to display the facilities on the connection.
15. The facilities on the connection are displayed by depressing **EXECUTE** and **NEXT CIRCUIT**.
16. When another initiating circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating circuit equipment location:
CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
17. **EXECUTE** must be depressed to display a copy of the connection information for the entered initiating circuit.

PROC 962, Test 2

Test 2

Test 2 is a dynamic test that continually updates the progress mark of the initiating circuit.

Test 2 is similar to Test 1 except that the connection information is displayed every time the progress mark changes, instead of only when depressing **EXECUTE**.

1. Test 2 is selected by use of **NEXT TEST**.
2. When Test 2 is initially called in, a default equipment location may be displayed in Fields 2 through 6.
Field 2 (module) is blinking, indicating an optional entry field.
3. The default equipment location can be the last equipment location displayed in Test 1 or Test 3 of **PROC 962**.

To display the default equipment location, proceed to Step 5.

4. A specific equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
5. To start Test 2, depress **EXECUTE**.
6. The initiating circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed. A TMS time slot number may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.
7. The following information is displayed for the initiating circuit and the facility or conference port linked to the initiating circuit:

Field 1 - 2.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 2.

Fields 2 through 6 - Initiating circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. If the initiating circuit is a trunk record, depressing **NEXT CIRCUIT** repeatedly steps through all the facilities that are linked.
10. If the initiating circuit is a conference record, depressing **NEXT CIRCUIT** repeatedly steps through all equipment locations on the conference.
The conference port number is displayed in Field 18.
11. When all facilities or conference records are displayed, depressing **NEXT CIRCUIT** again dashes Fields 10 through 18.
Depressing **NEXT CIRCUIT** once more restores the display to its initial state.
12. When a facility or conference port equipment location is displayed, depressing **CLEAR DATA; EXECUTE** transfers the facility or conference port equipment location to the initiating circuit equipment location.

Note: A TMS time slot number **cannot** be transferred to the initiating circuit equipment location.

13. After transfer, depressing **EXECUTE** displays the new facility or conference port equipment location associated with the new initiating circuit equipment location.
14. When Fields 11 through 15 display an ICOM record (Field 10 = 3), depressing **CLEAR DATA; EXECUTE** is used to display the facilities on the connection.
15. The facilities on the connection are displayed by depressing **EXECUTE** and **NEXT CIRCUIT**.
16. When a change occurs in the progress mark (Field 9) of the initiating circuit after **EXECUTE** is depressed, the display is updated as the change occurs. Refer to Table CB for definition of the octal encode.
17. When another initiating circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating circuit equipment location:
CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
18. **EXECUTE** must be depressed to display the connection information for the entered initiating circuit.

PROC 962, Test 3

Test 3

Test 3 is a dynamic test that continually updates the progress mark of the initiating DTDM circuit.

Test 3 is similar to Test 1 except that the connection information is displayed every time the progress mark changes, instead of only when depressing **EXECUTE**.

Note: A facility or conference port equipment location (Fields 11 through 15) **cannot** be transferred to the initiating DTDM circuit equipment location.

1. Test 3 is selected by use of **NEXT TEST**.
2. When Test 3 is initially called in, a default DTDM equipment location may be displayed in Fields 2 through 6.

Field 2 (module) is blinking, indicating an optional entry field.

3. The default DTDM equipment location can be the last DTDM equipment location displayed in Test 1 or Test 3 of **PROC 962**.

To display the default DTDM equipment location, proceed to Step 5.

4. A specific DTDM equipment location can be selected for display by entering the following:
(Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.

5. To start Test 3, depress **EXECUTE**.

6. The initiating DTDM circuit and its status and the facility or conference port data linked to the initiating circuit is provided when **EXECUTE** is depressed.

A TMS time slot number may be displayed in the facility or conference port equipment location (Fields 13 and 14) if a multi-module call has been made.

7. The following information is displayed for the initiating DTDM circuit and the facility or conference port linked to the initiating DTDM circuit:

Field 1 - 3.

Fields 2 through 6 - Initiating DTDM circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Field 10 - Internal number type (1 - indicating internal number when Field 17 = 5) or dashed.

Fields 11 through 15 - Facility or conference port equipment location or dashed.

Field 16 - How the facility or conference port is linked.

Field 17 - Facility or conference port circuit type or dashed.

Field 18 - Conference port number or dashed.

8. The following information is displayed when a multi-module call has been made:

Field 1 - 3.

Fields 2 through 6 - Initiating DTDM circuit equipment location.

Field 7 - Initiating circuit type.

Field 8 - Initiating circuit status.

Field 9 - Progress mark (octal).

Note: Refer to Table CB for definition of the octal encode.

Fields 10 through 12 - Dashed.

Fields 13 and 14 - TMS time slot number.

Note: Fields 13 and 14 are read as one field to obtain the TMS time slot number.

Fields 15 through 18 - Dashed.

9. When a change occurs in the progress mark (Field 9) of the initiating DTDM circuit after **EXECUTE** is depressed, the display is updated as the change occurs. Refer to Table CB for definition of the octal encode.
10. When another initiating DTDM circuit equipment location is to be displayed, the **CHANGE FIELD** sequence must be used to select the specific initiating DTDM circuit equipment location:

CHANGE FIELD; 2; ENTER; (Module number); ENTER; (Cabinet number); ENTER; (Carrier number); ENTER; (Slot number); ENTER; (Circuit number); ENTER.
11. **EXECUTE** must be depressed to display the connection information for the entered initiating DTDM circuit.

TABLE CB.

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
00	TRUNK_IDLE	104	WAIT_TO_SETTLE_11
01	FIRST_DIGIT_DIAL	106	WAIT_TO_SETTLE_1
02	MULT_DIGIT_MATCH	110	TIME_STTR_DTONE
03	SEQ_WAIT_5	112	WAIT_TO_SETTLE_5
04	TIME_ICPT	114	TIME_FOR_CNCT
05	WAIT_TO_SETTLE_2	116	T LIMBO
06	FIRST_DIGIT_MATCH	120	RING_STA_TRUNK
07	SOFT_HOLD	122	SEQ_WAIT_22
10	INCOMING_CALL	124	SEQ_WAIT_23
11	MORE_DIGITS_DIAL	126	SEQ_WAIT_16
12	INSEIZE_MATCH	130	TRK_WAIT_NET_1
13	DIAL_ICOM	132	TRK_WAIT_NET_2
14	DIAL_CO_ONE	134	NULL_TESTING
15	SEQ_WAIT_15	136	REJECT_TIMING
16	SEQ_WAIT_2	140	SEQ_WAIT_20
17	SEQ_WAIT_6	142	SEQ_WAIT_21
40	SEQ_WAIT_7	144	DID_DIAL
42	FLASH_TIME_3	146	DID_MATCH_STATE
44	DIAL_CO	150	DID_TONE
46	CO_WAIT_TSLOT	152	DID_WAIT_TSLOT
50	ICOM_RING	154	DID_WAIT_OR
52	SEQ_WAIT_3	156	3WAY_TALK_SST
54	TONE_STA_SOFT_HOLD	160	SEQ_WAIT_11
56	TONE_TRK_SOFT_HOLD	162	SEQ_WAIT_12
60	SEQ_WAIT_4	164	FLASH_TIME_6
62	FLASH_TIME_1	166	3WAY_TALK_SST
64	FLASH_TIME_2	170	SEQ_WAIT_13
66	TALK_ICOM	172	SEQ_WAIT_14
70	SEQ_WAIT_1	174	FLASH_TIME-8
72	TALK_STA_TRUNK	176	3WAY_TALK_SSS
74	FLASH_TIME_5	200	FLASH_TIME_7
76	SEQ_WAIT_17	202	XFER_TRUNK_STA
100	FLASH_TIME_9	204	WAIT_TO_SETTLE_9
102	SEQ_WAIT_18	206	WAIT_TO_SETTLE_7

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
210	FLASH_TIME_4	314	TIE_WAIT_4
212	SEQ_WAIT_10	316	FIRST_DIGIT_TIE
214	WAIT TO SETTLE 10	320	FIRST_MATCH_TIE
216	SEQ_WAIT_8	322	MULTI_DIGIT_TIE
220	SEQ_WAIT_9	324	MULTI_MATCH_TIE
222	DIAL_HOLD	326	TIME_TIE_SEIZE
224	HARD_HOLD	330	TIE_DIAL_ICOM
226	SEQ_WAIT_HOLD	332	TIE_WAIT_8
230	RING_STA_HELD_TK	334	TIE_WAIT_9
232	SEQ_WAIT_RING_TK	336	TIE_WAIT_10
234	TAAS_PM	340	TIE_DISC_1
236	TAAS_WAIT_1	342	TIE_DISC_2
240	G_CAMP_SEQ1	344	DIAL_TIE_TRK
242	G_CAMP_D_TONE3	346	TIE_WAIT_11
244	G_CAMP_D_QT3	350	TONE_FOR_TIE
246	G_CAMP_D_TONE2	352	TRK_WAIT_NET_5
250	G_CAMP_D_QT3	354	CFWD_COLLECT_DIGITS
252	G_CAMP_D_TONE	356	CFWD_ALL_RING
254	G_CAMP_D_TALK	360	CFWD_ATTND_ST1
256	FIRST_DIGIT_0_CWAIT	362	CFWD_ATTND_ST2
260	ORG_CWAIT	364	CFWD_CFIRM_TN_LINE
262	RSTR_CO_CK	366	SEQ_WAIT_DIC
264	RSTR_CO_ONE	370	TELDIC_DIAL_RCT
266	TIE_RSTR_CO_ONE	372	TELDIC_TALK_TT
270	TIE_RSTR_CO_CK	374	SDL_PAGE_DIAL_WAIT
272	TIE_WAIT_2	376	CFM_WAIT_DLPG
274	DR_WAIT_TSLOT	400	SDL_PAGING
276	TIE_WAIT_3	402	AZ_PAGE
300	DR_WAIT_OR	404	ANI_WAIT_1
302	TIME_DELAY_DIAL	406	ANIO_PM_CO
304	TIE_WAIT_5	410	ANIO_PM_CS
306	TIE_WAIT_6	412	TALK_TRUNK_TRUNK
310	TRK_WAIT_NET_4	414	TAND_WAIT_4
312	TIE_WAIT_1	416	TAND_WAIT_5

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
420	TAND_WAIT_6	524	SP_OGT_MATCH
422	CF_TALK	526	SPAD_DIAL
424	FIRST_DIGIT_EXEC	530	SPAD_FIRST_DIAL
426	EXEC_OVRIDE	532	SPAD_FIRST_MATCH
430	DIAL_EXEC	534	SPAD_STA_DIAL
432	EXEC_OVR_ALERT	536	SPAD_MULT_DIAL
434	SEQ_WAIT_ALERT	540	SPAD_MULT_MATCH
436	WAIT_CFIRM	542	SPAD_LAST_DIAL
440	CFWD_ICOM_RING	544	SPAD_TRK_DIAL
442	CFWD-RING_STA_TRK	546	SP_CFIRM
444	CFWD_RING_TIMING	550	SP_WAIT
446	CF_WAIT_1	552	SM_MATCH_8
450	FIRST_DIGIT_CB	554	SM_MATCH_10
452	AUTO_CB_CALLING	556	CTS_DICOM_DIG1
454	MORE_DIGITS_CB	560	CTS_DICOM_DIG2
456	CB_CONFIRM_TONE	562	DSS_BTN_WAIT
460	CB_AWAIT_CTL_DISC	564	DSS_WAIT
462	AUTO_CB_ENABLE_1	566	DSS_CHG_FIRST_DIG
464	AUTO_CB_ENABLE_2	570	DSS_CHG_FIRST_MTCH
466	RING_CB_WAIT_1	572	DSS_CHG_MULTI_DIAL
470	RING_CB_CLG_STA	574	ENT_OGT_1
472	RING_CB_WAIT_2	576	ENT_OGT_2
474	CI_DIAL	600	IN_OGTO
476	CIAD_FIRST_DIAL	602	OGT_ALRT_1
500	CIAD_FIRST_MATCH	604	TIME_RTRY
502	CIAD_MULT_DIAL	606	OGT_WAIT_1
504	CIAD_DIAL	610	OGT_MATCH
506	CI_CFIRM	612	RA_WAIT_TSLOT
510	CI_WAIT	614	RA_WAIT_1
512	SP_DIAL	616	RA_WAIT_2
514	SP_FIRST_MATCH	620	RA_WAIT_OR
516	SP_MULT_DIAL	622	RA_WAIT_3
520	SEQ_WAIT_SC	624	RA_DIAL_COMB
522	CCSA_SP_DIAL	626	REM_ACC_CALL

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
630	RA_WAIT_4	734	SM_MATCH_7
632	RA_WAIT_IDLE	736	TRK_WAIT_NET_11
634	ATTN_DIAL_AUTH	740	TRK_WAIT_NET_12
636	TIE_WAIT_7	742	TRK_WAIT_NET_13
640	TIE_TONE	744	TRK_WAIT_NET_14
642	DIAL_CCSA	746	TRK_WAIT_NET_15
644	TAND_WAIT_1	750	SM_DIAL_2
646	TAND_WAIT_2	752	SM_MATCH_2
650	TIE_DIAL_CCSA	754	SM_DIAL_3
652	TIE_DIAL_CO	756	SM_MATCH_3
654	TAND_WAIT_3	760	SM_DIAL_9
656	TIE_DIAL_CO_ONE	762	SM_MATCH_9
660	TAND_WAIT_7	764	TALK_STA_TRUNK_RCL
662	TAND_WAIT_8	766	3WAY_TALK_SST_RCL
664	TIE_DIAL_TIE	770	3WAY_TALK_SST_RCL
666	TAND_WAIT_9	772	TALK_TRUNK_TRUNK_RCL
670	TAND_DISC_1	774	TMRCL_TONE
672	TAND_DISC_2	776	TMRCL_WAIT
674	TAND_DISC_3	1000	DID_RC
676	TAND_DISC_4	1002	RC_PLAY
700	TRK_WAIT_NET_3	1004	SEQ_WAIT_RC
702	TRK_WAIT_NET_6	1006	SM_MATCH_11
704	TRK_WAIT_NET_7	1010	SM_MATCH_ARS
706	TRK_WAIT_NET_8	1012	ARS_DIAL
710	SM_ORDER_1	1014	ARS_OGT_MATCH
712	SM_ORDER_2	1016	ARS_WAIT_1
714	SM_DIAL_1	1020	ARS_DIAL_CO
716	SM_MATCH_1	1022	ARS_TIME_CNCT
720	SM_MATCH_4	1024	ARS_WARNING_TONE
722	SM_DIAL_5	1026	ARS_TIE_DIAL
724	SM_MATCH_5	1030	ARS_TIE_DIAL_CO
726	SM_DIAL_6	1032	SM_MATCH_TIE_ARS
730	SM_MATCH_6	1034	TTRS_INIT
732	SM_DIAL_7	1036	TTST_STATE_1

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1040	TTST_STATE_2	1144	ATT_TRK_WAIT
1042	DT_TEST_STATE	1146	P_HOLD_THRU_D
1044	MISC_TEST_STATE	1150	ATT_HOLD_OR1
1046	IN_QUE	1152	ATT_HOLD_OR2
1050	AT_ORIG	1154	ATT_HOLD_OR3
1052	ALERT_G	1156	P_HOLD_G_D_RNG
1054	ALERT_GD	1160	P_HOLD_G_D
1056	TALK_G_ONLY	1162	RECALL_GD
1060	G_PTY_DIAL_D1_REM	1164	F_TIME_GD_G_PTY
1062	A_ORIG_DIAL_D1_REM	1166	F_TIME_GD_D_PTY
1064	MATCH_G_ONLY	1170	F_TM_P_HOLD_GD_RNG
1066	MATCH_ORIG	1172	TRK_WAIT_NET_9
1070	TALK_G_D	1174	TRK_WAIT_NET_10
1072	TALK_D_ONLY	1176	G_CAMP_A_TONE
1074	RING_D_ONLY	1200	G_CAMP_A_TALK
1076	RING_G_D	1202	G_CAMP_D_UTONE_A_HLD
1100	TALK_D_TONE	1204	G_CAMP_A_HOLD
1102	TALK_G_D_TONE	1206	G_FLASH_A_HOLD
1104	P_HOLD_G_ONLY	1210	WAIT_FOR_BEEP
1106	F_TIME_G_ONLY	1212	G_CAMP_D_UTONE1_A_HD
1110	T_HOLD_G_D_RNG	1214	G_CAMP_D_UTONE2_A_HD
1112	F_TIME_G_D_RNG	1216	TALK_G_D_PRTY
1114	WAIT_ANS_1	1220	LISTEN_CONF_TONE
1116	CODE_MATCH_G_PTY	1222	TRK_CODE_ACT_TGA
1120	CODE_MATCH_A_ORIG	1224	TRK_CODE_CNL_TGA
1122	WAIT_SEIZE_2	1226	BV_START
1124	WAIT_SEIZE_3	1230	BV_DIAL
1126	DIAL_TRK_G_PRY	1232	BV_INIT_TONE
1130	DIAL_TRK_A_ORIG	1234	BV_TALK_NO_TONE
1132	DIAL_CODE_G_PPY	1236	BV_TALK_W_TONE
1134	DIAL_CODE_A_ORIG	1240	BV_ICOM
1136	ATTD_WAIT	1242	BV_ST_TR
1140	ATTD_DR_WAIT	1244	G_PTY_DIAL_TIE_D1
1142	ATT_CP_WAIT	1246	G_PTY_DIAL_TIE

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1250	A_ORIG_DIAL_TIE	1354	G_PPY_CCSA_D1
1252	WAIT_AUTO_TIE_1	1356	MERGE_CCSA
1254	WAIT_DIAL_TIE_1	1360	P_HOLD_DIAL_CCSA
1256	G_WAIT_DIAL_TIE_1	1362	HOLD_CCSA_1
1260	G_WAIT_AUTO_TIE_1	1364	HOLD_CCSA_2
1262	MERGE_TIE_ATT	1366	IPC_ALERT_G
1264	MONITOR_TIE_ANS	1370	IPC_ALERT_GD
1266	HOLD_DIAL_TIE_ATT	1372	IPC_ATT_DIAL
1270	HOLD_TIE_THRU	1374	IPC_ATT_DIAL_G
1272	HOLD_MERGE_TIE_ATT	1376	IPC_PHOLD_G_GA
1274	CTR_LN_1	1400	IPC_PHOLD-G_SA
1276	CTR_LN_2	1402	IPC_PHOLD_GA
1300	CTR_GP_1	1404	IPC_PHOLD_SA
1302	CTR_GP_2	1406	IPC_PHOLD_GD_GA
1304	CTR_GP_TIME	1410	IPC_PHOLD_GD_SA
1306	SDL_PAGE_FLASH	1420	IPC_RING_A
1310	ADL_PAGE_DIAL_WAIT	1422	IPC_RING_AG
1312	ADL_PAGE_DC	1424	IPC_STA_DIAL
1314	ADL_PAGING	1426	IPC_TALK_G_GA
1316	AB_DIAL_WAIT	1430	IPC_TALK_G_SA
1320	CFM_WAIT_AB	1432	IPC_TALK_GD_DA
1322	HOLD_AB_RING	1434	IPC_TALK_GD_GA
1324	AB_RING_D_ONLY	1436	PRIORITY_CALL
1326	SM_DIAL_4	1440	ALERT_CF
1330	TRK_WAIT_NET_16	1442	TALK_CF
1332	TRK_WAIT_NET_17	1444	DIAL_CF
1334	NT_STN_ST1	1446	TALK_CF_TONE
1336	NT_STA_ST2	1450	MATCH_CF
1340	CO_NITE_ST	1452	DIAL_CODE_CF
1342	TT_DIAL	1454	CODE_MATCH_CF
1344	TT_GOON	1456	WAIT_SEIZE_CF
1346	TT_ST_TR	1460	RING_CF
1350	TT_TR_TR	1462	RING_CF_TALK
1352	DIAL_CCSA_D1	1464	P_HOLD_RING_CF

TABLE CB. (Contd)

PROGRESS MARK OCTAL ENCODES AND DEFINITIONS DISPLAYED IN FIELD 9 OF PROC-962			
OCTAL	NAME	OCTAL	NAME
1466	TALK_D_CF	1506	CF_DIAL_TIE
1470	P_HOLD_D_CF	1510	SM_MATCH_12
1472	P_HOLD_CF	1512	SM_MATCH_13
1474	TALK_GD_CF_TONE	1514	CF_DIAL_SMDR
1476	DIAL_TRK_CF	1516	TALK_CF_RETON
1500	CF_WAIT_AUTO_TIE_1	1520	ALERT_TMRCL
1502	DIAL_CCSA_CF	1522	TALK_TMRCL
1504	CF_WAIT_DIAL_TIE_1	1524	HOLD_TMRCL

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PROC 999

5. Once a software table is accessed, the next word in sequence can be displayed by depressing **NEXT DATA**.

The address is automatically incremented by one, and the data contents of the new address are displayed.

To display the data contents of all memory addresses beginning with memory address **00000001**, perform the following:

1. Depress **PROC NO; 999; ENTER**.
2. Depress **NEXT DATA**.

The address and word contents are displayed in the address and data fields (Fields 1 and 2).

Note: The word has bad parity if 999999 is displayed in the data field (Field 2).

3. Depressing **NEXT DATA** repeatedly steps through all memory addresses and displays the data contents of each memory address.

SWITCH COMPONENT REPLACEMENT

GENERAL

This section provides a brief description of the switch cabinets and carriers and contains instructions for replacement of switch components.

Replacement of switch components and other maintenance tasks referenced from maintenance procedures consist of the following:

1. Circuit pack replacements for:
 - a. Unduplicated common control carrier circuit packs.
 - b. Duplicated common control carrier circuit packs.
 - c. TMS or module control carrier circuit packs.
 - d. Port carrier circuit packs.
 - e. Unduplicated common control DC/DC converter unit and duplicated common control power carrier circuit packs.
 - f. Remote carrier group housing unit.
2. Circuit pack switch option settings.
3. High Capacity Mini-recorder (HCMR) circuit pack replacement.
4. Cleaning HCMR tape head and capstan.
5. HCMR replacement.
6. 309A or 310A power supply replacement.
7. Bulk on-line switcher (OLS) power supply replacement.
8. 3965-2 battery charger replacement.
9. Frequency generator replacement.
10. DC fan and fan assembly replacement.
11. TMS/RMI cabinet AC distribution unit replacement.
12. Module control or port cabinet AC distribution unit replacement.
13. DC filter replacement.
14. Console component replacement.
15. Alarm panel replacement.
16. AEH4 alarm board replacement.

EQUIPMENT CONFIGURATION

Overview

The switch consists of various arrangements of the four basic cabinets. One or more auxiliary cabinets may be provided for mounting peripheral equipment. The Station Message Detail Recorder (SMDR) cabinet, when provided and connected to the switch, is also part of the switch.

A typical System 85 equipment configuration (refer to Figure 24) consists of a common control cabinet, one or more module control cabinets, a TMS/RMI cabinet, and one or more port cabinets.

Figure 25 illustrates a typical module/cabinet/carrier numbering scheme for an expanded duplicated multimodule system.

Common Control Cabinet

The common control cabinet can be either an unduplicated common control cabinet or a duplicated common control cabinet.

Unduplicated Common Control Cabinet

An unduplicated common control cabinet contains the common control carrier and up to three port carriers and/or DS-1/MFAT carriers. The common control carrier and a High Capacity Mini-recorder (HCMR) make up the control complex.

An unduplicated common control cabinet (refer to Figure 26) contains the following equipment:

1. An unduplicated alarm panel and thermal assembly (sensor).
2. Up to three port carriers and/or DS-1/MFAT carriers.
3. One common control carrier.
4. A fan assembly and alarm board.
5. One battery reserve unit.

Note: When equipped with extended power reserve, the battery reserve unit is not included.

6. A frequency generator.
7. One HCMR.
8. One DC/DC converter unit.
9. A DC filter.

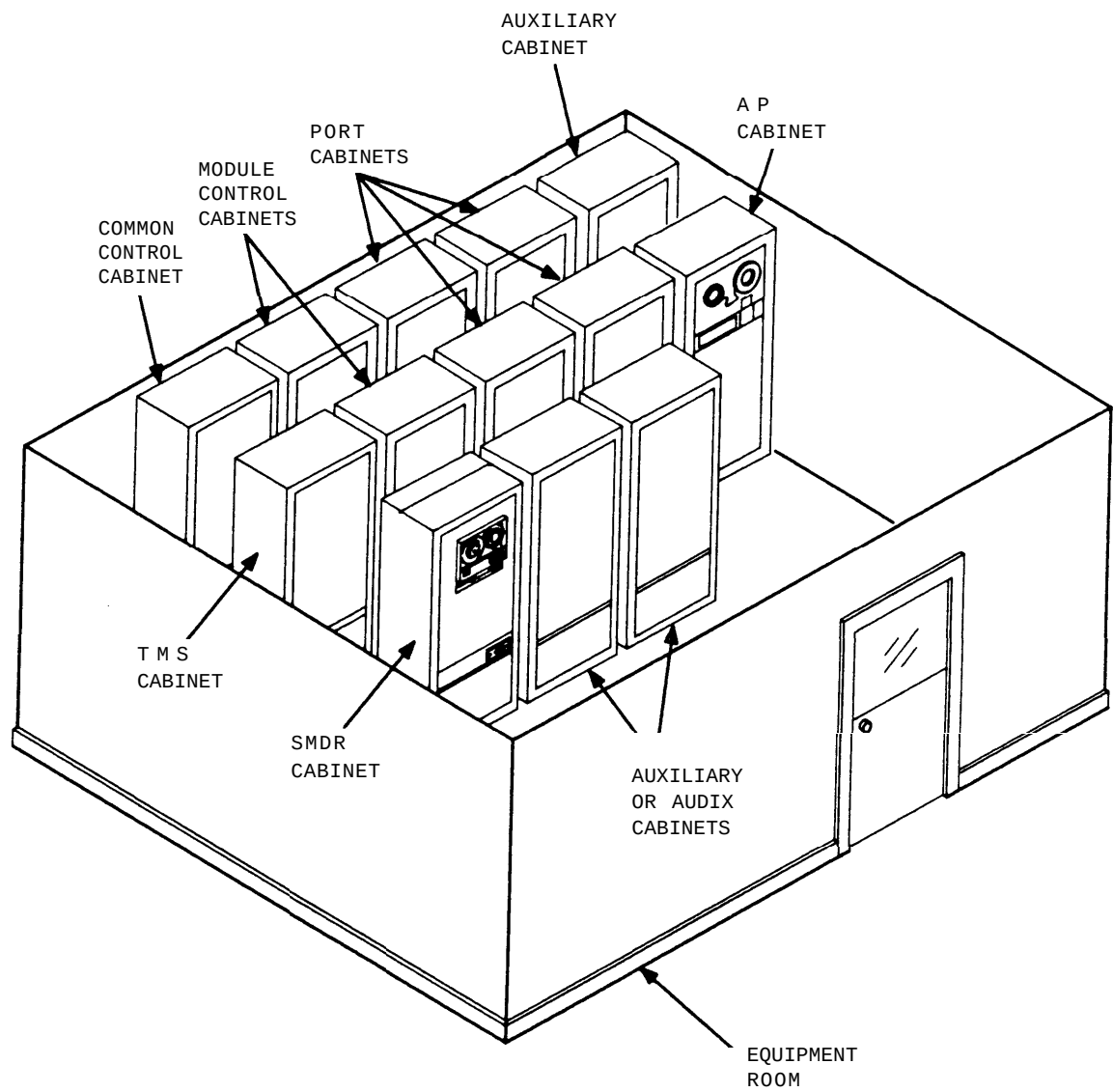


Figure 24. Typical System 85 Equipment Configuration

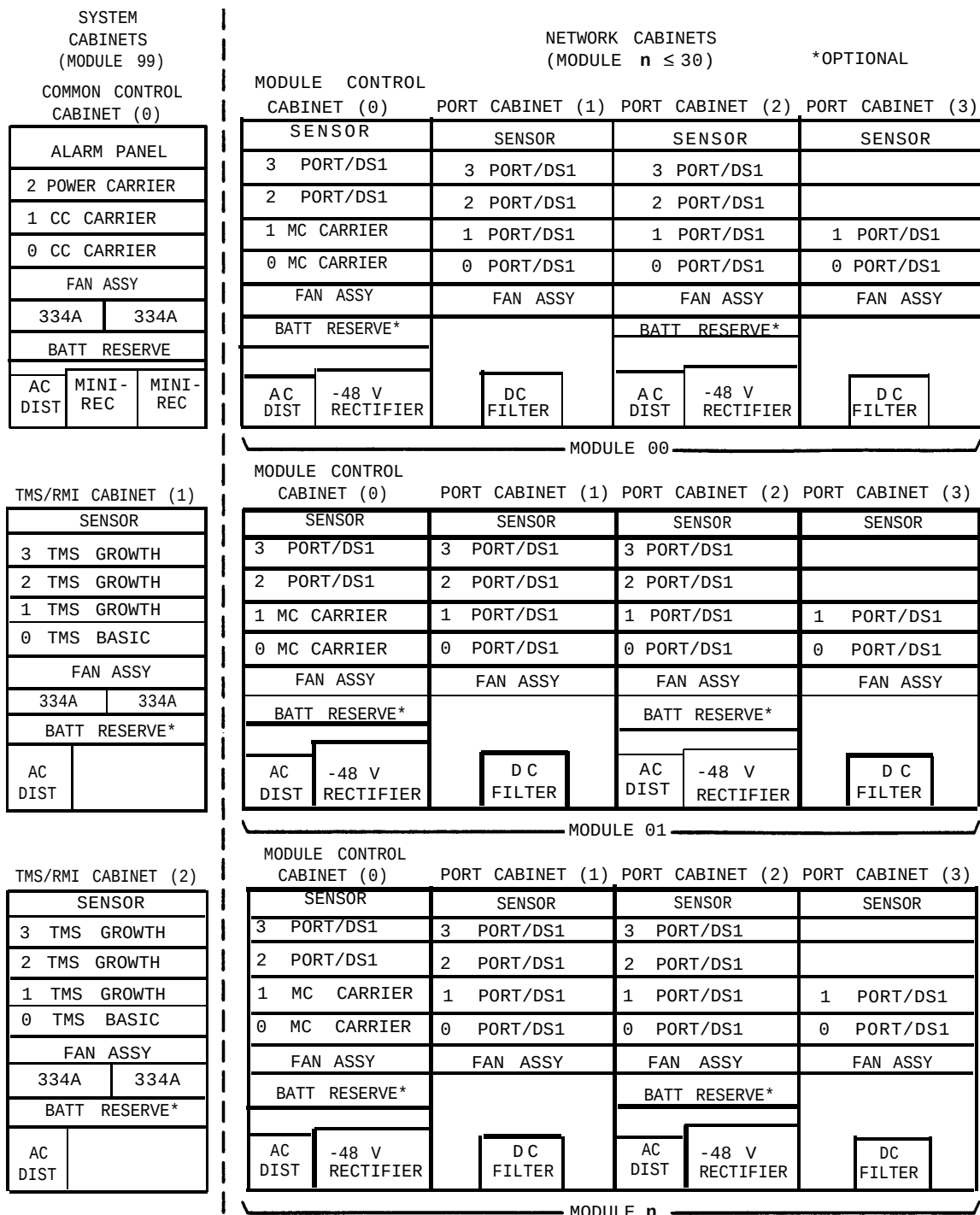
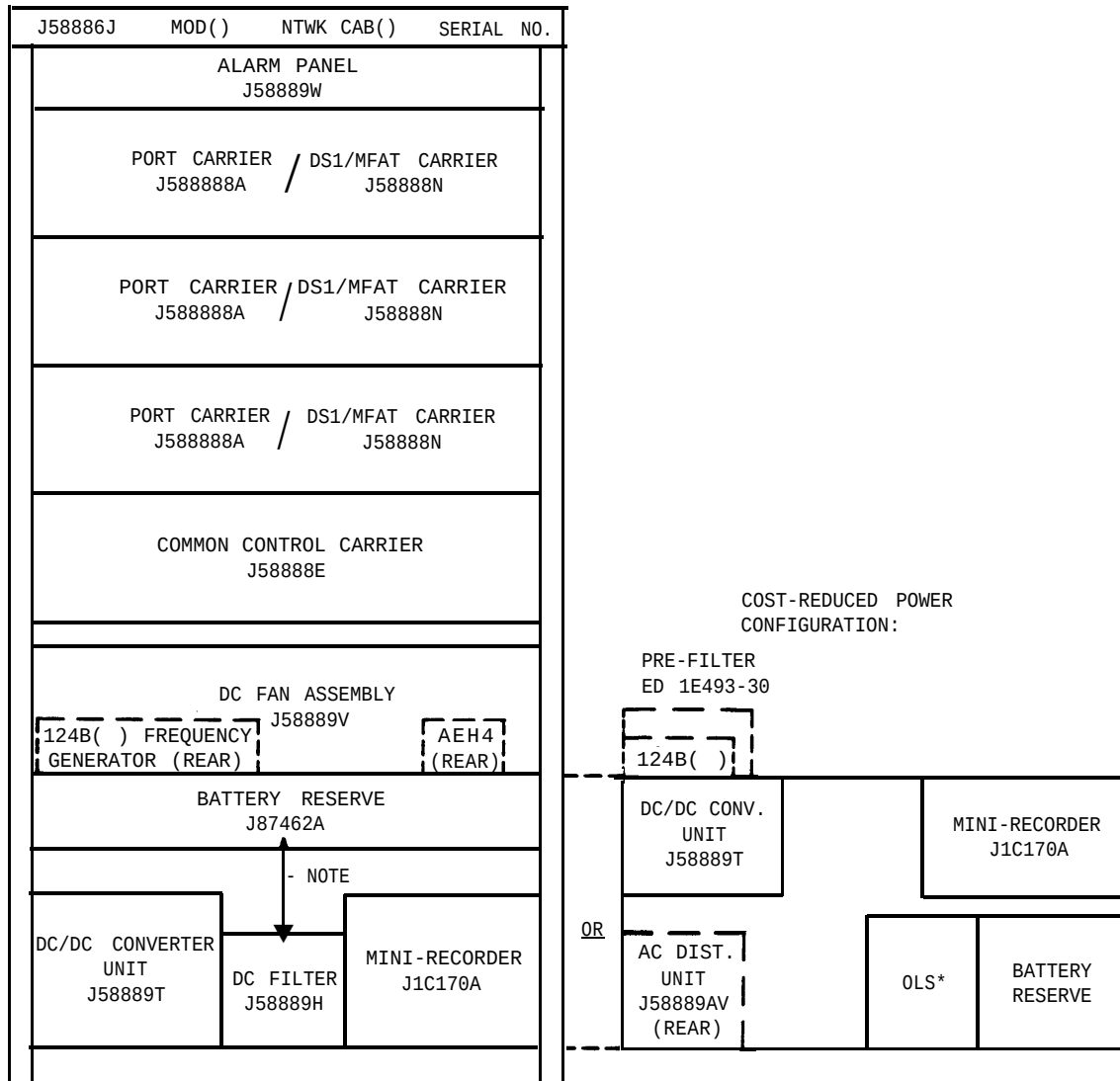


Figure 25. Module/Cabinet/Carrier Identification for a Typical Duplicated Multimodule System 85



NOTE: STANDARD POWER
EQUIPMENT AS INDICATED
NOT FURNISHED FOR STANDBY
POWER CONFIGURATION. DC FRAME
FILTER, J58889AD IS
SUBSTITUTED.

* A SECOND OLS POWER SUPPLY IS REQUIRED
IF MORE THAN 40 ANN17B CIRCUIT PACKS
ARE USED.

Figure 26. Unduplicated Common Control Cabinet

Duplicated Common Control Cabinet

A duplicated common control cabinet (refer to Figure 27) contains the following equipment:

1. A duplicated alarm panel and thermal assembly (sensor).
2. Two common control carriers.
3. One power carrier.
4. A fan assembly and alarm board.
5. Two HCMRs.
6. Two 334A power units.
7. One battery reserve unit.
8. An AC distribution unit.

Note: When equipped with an extended power reserve, the power units and battery reserve unit are not included, and a DC filter replaces the AC distribution unit.

TMS/RMI Cabinet

The TMS/RMI cabinet is used only in multimodule switches and may contain up to four TMS carriers or 4 RMI carriers.

In the unduplicated TMS configuration, there is one basic carrier and up to three growth carriers.

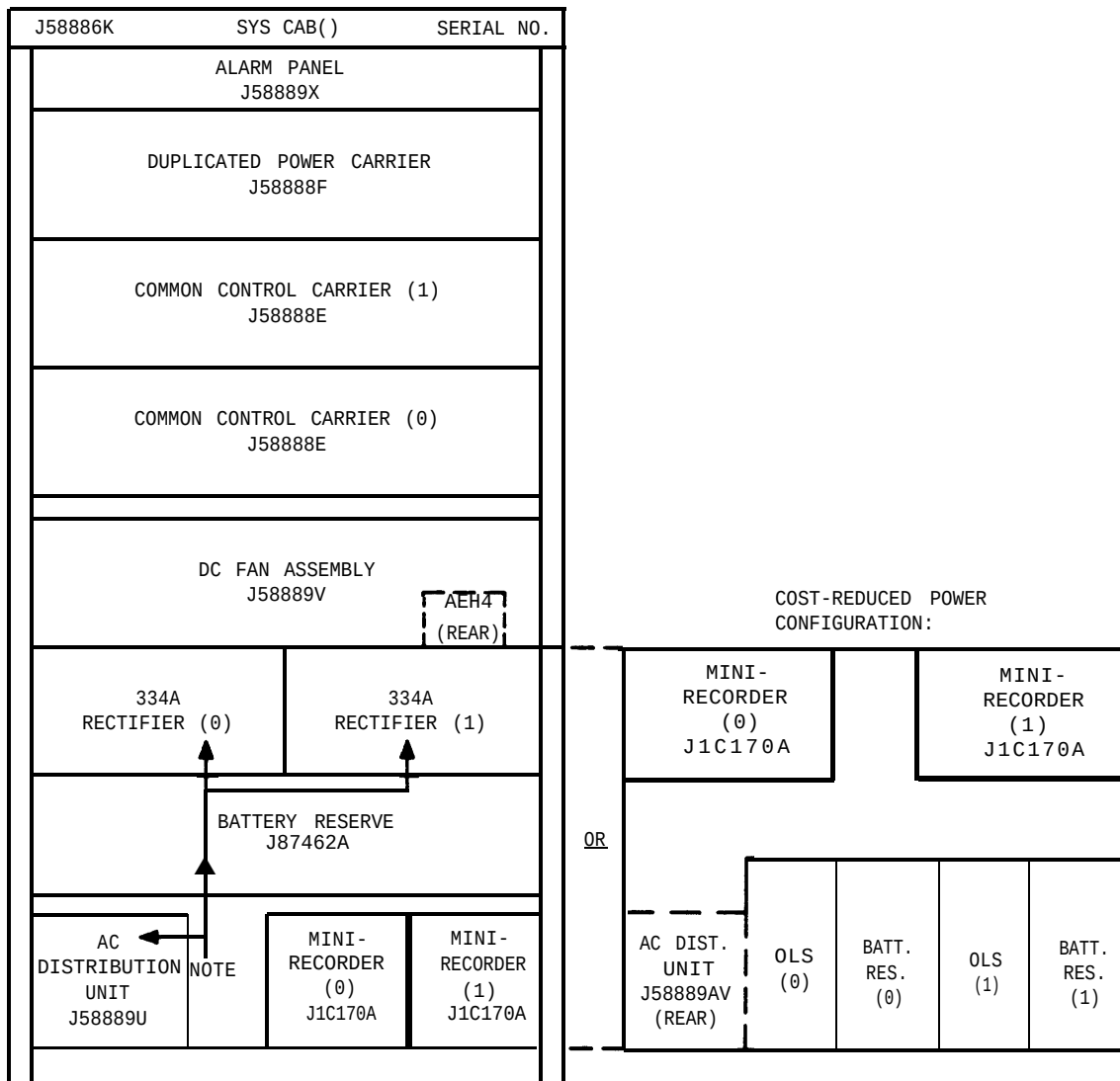
In a duplicated TMS configuration, there may be two basic carriers, a no-carrier adapter, and a RMI carrier.

In the maximum duplicated TMS configuration, two TMS cabinets are provided, each containing one basic carrier and two or three growth carriers. Both TMS cabinets must contain the same number of growth carriers.

The TMS/RMI cabinet (refer to Figure 28) may contain the following equipment:

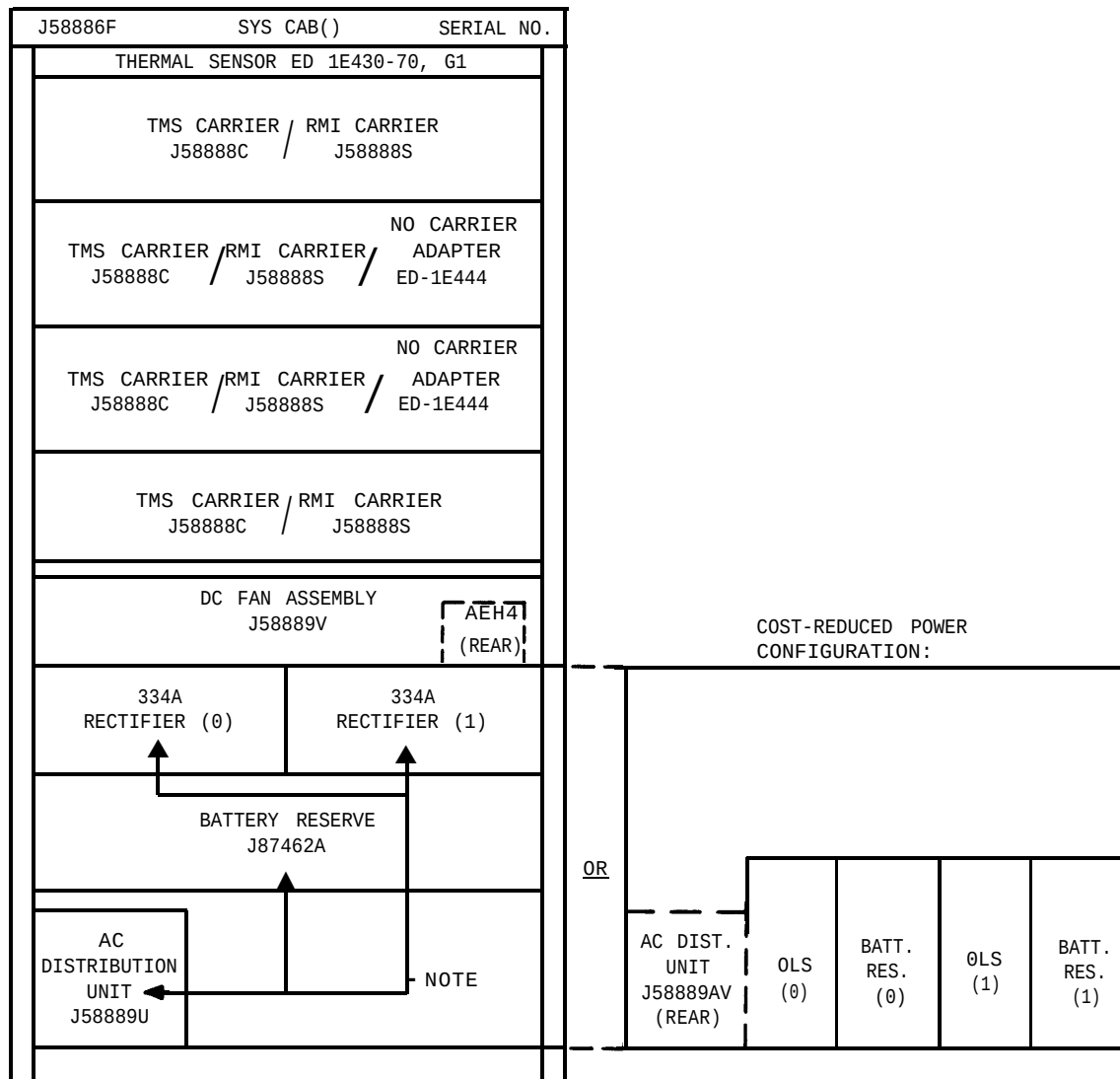
1. A thermal assembly (sensor).
2. Up to four TMS carriers, or 4 RMI carriers, or a combination of both.
3. A fan assembly and alarm board.
4. One or two 334A rectifiers.
5. One battery reserve unit.
6. An AC distribution unit.

Note: When equipped with extended power reserve, the power units and battery reserve unit are not included, and a DC filter replaces the AC distribution unit.



NOTE: STANDARD POWER
EQUIPMENT AS INDICATED
NOT FURNISHED FOR STANDBY
POWER CONFIGURATION. DC FRAME
FILTER, J58889AD IS
SUBSTITUTED.

Figure 27. Duplicated Common Control Cabinet



NOTE: STANDARD POWER EQUIPMENT AS INDICATED NOT FURNISHED FOR STANDBY POWER CONFIGURATION. DC FRAME FILTER, J58889AD IS SUBSTITUTED.

Figure 28. Time Multiplexed Switch (TMS)/Remote Module Interface (RMI) Cabinet

Module Control Cabinet

The module control cabinet may be configured for duplicated or unduplicated module control.

A module control carrier and up to three port carriers (or one port carrier and two DS-1/MFAT carriers, or a combination of both) may be contained in an unduplicated module control cabinet configuration.

Two module control carriers and up to two port carriers (or two DS-1/MFAT carriers or a combination of both) may be contained in a duplicated module control cabinet configuration.

The module control cabinet (refer to Figure 29) contains the following equipment:

1. A thermal assembly (sensor).
2. Up to three port carriers.
3. Up to two DS-1/MFAT carriers.
4. One module control carrier for an unduplicated module control or two module control carriers for a duplicated module control.
5. A fan assembly and alarm board.
6. A frequency generator.
7. One battery reserve unit.
8. A -48 volt rectifier.
9. An AC distribution unit.

Note: When equipped with extended power reserve, the battery reserve unit and rectifier are not included, and a DC filter replaces the AC distribution unit.

Port Cabinet

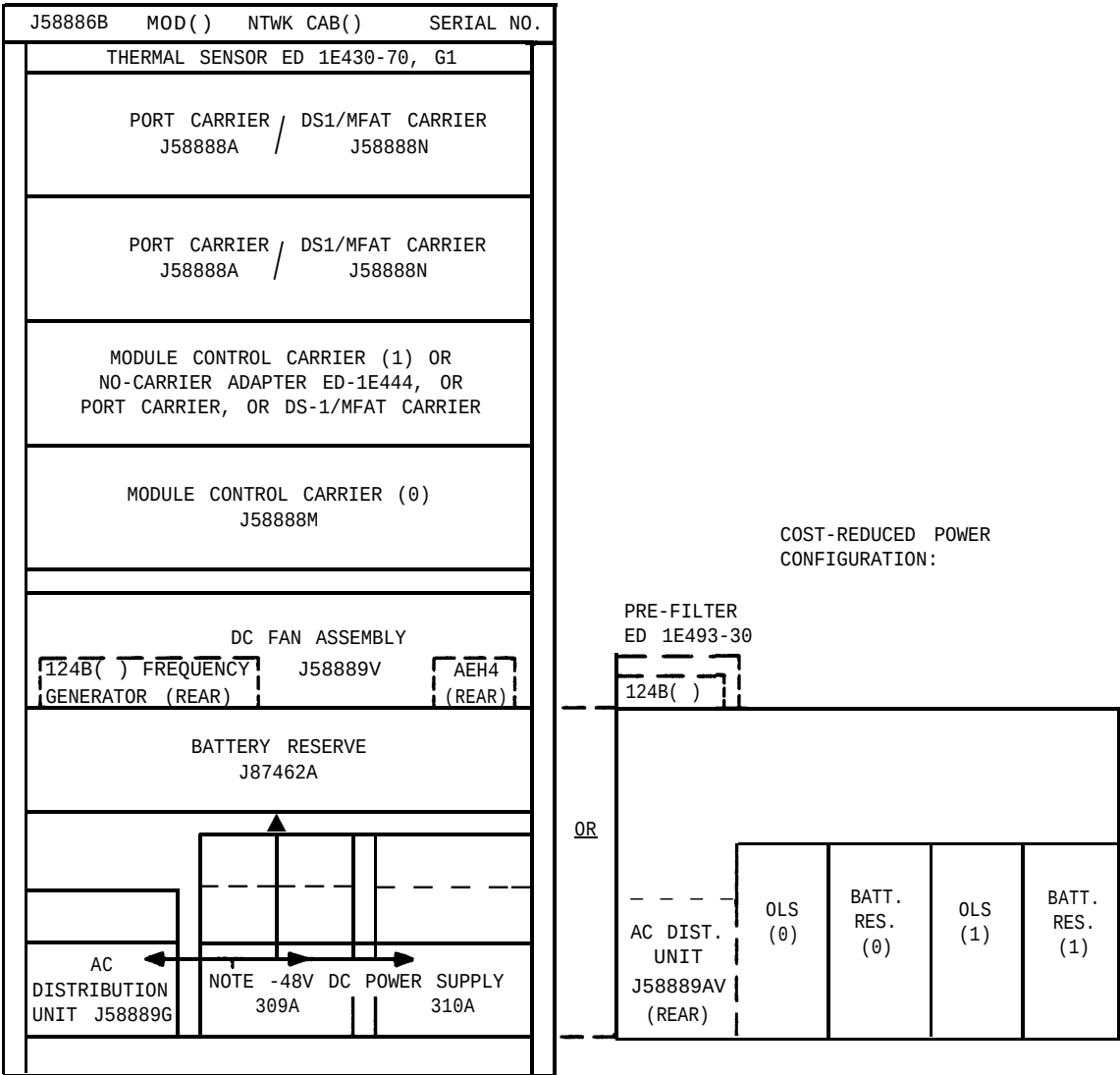
The port cabinet (refer to Figure 30) is equipped with up to four port carriers.

The port cabinet contains:

1. A thermal assembly (sensor).
2. From one to four port carriers.
3. Up to four DS-1/MFAT carriers.
4. A fan assembly and alarm board.
5. A frequency generator.
6. One battery reserve unit.
7. A -48 volt rectifier and AC distribution unit, or a DC filter.

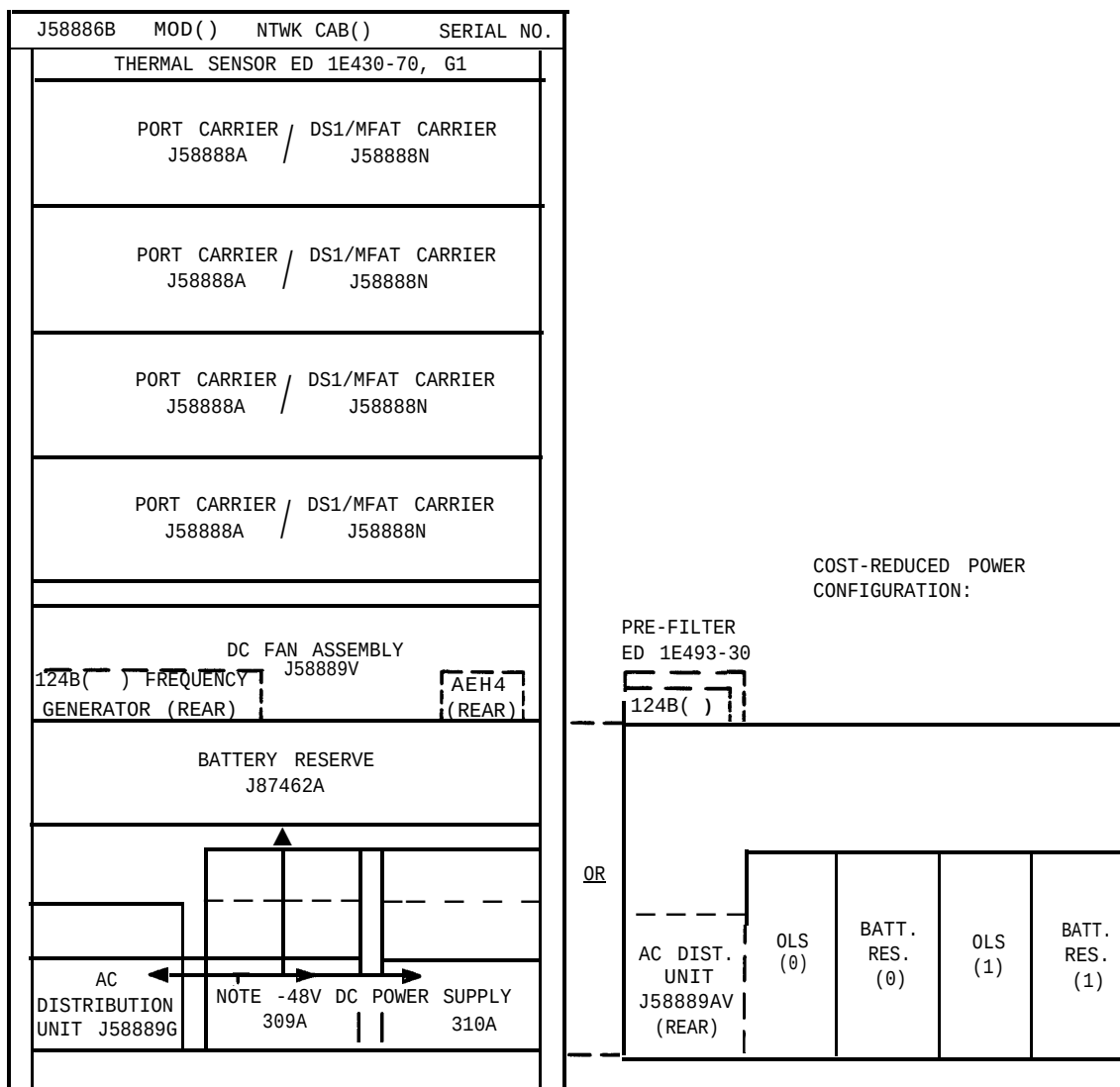
Note: When equipped with extended power reserve, the battery reserve unit and rectifier are not included, and a DC filter replaces the AC distribution unit.

The first port cabinet in a duplicated common control switch receives power from the module control cabinet.



NOTE: STANDARD POWER
EQUIPMENT AS INDICATED
NOT FURNISHED FOR STANDBY
POWER CONFIGURATION. DC FRAME
FILTER, J58889AD IS
SUBSTITUTED.

Figure 29. Module Control Cabinet



NOTE: STANDARD POWER EQUIPMENT AS INDICATED NOT FURNISHED FOR STANDBY POWER CONFIGURATION. DC FRAME FILTER, J58889AD IS SUBSTITUTED.

Figure 30. Port Cabinet

Common Control Carrier

The common control carrier provides primary control, memory, and input/output channels for processing, supervising, and coordinating system operations.

Backplane wiring provides connections between circuit packs in the common control carrier. Circuit breakers are provided on the right side of the common control carrier. Numbers are stamped adjacent to the circuit breakers to identify the slot numbers or components associated with each circuit breaker.

Figure 31 identifies the circuit pack type and code for each slot location in the common control carrier.

Unduplicated Common Control DC/DC Converter Unit

The DC/DC converter unit provides operating +5 volts to the unduplicated common control carrier circuit packs.

Circuit breakers are provided on the left side of the unduplicated common control DC/DC converter unit. Numbers are stamped adjacent to the circuit breakers to identify the slot numbers associated with each circuit breaker.

Figure 32 identifies the circuit pack type and code for each slot location in the unduplicated common control DC/DC converter unit.

Duplicated Common Control Power Carrier

The common control power carrier provides operating +5 volts to the duplicated common control carrier circuit packs.

Circuit breakers are provided on the right side of a duplicated common control power carrier. Numbers are stamped adjacent to the circuit breakers to identify the slot numbers associated with each circuit breaker.

Figure 33 identifies the circuit pack type and code for each slot location in the duplicated common control power carrier.

TMS Carrier

The TMS carrier provides the time multiplexed space division switch that interconnects the modules in a multimodule switch.

Backplane wiring provides connections between circuit packs in the TMS carrier. Circuit breakers are provided on the right side of the TMS carrier. Numbers are stamped adjacent to the circuit breakers to identify the slot numbers associated with each circuit breaker.

Figure 34 identifies the circuit pack type and code for each slot location in the TMS carrier.

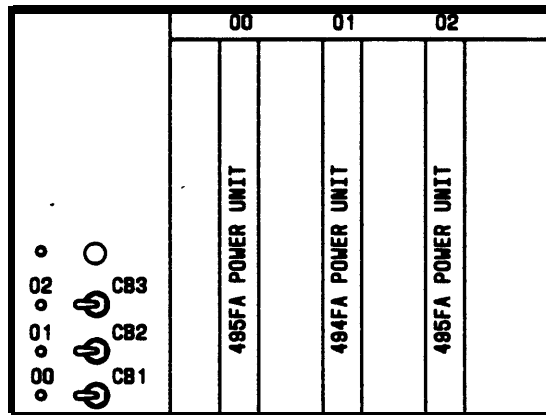


Figure 32. Unduplicated Common Control DC/DC Converter Unit

Port Carrier

The port carrier connects the switch to peripheral equipment (analog/digital, voice/data, and lines/trunks). The port carrier provides dedicated port circuits determined by the equipment connected.

Backplane wiring provides connections between circuit packs in the port carrier. A fuse panel is provided on the right side of the port carrier. Numbers are stamped adjacent to the fuses to identify the slot numbers associated with each fuse.

Figure 36 identifies the circuit pack type and code for each slot location in the port carrier.

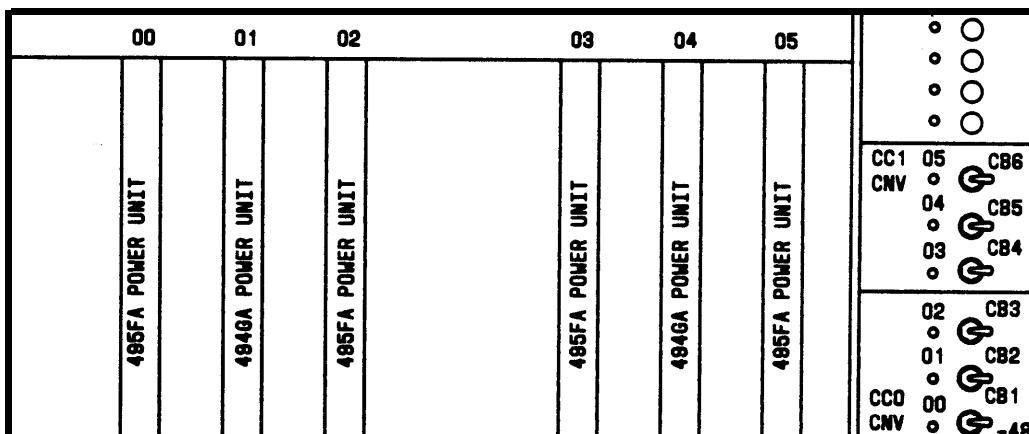
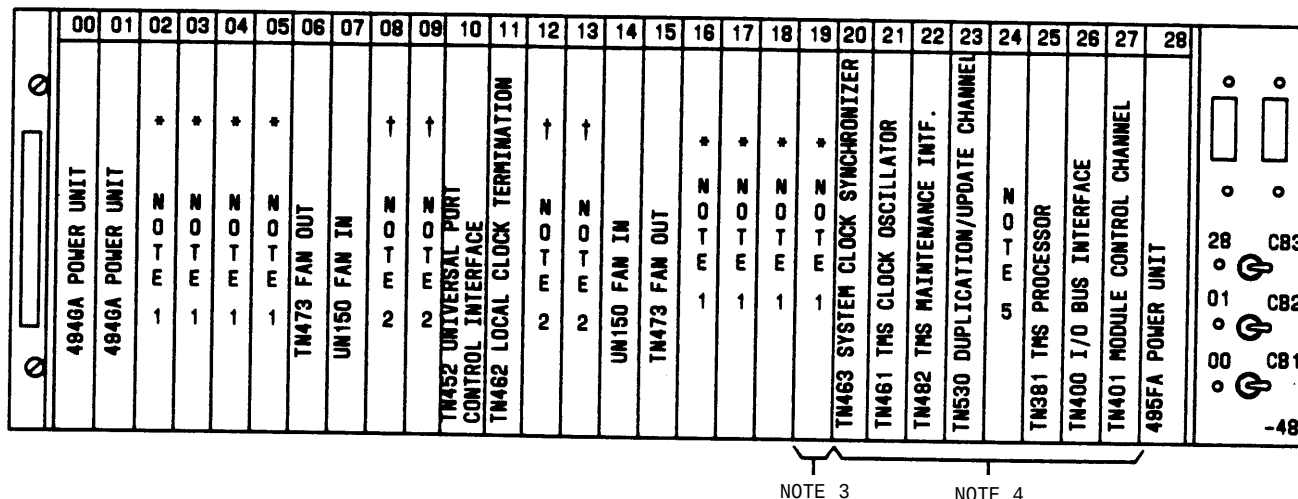


Figure 33. Duplicated Common Control Power Carrier



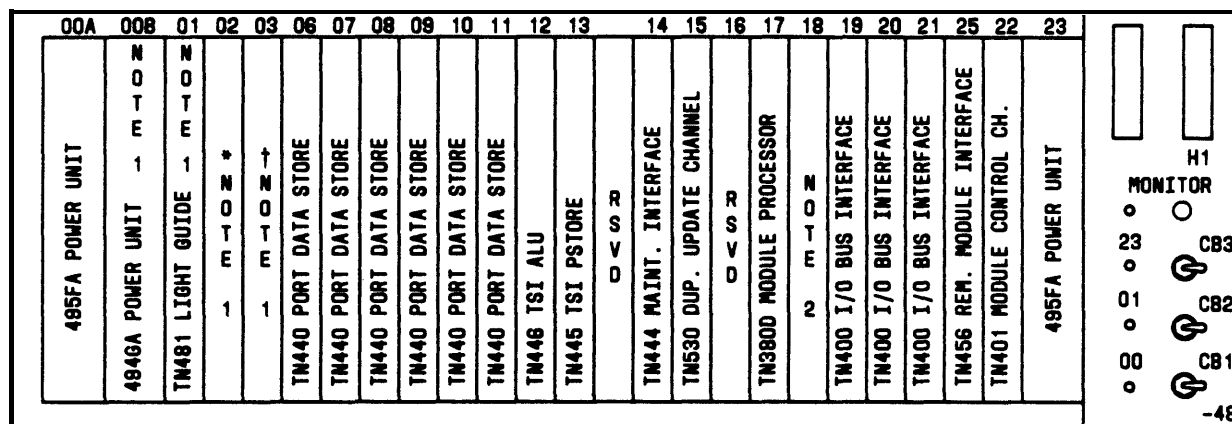
* = TN480 (MODULE INTERFACE)

† = TN470 (TMS MULTIPLEXOR)

NOTES:

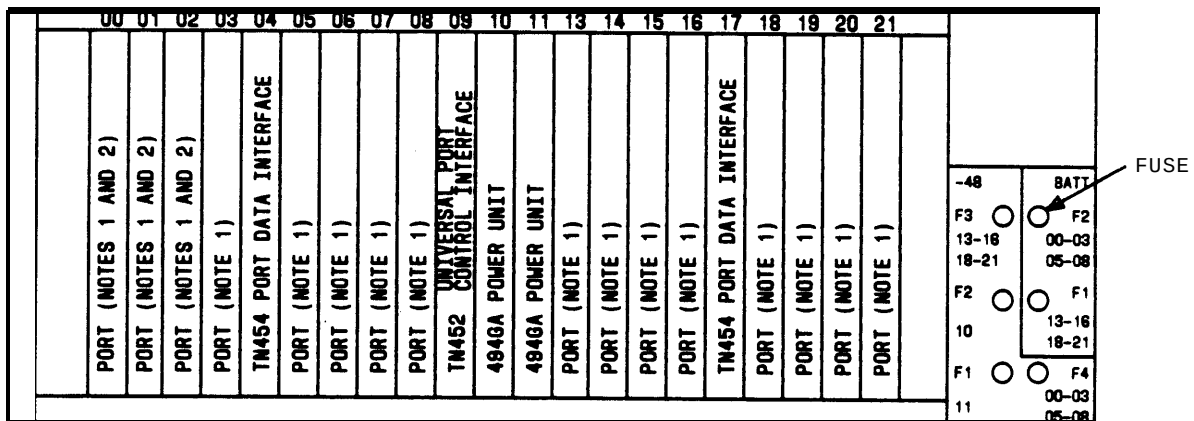
1. ONE TN480 IS REQUIRED PER MODULE.
2. ONE TN470 IS REQUIRED IN THE BASIC TMS CARRIER FOR THE FIRST MODULE AND ONE TN470 IS REQUIRED FOR EVERY TWO MODULES THEREAFTER.
3. TN480 IN SLOT 19 IS NOT INSTALLED IN THE BASIC TMS CARRIER.
4. CIRCUIT PACKS IN SLOTS 20-27 ARE NOT INSTALLED IN TMS GROWTH CARRIERS.
5. SLOT 24 CONTAINS TN512 (TEST SUPPORT) IF SHIPPED WITH THE SWITCH.

Figure 34. TMS Carrier



NOTES:

Figure 35. Module Control Carrier



NOTES:

1. CARRIER POSITIONS 00-03, 05-08, 13-16, 18-21 ARE UNIVERSAL PORT POSITIONS WHICH CAN ACCEPT THE FOLLOWING SN-CODED CIRCUIT PACKS:

CKT PACK CODE	CIRCUIT PACK NAME	CKT PACK CODE	CIRCUIT PACK NAME
SN224	MFET LINE PORT	SN250	CALL PROGRESS TONE
SN228	OFF PREMISES LINE	SN251	TOUCH-TONE RECEIVER
SN229	ON PREMISES LINE	SN252	TOUCH-TONE SENDER
SN230	CO TRUNK	SN253	AUXILIARY TONES
SN231	AUXILIARY TRUNK	SN254	ATTENDANT CONFERENCE
SN232	DID TRUNK	SN255	TONE DETECTOR 2
SN233	TIE TRUNK/ATTENDANT INTERFACE	SN261C	ANALOG/DIGITAL FACILITY TEST
SN238	EIA INTERFACE	SN270	GENERAL PURPOSE PORT
SN241	CONTACT INTERFACE		
SN243	DATA PORT		

2. CARRIER POSITIONS 00 THROUGH 02 CAN ACCEPT SN244 AUTOMATIC NUMBER IDENTIFICATION (ANI) CIRCUIT PACK

Figure 36. Port Carrier

DS-1/MFAT Carrier

The DS-1/MFAT carrier is a modified port carrier. The DS-1/MFAT carrier provides high-density dedicated interface circuits for DS-1 trunks and/or low-cost hybrid voice terminals. The DS-1/MFAT carrier also provides the same dedicated port circuits as the port carrier.

Backplane wiring provides connections between circuit packs in the DS-1/MFAT carrier. A fuse panel is provided on the right side of the DS-1/MFAT carrier. Numbers are stamped adjacent to the fuses to identify the slot numbers associated with each fuse.

Figure 37 identifies the circuit pack type and code for each slot location in the DS-1/MFAT carrier.

RMI Carrier

The RMI carrier houses the TN456 RMI circuit packs to support remote modules. The RMI carrier is mounted in the TMS/RMI cabinet. A maximum of two RMI carriers are possible for a switch with unduplicated module controls, and four RMI carriers for a switch with duplicated module controls.

Backplane wiring provides connections between circuit packs in the RMI carrier. A circuit breaker panel is provided on the right side of the RMI carrier. Circuit breaker **CB1** is associated with slots 00 through 10 and circuit breaker **CB2** is associated with slots 11 through 22. The **MAAP** connector on the circuit breaker panel allows the user to plug in a **MAAP** to the RMI carrier. Only one RMI carrier per TMS/RMI cabinet is equipped with the **MAAP** connector.

Figure 38 identifies the circuit pack type and code for each slot location in the RMI carrier.

Remote Carrier Group Housing Unit

The remote carrier group housing unit provides the capability to remote digital and analog lines and trunks in a remote group system configuration.

Though not a standard carrier housed in a network cabinet, this self-contained unit houses up to two remoted port groups.

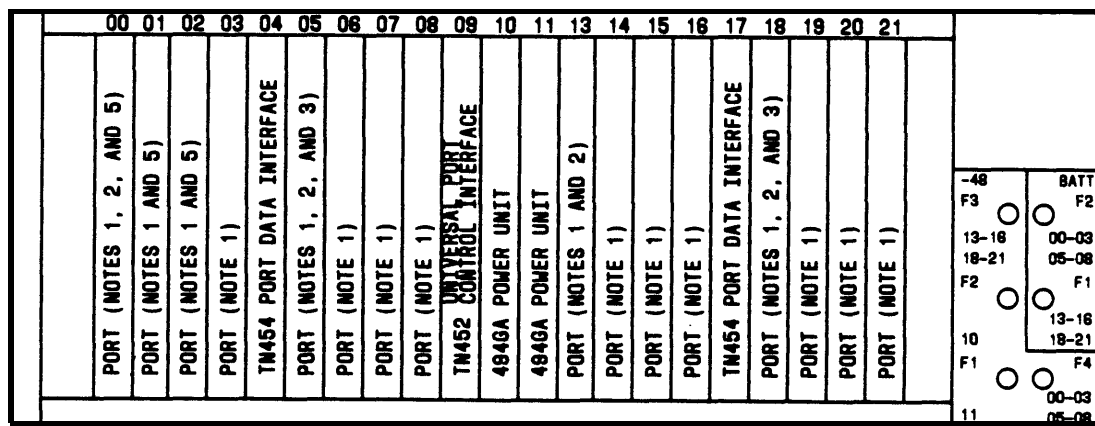
Each port group consists of one controller circuit pack (ANN16) and up to three port interface circuit packs (analog, hybrid, digital, or EIA).

Figure 39 identifies the circuit pack type and code for each slot location in the remote carrier group housing unit.

PRECAUTIONS

When performing maintenance or translation procedures on System 85 switch equipment, certain precautions must be observed by user personnel.

Cautions, warnings, and danger statements contained within the service manual **must** be observed to prevent loss of service, possible equipment damage, and possibility of personnel injury.



NOTES:

1. CARRIER POSITIONS 00-03, 05-08, 13-16, 18-21 ARE UNIVERSAL PORT POSITIONS WHICH CAN ACCEPT ALL SN-CODED CIRCUIT PACKS AND ANN17 MFAT LINE PORT.
2. CARRIER POSITIONS 00, 05, 13, AND 18 CAN ACCEPT CIRCUIT PACK ANN15 REMOTE CARRIER LOCAL (RCL) OR ANN11 DS1 TRUNK INTERFACE. IF ANN15 IS USED IN SLOT 00, 05, 13, OR 18, THE NEXT TWO ADJACENT SLOTS TO THE RIGHT MUST BE LEFT VACANT. ANN11 CAN BE USED IN SLOTS 00 AND 13 IN THE LINE ONLY MODE AND IN SLOTS 05 AND 18 IN THE LINE+TRUNK MODE.
3. CARRIER POSITIONS 05 AND 18 CAN ACCEPT CIRCUIT PACK ANN11 DS1 TRUNK INTERFACE OR ANN35 ISDN PRIMARY RATE PORT. IF ANN11 OR ANN35 IS USED IN SLOT 05, SLOTS 00, 01, 02, 06 AND 07 CANNOT BE USED. HOWEVER, SLOTS 03 AND 08 CAN BE USED FOR ANN17 OR ANY PORT CIRCUIT WHEN SLOT 05 IS USED FOR ANN11 OR ANN35. IF ANN11 OR ANN35 IS USED IN SLOT 18, SLOTS 13, 14, 15, 19, AND 20 CANNOT BE USED. HOWEVER, SLOTS 16 AND 21 CAN BE USED FOR ANN17 OR ANY PORT CIRCUIT WHEN SLOT 18 IS USED FOR ANN11 OR ANN35.
4. THE DS1/MFAT CARRIER IS NOT INTENDED TO REPLACE THE PORT CARRIER. USE OF SN PORT CIRCUIT PACKS IN THE DS1/MFAT CARRIER CAUSES INEFFICIENT USE OF THE WALL FIELD.
5. CARRIER POSITIONS 00 THROUGH 02 CAN ACCEPT SN244 AUTOMATIC NUMBER IDENTIFICATION (ANI) CIRCUIT PACK.

Figure 37. DS-1/MFAT Carrier

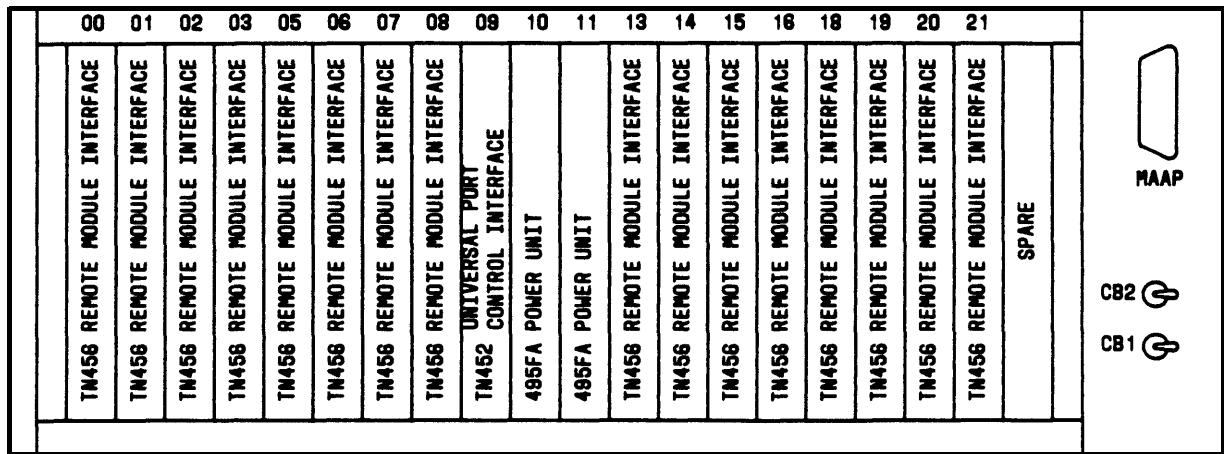
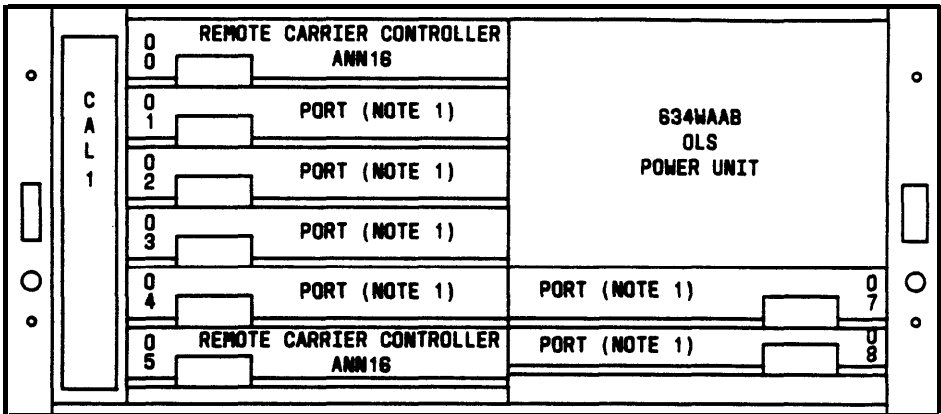


Figure 38. Remote Module Interface (RMI) Carrier



- NOTES:
- CARRIER POSITIONS 01-04, 07, AND 08 ARE UNIVERSAL PORT POSITIONS WHICH CAN ACCEPT THE FOLLOWING CIRCUITS PACKS:

CKT PACK	CIRCUIT PACK
<u>CODE</u>	<u>NAME</u>
ANN17	MULTIFUNCTIONAL ANALOG TERMINAL (MFAT)
SN228	OFF PREMISES LINE
SN238	EIA INTERFACE
SN270	GENERAL PURPOSE PORT
 - CAL1 CIRCUIT PACK - FREQUENCY GENERATOR/ALARM IS INSTALLED IN SLOT 09.

Figure 39. Remote Carrier Group Housing Unit

In addition, the following precautions regarding electromagnetic interference and static electricity **must** be observed.

- a. **Electromagnetic Interference:** This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise to be introduced into the customer's equipment. If the equipment is not installed and used in accordance with the instruction manual, interference to radio communications may be caused.

WARNING: To maintain the Electromagnetic Interference (EMI) integrity of the System 85 switch, maintenance personnel (after performing any translation or maintenance activities) must ensure that all cabinet panels, covers, etc., are firmly secured in place prior to leaving the customer's premises.

- b. **Static Electricity:** To prevent or reduce electrostatic discharge, maintenance personnel **must** always attach wrist grounding straps before working on switch components or handling circuit packs.

Caution: Electrostatic discharge can damage or destroy circuit paths containing integrated circuits (ICS).

CIRCUIT PACK REPLACEMENTS

Overview

When replacing circuit packs in the switch, it is necessary to maintain switch integrity and identify the correct circuit pack, vintage, and series to be replaced. Switch integrity is maintained by taking the appropriate steps when replacing circuit packs in the switch carriers. Circuit packs to be replaced in the digital network can be identified by using **PROC 290, Word 2**.

PROC 290, Word 2 is used to search for all circuit packs installed in module control and port carriers. The prefix, number, suffix, vintage series, and vintage update of each circuit pack is displayed.

Circuit packs should be replaced with circuit packs of the same suffix or later (i.e., SN270 replaced by SN270 or SN270B).

Any circuit pack to be replaced should be unseated and resealed to ensure its connector is making good contact with the mating connector. Retest the circuit pack after resealing. If circuits are still defective, replace the circuit pack.

Precautions

To prevent or reduce electrostatic discharge, maintenance personnel should always attach wrist grounding straps before working on system components or handling circuit packs.

Caution: Electrostatic discharge can damage or destroy circuit packs containing integrated circuits (ICS).

1. The EMC wrist strap and cable assembly (cc900698226) is placed in the bottom of the module control cabinet in a poly bag (cc900492372) next to the AC distribution unit.
2. The EMC wrist strap assembly is used in the following manner:
 - a. Attach the wrist strap to either wrist.
 - b. Connect the alligator clip to the cabinet frame.
3. A good ground connection for the alligator clip is:
 - a. In equipment coded cabinets which have removable sides, attach the alligator clip to any convenient screw head that fasten the hinges to the cabinet or to the screws that fasten the door latch to the frame.
 - b. In equipment coded cabinets which have integrated sides, the alligator clip may be attached to any of the front and rear cabinet formed faces (front door area or back area when viewed in an open position) which are coated with a conductive paint.
 - c. In either case, an area close to the vertical center of the cabinet should be selected for the alligator clip allowing a more central position to operate from.

To ensure that the System 85 switch recovers from circuit pack replacement in the switch carriers, certain precautions should be exercised during circuit pack replacement. These precautions consist of busying out circuits, using the **GO/HALT** switch, etc., and are covered in the parts on circuit pack replacements for each type of switch carrier.

Requirement: These precautions should also be taken when unseating and reseating circuit packs.

Option Settings

Prior to reseating and/or replacing circuit packs in any of the switch carriers, the option settings on appropriate circuit packs should be checked to determine if the correct option setting is being used for the application required. Refer to **Circuit Pack Switch Option Settings** in this section for circuit packs with option settings.

Unduplicated Common Control Carrier Circuit Pack Replacement

When replacing circuit packs in an unduplicated common control carrier, use of the **GO/HALT** switch is required. Placing the **GO/HALT** switch in the **HALT** position before removing any circuit pack in the common control carrier stops any interactions with memory when removing or replacing circuit packs.

Caution: *Reseating or replacing circuit pack TN406 (DCIU processor memory) in Slot 16 of the unduplicated common control carrier without use of the GO/HALT switch causes a partial reload.*

Perform the following steps when replacing circuit packs in a unduplicated common control carrier.

Note: The following steps are performed at the alarm panel and at the common control carrier.

1. Determine if the switch is in emergency transfer.

If the switch is in emergency transfer, set the **EMERGENCY TRANSFER** switch to **ACT** and proceed to Step 3.

2. If the switch is not in emergency transfer, set the **EMERGENCY TRANSFER** switch to **INHIB** and notify the user that no new calls can be processed.

Proceed to Step 3.

3. Set the **GO/HALT** switch to **HALT**.

4. Remove the circuit pack being replaced.

Note: Prior to replacement of circuit pack TN492, insure that the battery (comcode 844665836) is connected (or connect) to the back side of the circuit pack.

- a. Mark the date of the next battery replacement (month and year) on the **Date Label** that is attached to the battery.

Note: The battery replacement date is established by adding 5 years to the date of installation of the TN492 circuit pack and associated battery. Example TN492 circuit pack replaced July 1987; date to be written on the label is July 1992.

- b. Affix the **Date Label** to the faceplate of the TN492 circuit pack.

Note: If the YELLOW LED is lighted, after the circuit pack is replaced, the battery is **not** connected or wired correctly.

5. Verify option settings on the replacement circuit pack are correct (if applicable).

6. Replace the circuit pack.

7. Determine the status of the **EMERGENCY TRANSFER** switch.

If the **EMERGENCY TRANSFER** switch is in the **INHIB** position, proceed to Step 8.

If the **EMERGENCY TRANSFER** switch is in the **ACT** position, proceed to Step 10.

Caution: In the following step, the **GO/HALT** switch must be set to **GO** within 5 seconds after depressing **RESET** to avoid a major alarm indication.

8. Depress **RESET**, and set the **GO/HALT** switch to **GO** within 5 seconds.

9. Set the **EMERGENCY TRANSFER** switch to **OFF**.

Note: Replacement of the circuit pack is complete.

10. Set the **GO/HALT** switch to **GO**.

11. If the system appears to be functioning normally, set the **EMERGENCY TRANSFER** switch to **OFF** and proceed to Step 12.

If the switch does not appear to be functioning normally, investigate other possible problem areas, using **PROC 600**, **PROC 612**, and microdiagnostic testing.

12. Notify the customer that emergency transfer service will be interrupted.

13. Depress **RESET**.

Note: Replacement of circuit pack is complete.

Duplicated Common Control Carrier Circuit Pack Replacement

When replacing circuit packs in both the on-line and off-line side of a duplicated common control carrier, use of the **GO/HALT** switch is required. Placing the **GO/HALT** switch in the **HALT** position before removing any circuit pack in the common control carrier stops any interactions with memory when removing or replacing circuit packs.

Caution: *Reseating or replacing circuit pack TN406 (DCIU processor memory) in Slot 16 of the duplicated common control carrier without use of the GO/HALT switch causes a partial reload.*

Perform the following steps when replacing circuit packs in a duplicated common control carrier.

Note: The following steps are performed at the alarm panel and at the common control carrier.

1. Determine if the circuit pack being replaced is in the on-line or off-line side of the duplicated common control.

If the circuit pack being replaced is in the on-line side of the duplicated common control, proceed to Step 2.

If the circuit pack being replaced is in the off-line side of the duplicated common control, proceed to Step 9.

2. Use **PROC 613**, Test 3 to soft switch the on-line common control to the off-line side.

If the soft switch was successful, proceed to Step 9.

If the soft switch failed, indicated by a 1 displayed in Field 2 and a failure code of 95 displayed in Field 12 of **PROC 613**, Test 3 or special error code 80 (illegal switch attempt) is displayed in the **MAAP** error code field, proceed to Step 3.

3. After the off-line common control has reloaded (as a result of a switch failure), select Test 2 of **PROC 613** and depress **EXECUTE**.

4. Determine the health of the off-line processor displayed in Fields 6 through 8.

If the soft switch cannot be performed because the off-line common control is unhealthy, replace circuit pack(s) in the on-line side using the steps for **Unduplicated Common Control Carrier Circuit Pack Replacement** above.

5. If the off-line common control is healthy, use the **MODE** display procedure to ensure that the remote ports and the runtape agent is not active.

Proceed to Step 6.

6. Depress **MODE**.

Examine Fields 9 through 13 of the **MODE** display procedure to determine if encodes 0 through 4 are displayed.

7. If encode 0 is displayed, it should be the local **MAAP's** current port that you are using.
If encode 3 or 4 is displayed, determine from Fields 6 and 7 if the agent encode displayed is 10 (runtape).
8. If any of the encodes are displayed, obtain full release of all remote ports, and the pseudo port performing a **RUNTAPE** by contacting the appropriate users.

Note: After the soft switch is completed and the necessary repair action is performed, notify the previous users that you have completed your task in order for them to perform their task(s).

After obtaining full release of all remote ports, proceed to Step 9.

9. Set the **LOCK ON LINE** switch to the active (on-line) CC position; i.e., **CC0** or **CC1**.
10. At the off-line common control, set the **GO/HALT** switch to **HALT**.
11. At the off-line common control, remove the circuit pack being replaced.

Note: Prior to replacement of circuit pack TN492, insure that the battery (comcode 844665836) is connected (or connect) to the back side of the circuit pack.

- a. Mark the date of the next battery replacement (month and year) on the **Date Label** that is attached to the battery.

Note: The battery replacement date is established by adding 5 years to the date of installation of the TN492 circuit pack and associated battery. Example: TN492 circuit pack replaced July 1987; date to be written on the label is July 1992.

- b. Affix the **Date Label** to the faceplate of the TN492 circuit pack.

Note: If the YELLOW LED is lighted, after the circuit pack is replaced, the battery is **not** connected or wired correctly.

12. Verify option settings on the replacement circuit pack are correct (if applicable).
13. At the off-line common control, replace the circuit pack.
14. At the off-line common control, set the **GO/HALT** switch to **GO**.
15. Set the **LOCK ON LINE** switch to **OFF**.

Note: Replacement of circuit pack is complete.

16. Use **PROC 613**, Test 3 to soft switch the off-line common control to the on-line side (if required) for further testing to determine if replacement of the circuit pack corrected the problem.

Requirement: If further testing can be accomplished in the off-line common control, do not soft switch until the appropriate test(s) complete with a pass indication.

TMS, Module Control, or RMI Carrier Circuit Pack Replacement

Perform the following steps when replacing circuit packs in the TMS, module control, or RMI carrier.

1. Determine if the TMS or module control carrier is duplicated.
If the TMS or module control carrier is duplicated, proceed to Step 2.
If the TMS or module control carrier is unduplicated, proceed to Step 6.
2. Determine if the circuit pack being replaced is in the on-line or off-line side of the TMS, module control, or RMI carrier.
3. If the circuit pack being replaced is in the on-line side of the TMS, module control, or RMI carrier, proceed to Step 5.
4. If the circuit pack being replaced is in the off-line side of the TMS, module control, or RMI carrier, proceed to Step 6.
5. Use **PROC 621**, Test 2 to soft switch the on-line TMS or module control to the off-line side, and proceed to Step 6.

Note: If the soft switch cannot be performed, proceed to Step 6.

6. Remove the circuit pack being replaced.
7. Verify option settings on the replacement circuit pack are correct (if applicable).
8. Replace the circuit pack.

Caution: *The DC/DC converter handle should not be toggled when replacing circuit packs in the TMS, module control, and/or RMI carriers. If the 494GA power unit in Slot 00B of the module control carrier is reset (toggled), a loopback condition in the fiber link of a duplicated TMS will be forced. If that TMS was on-line, it will be forced off-line. Until the loopback is cleared the newly forced off-line TMS will not be available for back-up in event of another failure.*

9. Replacement of circuit pack is complete.
10. If the TMS or module control carrier is duplicated, and a soft switch was performed, use **PROC 621**, Test 2 to soft switch the off-line TMS or module control to the on-line side (if required) for further testing to determine if replacement of the circuit pack corrected the problem.

Requirement: If further testing can be accomplished in the off-line TMS or module control, do not soft switch until the appropriate test(s) complete with a pass indication.

Port or DS-1/MFAT Carrier Circuit Pack Replacement

When replacing circuit packs in a port or DS-1/MFAT carrier, multiple circuits associated with the circuit pack being replaced should be busied out.

Caution: *Busying out port circuits that are in use (indicated by a YELLOW LED on the circuit pack's edge) results in the connection(s) being dropped.*

1. **Port Circuit Packs:** When a port circuit pack (i.e., line or trunk) is being replaced, all circuits on the circuit pack should be idle, if at all possible, before removal.
2. **PDI or PCI Circuit Packs:** When a Port Data Interface (PDI) or a Port Control Interface (PCI) circuit pack is replaced, all port circuits served by the PDI (left or right side of the port or DS-1/MFAT carrier) or PCI should be busied out. Busying out the circuits associated with a PDI prevents any interaction to the circuits if the PDI comes up in loop around. Busying out the circuits associated with a PCI prevents the circuits changing to unpredictable states when removing or replacing the PCI.
3. **DS-1, PRI, RCL, or RCC Circuit Packs:** When a DS-1, Primary Rate Interface (PRI), Remote Carrier Local (RCL), or Remote Carrier Controller (RCC) circuit pack is replaced, all 24 ports of the DS-1, PRI, RCL, or RCC circuit pack should be busied out by depressing **BUSY OUT** when the circuit pack is displayed.
 - a. Busy out of a PRI circuit pack takes a short period of time for the last few ISDN ports to be made busied at the far end.
 - b. Depressing **BUSY OUT** does **not** mean the ISDN ports are busied out.
 - c. **PROC 635** and/or **PROC 648** can be used to ensure that all ISDN ports are busied out by checking the circuit status of the ISDN ports.

The circuit status of the ISDN ports are independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Perform the following steps when replacing circuit packs in a port or DS-1/MFAT carrier.

All circuits associated with the port circuit pack, PDI, PCI, DS-1, PRI, RCL, or RCC circuit pack being replaced should be busied out before the circuit pack is removed from the port or DS-1/MFAT carrier.

Caution: *Busying out a circuit when the circuit is in use (lighted YELLOW LED on the circuit pack) results in the connection being dropped. Busying out a DS-1, PRI, RCL, or RCC circuit pack disrupts calls in progress on all 24 ports of the DS-1, PRI, RCL, or RCC circuit pack.*

1. Using **PROC 632**, Test 3 (carrier busy), busy out the circuit(s) affected by the circuit pack being replaced.

To busy out port circuits, display the circuit or circuit pack in **PROC 632**, Test 3 and depress **BUSY OUT**.

Repeat the sequence until all circuits affected by the port circuit pack being replaced are busied out.

- a. Depressing **BUSY OUT** for a PRI circuit pack does **not** mean all the ISDN ports are busied out.

Busy out of a PRI circuit pack takes a short period of time for the last few ISDN ports to be made busied at the far end.

- b. **PROC 635** and/or **PROC 648** can be used to ensure that all ISDN ports are busied out by checking the circuit status of the ISDN ports.

The circuit status of the ISDN ports are independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

2. Remove the circuit pack being replaced.

Caution: *Removal of the circuit pack, when any circuit on the circuit pack is in use (indicated by a lighted YELLOW LED on the circuit pack's edge) results in the connection(s) being dropped.*

3. Verify option settings on the replacement circuit pack are correct (if applicable).
4. Replace the circuit pack.

After replacement, the port circuits associated with the port circuit pack, PDI, PCI, DS-1, PRI, RCL, or RCC circuit pack replaced should be released from busy.

5. Use **PROC 632**, Test 3 to release from busy the circuits busied out in Step 1.

To release busy out port circuits, display the circuit or circuit pack in **PROC 632**, Test 3 and depress **RLS BUSY OUT**.

Repeat the sequence until all circuits busied out in Step 1 are released from busy.

- a. Releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out.

If the far end does not agree, the trunk(s) will stay in T-Limbo (trunk is in a limbo state).

If the far end switch has the trunk(s) in a maintenance busy state the trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- b. Depressing **RLS BUSY OUT** does **not** mean the trunk(s) is available for use.
- c. **PROC 635** and/or **PROC 648** can be used to ensure that the trunk(s) are released from busy by checking the circuit status of the ISDN trunk(s).

The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

Unduplicated Common Control DC/DC Converter Unit or Duplicated Common Control Power Carrier Circuit Pack Replacement

Perform the following steps when replacing circuit packs in the unduplicated common control DC/DC converter unit or duplicated common control power carrier.

1. Set the circuit breaker associated with the circuit pack to be replaced to **OFF**.
2. Remove the circuit pack by releasing the lever and pulling outward.

Note: Do not pull out the circuit pack by using the lever.

3. Install the replacement circuit pack by sliding inward and then pushing the lever forward.
4. Set the circuit breaker associated with the circuit pack replaced to **ON**.

Remote Carrier Group Circuit Pack Replacement

Perform the following steps when replacing circuit packs in the remote carrier group.

Note: There is no **MAAP** at the remote carrier group location.

1. Circuit packs in the remote carrier group are mounted horizontally.

The circuit packs are removed the same as those circuit packs in the network cabinets.

Note: If circuit pack CAL1 is being replaced, power down the remote carrier group housing unit. Circuit pack CAL1 should only be replaced in periods of low traffic if at all possible.

2. Remove the circuit pack being replaced.

Caution: *Removal of the circuit pack, when any circuit on the circuit pack is in use (indicated by a lighted YELLOW LED on the circuit pack's edge) results in the connection(s) being dropped.*

Note: The **YELLOW** LED on the general purpose port (SN270 or SN271) circuit pack in the remote carrier group is not used.

3. Verify option settings on the replacement circuit pack are correct (if applicable).
4. Replace the circuit pack.

CIRCUIT PACK SWITCH OPTION SETTINGS

Overview

Prior to reseating and/or replacing circuit packs in any of the switch carriers, the option settings on appropriate circuit packs should be checked to determine if the correct option setting is being used for the application required.

Option settings by means of rocker-type switches use the following convention:

D - Down (switch contacts are closed).

U - Up (switch contacts are open).

X - Don't care (switch contacts are not used and may be set in either position).

Note: Switches are set down (closed) when the rocker end adjacent to the number is depressed and up (open) when the rocker end away from the number is depressed.

The following paragraphs list the circuit packs that have option settings in the switch carriers.

Common Control Carrier Circuit Pack Option Settings

The following circuit packs in the common control carrier have circuit pack option settings. Use the referenced figure to determine if the option setting is correct for the application being used.

TN513 (Slot 15 in common control carrier), Figure 40.

TN403 (Slots 23 through 26 in common control carrier), Figure 41.

Module Control or RMI Carrier Circuit Pack Option Settings

The following circuit pack in the module control or RMI carrier has option settings. Use the referenced figure to determine if the option setting is correct for the application being used. Carrier position 25 in the module control carrier and carrier positions 00 through 08 and 13 through 21 in the RMI carrier house the TN456 circuit pack.

TN456 (Slot 15 in common control carrier), Figure 42.

Port Carrier, DS-1/MFAT Carrier, or Remote Carrier Group Circuit Pack Option Settings

The following circuit packs in the port carrier, DS-1/MFAT carrier, or remote carrier group have circuit pack option settings. Use the referenced figure to determine if the option setting is correct for the application being used. Carrier positions 00 through 03, 05 through 08, 13 through 16, and 18 through 21 in the port or DS-1/MFAT carriers are universal port positions which can accept any port circuit pack.

ANN11B or ANN11C (DS-1/MFAT Carrier Only), Figure 43.

ANN11D or ANN11E, Figure 44.

ANN15, Figure 45.

ANN16 (Remote Carrier Group), Figure 46.

ANN35, Figure 47.

CAL1 (Remote Carrier Group), Figure 48.

SN224B, Figure 49.

SN228, Figure 50.

SN230, Figure 51.

SN231, Figure 52.

SN232B, Figure 53.

SN233C, Figure 54.

SN238, Figure 55.

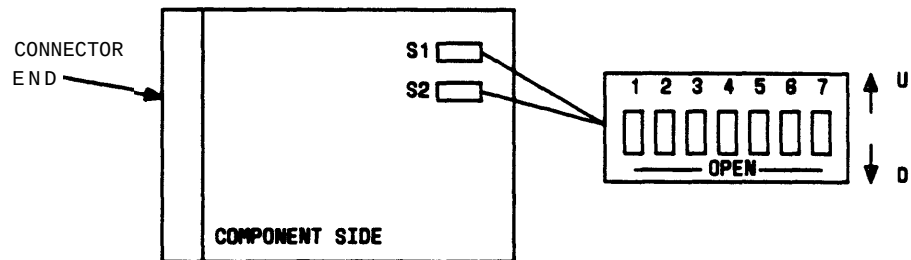
SN243B, Figure 56.

SN253B, Figure 57.

SN270, Figure 58.

TN513 DCIU TEST SUPPORT OPTION SETTINGS

TWO SWITCH PACKAGES WITH SEVEN SWITCH SECTIONS ALLOW CONFIGURATION OF THE SERIAL PORT HARDWARE. SWITCH S1 IS USED TO CONFIGURE CHANNEL 0 USART AND SWITCH S2 IS USED TO CONFIGURE CHANNEL 1 USART.



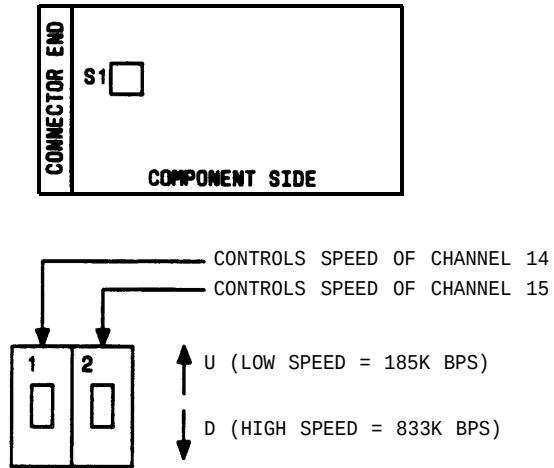
THE FOLLOWING TABLE INDICATES THE S1 AND S2 SWITCH SECTION POSITIONS REQUIRED FOR EACH OPTION PROVIDED. (U) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS DEPRESSED AT THE LOWER END.

FUNCTION	SWITCH	SWITCH SECTION	POSITION
RX/TX DIRECT MODE	1 OR 2	1, 4	D
		2, 3	U
RX/TX NULL MODE	1 OR 2	2, 3	D
		1, 4	U
SHORT CTS/RTS	1 OR 2	5	D
SHORT DTR/DSR	1 OR 2	6	D
LOGICALLY (AND) CH0 AND CH1 USART INTERRUPTS	1	7	D
	2	7	U
INDEPENDENT CH0 AND CH1 USART INTERRUPTS	1	7	U
	2	7	D
DISABLE CH1 USART INTERRUPTS	1	7	U
	2	7	U

Figure 40. TN513 DCIU Test Support Option Settings

TN403 DUAL SPEED DATA CHANNEL OPTION SETTINGS

SWITCH S1 CONTROLS THE DATA TRANSMISSION RATE FOR CIRCUIT PACK CHANNELS 14 AND 15.

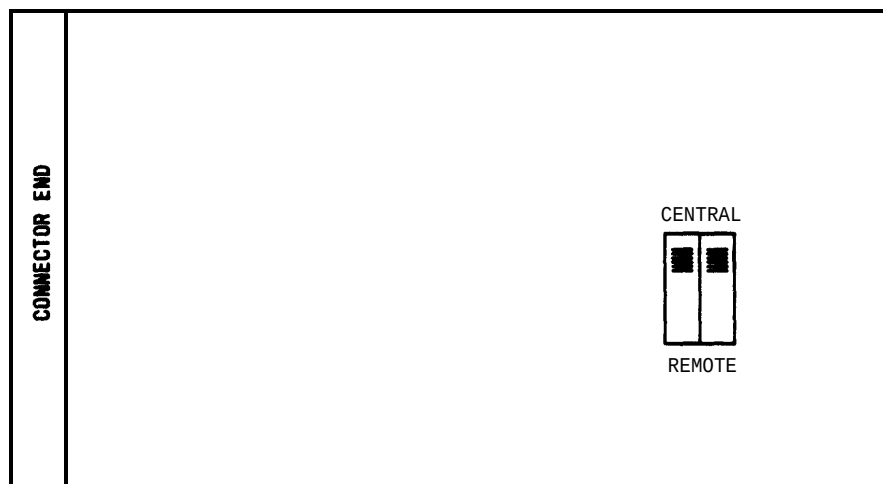


THE FOLLOWING TABLE INDICATES THE SWITCH POSITIONS REQUIRED FOR LOW AND HIGH SPEED OPTIONS. (U) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE UPPER END AND (D) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE LOWER END.

CARRIER SLOT	CHANNEL NUMBERS	TN403 CHANNEL NUMBER	SWITCH SECTION	SWITCH POSITION
23	00-15	15	2	D
		14	1	D
24	16-31	15	2	U
		14	1	U
25	32-47	15	2	U
		14	1	U
26	48-63	15	2	U
		14	1	U
CHANNELS 0-13 ARE NOT SPEED OPTIONABLE. THEY WILL ONLY OPERATE AT LOW SPEED (185K BPS).				

Figure 41. TN403 Dual Speed Data Channel Option Settings

TN456 REMOTE MODULE INTERFACE OPTION SETTINGS

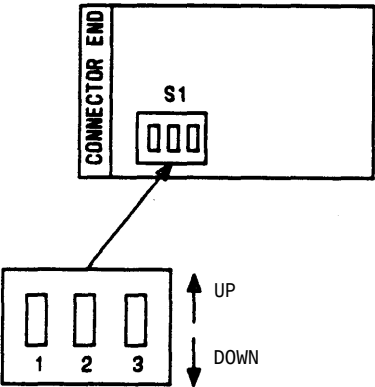


THE SWITCH POSITION ON TN456 DEPENDS ON THE OPTION REQUIRED. FOR CENTRAL LOCATION OPERATION (COMMON CONTROL COMPLEX END OF THE LINK), SET BOTH SWITCHES IN THE UP POSITION. FOR REMOTE LOCATION OPERATION (MODULE AT THE FAR END OF THE LINK FROM THE COMMON CONTROL COMPLEX), SET BOTH SWITCHES IN THE DOWN POSITION.

Figure 42. TN456 Remote Module Interface Option Settings

ANN11B AND ANN11C DS-1 INTERFACE OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING THREE ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



TO SELECT ONE OF FIVE TRANSMIT EQUALIZER SETTINGS, SET THE SWITCH SECTIONS AS SHOWN IN THE FOLLOWING TABLE. IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END.

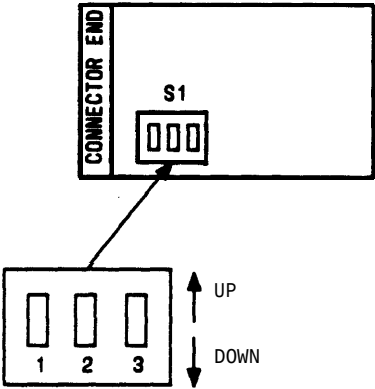
DISTANCE TO SPECIFIED POINT	SWITCH SECTION		
	1	2	3
0 TO 133 FEET	D	D	U
133 TO 266 FEET	D	U	D
266 TO 399 FEET	D	U	U
399 TO 533 FEET	U	D	D
533 TO 655 FEET	U	D	U

THE EQUALIZER SETTING REQUIRED IS BASED ON THE DISTANCE ALONG THE 606 TYPE CABLE CONNECTION FROM THE SYSTEM 85 DS-1 CONNECTOR TO A SPECIFIED POINT. THE EQUALIZERS PROVIDE PRECONDITIONING OF THE TRANSMIT SIGNAL SO THAT THE DS-1 PULSE SHAPE FALLS WITHIN DEFINED BOUNDARIES AT A COMMON SPECIFIED POINT.

Figure 43. ANN11B and ANN11C DS-1 Interface Option Settings

ANN11D AND ANN11E DS-1 INTERFACE OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING THREE ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



TO SELECT ONE OF FIVE TRANSMIT EQUALIZER SETTINGS, SET THE SWITCH SECTIONS AS SHOWN IN THE FOLLOWING TABLE. IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END.

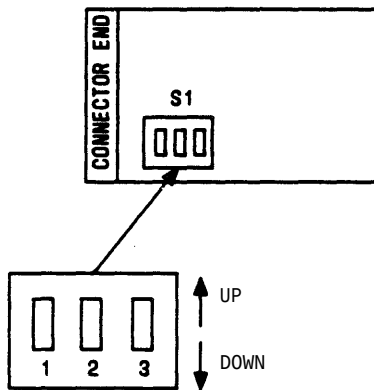
DISTANCE TO SPECIFIED POINT	SWITCH SECTION		
	1	2	3
0 TO 133 FEET	D	D	U
133 TO 266 FEET	D	U	D
266 TO 399 FEET	D	U	U
399 TO 533 FEET	U	D	D
533 TO 655 FEET	U	D	U

THE EQUALIZER SETTING REQUIRED IS BASED ON THE DISTANCE ALONG THE 606 TYPE CABLE CONNECTION FROM THE SYSTEM 85 DS-1 CONNECTOR TO A SPECIFIED POINT. THE EQUALIZERS PROVIDE PRECONDITIONING OF THE TRANSMIT SIGNAL SO THAT THE DS-1 PULSE SHAPE FALLS WITHIN DEFINED BOUNDARIES AT A COMMON SPECIFIED POINT.

Figure 44. ANN11D and ANN11E DS-1 Interface Option Settings

ANN15 REMOTE CARRIER LOCAL (RCL) OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING THREE ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



TO SELECT ONE OF FIVE TRANSMIT EQUALIZER SETTINGS, SET THE SWITCH SECTIONS AS SHOWN IN THE FOLLOWING TABLE. IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END.

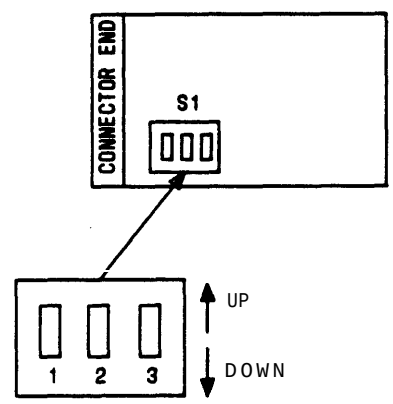
DISTANCE TO SPECIFIED POINT	SWITCH SECTION		
	1	2	3
0 TO 133 FEET	D	D	U
133 TO 266 FEET	D	U	D
266 TO 399 FEET	D	U	U
399 TO 533 FEET	U	D	D
533 TO 655 FEET	U	D	U

THE EQUALIZER SETTING REQUIRED IS BASED ON THE DISTANCE ALONG THE 606 TYPE CABLE CONNECTION FROM THE SYSTEM 85 DS-1 CONNECTOR TO A SPECIFIED POINT. THE EQUALIZERS PROVIDE PRECONDITIONING OF THE TRANSMIT SIGNAL SO THAT THE DS-1 PULSE SHAPE FALLS WITHIN DEFINED BOUNDARIES AT A COMMON SPECIFIED POINT.

Figure 45. ANN15 Remote Carrier Local (RCL) Option Settings

ANN16 REMOTE CARRIER CONTROLLER (RCC) OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING THREE ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



SET THE SWITCH SECTIONS BASED ON THE LENGTH OF THE DS-1 CABLE BETWEEN THE CABINET AND THE DSX-1 CROSS-CONNECT POINT USING THE FOLLOWING TABLE. IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END.

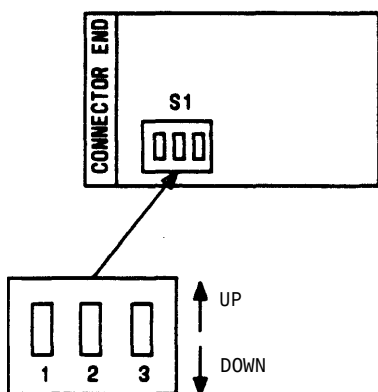
CABLE LENGTH	SWITCH SECTION		
	1	2	3
0 TO 133 FEET	D	D	U
133 TO 266 FEET	D	U	D
266 TO 399 FEET	D	U	U
399 TO 533 FEET	U	D	D
533 TO 655 FEET	U	D	U

THE DSX-1 CROSS-CONNECT POINT IS NORMALLY AT THE INPUTS TO A CSU, CDM, OR CEM INTERFACE FACILITY.

Figure 46. ANN16 Remote Carrier Controller (RCL) Option Settings

ANN35 ISDN PRIMARY RATE PORT OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING THREE ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



TO SELECT ONE OF FIVE TRANSMIT EQUALIZER SETTINGS, SET THE SWITCH SECTIONS AS SHOWN IN THE FOLLOWING TABLE. IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END.

DISTANCE TO SPECIFIED POINT	SWITCH SECTION		
	1	2	3
0 TO 133 FEET	D	D	U
133 TO 266 FEET	D	U	D
266 TO 399 FEET	D	U	U
399 TO 533 FEET	U	D	D
533 TO 655 FEET	U	D	U

THE EQUALIZER SETTING REQUIRED IS BASED ON THE DISTANCE ALONG THE 606 TYPE CABLE CONNECTION FROM THE SYSTEM 85 PRIMARY RATE PORT CONNECTOR TO A SPECIFIED POINT. THE EQUALIZERS PROVIDE PRECONDITIONING OF THE TRANSMIT SIGNAL SO THAT THE PRIMARY RATE PORT PULSE SHAPE FALLS WITHIN DEFINED BOUNDARIES AT A COMMON SPECIFIED POINT.

Figure 47. ANN35 ISDN Primary Rate Port Option Settings

CAL1 FREQUENCY GENERATOR/ALARM OPTION SETTINGS

ONE SWITCH PACKAGE (S1) CONTAINING EIGHT ROCKER SWITCH SECTIONS IS POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM.

SET THE SWITCH SECTIONS BASED ON THE TYPE OF POWER UNIT USING THE FOLLOWING TABLE.



POWER UNIT	SWITCH SECTIONS							
	1	2	3	4	5	6	7	8
OLS OR ØBS	0	1	0	0	0	0	0	1
DC CONVERTER	0	1	0	0	0	1	1	0

A SWITCH SECTION IS CLOSED WHEN THE ROCKER ARM IS DEPRESSED TOWARD THE SWITCH SECTION POLE NUMBER. AS SHOWN, SWITCH SECTIONS 2 AND 8 ARE CLOSED.

0 EQUALS SWITCH SECTION OPEN. 1 EQUALS SWITCH SECTION CLOSED.

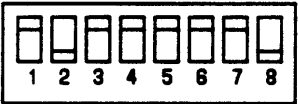


Figure 48. CAL1 Frequency Generator/Alarm Option Settings

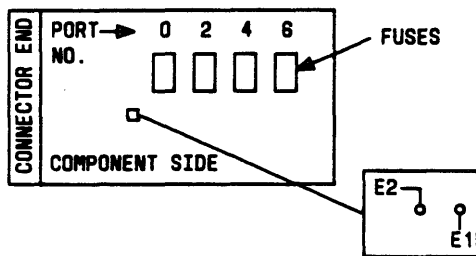
SN224B MFET LINE PORT SETTINGS AND FUSES

SN224B OPTION SETTINGS

A SINGLE SHORTING PLUG IS PROVIDED TO ADAPT THE PORT CIRCUITS TO INTERFACE WITH EITHER MULTIFUNCTION ELECTRONIC TELEPHONE (MFET) OR MULTIBUTTON ELECTRONIC TELEPHONE (MET) TERMINALS. ALL FOUR PORTS ARE ALTERED BY THE SINGLE PLUG. FOR MET TERMINALS, THE SHORTING PLUG IS PLACED OVER TERMINALS E1 AND E2. FOR MFET TERMINALS, THE SHORTING PLUG IS PLACED OVER TERMINAL E1 ONLY.

SN224B FUSES

THE -48 VOLT POWER SUPPLIED TO STATION APPARATUS FROM EACH OF THE FOUR PORTS ON THIS PACK IS FUSED AT EACH PORT. THE FUSES, CODED 70H(0.75 AMP.), ARE LOCATED ON THE PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



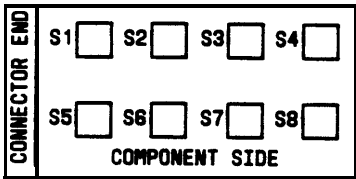
WHEN MAINTENANCE PROCEDURES INDICATE A FUSE MAY NEED REPLACEMENT, ALL PORTS ON THE PACK SHOULD BE MADE MAINTENANCE BUSY BEFORE REMOVING THE PACK FROM THE CARRIER. PROC 630 CAN BE USED TO MAKE THE PORTS MAINTENANCE BUSY

Figure 49. SN224B MFET Line Port Option Settings and Fuses

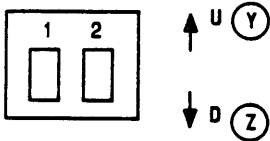
SN228 OFF PREMISES STATION (OPS) OPTION SETTINGS

SELECTION OF OPTION **(Z OR Y)**

EIGHT SWITCH PACKAGES, S1-S8, EACH CONTAINING TWO ROCKER SWITCH SECTIONS, ARE POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM. EACH SWITCH PACKAGE SERVES ONE OF THE EIGHT PORT CIRCUITS PROVIDED ON THE PACK.



A SINGLE SWITCH PACKAGE IS SHOWN BELOW TO IDENTIFY THE TWO SWITCH SECTIONS (1,2) IN THE PACKAGE.



TO SELECT THE REQUIRED OPTION FOR A PORT CIRCUIT, REFER TO THE FOLLOWING TABLE. FIRST, IDENTIFY THE SWITCH PACKAGE (S1-S8) ASSOCIATED WITH THE PORT CIRCUIT. THEN SET THE SWITCH SECTION FOR THAT PORT AS SHOWN IN THE TABLE; (U) INDICATES THE SWITCH SECTION IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH SECTION IS FULLY DEPRESSED AT THE LOWER END.

PORT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION POSITION	
			OPTION (600 OHMS) (Z)	OPTION (RC NTWK) (Y)
0	1	1 AND 2	D	U
1	2	1 AND 2	D	U
2	3	1 AND 2	D	U
3	4	1 AND 2	D	U
4	5	1 AND 2	D	U
5	6	1 AND 2	D	U
6	7	1 AND 2	D	U
7	8	1 AND 2	D	U

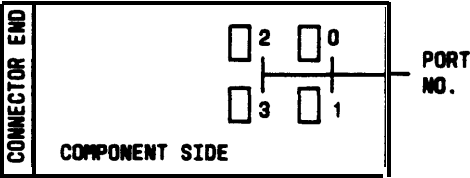
USE 600 OHM OPTION WHEN LOOP LENGTH IS LESS THAN 3500 FEET (ABOUT 600 OHMS WITHOUT SET). USE RC NETWORK OPTION FOR LOOP LENGTH GREATER THAN 3500 FEET.

Figure 50. SN228 Off Premises Station (OPS) Option Settings

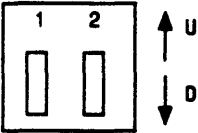
SN230 CENTRAL OFFICE (CO) TRUNK OPTION SETTINGS

SELECTION OF OPTION **W** OR **X**

FOUR SWITCH PACKAGES, EACH CONTAINING TWO ROCKER SWITCH SECTIONS, ARE POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM. EACH SWITCH PACKAGE IS ASSIGNED TO A SINGLE PORT CIRCUIT AS IDENTIFIED IN THE DIAGRAM.



A SINGLE SWITCH PACKAGE IS SHOWN BELOW TO IDENTIFY THE TWO SWITCH SECTIONS (1,2) IN THE PACKAGE.



TO SELECT THE REQUIRED OPTION FOR A PORT CIRCUIT, IDENTIFY THE ASSOCIATED SWITCH PACKAGE FROM THE PACK DIAGRAM. THEN SET THE SWITCH SECTIONS FOR THAT PORT AS SHOWN IN THE FOLLOWING TABLE.

OPTION	TERMINATION	SWITCH SECTION	
		1	2
W	RC BALANCE NTKW	U	X
X	600 OHMS	D	X

IN THE TABLE, (U) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS FULLY DEPRESSED AT THE LOWER END. NOTE THAT SWITCH SECTION 2 IS NOT USED, AS INDICATED BY (X) AND THE POSITION OF THIS SWITCH HAS NO EFFECT ON CIRCUIT OPERATION.

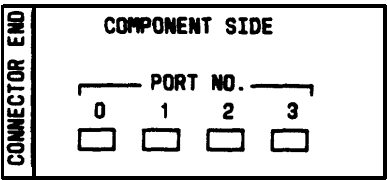
USE 600 OHM OPTION WHEN LOOP LENGTH IS LESS THAN 3500 FEET. USE RC NETWORK OPTION FOR LOOP LENGTH GREATER THAN 3500 FEET.

Figure 51. SN230 Central Office (CO) Trunk Option Settings

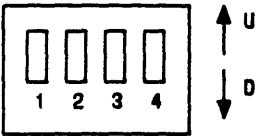
SN231 AUXILIARY TRUNK OPTION SETTINGS

SELECTION OF OPTION **Q**, **R**, OR **S**

FOUR SWITCH PACKAGES, EACH CONTAINING FOUR
ROCKER SWITCH SECTIONS ARE POSITIONED ON THE
CIRCUIT PACK AND ASSIGNED TO A SINGLE PORT
CIRCUIT AS IDENTIFIED IN THE FOLLOWING
DIAGRAM.



A SINGLE SWITCH PACKAGE IS SHOWN BELOW TO
IDENTIFY THE FOUR SWITCH SECTIONS IN
THE PACKAGE.



TO SELECT THE REQUIRED OPTION FOR A PORT
CIRCUIT, IDENTIFY THE ASSOCIATED SWITCH
PACKAGE FROM THE PACK DIAGRAM. SET THE
SWITCH SECTIONS FOR THAT PORT AS SHOWN
IN THE FOLLOWING TABLE.

OPTION	TRANSMISSON	SWITCH SECTION			
		1	2	3	4
S	ONE-WAY INCOMING	X	U	D	X
R	ONE-WAY OUTGOING	X	D	U	X
Q	TWO-WAY	X	U	U	X
ZA	TWO WIRE SIGNALING	D	X	X	X
ZB	FOUR WIRE SIGNALING	U	X	X	X

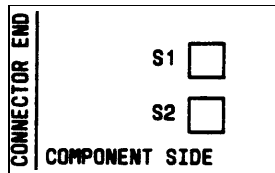
IN THE TABLE, (U) INDICATES THE SWITCH IS
FULLY DEPRESSED AT THE UPPER END AND (D)
INDICATES THE SWITCH IS FULLY DEPRESSED
AT THE LOWER END. X INDICATES THAT THE
POSITION OF THESE SECTIONS HAS NO EFFECT
ON CIRCUIT OPERATION.

Figure 52. SN231 Auxiliary Trunk Option Settings

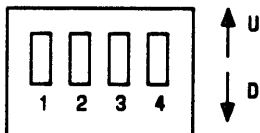
SN232B — DIRECT INWARD DIALING (DID) TRUNK OPTION SETTINGS

SELECTION OF OPTION **(T)** OR **(V)**

TWO SWITCH PACKAGES, S1 AND S2, EACH CONTAINING FOUR ROCKER SWITCH SECTIONS, ARE POSITIONED ON THE CIRCUIT PACK AS SHOWN IN THE FOLLOWING DIAGRAM. EACH SWITCH PACKAGE SERVES TWO OF THE FOUR PORT CIRCUITS PROVIDED ON THE PACK.



A SINGLE SWITCH PACKAGE IS SHOWN BELOW TO IDENTIFY THE FOUR SWITCH SECTIONS (1-4) IN THE PACKAGE.



TO SELECT THE REQUIRED OPTION FOR A PORT CIRCUIT, REFER TO THE FOLLOWING TABLE. THE SYMBOL (U) INDICATES THE SWITCH SECTION IS FULLY DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH SECTION IS FULLY DEPRESSED AT THE LOWER END.

PORT CIRCUIT	SWITCH PACKAGE	SWITCH SECTION	SWITCH SECTION SETTING	
			OPTION (RC NTWK) (T)	OPTION (600 OHMS) (V)
0	S1	1	U	D
		2	D	U
1	S2	1	U	D
		2	D	U
2	S1	3	U	D
		4	D	U
3	S2	3	U	D
		4	D	U

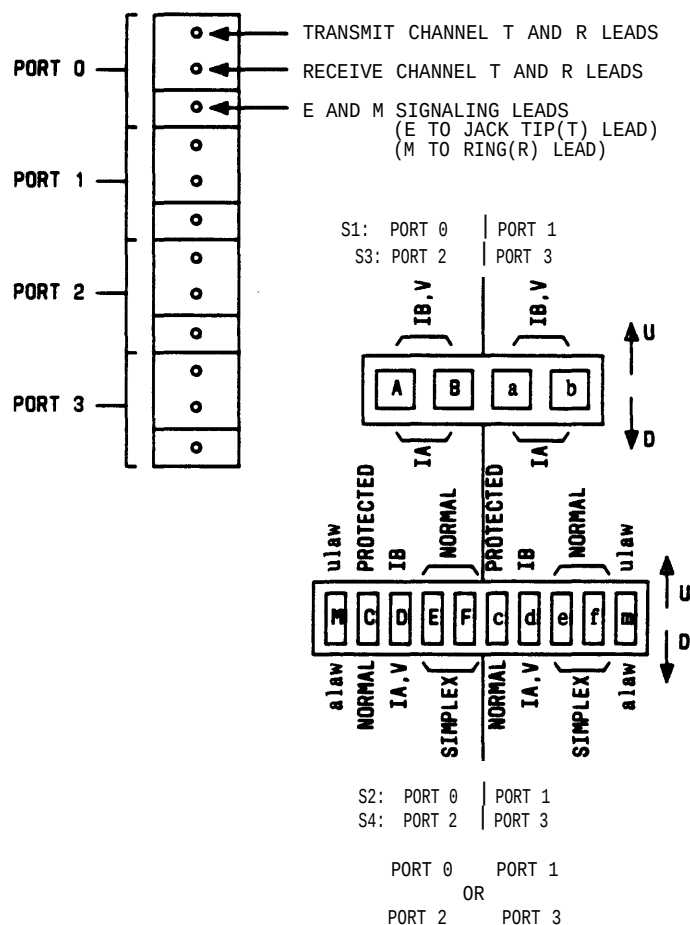
USE 600 OHM OPTION WHEN LOOP LENGTH IS LESS THAN 3500 FEET. USE RC NETWORK OPTION FOR LOOP LENGTH GREATER THAN 3500 FEET.

Figure 53. SN232B Direct Inward Dialing (DID) Trunk Option Settings

SN233C TIE TRUNK/ATTENDANT INTERFACE OPTION SETTINGS

SN233C JACK FUNCTIONS

ACCESS TO BOTH TRANSMIT AND RECEIVE TRANSMISSION CHANNELS AND TO THE E AND M SIGNALING LEADS FOR EACH PORT IS PROVIDED BY JACKS ON THE FRONT OF THE PACK. THE JACK ASSIGNMENT IS SHOWN BELOW. PLUG INSERTION HALF WAY INTO THE TRANSMIT OR RECEIVE CHANNEL JACK ALLOWS MONITORING OF THE SIGNALS. FULL INSERTION OF THE JACK ACCESSES THE LOCAL END AND OPENS THE CHANNEL TOWARD THE DISTANT END. PLUG INSERTION INTO THE SIGNALING LEAD JACK ALLOWS MONITORING OF THE E AND M LEADS. THE E AND M LEADS CANNOT BE OPENED BY USE OF THIS JACK.



SWITCH ASSIGNMENT

THE TYPE OF SIGNALING USED ON THE PORT IS SET BY OPTION SWITCHES AS DESCRIBED BELOW. FOUR SWITCH PACKAGES, S1 THROUGH S4, ARE LOCATED AS SHOWN ON THE PACK DIAGRAM. S1 CONTAINS FOUR ROCKER SWITCH SECTIONS WHICH ARE SHARED BETWEEN PORT 0 AND PORT 1. S3 ALSO CONTAINS FOUR ROCKER SWITCH SECTIONS WHICH ARE SHARED BETWEEN PORT 2 AND PORT 3. S2 CONTAINS TEN ROCKER SWITCH SECTIONS WHICH ARE SHARED BETWEEN PORT 0 AND PORT 1. S4 ALSO CONTAINS TEN ROCKER SWITCH SECTIONS WHICH ARE SHARED BETWEEN PORT 2 AND PORT 3. THE SWITCH SETTINGS DETERMINE THE TYPE AND METHOD OF SIGNALING USED FOR THE PORT AND THE CODEC CONVERSION MODE. THE TABLE BELOW SHOWS THE SWITCH SETTINGS FOR THE VARIOUS SIGNALING TYPES FOR ANY PORT.

SWITCH SECTION		A a	B b	C c	D d	E e	F f
STANDARD E&M TYPE	IA	D	D	D	D	U	U
	IB	U	U	D	U	U	U
	V	U	U	D	D	U	U
PROTECTED TYPE	IA	D	D	U	D	U	U
	IB	U	U	U	U	U	U
	V	U	U	U	D	U	U
SIMPLEX TYPE	IA	D	D	U	D	D	D
	IB	U	U	U	U	D	D
	V	U	U	U	D	D	D

CAPITAL LETTERS A THROUGH F = PORT 0 AND PORT 2
SMALL LETTERS A THROUGH F = PORT 1 AND PORT 3
SET SWITCH M FOR APPROPRIATE CONVERSION MODE:

ulaw (DOMESTIC) = U
alaw (INTERNATIONAL) = D
NOTE: SOME INTERNATIONAL COUNTRIES USE ulaw.

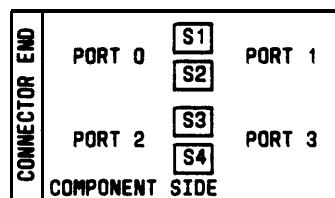


Figure 54. SN233C Tie Trunk/Attendant Interface Option Settings

SN238 EIA INTERFACE OPTION SETTINGS

TWO SWITCH PACKAGES EACH CONTAINING EIGHT SWITCH SECTIONS. SWITCH S1 IS USED TO SELECT ODD OR EVEN PARITY, ENABLE OR DISABLE PARITY, AND TO SELECT A BAUD (DATA) RATE. SWITCH S2 IS USED TO ENABLE OR DISABLE AUTO-BAUD AND AUTO-PARITY FOR PORTS 0-3. S2 IS ALSO USED TO ENABLE OR DISABLE KEYBOARD DIALING FOR PORTS 0-3.

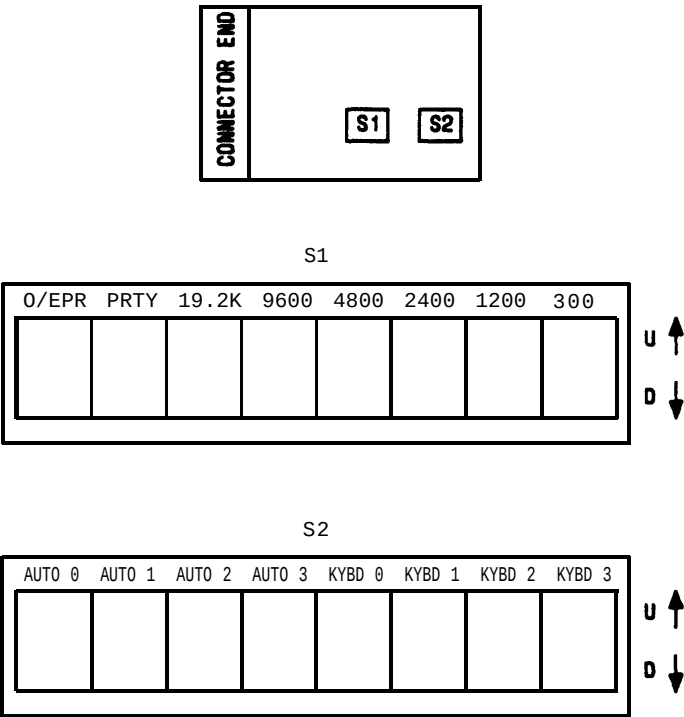


Figure 55. SN238 EIA Interface Option Settings (Sheet 1 of 3)

SN238 EIA INTERFACE OPTION SETTINGS (CONTD)

S1 OPTION SETTING

NOTE: IF MORE THAN ONE BAUD RATE IS SELECTED, THE PORT BOARD WILL DETERMINE THE HIGHEST COMMON BAUD RATE WITH THE THE DISTANT END. WHEN A CALL IS DISCONNECTED OR NOT INITIATED, THE PORTBOARD FOLLOWS THE HIGHEST BAUD RATE SELECTED ON S1.

SWITCH	SETTING	FUNCTION
0/EPR	D	Odd parity
	U	Even parity
PRTY	D	Parity enabled
	U	Parity disabled
19.2K	D	19.2K baud
	U	Switch disabled
9600	D	9600 baud
	U	Switch disabled
4800	D	4800 baud
	U	Switch disabled
2400	D	2400 baud
	U	Switch disabled
1200	D	1200 baud
	U	Switch disabled
300	D	300 baud
	U	Switch disabled

Figure 55. SN238 EIA Interface Option Settings (Sheet 2 of 3)

SN238 EIA INTERFACE OPTION SETTINGS (CONTD)

S2 SETTINGS

SWITCH	SETTING	FUNCTION
AUTO 0	D	ENABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 0
	U	DISABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 0
AUTO 1	D	ENABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 1
	U	DISABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 1
AUTO 2	D	ENABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 2
	U	DISABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 2
AUTO 3	D	ENABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 3
	U	DISABLES AUTO-BAUD AND AUTO-PARITY FOR PORT 3
KYBD 0	D	ENABLES KEYBOARD DIALING FOR PORT 0
	U	DISABLES KEYBOARD DIALING FOR PORT 0
KYBD 1	D	ENABLES KEYBOARD DIALING FOR PORT 1
	U	DISABLES KEYBOARD DIALING FOR PORT 1
KYBD 2	D	ENABLES KEYBOARD DIALING FOR PORT 2
	U	DISABLES KEYBOARD DIALING FOR PORT 2
KYBD 3	D	ENABLES KEYBOARD DIALING FOR PORT 3
	U	DISABLES KEYBOARD DIALING FOR PORT 3

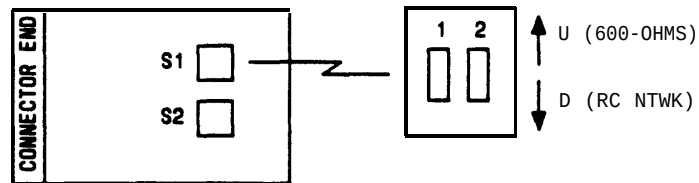
NOTE:

IF AUTO-BAUD AND AUTO-PARITY ARE ENABLED WITH S2, THE OPTION SETTINGS ON S1 ARE IGNORED. IF AUTO-BAUD AND AUTO-PARITY ARE ENABLED FOR A PORT, KEYBOARD DIALING FOR THE SAME PORT MUST BE ENABLED.

Figure 55. SN238 EIA Interface Option Settings (Sheet 3 of 3)

SN243B DATA PORT OPTION SETTINGS

TWO SWITCH PACKAGES, S1 AND S2, EACH CONTAINING TWO ROCKER SWITCH SECTIONS, ARE LOCATED ON THE CIRCUIT PACK AS SHOWN BELOW. EACH SWITCH PACKAGE SERVES TWO PORT CIRCUITS.



THE FOLLOWING TABLE INDICATES THE SWITCH PACKAGE AND SECTION ASSOCIATED WITH EACH PORT CIRCUIT. A SWITCH SECTION IS FULLY DEPRESSED AT THE UPPER (U) END TO PROVIDE THE 600 OHMS OPTION AND FULLY DEPRESSED AT THE LOWER END (D) FOR THE RC NETWORK OPTION.

PORT	SWITCH	SECTION
0	S1	1
1		2
2	S2	1
3		2

USE 600 OHM OPTION WHEN LOOP LENGTH IS LESS THAN 3500 FEET (ABOUT 600 OHMS WITHOUT SET). USE RC NETWORK OPTION FOR LOOP LENGTH GREATER THAN 3500 FEET.

Figure 56. SN243B Data Port Option Settings

SN253B AUXILIARY TONES OPTION SETTINGS

SELECTION OF OPTIONS **F** , **G** , **J** , OR **K**

A SWITCH PACKAGE CONTAINING TWO ROCKER SWITCH SECTIONS IS LOCATED ON THE CIRCUIT PACK IN THE UPPER LEFT CORNER (COMPONENT SIDE, CONNECTOR TO THE LEFT) AND SHOWN IN THE DIAGRAM BELOW.



THE FOLLOWING TABLE INDICATES THE SWITCH SECTION POSITIONS REQUIRED FOR EACH OPTION PROVIDED. IN THE TABLE, (U) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE UPPER END AND (D) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE LOWER END.

FUNCTION		OPTION	SWITCH	
			S1	S2
INTERNAL SYSTEM CHIME ONLY (0.5 SEC PERIOD)		K	U	U
EXTERNAL CHIME PERIOD (SEC.) *	0.50	J	D	U
	1.00	G	U	D
	2.00	F	D	D

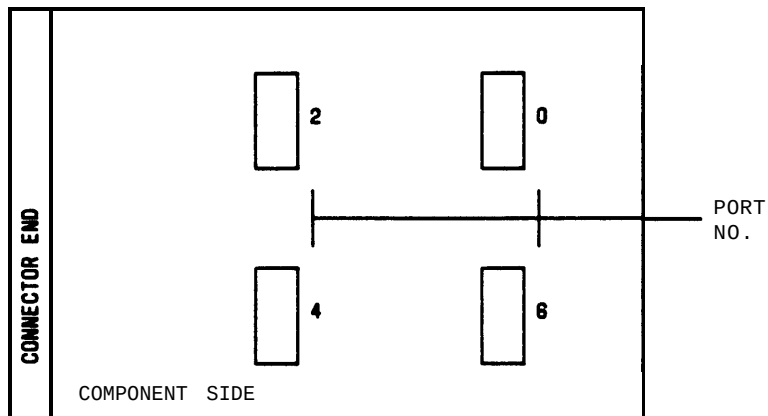
* INTERNAL CHIME WILL ALSO OPERATE AT THE SAME RATE CHOSEN FOR THE EXTERNAL CHIME.

Figure 57. SN253B Auxiliary Tones Option Settings

SN270 GENERAL PURPOSE PORT FUSES

SN270 FUSES

THE -48 VOLTS POWER SUPPLIED TO STATION APPARATUS FROM EACH OF THE FOUR PORTS ON THIS PACK IS FUSED AT EACH PORT. THE FUSES, CODED 70G (0.5A), ARE LOCATED ON THE PACK AS SHOWN IN THE FOLLOWING DIAGRAM.



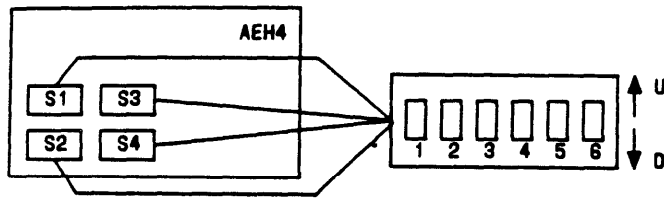
WHEN MAINTENANCE PROCEDURES INDICATE A FUSE MAY NEED REPLACEMENT, ALL PORTS ON THE PACK SHOULD BE MADE MAINTENANCE BUSY BEFORE REMOVING THE PACK FROM THE CARRIER. PROC 632 TEST 3 CAN BE USED TO MAKE THE PORTS MAINTENANCE BUSY.

Figure 58. SN270 General Purpose Port (GPP) Fuses

All Cabinets Alarm Board Option Settings

Alarm board AEH4 located behind the fan assembly in each cabinet can affect the alarm strategy. Use Figure 59 to determine if the option setting is correct for the application being used.

ALARM BOARD AEH4 OPTION SETTINGS



FOUR SWITCH PACKAGES WITH SIX SWITCH SECTIONS ALLOW CONFIGURATION OF THE ALARM BOARD.

THE FOLLOWING TABLE INDICATES THE FOUR SWITCH PACKAGES POSITIONS REQUIRED FOR EACH OPTION PROVIDED. (U) INDICATES THE ROCKER SWITCH IS DEPRESSED AT THE UPPER END AND (D) INDICATES THE SWITCH IS DEPRESSED AT THE LOWER END.

	AIR FLOW						OVER TEMP						HOLD OVER						RECTIFIER						DC FAN FUSES					
	SWITCH S1						SWITCH S2						SWITCH S3						SWITCH S4											
	SECTION						SECTION						SECTION						SECTION											
AEH4 LOCATED IN THIS TYPE OF CABINET	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6						
UNDUPLICATED COMMON CONTROL (501CC) (CONTAINS PORT CIRCUITS)	U	D	D	U	U	D	D	U	U	U	U	U	U	U	U	U	U	D	D	U	U	U	D							
DUPLICATED COMMON CONTROL (501CC) (DOES NOT CONTAIN PORT CIRCUITS)	U	D	D	U	U	D	D	U	U	U	U	D	U	U	U	D	D	U	U	U	U	D	U	D						
MODULE CONTROL WITH 309A/310A UNDUPLICATED 501CC SYSTEM	D	U	U	D	D	U	U	D	D	D	D	U	U	U	U	U	U	U	U	U	U	U	D	U						
MODULE CONTROL WITH 309A/310A DUPLICATED 501CC SYSTEM	D	U	U	D	D	U	U	D	D	D	D	U	U	U	D	U	U	D	D	D	U	U	D	U						
PORT CABINET WITH 309A/310A	D	U	U	D	D	U	U	D	D	D	D	U	U	U	D	U	U	D	D	D	U	U	D	U						
PORT CABINET WITHOUT 309A/310A	D	U	U	D	D	U	U	D	U	U	U	U	U	U	U	U	U	U	U	U	U	U	D	U						
UNDUPLICATED TMS FOR UP TO 31 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U						
DUPLICATED TMS - ONE CABINET FOR UP TO 15 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U						
DUPLICATED TMS - TWO CABINETS FOR 16 - 31 MODULES	D	U	U	D	D	U	U	D	D	D	D	D	D	D	D	U	U	D	D	D	D	U	D	U						
AUXILIARY CABINET WITH DC FAN ASSEMBLY	U	D	D	U	U	D	D	U	U	U	U	U	U	U	U	U	U	U	U	U	D	U	D	D						
DUPLICATED MODULE CONTROL CABINET WITH 2 BULK OLS POWER SUPPLIES	D	U	U	D	D	U	U	D	D	D	D	D	U	U	U	U	U	D	U	D	U	D	D	D						

Figure 59. Alarm Board AEH4 Option Settings

HIGH CAPACITY MINIRECORDER (HCMR)

The high capacity minirecorder drives a tape cartridge which contains a copy of the programs, parameters, translations, and maintenance used by the switch common control. The minirecorder reloads the switch memory when power to the switch is interrupted or when memory is lost for other reasons.

HCMR Circuit Pack Replacement

Perform the following steps when replacing circuit packs in the HCMR. (Refer to Figure 60.)

1. Remove the tape cartridge.

Note: The tape cartridge can be removed if the **YELLOW** LED on the HCMR is lighted or not lighted.

2. Lift up the front cover to release the catch on both sides and lower the cover.
3. Power down the minirecorder.

Caution: *Damage to components on the circuit pack to be removed or other circuit packs (tape pin connectors -12 V) and running tape off the reel on the tape cartridge may occur if the minirecorder is not powered down.*

- a. If SN446 (power supply) is to be replaced, set the rocker switch (plunger) on SN446 to **OFF** and set circuit breaker **CB3** on the common control carrier to **OFF**.

Note: The **GREEN** LED on SN446 goes off.

- b. If other circuit packs in the HCMR are to be replaced, set the rocker switch (plunger) on SN446 to **OFF**.

Note: The **GREEN** LED on SN446 goes off.

4. Remove the circuit pack to be replaced by releasing the lever and pulling outward.

Note: Do not pull out the circuit pack by using the lever.

5. Install the replacement circuit pack by sliding inward and then pushing the lever forward.
6. Power up the minirecorder.

- a. If SN446 (power supply) was replaced, depress the rocker switch (plunger) on SN446 and set circuit breaker **CB3** on the common control carrier to **ON**.

Note: The **GREEN** LED on SN446 is lighted.

- b. If other circuit packs in the HCMR were replaced, depress the rocker switch (plunger) on SN446.

Note: The **GREEN** LED on SN446 is lighted.

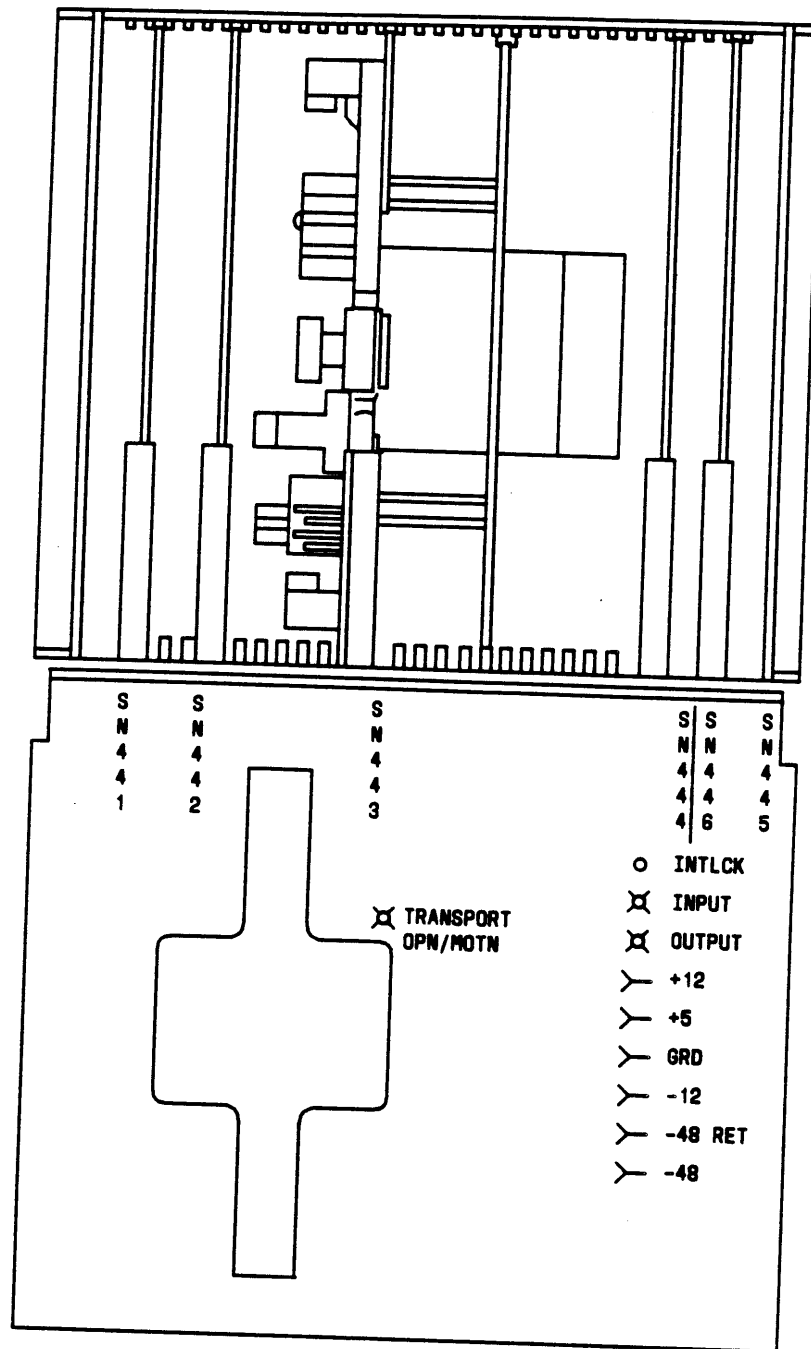


Figure 60. Replacing High Capacity Minirecorder (HCMR) Circuit Packs

7. Raise the cover and secure to the HCMR.
8. Insert the tape cartridge.

Caution: *If the test fails after replacing the HCMR circuit pack, and the circuit pack replaced was SN441 or SN445, reseal the proms on SN441 or SN445 before assuming the replacement circuit pack or any other circuit pack is faulty.*

Cleaning HCMR Tape Head and Capstan

Perform the following steps when cleaning the HCMR tape head and capstan.

1. Remove the tape cartridge.
2. Lift up the front cover to release the catch on both sides and lower the cover.
3. Power down the minirecorder.

Caution: *Damage to components on the circuit pack to be removed or other circuit packs (tape pin connectors -12 V) and running tape off the reel on the tape cartridge may occur if the minirecorder is not powered down.*

4. Set the rocker switch (plunger) on SN446 to **OFF**.

Note: The **GREEN** LED on SN446 goes off.

5. Remove SN443 circuit pack by releasing the lever and pulling outward.

Note: Do not pull out the circuit pack by using the lever.

6. Turn SN443 on its side to expose tape head, capstan, etc. (Refer to Figure 61.)
7. Cover end-of-tape sensor with cloth or suitable material.
8. Wipe face of tape head with lint-free cloth moistened with 71% pure isopropyl alcohol.
Dry with clean cloth.
9. Wipe capstan with lint-free cloth moistened with 71% pure isopropyl alcohol.
Dry with clean cloth.
10. Remove cloth from end-of-tape sensor.
11. Install SN443 into the HCMR by sliding inward and then pushing the lever forward.
12. Power up the minirecorder.

Depress the rocker switch (plunger) on SN446.

Note: The **GREEN** LED on SN446 is lighted.

13. Raise the cover and secure to the HCMR.
14. Insert the tape cartridge.

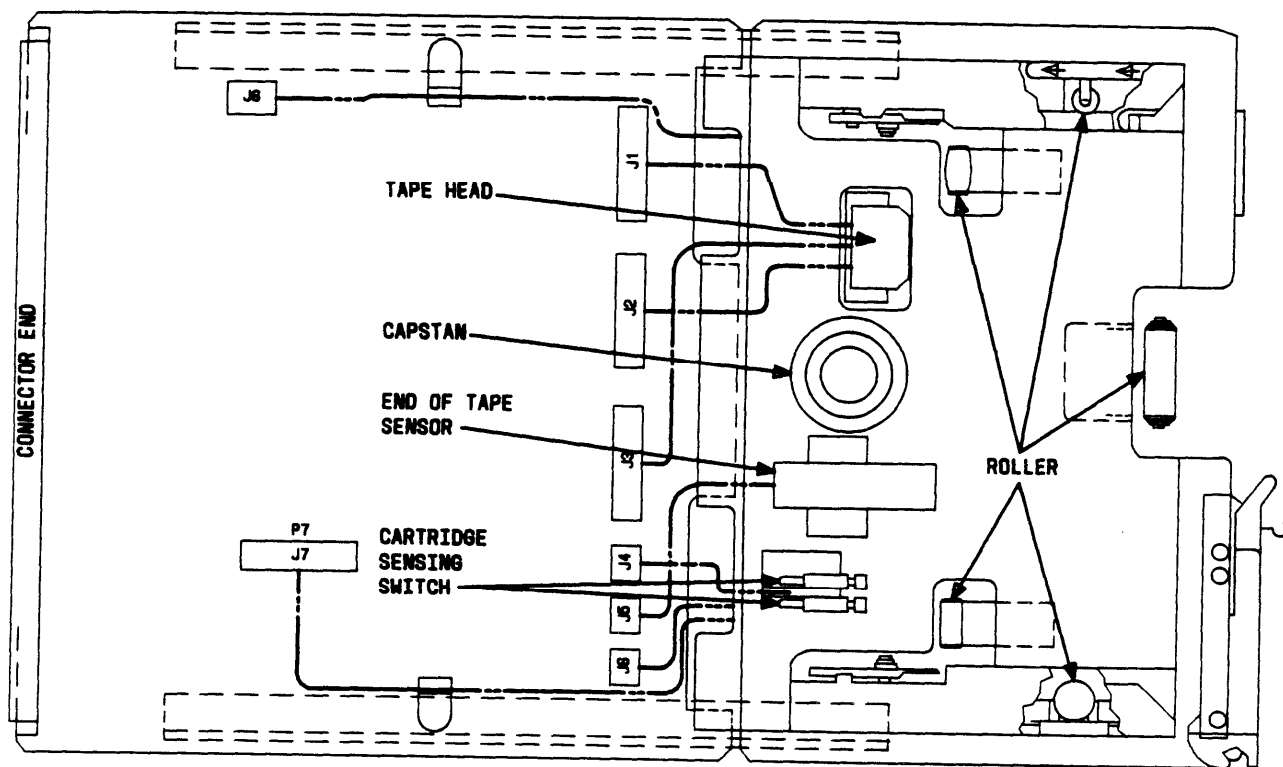


Figure 61. Cleaning Tape Head and Capstan on HCMR Circuit Pack SN443

HCMR Replacement

To replace the HCMR perform the following steps:

1. At the rear of the HCMR, pull out terminal leads **(48 and 48 RET)**.
2. Remove two mounting screws securing the HCMR to the cabinet.
3. Remove the HCMR from the front of the cabinet.
4. Install the replacement HCMR into the cabinet.
5. Secure the HCMR to the cabinet using the two mounting screws.
6. Connect the terminal leads to the rear of the HCMR.

309A OR 310A POWER SUPPLY REPLACEMENT

To replace the 309A or 310A power supply perform the following steps:

1. Set the circuit breaker **ON/OFF** switch on the 309A power supply to **OFF**.
2. Wait one minute and set the **BATT** switch on the 310A power supply to **OFF**.
3. Remove the AC input power to the power supply.
4. Tag and disconnect the cables from the power supply.
5. Remove the mounting screws securing the power supply to the cabinet.

Caution: *An adequate lifting device must be used to support and lift the power supply in order to prevent personnel injury.*

6. Remove the power supply from the cabinet.
7. Set the switches on the replacement power supply to **OFF**.
8. Install the replacement power supply into the cabinet.
9. Secure the power supply to the cabinet using the mounting screws.
10. Connect the cables to the replacement power supply.
11. Apply AC input power to the replacement power supply.
12. Set the **BATT** switch on the 310A power supply to **ON**.
13. Set the circuit breaker **ON/OFF** switch on the 309A power supply to **ON**.

After replacing the 309A or 310A power supply, perform voltage tests on the 310A power supply as appropriate.

BULK ON-LINE SWITCHER (OLS) POWER SUPPLY REPLACEMENT

To replace the OLS power supply (refer to Figure 62), perform the following removal and installation steps.

Removal Steps:

1. At the front of the OLS power supply:
 - Set the **ON/OFF** switch to **OFF**.
 - Disconnect the AC cord from the AC distribution unit.

Note: The AC cord runs beneath the alarm leads to the front of the AC distribution unit.

- Remove two (2) screws connecting the OLS power supply to the front mounting plate.
2. At the rear of the OLS power supply:
 - Remove the lower back cover from the cabinet by removing the attaching screws (approximately 12 screws).

- Disconnect the **-48V** and ground connectors.
 - Disconnect the alarm connector.
 - Remove two (2) screws connecting the OLS power supply to the rear mounting plate.
3. At the front of the OLS power supply:
- Lift up the OLS power supply to clear the front mounting plate.
 - Remove the OLS power supply from the cabinet by sliding it forward.

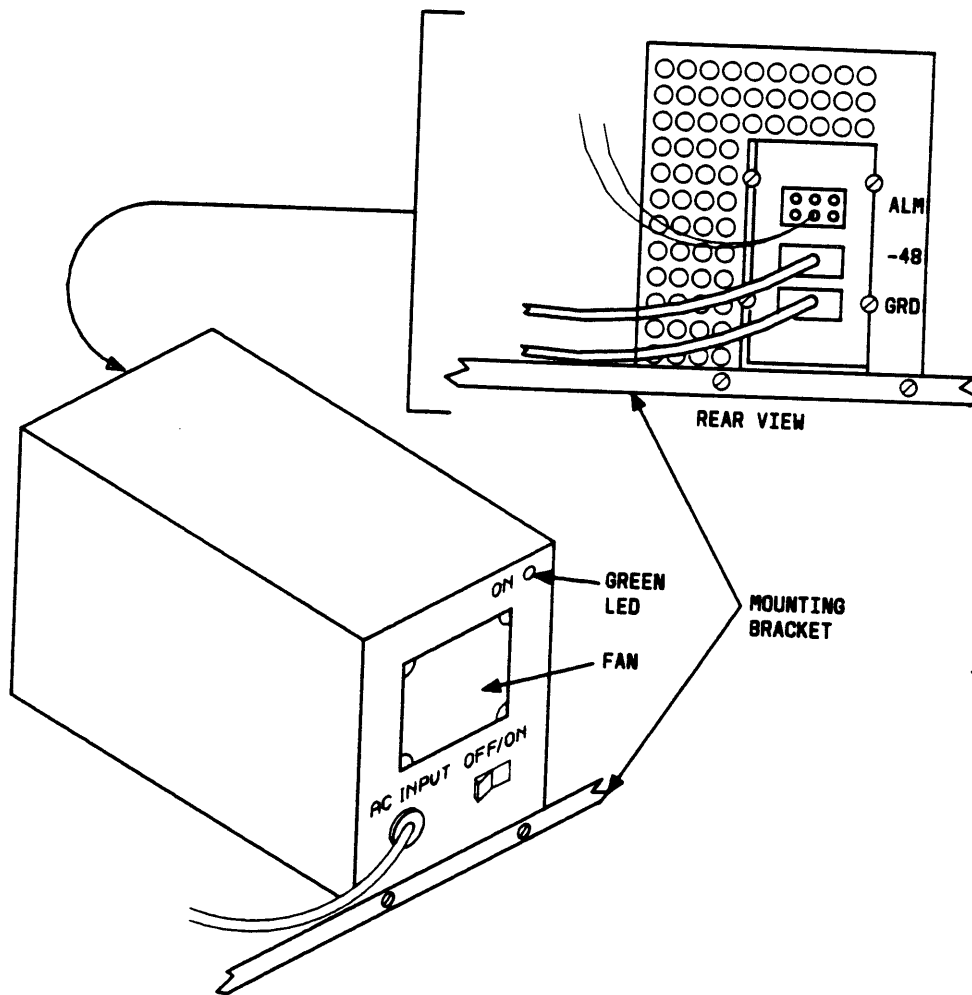


Figure 62. Replacing Bulk On-Line Switcher (OLS) Power Supply

Installation Steps:

1. Set the **ON/OFF** switch on the replacement power supply to **OFF**.
2. At the front of the OLS power supply:
 - Lift up the OLS power supply to clear the front mounting plate.
 - Install the replacement power supply into the cabinet by sliding it toward the rear.
3. At the rear of the OLS power supply:
 - Connect the **-48V** and ground connectors.
 - Connect the alarm connector.
 - Secure the OLS power supply to the rear mounting plate using two (2) screws.
 - Replace the lower back cover to the cabinet by securing the attaching screws (approximately 12 screws).
4. At the front of the OLS power supply:
 - Connect the AC cord to the AC distribution unit.

Note: The AC cord runs beneath the alarm leads to the front of the AC distribution unit.

- Secure the OLS power supply to the front mounting plate using two (2) screws.
- Turn the **ON/OFF** switch to **ON**.

After replacing the OLS power supply, perform voltage tests on the OLS power supply as appropriate.

3965-2 BATTERY CHARGER REPLACEMENT

To replace the 3965-2 battery charger (refer to Figure 63), perform the following removal and installation steps.

Removal Steps:

1. At the front of the 3965-2 battery charger:
 - Set the **ON/OFF** switch to **OFF**.
 - Remove two (2) screws connecting the 3965-2 battery charger to the front mounting plate.
2. At the rear of the 3965-2 battery charger:
 - Remove the lower back cover from the cabinet by removing the attaching screws (approximately 12 screws).
 - Disconnect the **ALM**, **-48V** and **GRD** connectors.
 - Remove two (2) screws connecting the 3965-2 battery charger to the rear mounting plate.

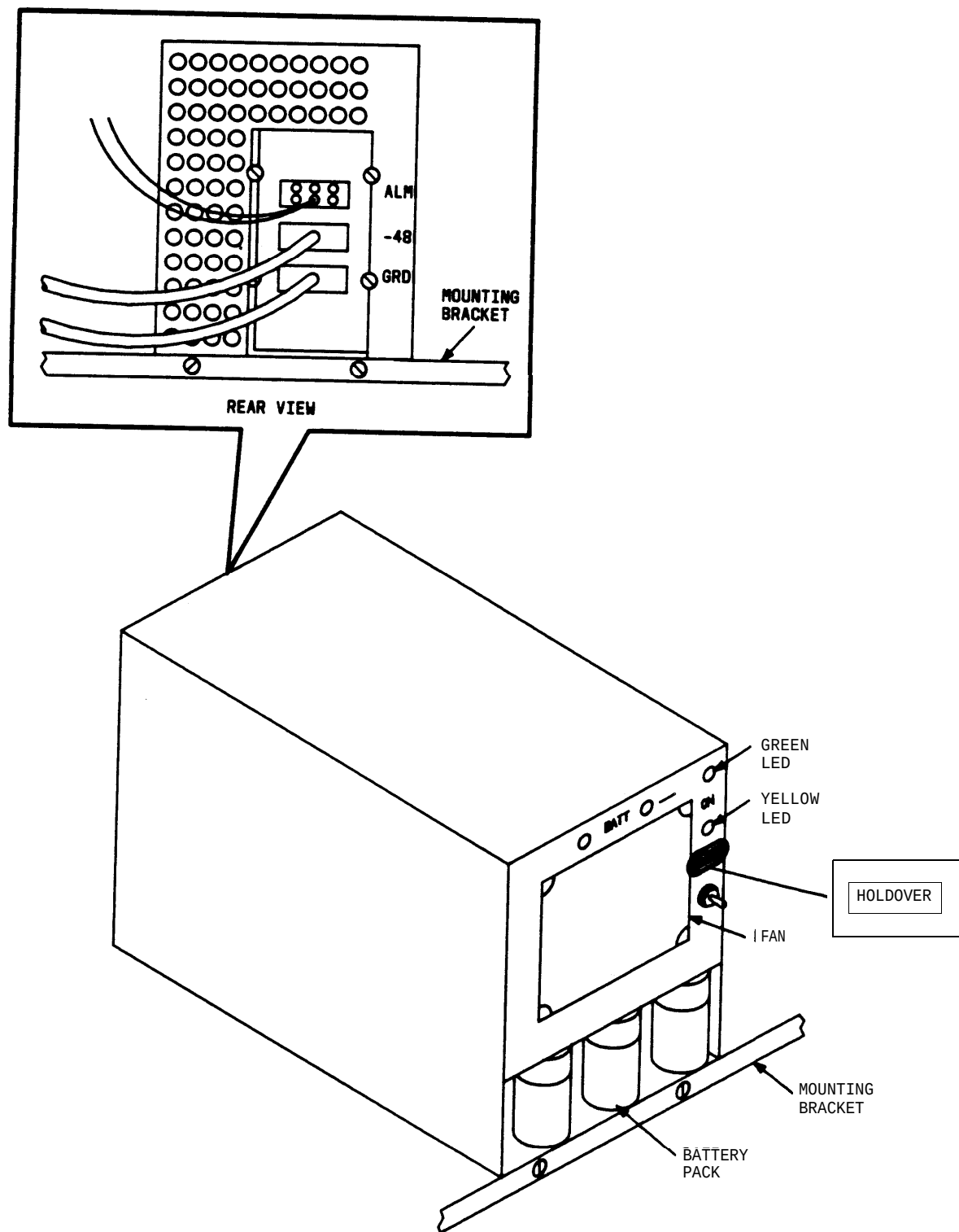


Figure 63. Replacing 3965-2 Battery Charger

3. At the front of the 3965-2 battery charger:
 - Lift up the 3965-2 battery charger to clear the front mounting plate.
 - Remove the 3965-2 battery charger from the cabinet by sliding it forward.

Installation Steps:

1. Set the **ON/OFF** switch on the replacement battery charger to **OFF**.
2. At the front of the 3965-2 battery charger:
 - Lift up the 3965-2 battery charger to clear the front mounting plate.
 - Install the replacement battery charger into the cabinet by sliding it toward the rear.
3. At the rear of the 3965-2 battery charger:
 - Connect the **ALM**, **-48V** and **GRD** connectors.
 - Secure the 3965-2 battery charger to the rear mounting plate using two (2) screws.
 - Replace the lower back cover to the cabinet by securing the attaching screws (approximately 12 screws).
4. At the front of the 3965-2 battery charger:
 - Secure the 3965-2 battery charger to the front mounting plate using two (2) screws.
 - Turn the **ON/OFF** switch to **ON**.

After replacing the 3965-2 battery charger, perform voltage tests on the 3965-2 battery charger as appropriate.

FREQUENCY GENERATOR REPLACEMENT

To replace the 124B, 124B1, or 124B2 frequency generator (refer to Figure 64 or Figure 65), perform the following removal and installation steps.

Removal Steps:

1. Remove the -48 volt fuse associated with the frequency generator.
2. Disconnect the connectors from **PFG IN** and **PFG OUT** (124B frequency generator) or from **OUTPUT** and **INPUT** (124B1 or 124B2 frequency generator).
3. Remove four mounting screws (two from each side) securing the frequency generator to the fan assembly.
4. Remove the frequency generator from the fan assembly.

Installation steps:

1. Mount the replacement frequency generator on the fan assembly and secure with the four mounting screws.
2. Assure that the AC power cord (if applicable) is secured by the cable clamp.

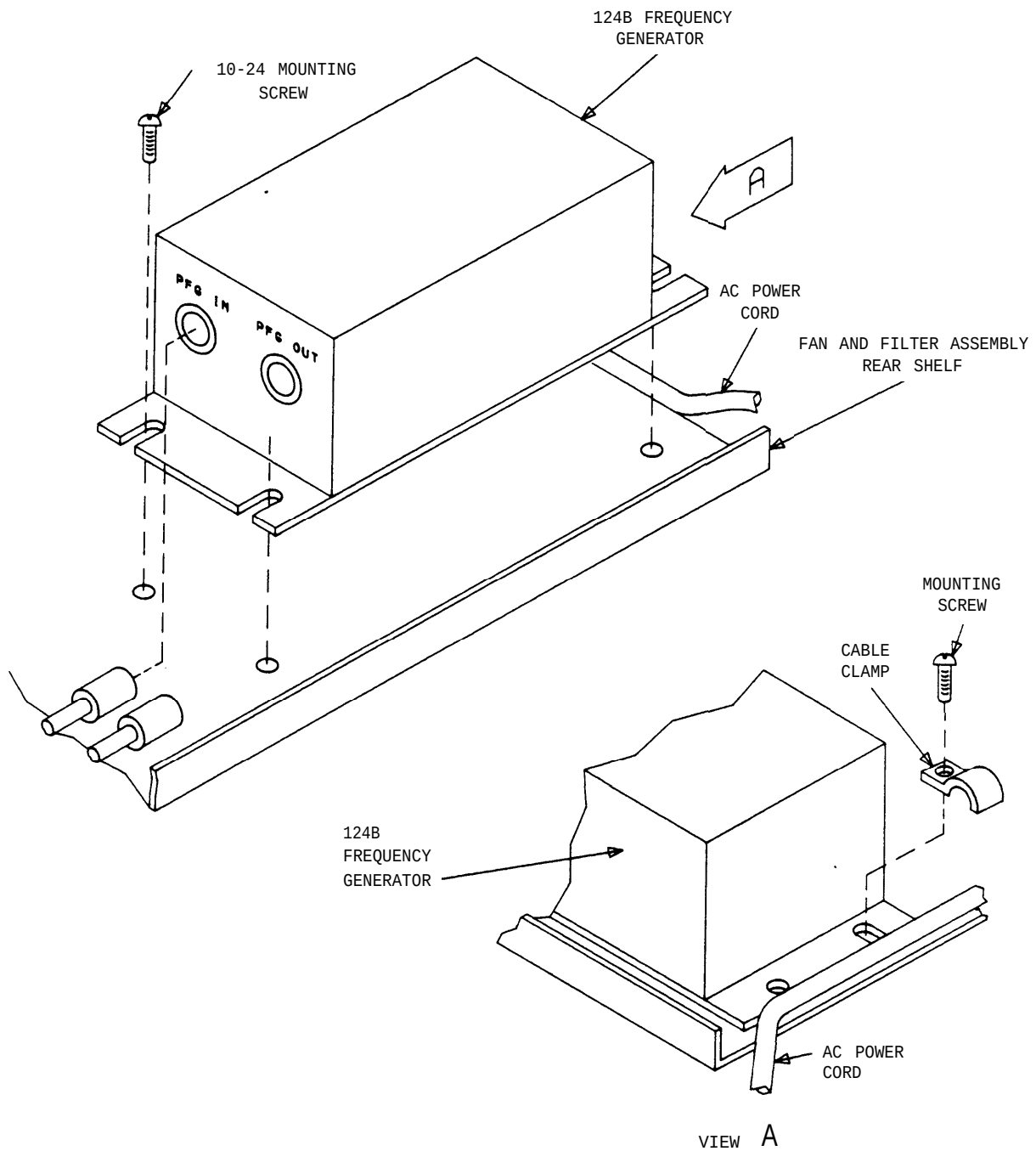


Figure 64. Replacing 124B Frequency Generator

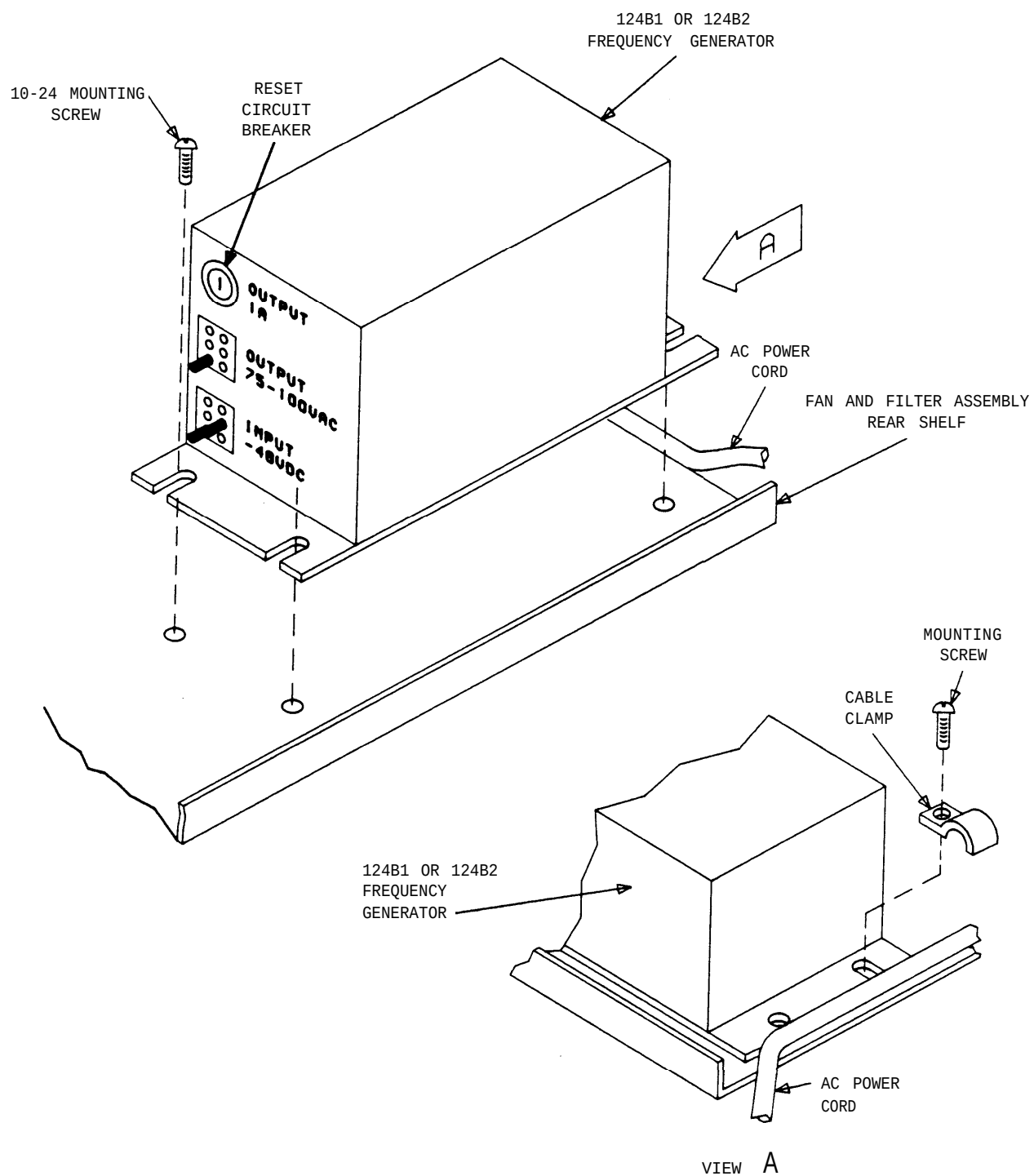


Figure 65. Replacing 124B1 or 124B2 Frequency Generator

3. Connect the connectors to **PFG IN** and **PFG OUT** (124B frequency generator) or to **OUTPUT** and **INPUT** (124B1 or 124B2 frequency generator).
4. Replace the -48 volt fuse associated with the frequency generator.

DC FAN AND FAN ASSEMBLY REPLACEMENT

The fan assembly provides three fans to maintain interior cabinet temperature within the acceptable operating limit. The fans are mounted vertically side by side. They are designed to run continuously at variable speed and operate on DC power.

DC Fan Replacement

To replace a DC fan (refer to Figure 66), perform the following removal and installation steps.

Removal Steps:

1. Remove the fuse (F1 or F2) associated with the fan to be replaced.

Note: Fuse F1 controls all the fans in the upper fan assembly and Fuse F2 controls all the fans in the lower fan assembly.

2. Disconnect the plug from the fan to be replaced.
3. Remove two mounting screws.
4. Remove the fan from the fan assembly.

Installation steps:

1. Mount the replacement fan on the fan assembly and secure with the two mounting screws.
2. Install the fan plug to the replacement fan.
3. Install the fuse (F1 or F2) associated with the fan replaced.

DC Fan Wire Replacement

To replace a fan wire suspected of failing, perform the following removal and installation steps.

Removal Steps:

1. Remove the fuse (F1 or F2) associated with the fan wire to be replaced.

Note: Fuse F1 controls all the fans in the upper fan assembly and Fuse F2 controls all the fans in the lower fan assembly.

2. Disconnect the fan wire (plug) to be replaced.
3. Thread the fan wire through the fan assembly toward the rear.

DC Fan Assembly Replacement

To replace the DC fan assembly, perform the following removal and installation steps.

Removal Steps:

1. At the rear of the fan assembly:
 - a. Disconnect four ground straps at the top of the fan assembly.
 - b. Tag and disconnect the alarm leads from AEH4.
 - c. Disconnect two bus bar ground cables.
 - d. Disconnect the JTMP connectors in two places.
2. At the front of the fan assembly:
 - a. Remove four mounting screws (two on the left and right sides) securing the fan assembly to the cabinet.
 - b. Remove the fan assembly from the cabinet.

Installation Steps:

Note: When the DC fan assembly is shipped loose, attach 900658329 vinyl plastic tape (approximately 60 inches) to the top and bottom edges of the unit before installing the DC fan assembly into the cabinet.

1. At the front of the cabinet, mount the replacement fan assembly and secure with the four mounting screws.
2. At the rear of the fan assembly:
 - a. Connect the JTMP connectors in two places.
 - b. Connect two bus bar ground cables.
 - c. Connect the alarm leads to AEH4.
 - d. Connect four ground straps at the top of the fan assembly.

TMS/RMI CABINET AC DISTRIBUTION UNIT REPLACEMENT

To replace the TMS/RMI cabinet AC distribution unit (refer to Figure 67), perform the following removal and installation steps.

Removal Steps:

1. Set the circuit breaker on the TMS/RMI cabinet AC distribution unit to **OFF**.
2. At the front of the TMS/RMI cabinet AC distribution unit, disconnect the cables from **J1** through **J3** as appropriate.

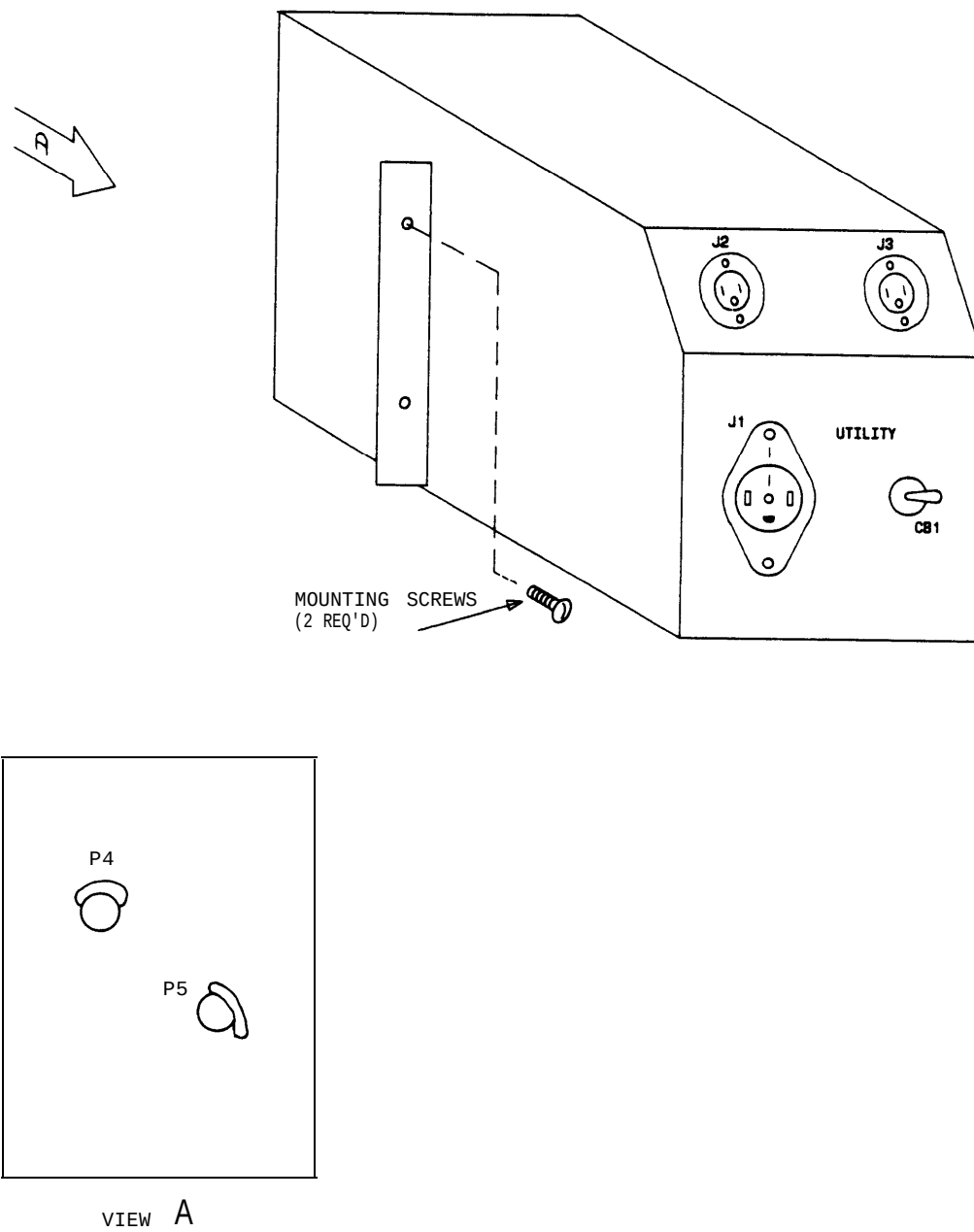


Figure 67. Replacing TMS/RMI Cabinet AC Distribution Unit

3. At the rear of the TMS/RMI cabinet AC distribution unit, disconnect the cables from **P4** and **P5** as appropriate.
4. Remove two mounting screws and remove the TMS/RMI cabinet AC distribution unit from the cabinet.

Installation steps:

1. Set the circuit breaker on the replacement AC distribution unit to **OFF**.
2. Install the replacement AC distribution unit into the TMS/RMI cabinet and secure the unit to the cabinet using two mounting screws.
3. At the rear of the TMS/RMI cabinet AC distribution unit, connect the cables to **P4** and **P5** as appropriate.
4. At the front of the TMS/RMI cabinet AC distribution unit, connect the cables to **J1** through **J3** as appropriate.
5. Set the circuit breaker on the replacement AC distribution unit to **ON**.

MODULE CONTROL OR PORT CABINET AC DISTRIBUTION UNIT REPLACEMENT

To replace the module control or port cabinet AC distribution unit (refer to Figure 68), perform the following removal and installation steps.

Removal Steps:

1. Set circuit breaker **ON/OFF** switch at the 309A power supply to **OFF**.
2. Wait one minute and set the **BATT** switch on the 310A power supply to **OFF**.
3. Set the three circuit breakers on the AC distribution unit to be replaced to **OFF**.
4. Disconnect **J1** from the 309A/310A power supply.
5. Disconnect the power cord from the **AC INPUT** connector.
6. Tag and disconnect the remaining cables from the AC distribution unit to be replaced.
7. Remove three mounting screws and remove the AC distribution unit from the cabinet.

Installation steps:

1. Set the three circuit breakers on the replacement AC distribution unit to **OFF**.
2. Install the replacement AC distribution unit into the cabinet and secure the unit to the cabinet using three mounting screws.
3. Connect the cables (disconnected in Step 6 of the removal steps) to the replacement AC distribution unit.
4. Connect the power cord of the replacement AC distribution unit to the **AC INPUT** connector.
5. Connect **J1** to the 309A/310A power supply.

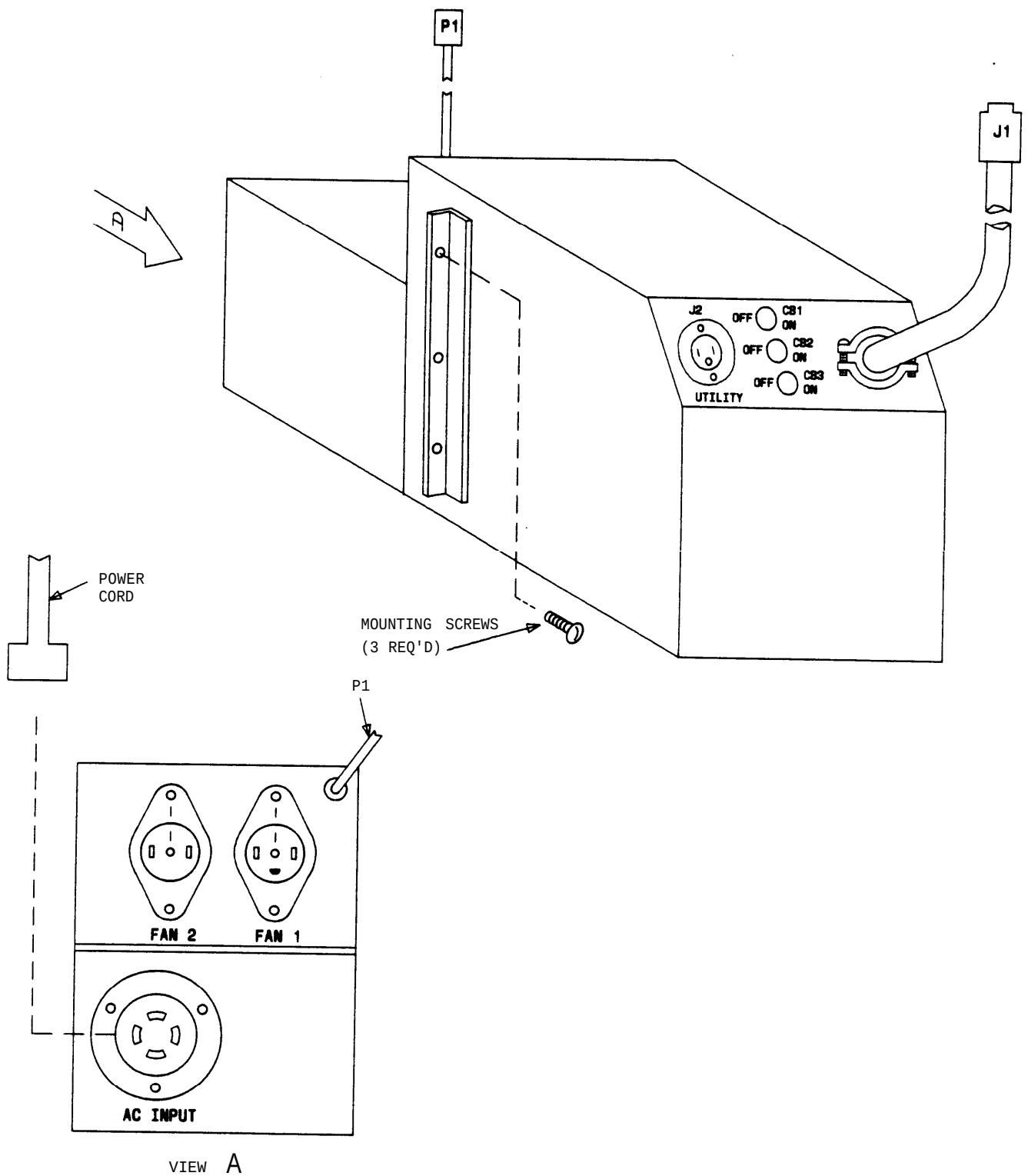


Figure 68. Replacing Module Control or Port Cabinet AC Distribution Unit

6. Set the three circuit breakers on the replacement AC distribution unit to **ON**.
7. Set the **BATT** switch on the 310A power supply to **ON**.
8. Set the circuit breaker **ON/OFF** switch at the 309A power supply to **ON**.

DC FILTER REPLACEMENT

To replace the DC filter (refer to Figure 69), perform the following steps.

1. At the front of the DC filter, set the **-48V** circuit breaker to **OFF**.
2. At the top of the DC filter, disconnect the alarm leads by pressing the clasps on both sides and lifting up.
3. At the rear of the DC filter, tag and disconnect the leads on both terminal strips.
4. Remove the mounting screws securing the DC filter to the cabinet.
5. Remove the DC filter from the cabinet.
6. Install the replacement DC filter into the cabinet ensuring the **-48V** circuit breaker is set to **OFF**.
7. Secure the DC filter to the cabinet using the mounting screws.
8. At the rear of the DC filter, connect the leads to both terminal strips on the replacement DC filter.
9. At the top of the replacement DC filter, connect the alarm leads.
10. At the front of the replacement DC filter, set the **-48V** circuit breaker to **OFF**.

CONSOLE COMPONENT REPLACEMENT

Overview

Prior to replacing console components, disconnect the console power cord and move the console to a convenient work area for disassembly. Disconnect the handset from the console.

Console components identified as replaceable are:

1. Power supply (Figure 70).
2. DSS and BLF carrier or button units (Figure 71).
3. Timing control and speech or alphanumeric control (Figure 73).
4. Alphanumeric display, lamp control and carrier, or dial key pad (Figure 74).

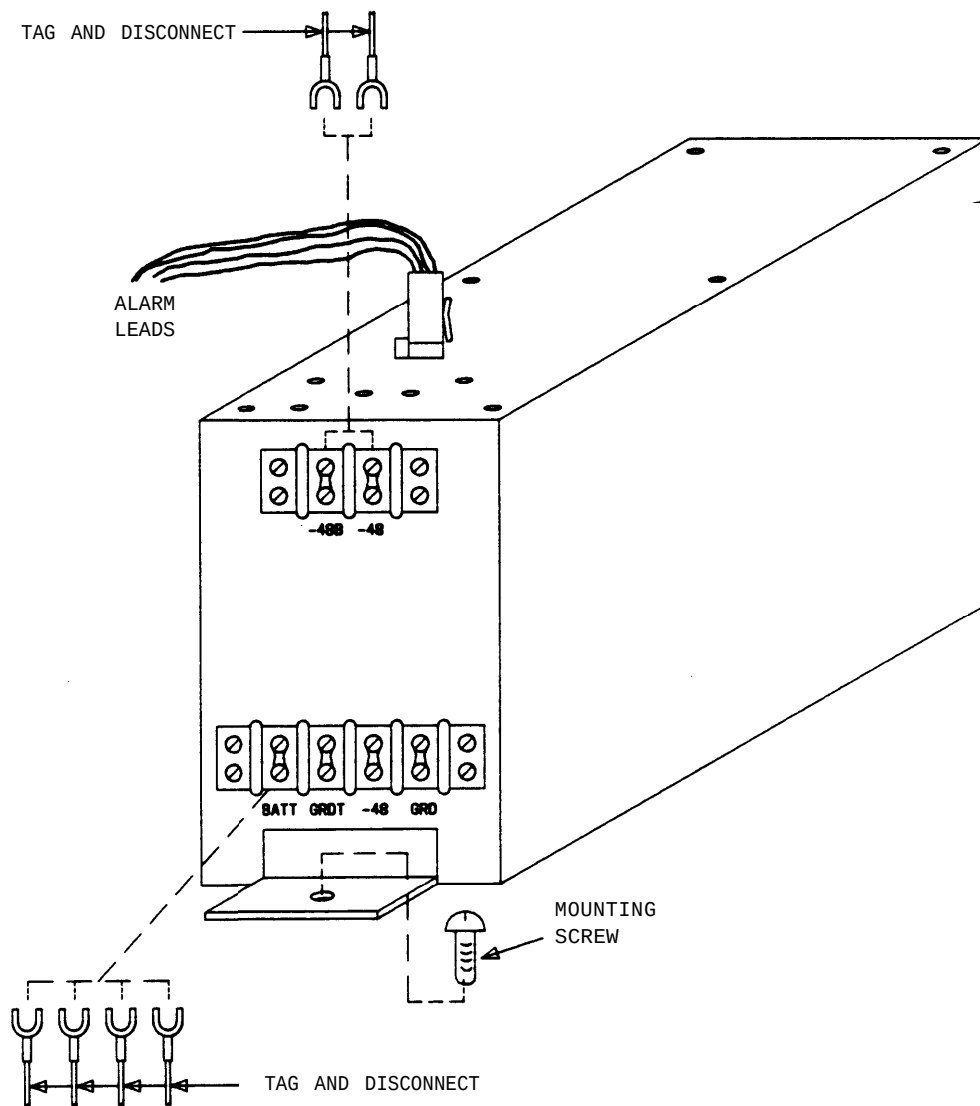


Figure 69. Replacing DC Filter

Console Power Supply Replacement

To replace the console power supply (refer to Figure 70), perform the following steps:

1. Tilt the console to access the bottom of the console.
2. Remove four screws to remove the power supply cover.
3. Remove the screw in the center of the power supply.

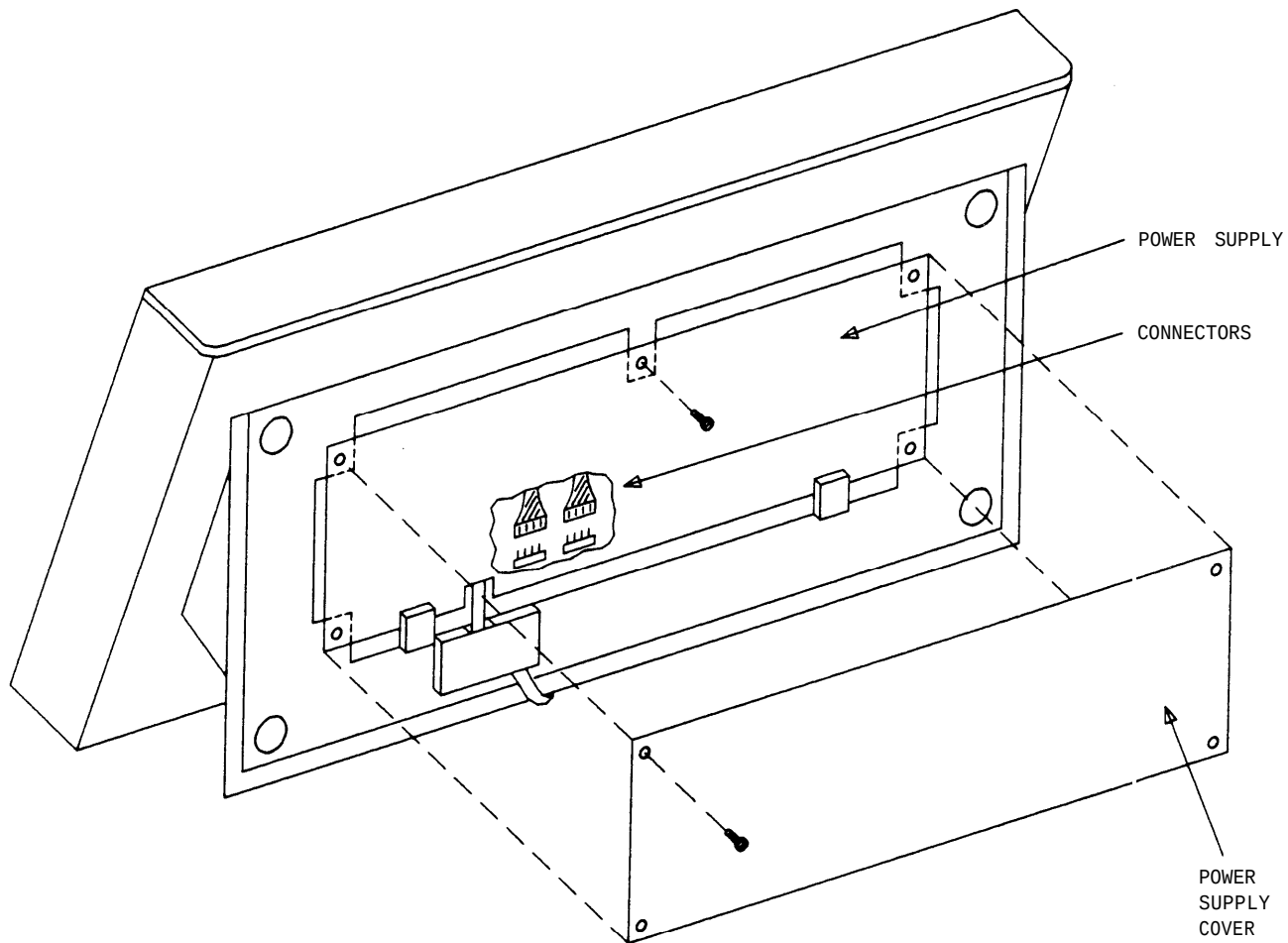


Figure 70. Replacing Console Power Supply

4. Lift the power supply up and out to remove the power supply from inside the console.
5. Disconnect two connectors from the power supply.
6. Connect two connectors to the replacement power supply.
7. Install the power supply inside the console.
8. Secure the power supply to the console by mounting the screw in the center of the power supply.
9. Secure the power supply cover with four screws.

Console DSS and BLF Carrier or Button Units Replacement

To replace the console DSS and BLF carrier or button units (refer to Figure 71), perform the following steps.

1. Lift up and pull out to remove the rear access cover.
2. Disconnect the carrier connector.
3. Remove seven flat head screws to remove the DSS and BLF carrier.
4. Push the DSS and BLF carrier from the front and remove the carrier from the console.
5. Unplug the key/lamp unit from the DSS and BLF carrier.
6. Plug the key/lamp unit into the replacement DSS and BLF carrier or plug the replacement key/lamp unit into the original DSS and BLF carrier.
7. Install the DSS and BLF carrier inside the console.
8. Secure the DSS and BLF carrier to the console using seven flat head screws.
9. Connect the carrier connector.
10. Replace the rear access cover.

Console Timing Control and Speech or Alphanumeric Control Replacement

To replace the timing control and speech or alphanumeric control (refer to Figures 72 and 73), perform the following steps:

1. Lean the console toward the rear and rest the console on rear of the DSS faceplate.
2. Remove the front cover and access panel (refer to Figure 72), by opening the front cover and removing eight screws from the access panel.
3. To replace the alphanumeric control, proceed to Step 4.
To replace the timing control and speech, proceed to Step 5.
4. Rotate both latches and remove the alphanumeric control.
Install the alphanumeric control and rotate both latches counterclockwise.
Proceed to Step 8.

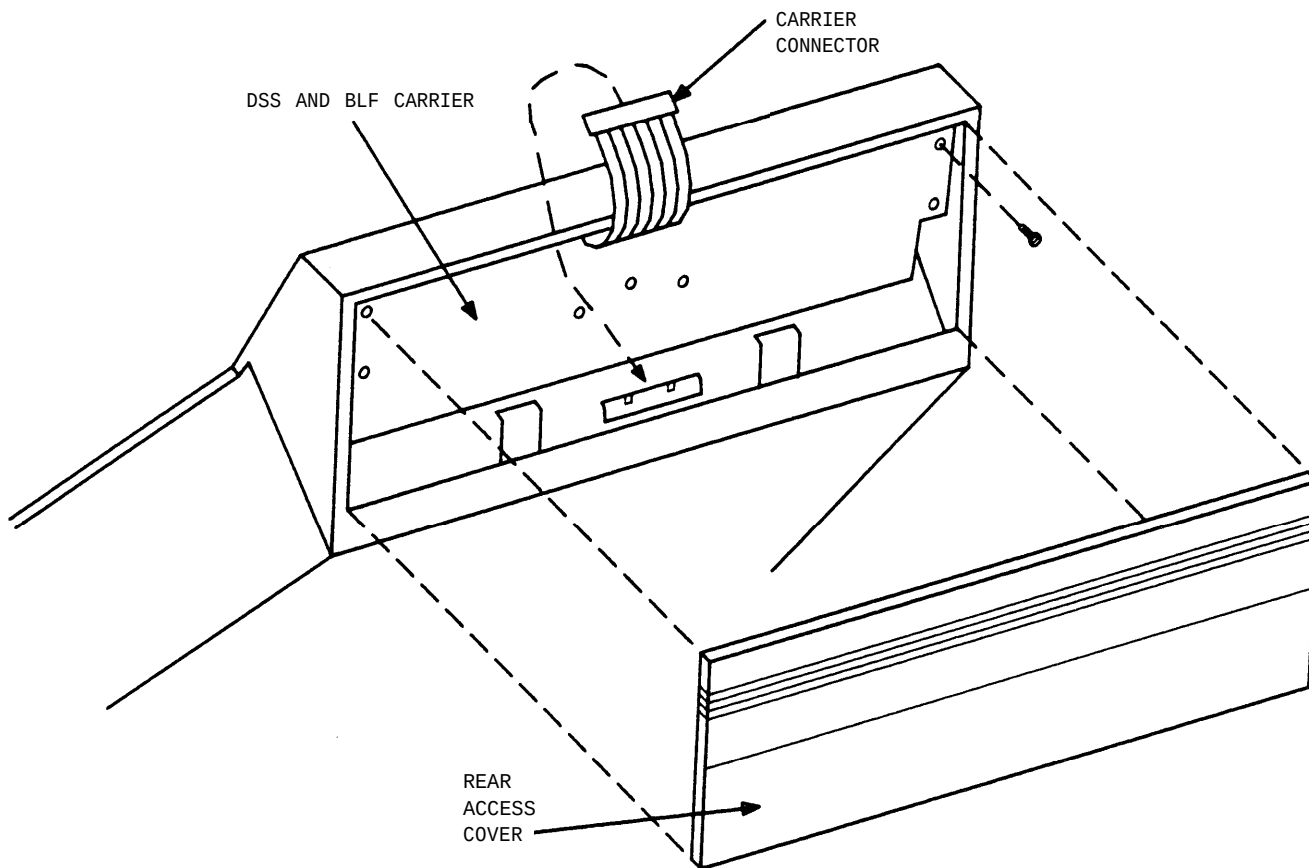


Figure 71. Replacing Console DSS and BLF Carrier or Button Units

5. Pull key pad connector forward and disconnect from timing control and speech board.
6. Release both latches and remove the timing control and speech board.
7. Install the replacement timing control and speech board.
 - a. Secure both latches by rotating counterclockwise.
 - b. Plug key pad connector into connector on front of timing control and speech board.

Proceed to Step 8.

8. Install access panel and front cover using eight screws.
9. Pull console toward front and place in normal position.

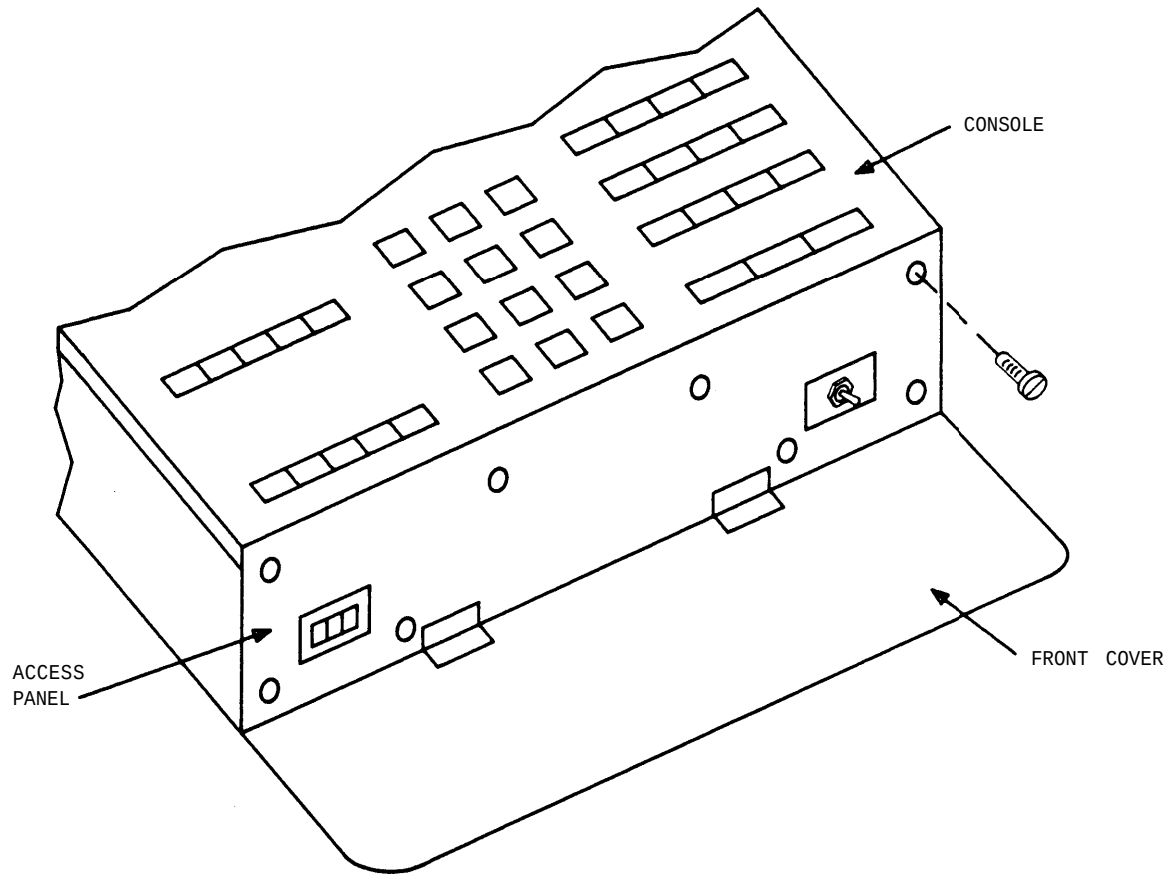


Figure 72. Removing Console Front Access Panel

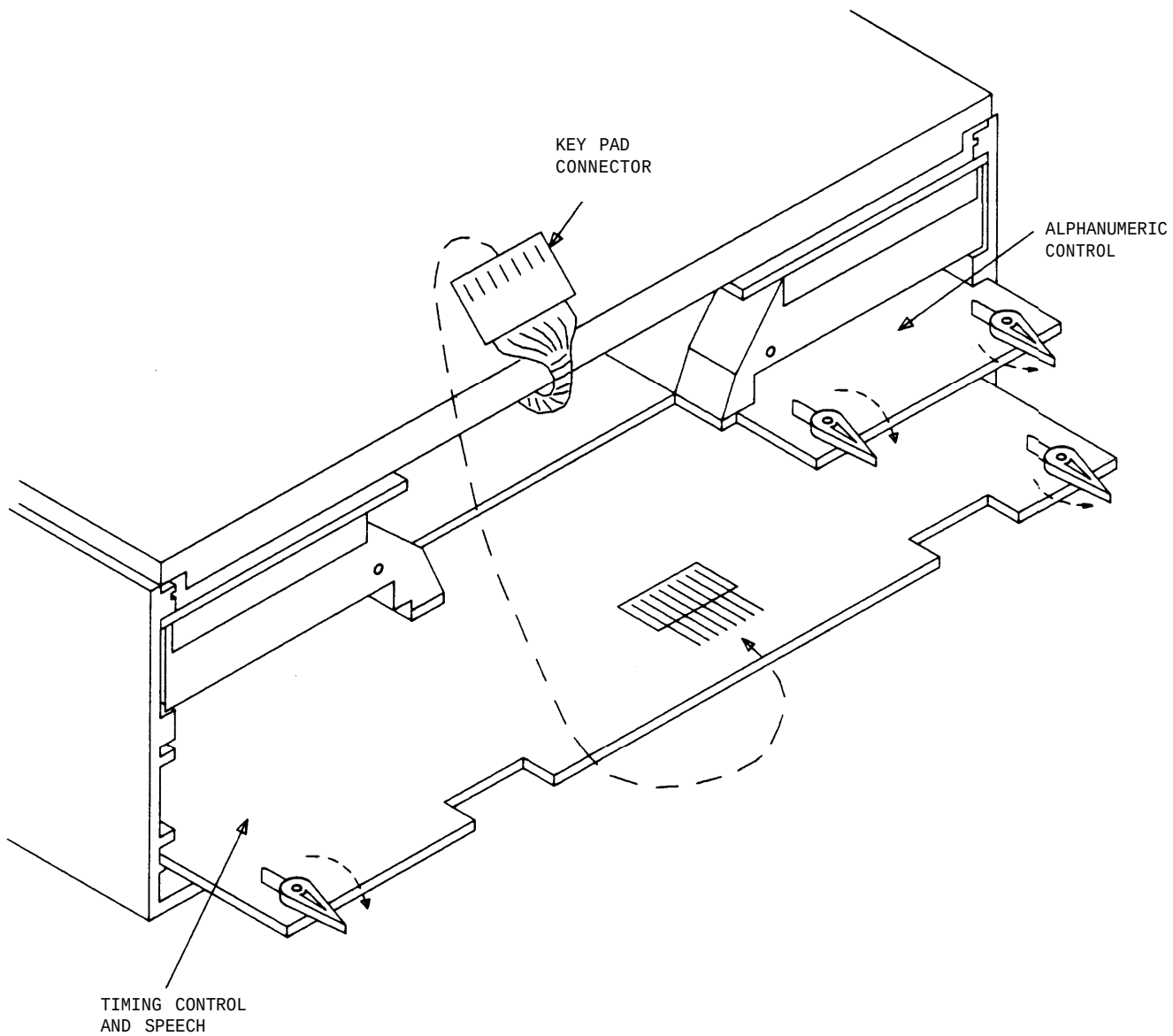


Figure 73. Replacing Console Timing Control and Speech or Alphanumeric Control

Console Alphanumeric Display, Lamp Control, or Dial Key Pad Replacement

To replace the console alphanumeric display, lamp control, or dial key pad (refer to Figure 74), perform the following steps:

1. Lean console toward the rear and rest console on the rear of the DSS faceplate.
2. Remove the front cover and access panel (refer to Figure 72) by opening the front cover and removing eight screws from the access panel.
3. Pull out then pull up to remove the console faceplate.
 - a. To replace the alphanumeric display, proceed to Step 4.
 - b. To replace the dial key pad or lamp control and carrier, proceed to Step 5.
4. Pull up to remove the alphanumeric display.

Install the replacement alphanumeric display and proceed to Step 12.
5. Disconnect the dial key pad connector.
6. Remove four screws to remove the dial key pad.
 - a. To replace the dial key pad, proceed to Step 7.
 - b. To replace the lamp control and carrier, proceed to Step 8.
7. Install the replacement dial key pad and proceed to Step 12.
8. Rotate both locks outward to remove the lamp control and carrier.

Install the replacement lamp control and carrier and proceed to Step 9.
9. Secure the lamp control and carrier by rotating both locks counterclockwise.

Install the dial key pad and proceed to Step 10.
10. Secure the dial key pad to the console using four screws.
11. Connect the dial key pad connector.
12. Install the console faceplate.
13. Install access panel and front cover using eight screws.
14. Pull console toward front and place in normal position.

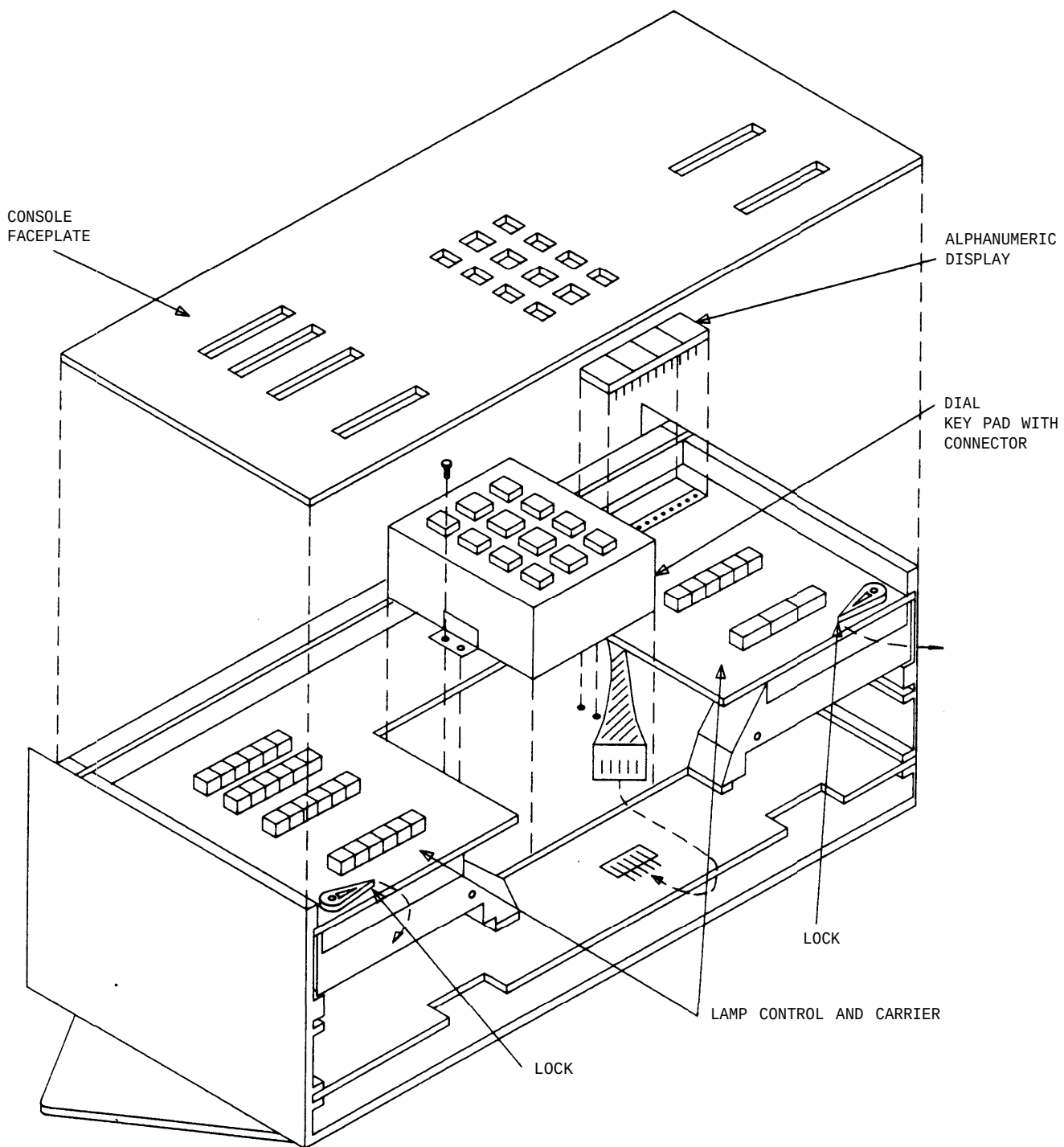
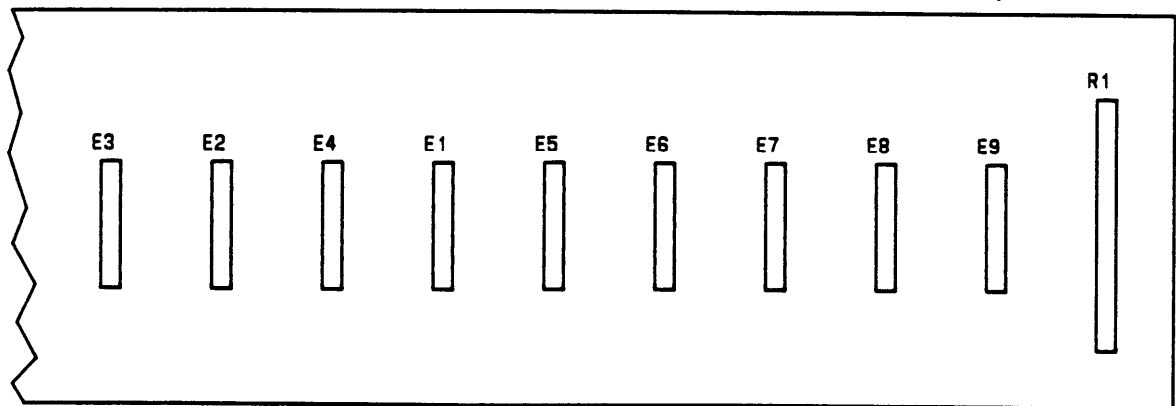


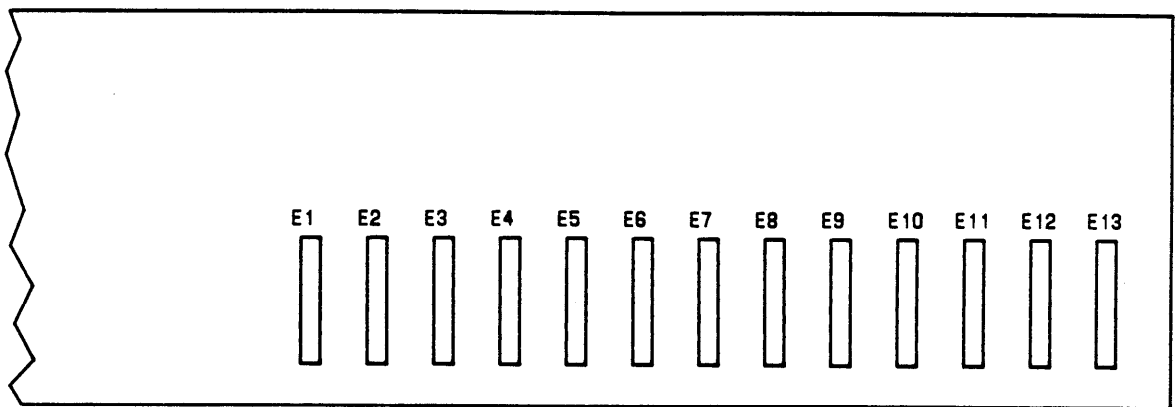
Figure 74. Replacing Console Alphabetic Display, Lamp Control Carrier, or Dial Key Pad

ALARM PANEL REPLACEMENT

To replace the alarm panel (refer to Figure 75), perform the following removal and installation steps.



PARTIAL REAR VIEW UNDUPLICATED ALARM PANEL



PARTIAL REAR VIEW DUPLICATED ALARM PANEL

Figure 75. Replacing Alarm Panel

Removal Steps:

1. Set the **GO/HALT** switch(s) on the alarm panel to **HALT**.
2. Remove the tape cartridge(s) from the HCMR(s).
3. At the rear of the alarm panel, disconnect and tag the cables from the E* connectors.
4. At the rear of the alarm panel (left side), disconnect and tag **PKBR** and **PAPPWR** (2) wires.
5. Slide the alarm panel out the front of the common control cabinet.

Installation Steps:

1. On the replacement alarm panel, set switches **GO/HALT** to **HALT**, **TEST SELECT** to **15**, **EMERGENCY TRANSFER** to **OFF**, and **LOCK ON LINE** (when provided) to **OFF**.
2. Slide the replacement alarm panel into the common control cabinet.
3. At the rear of the alarm panel (left side), connect the **PBKR** and **PAPPWR(s)** wires.
4. At the rear of the alarm panel, connect the cables to the E* connectors.
5. Insert the tape cartridge(s) into the HCMR(s).
6. At the front of the replacement alarm panel, set the **GO/HALT** switch on **CC0** to **GO** and depress **RESET**, **ENABLE**.

Note: When the alarm panel is duplicated, set the **GO/HALT** switch on **CC1** to **GO** and depress **RESET**, **ENABLE** on **CC1** after the tape is loaded in **CC0**.

AEH4 ALARM BOARD REPLACEMENT

To replace the AEH4 alarm board, perform the following steps:

1. At the rear of the fan assembly, remove four ribbon cables from the AEH4 alarm board.

Note: All four ribbon cables may not be connected. Record the ribbon cables that are connected and the location they are connected to.

2. Remove eight clip-on fasteners from the AEH4 alarm board plugs labeled **JTMP**, **JMISC**, **JFAN**, **JALM**, **JBKR0**, **JBKR1**, **JRSV0**, and **JRSV1**.

Note: All eight fasteners may not be connected. Record the clip-on fasteners that are connected and the location they are connected to.

3. Remove two screws mounting the AEH4 alarm board to the fan assembly shelf.
4. Remove the AEH4 alarm board.
5. Record the option settings of the four switch packages on the AEH4 alarm board.
6. Set the four switch packages on the replacement AEH4 alarm board to the option settings as recorded in Step 5.
7. Install the replacement AEH4 alarm board on the fan assembly shelf and secure with the two mounting screws.
8. Connect the eight clip-on fasteners (if appropriate) as recorded in Step 2.
9. Connect the four ribbon cables (if appropriate) as recorded in Step 1.

SMDR COMPONENT REPLACEMENT

GENERAL

This section provides a brief description of the Station Message Detail Recorder (SMDR) and contains instructions for replacement of SMDR components.

Replacement of SMDR components, as determined by performing maintenance procedures, consist of the following:

1. SMDR carrier circuit pack replacements.
2. SMDR formatter circuit pack replacements.
3. SMDR tape drive circuit pack replacements and adjustments.
4. SMDR power supply replacement.
5. SMDR formatter replacement.
6. SMDR tape drive replacement.
7. SMDR clock/calendar display unit replacement.

SMDR CABINET

The SMDR cabinet (refer to Figure 76) contains the following:

1. A Kennedy 9800 tape drive.
Drives a 9-track magnetic tape.
2. A 9-track magnetic tape.
Stores information for approximately 330,000 calls (a readable form of the tape can be provided through machine processing).
3. A clock/calendar display.
Provides a means for setting the time and date to be recorded onto the tape.
4. A call information display.
Displays detailed call information for one call at a time.
5. A control panel.
Provides a user interface to the 9-track tape operation for functions such as changing the tape, dumping memory, and clearing the display.
6. An SMDR carrier.
Contains the circuit packs that control SMDR operations.
7. A fan assembly.
Maintains interior cabinet temperature.

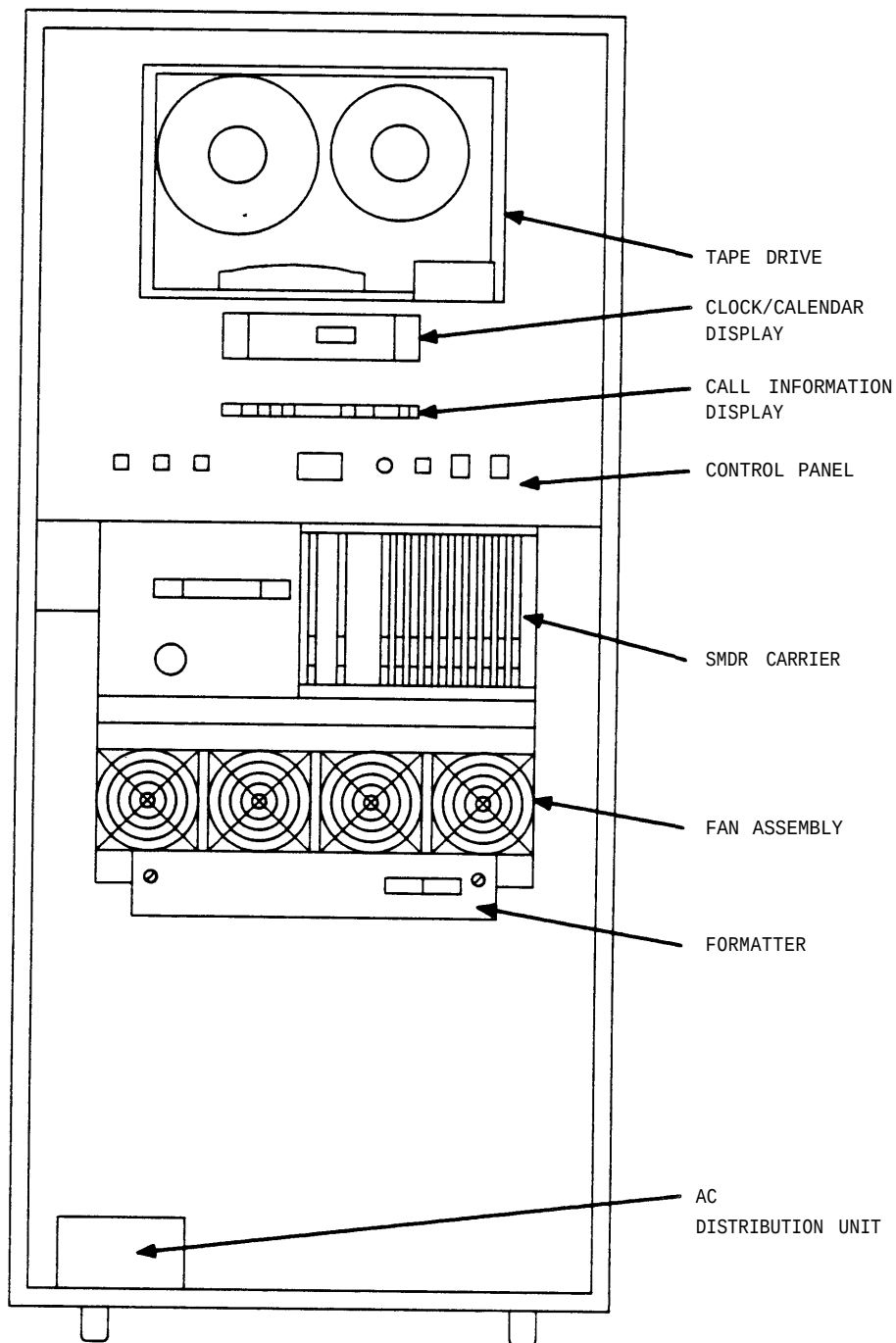


Figure 76. Station Message Detail Recorder (SMDR) Cabinet

8. A Kennedy 9217 tape formatter.
Records data on a standard 9-track magnetic tape.
9. An AC distribution unit.
Distributes AC power throughout the cabinet.

SMDR CARRIER CIRCUIT PACK REPLACEMENT

To replace circuit packs in the SMDR carrier (refer Figure 77), proceed as follows:

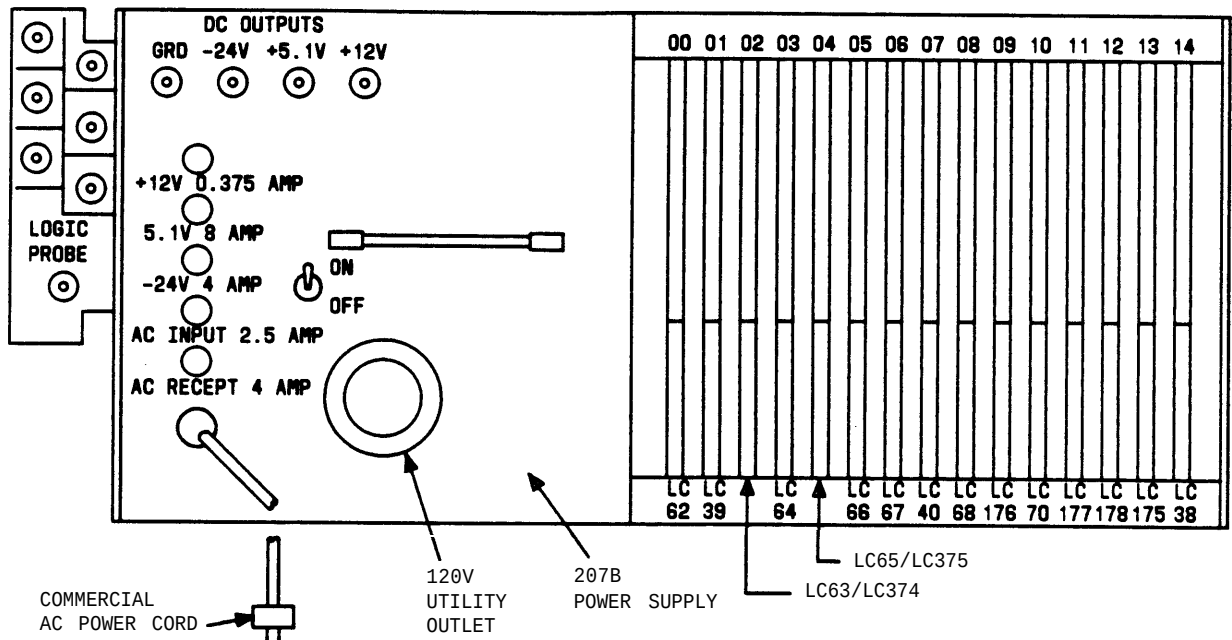


Figure 77. SMDR Carrier

1. At the SMDR power supply, set power switch to **OFF**.
2. At the SMDR carrier, replace the circuit pack.
3. At the SMDR power supply, set power switch to **ON**.
4. At the SMDR control panel, depress the system **ON LINE** button.
5. If the **ON LINE** lamp on the tape drive is not lighted, depress the **ON LINE** button.

SMDR FORMATTER CIRCUIT PACK REPLACEMENT

To replace circuit packs in the SMDR formatter (refer to Figure 78), proceed as follows:

1. Remove two screws from the front of the SMDR formatter to remove the front cover.
2. At the SMDR formatter, replace the circuit pack.
3. Replace the front cover on the SMDR formatter using two screws.
4. At the SMDR control panel, depress the system **ON LINE** button.
5. If the **ON LINE** lamp on the tape drive is not lighted, depress the **ON LINE** button.

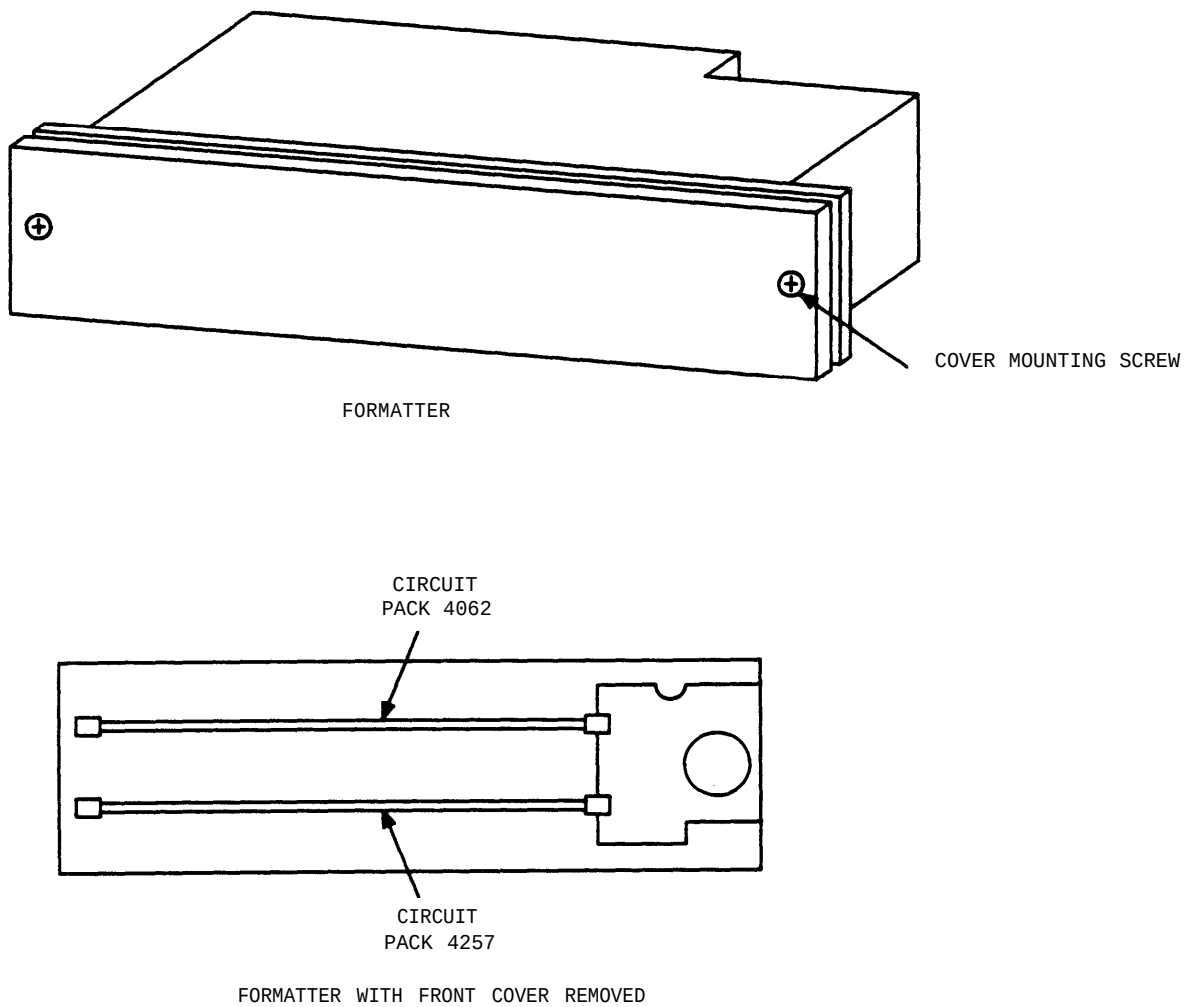


Figure 78. Replacing SMDR Formatter Circuit Packs

SMDR TAPE DRIVE CIRCUIT PACK REPLACEMENT

Circuit Pack Replacement

To replace circuit packs in the SMDR tape drive (refer to Figure 79), proceed as follows:

1. At the SMDR tape drive (behind dust cover), set power **ON/OFF** switch to **OFF**.
2. At top rear of the SMDR tape drive, replace the circuit pack.
3. Refer to Table CC and perform adjustments required for the circuit pack replaced.
4. At the SMDR tape drive, set power **ON/OFF** switch to **ON** (if off).
5. At the SMDR control panel, depress the **SYSTEM ON LINE** button.
6. If the **ON LINE** lamp on the tape drive is not lighted, depress the **ON LINE** button.

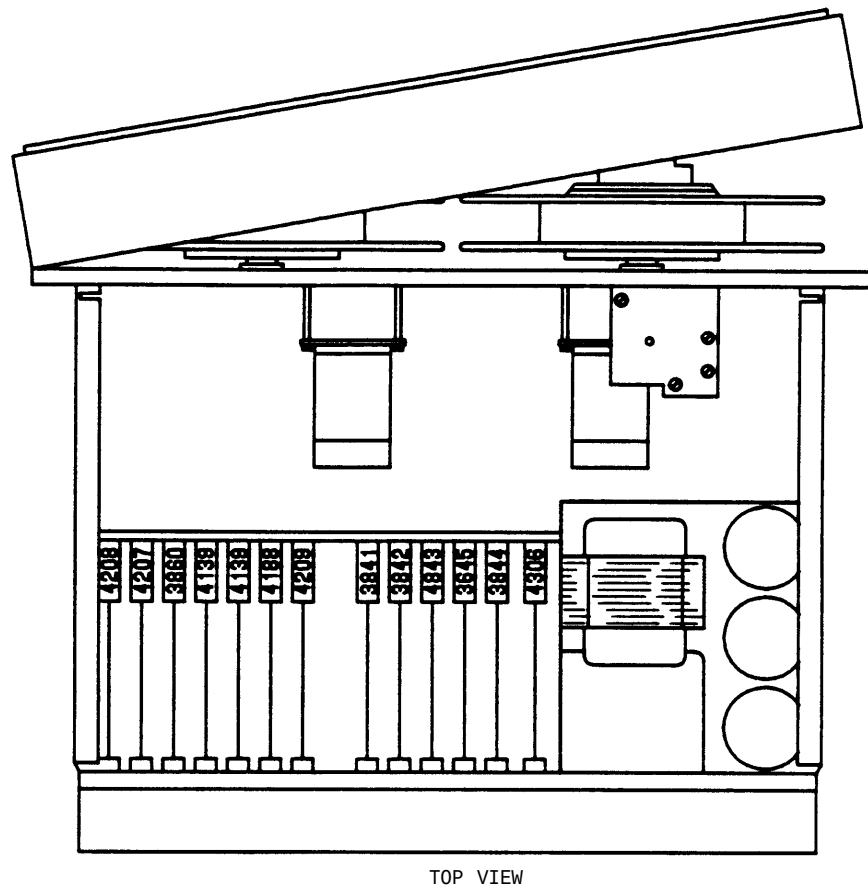


Figure 79. Replacing SMDR Tape Drive Circuit Packs

TABLE CC.

TAPE DRIVE ADJUSTMENTS		
CIRCUIT PACK CODE	CIRCUIT PACK POSITION(S)	REQUIRED ADJUSTMENT(S)
3645	11	TAPE SPEED
		RAMP TIME
3844	12	PHOTOSENSOR
4139	4 AND 5	READ SKEW
4306	13	CAPSTAN ZERO OFFSET
		BUFFER ARM TRAVEL

Adjustments for Tape Drive Circuit Packs

Tape Speed Adjustment:

This adjustment is performed on the SMDR tape drive ramp generator circuit board 3645 as follows:

1. At the SMDR tape drive (behind dust cover), set power **ON/OFF** switch to **OFF**.
2. Remove circuit board 4139 from position 4, (refer to Figure 80) and insert a Kennedy card extender in its place.
3. Insert circuit board 4139 into the card extender.
4. At the SMDR tape drive, set power **ON/OFF** switch to **ON**.
5. Load the master skew tape.
6. Connect the test panel to the test connector on circuit board 4843 (refer to Figure 81).
7. At the test panel, depress the **STOP** button.
8. At the test panel, depress the **TEST MODE** button.
9. At the test panel, depress the **FORWARD RUN** button to advance the tape beyond load point and then depress the **STOP** button.
10. Connect an oscilloscope to pin H on the extender card.
11. At the test panel, depress the **FORWARD RUN** button while observing the signal on the oscilloscope.

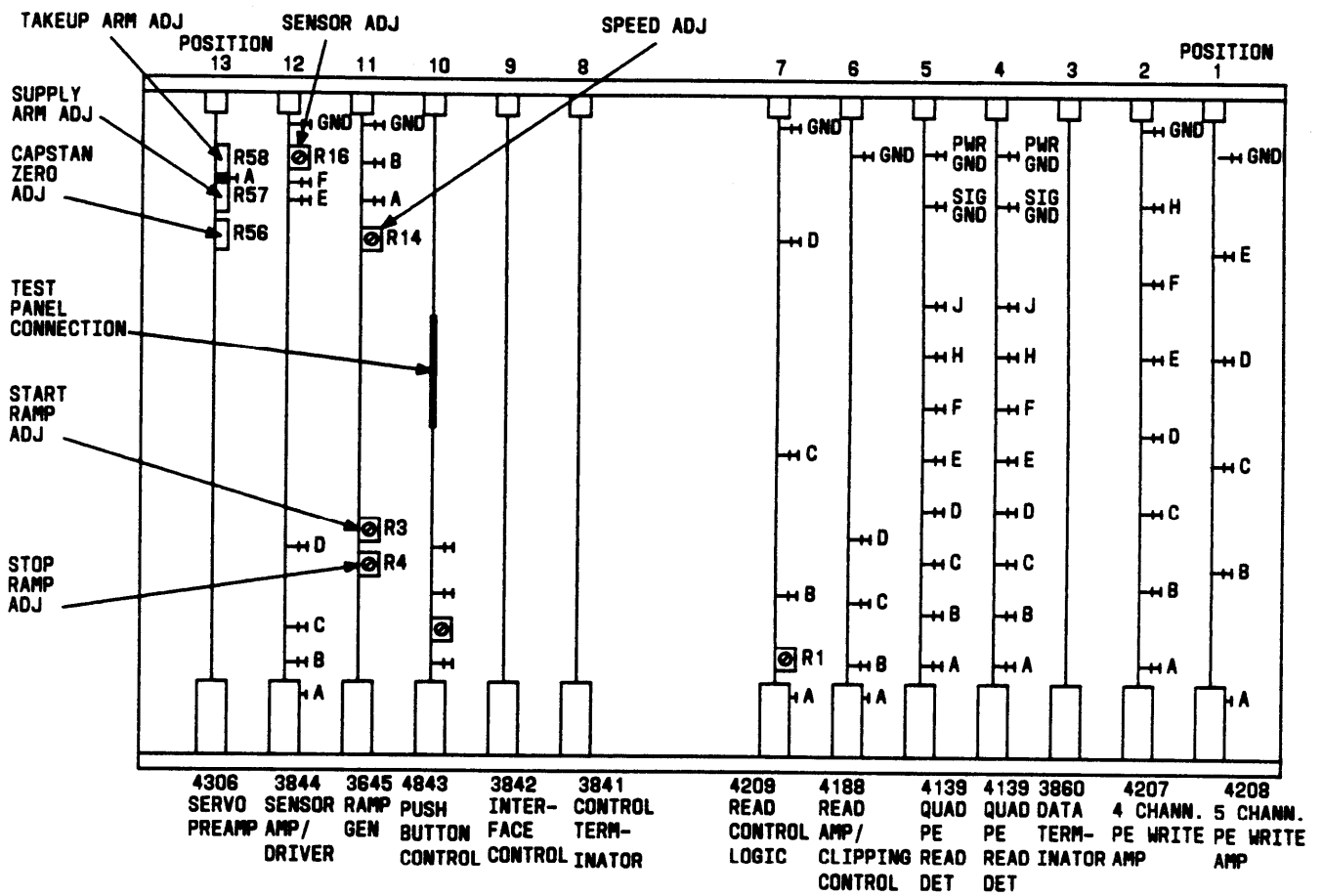


Figure 80. SMDR Tape Drive Test Points and Adjustments

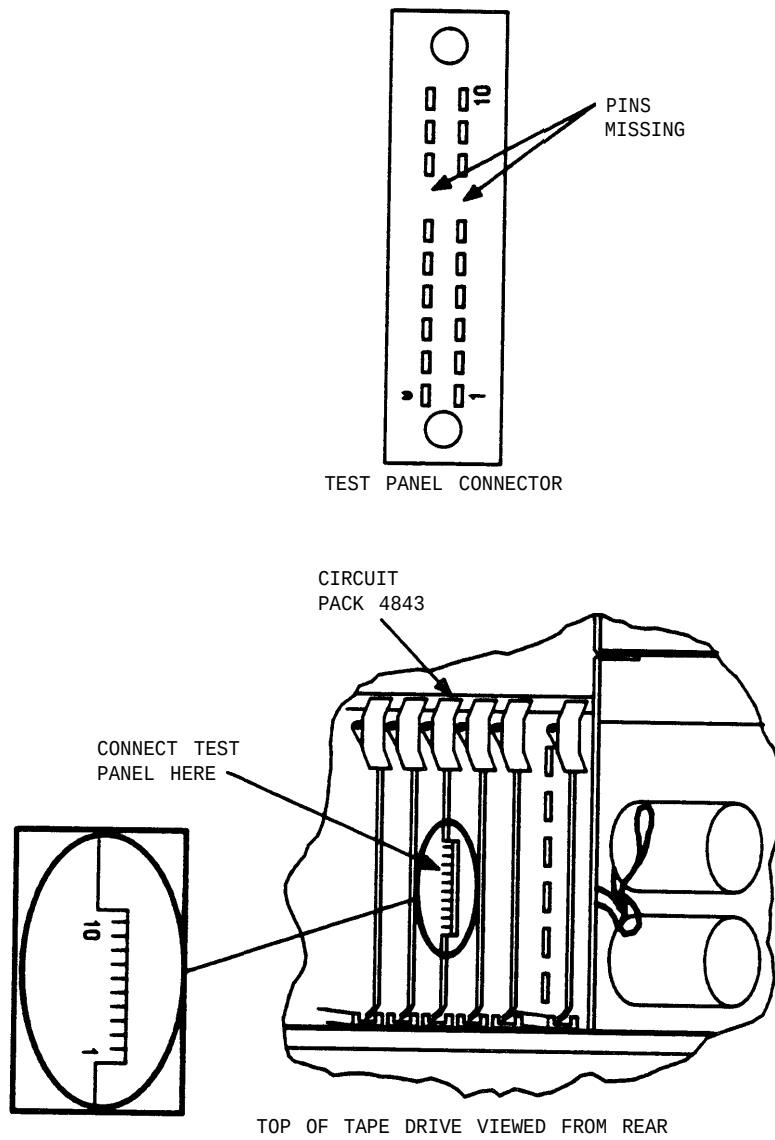


Figure 81. Test Panel Connection to Circuit Pack 4843

12. If necessary, adjust potentiometer R14 on circuit board 3645 (refer to Figure 80) for a signal with a period (T) of 100 usec as displayed on the oscilloscope (refer to Figure 82).

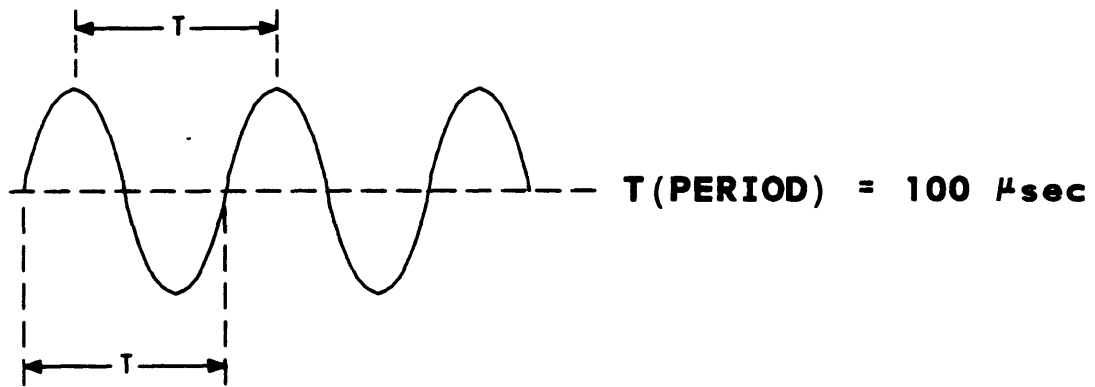


Figure 82. Waveform for Tape Speed Adjustment

Ramp Time Adjustment:

This adjustment is performed on the ramp generator circuit board. With the test conditions as in Step 12 of **Tape Speed Adjustment** above, proceed as follows:

1. Connect a test lead from pin Y on card extender to the external trigger input on the oscilloscope.
2. Condition the oscilloscope to trigger on a high going external signal.
3. Connect the oscilloscope probe to point A on circuit board 3645 (refer to Figure 80).
4. At the test panel, depress the **FORWARD RUN** button and observe trace of ramp-up signal (refer to Figure 83).

This signal appears each time the tape starts to run forward.

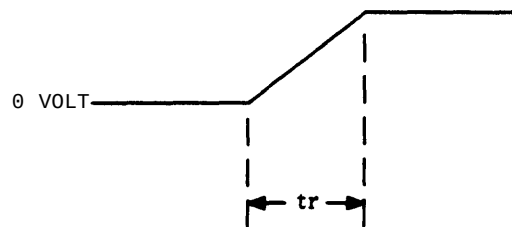


Figure 83. Ramp-Up Signal

5. Alternately depress the **FORWARD RUN** and **STOP** buttons to cause the signal to repeat.
6. Adjust the start ramp potentiometer R3 on circuit board 3645 (refer to Figure 80) if necessary, for a ramp-up time (tr) of 15 ms (refer to Figure 83).

7. Condition the oscilloscope to trigger on a low going external signal.
8. At the test panel, alternately depress the **FORWARD RUN** and **STOP** buttons while observing the ramp-down signal (refer to Figure 84) on the oscilloscope.
9. If necessary, adjust stop ramp potentiometer R4 on circuit board 3645 for a ramp-down time (t_r) of 15 ms (refer to Figure 84).

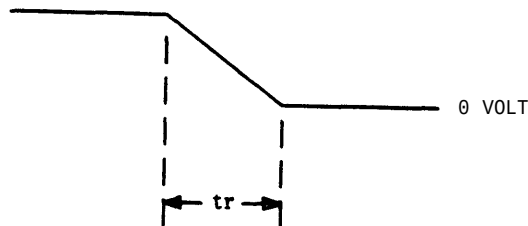


Figure 84. Ramp-Down Signal

10. At the SMDR tape drive, set power **ON/OFF** switch to **OFF**.
11. Remove the test panel from circuit board 4843.
12. Remove circuit board 3645 from the card extender.
13. Remove the card extender and insert circuit board 3645 in its place.
14. Disconnect the oscilloscope probe and test cable.
15. At the SMDR tape drive, set power **ON/OFF** switch to **ON**.
16. Unload master skew tape, and load original 9-track tape.

Photosensor Adjustment:

This adjustment is performed on sensor amplifier driver circuit board 3844 as follows:

1. Load the master skew tape (or standard 9-track tape) and advance the tape to the load point.
2. Connect the test panel to test connector on circuit board 4843 (refer to Figure 81).
3. At the test panel, depress the **STOP** button.
4. At the test panel, depress the **TEST MODE** button.

Note: Do not operate the **FAST FORWARD** or **FAST REVERSE** buttons on the test panel when using a master skew tape.

5. Connect a voltmeter between test points E and F on circuit board 3844 (refer to Figure 80) and adjust potentiometer R16 to 0 volts on the voltmeter.
6. Disconnect the voltmeter and test panel.
7. Unload master skew tape and load original 9-track tape.

Read Skew Adjustment:

This adjustment is performed on the quad phase encoded read detector circuit board 4139 as follows:

1. Load master skew tape on tape drive and advance tape to the load point.

Note: Tape drive must be off-line.

2. Connect the test panel to test connector on circuit board 4843 (refer to Figure 81).
3. At the test panel, depress the **STOP** button.
4. At the test panel, depress the **TEST MODE** button.
5. At the test panel, depress the **FORWARD RUN** button.
6. When the tape reaches end-of-tape marker, depress the **REVERSE RUN** button and observe the **SKEW** indicator lamp on the test panel. The **SKEW** lamp when illuminated, indicates excessive skew.
7. If the **SKEW** lamp lights while tape is running forward, adjust skew adjusting screw (refer to Figure 85) until **SKEW** lamp is extinguished.
8. Disconnect the test panel from circuit board 4843.
9. Unload master skew tape and load original 9-track tape.

Capstan Servo Zero Offset Adjustment:

This adjustment is performed on the servo preamplifier circuit board 4306 as follows:

1. At the SMDR tape drive (behind dust cover), set power **ON/OFF** switch to **OFF**.

Note: Tape must be loaded.

2. Remove circuit board 4306 and insert the card extender in its place.
3. Insert circuit board 4306 into the card extender.
4. At the SMDR tape drive, set power **ON/OFF** switch to **ON**.
5. Connect a voltmeter to test point A on circuit board 4306 to observe the voltage output of the capstan servo amplifier stage.
6. With tape at load point, adjust potentiometer R56 to 0 volts on voltmeter.
7. Observe that capstan does not rotate.

Buffer Arm Travel Adjustment:

This adjustment is performed on the servo preamplifier circuit board 4306 to prevent excessive travel of the supply and take-up buffer arms during ramp-ups and ramp-downs. With the test conditions as in Step 7 of **Capstan Zero Offset Adjustment** above, proceed as follows.

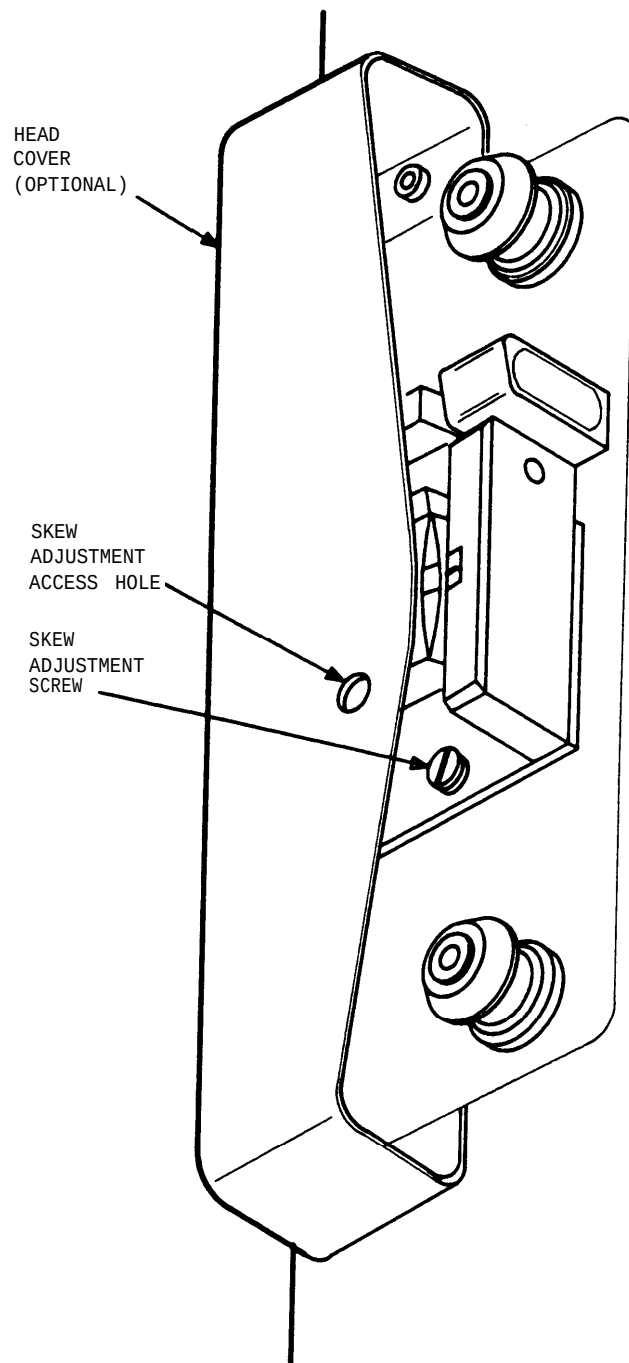


Figure 85. Read Skew Adjustment

1. Connect the test panel to test connector on circuit board 4316 (refer to Figure 80).
2. With the tape drive off-line, depress the **STOP** button on the test panel.
3. At the test panel, depress the **TEST MODE** button.
4. At the test panel, alternately depress the **FORWARD RUN** and **REVERSE RUN** buttons while observing supply buffer arm travel.
5. Adjust R57 on circuit board 4306 for minimum travel of the supply buffer arm during ramp-ups and ramp-downs.
6. Adjust R58 on circuit board 4306 for minimum travel of the take-up buffer arm during ramp-ups and ramp-downs.
7. At the SMDR tape drive, set power **ON/OFF** switch to **OFF**.
8. Remove circuit board 4306 from card extender.
9. Remove card extender from tape drive and install circuit board 4306 in its place.
10. At the SMDR tape drive, set power **ON/OFF** switch to **ON**.
11. Remove test panel from circuit board 4843.

SMDR 207B POWER SUPPLY REPLACEMENT

To replace the SMDR 207B power supply (refer to Figure 86), perform the following removal and installation steps.

Removal Steps:

1. Set switch on SMDR power supply to **OFF**.
2. Disconnect SMDR power cord from AC receptacle.
3. Tag and disconnect leads from rear of power supply.
4. Remove four mounting screws securing power supply to cabinet.
5. Remove power supply from cabinet.

Installation steps:

1. Install the replacement power supply into the cabinet and secure with four mounting screws.
2. Connect leads (disconnected in Step 3 of removal steps) to rear of replacement power supply.
3. Connect SMDR power cord to AC receptacle.
4. Set switch on power supply to **ON**.

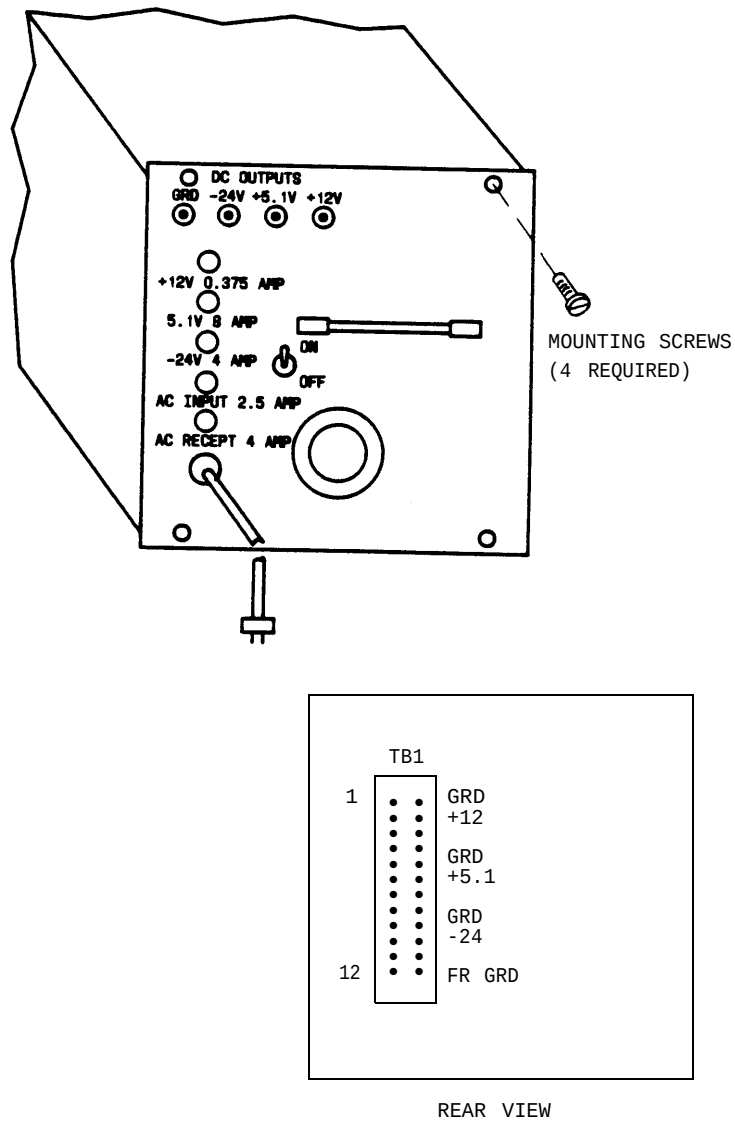


Figure 86. Replacing SMDR 207B Power Supply

SMDR FORMATTER REPLACEMENT

To replace the SMDR formatter (refer to Figure 87), perform the following removal and installation steps.

Removal Steps:

1. At rear of the SMDR cabinet, disconnect formatter power cord.
2. Tag and disconnect cables at rear of formatter.
3. Remove two mounting screws from formatter front cover and remove front cover.
4. Remove four mounting screws securing formatter to brackets.
5. Remove formatter from cabinet.

Installation steps:

1. Remove two mounting screws from front cover on replacement formatter and remove front cover.
2. Install the replacement formatter into the cabinet and secure to the brackets with four mounting screws.
3. Secure front cover on the replacement formatter using two mounting screws.
4. Connect cables (disconnected in Step 2 of removal steps) to rear of replacement formatter.
5. Connect formatter power cord.
6. At the rear of replacement formatter, set voltage switch to 115 volts.
7. At the SMDR control panel, depress the **SYSTEM ON LINE** button.
8. If the **ON LINE** lamp on the tape drive is not lighted, depress the **ON LINE** button.

SMDR TAPE DRIVE REPLACEMENT

To replace the SMDR tape drive (refer to Figure 88, Sheets 1 and 2), perform the following removal and installation steps.

Removal Steps:

1. At the SMDR control, depress the **TAPE UNLOAD** button.
2. Rewind tape onto supply reel either manually or by depressing the **ON LINE** and **REWIND** buttons on the tape drive.
3. Remove supply reel from the tape drive.
4. Set tape drive power switch to **OFF**.
5. Disconnect power cord from AC voltage source.
6. Tag and disconnect cables at rear of the tape drive.
7. Remove eight mounting screws at front of tape drive.

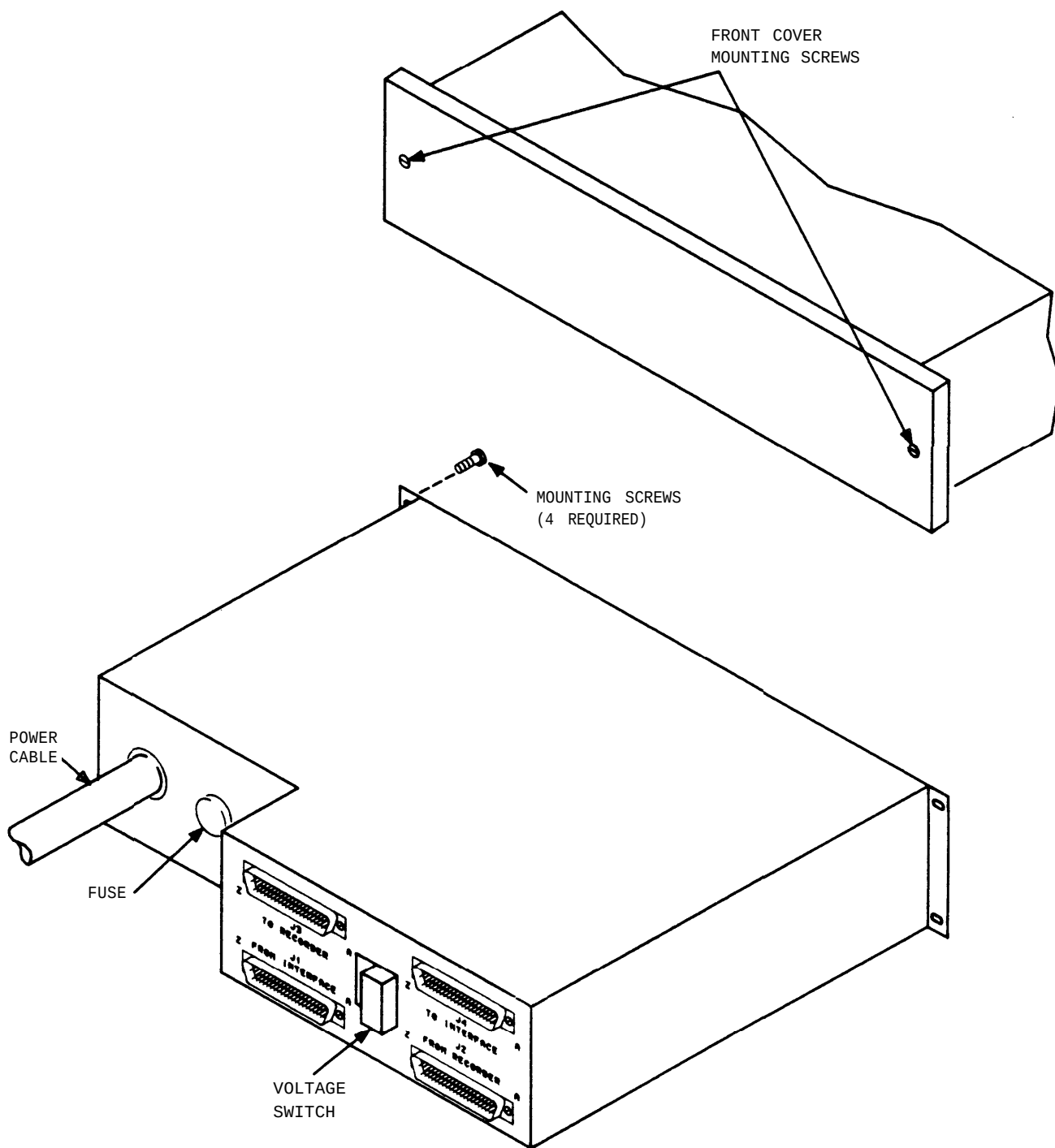


Figure 87. Replacing SMDR Formatter

8. At rear of the tape drive, remove two mounting screws securing bracket to tape drive.
9. Remove tape drive from the control panel.

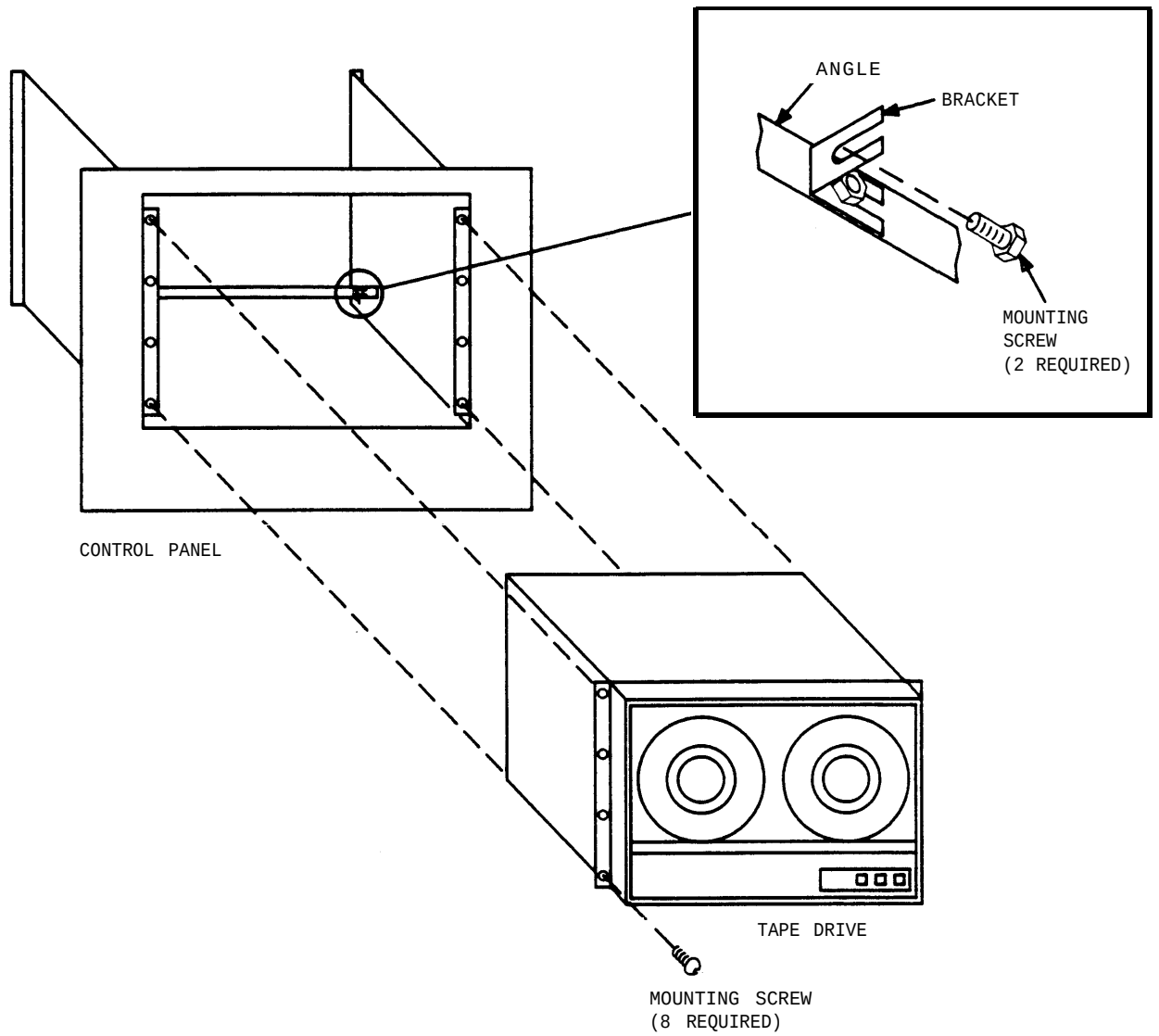
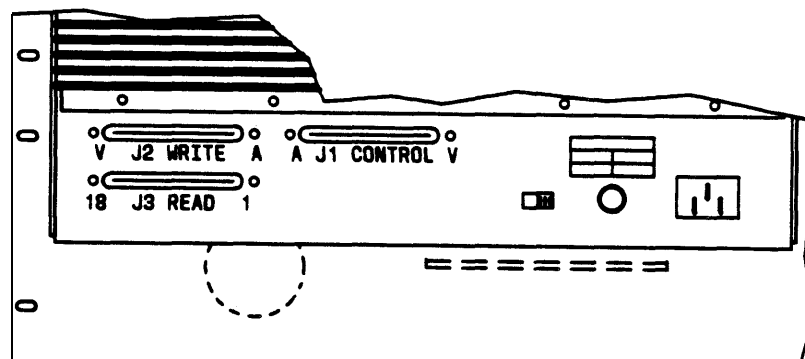


Figure 88. Replacing SMDR Tape Drive (Sheet 1 of 2)



PARTIAL REAR VIEW

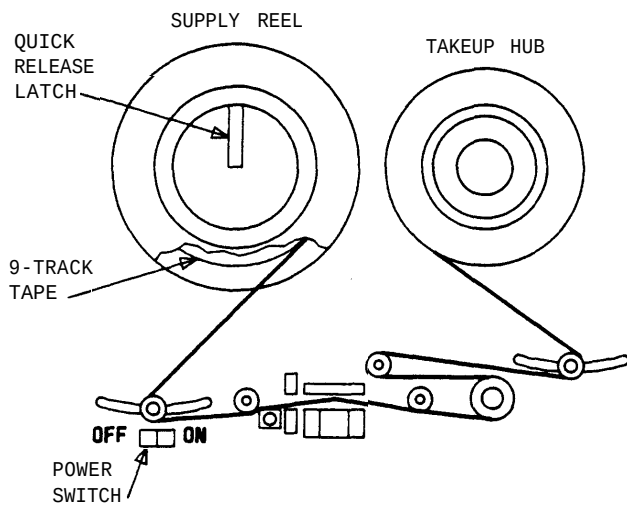


Figure 88. Replacing SMDR Tape Drive (Sheet 2 of 2)

Installation steps:

1. Install the replacement tape drive into the control panel and secure the tape drive to the control panel using eight mounting screws.
2. Secure bracket to tape drive using two mounting screws.
3. Verify (or set) voltage switch at rear of tape drive is set to 115 volts.
4. Connect cables (disconnected in Step 7 of removal steps) to rear of the tape drive.

5. Connect power cord to AC voltage source.
6. At the tape drive, raise the quick release latch.
7. Install the supply reel on supply hub with the write enable ring side next to the tape transport deck.
8. Hold supply reel flush against the butt flange and secure the supply reel by depressing the quick release latch.
9. Thread tape and wind a few turns clockwise around the take up reel until the slack in the tape is removed.
10. Set the tape drive power switch to **ON**.
11. Close the dust cover and depress the **LOAD BUTTON**.
12. At the SMDR control panel, depress the **SYSTEM ON LINE** button.
13. At the SMDR tape drive, depress the **ON LINE** button.
14. At the SMDR control panel, depress the **DUMP MEMORY** button.

SMDR CLOCK/CALENDAR DISPLAY REPLACEMENT

To replace the SMDR clock/calendar display (refer to Figure 89), perform the following removal and installation steps.

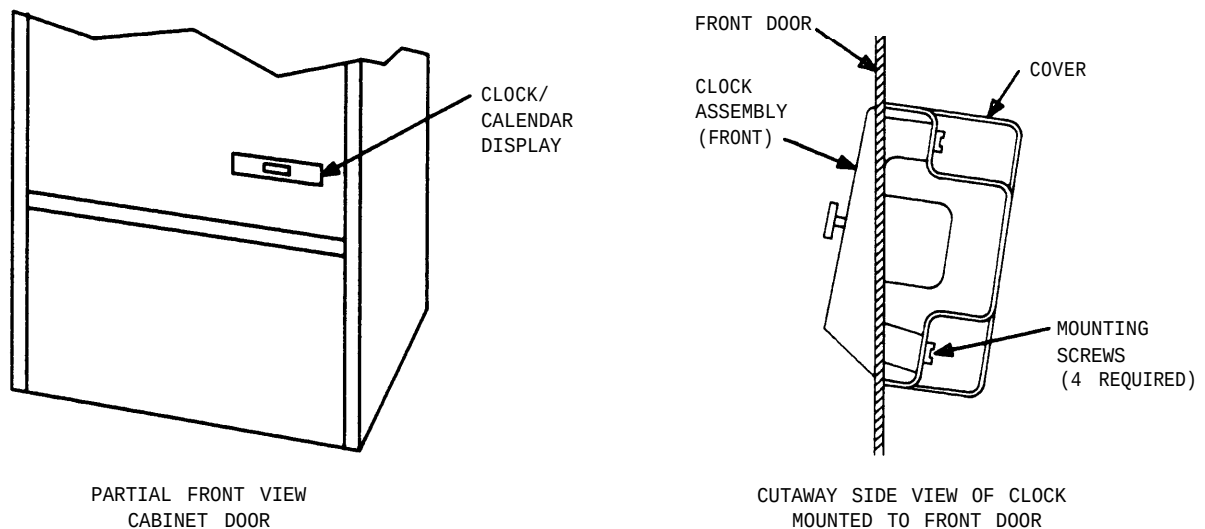


Figure 89. Replacing SMDR Clock/Calendar Display

Removal Steps:

1. At rear of the SMDR cabinet, disconnect connector **CLK1** from **CD01** jack on the SMDR carrier.
2. At inside front door of the SMDR cabinet, remove four screws securing clock/calendar display assembly.
3. Remove clock/calendar display assembly from the door.

Installation steps:

1. Install the replacement clock/calendar display assembly into the inside front door of the SMDR cabinet, and secure the clock/calendar display assembly to the door using four screws.
2. At rear of the SMDR cabinet, connect connector **CLK1** to **CDO1** jack on SMDR carrier.
3. At the clock/calendar display, set display switch to **TIME**.
4. Depress the **TIME SET HRS** button until correct hours digit is displayed.
5. Depress the **TIME SET MIN** button until correct minutes digit is displayed.
6. Set display switch to **DATE**.
7. Depress the **DATE SET** button until correct date is displayed.
8. Depress the **DATE PRINT** button.

AUXILIARY CABINET COMPONENT REPLACEMENT

GENERAL

This section provides a brief description of the auxiliary cabinet and contains instructions for replacement of auxiliary cabinet components.

Replacement of auxiliary cabinet components, as determined by performing maintenance procedures, consist of the following:

1. Frequency generator replacement.
2. DC fan and fan assembly replacement.
3. AC distribution unit replacement.
4. Rectifier replacement.

AUXILIARY CABINET

The auxiliary cabinet (refer to Figure 90) contains System 85 auxiliary equipment required by the customer.

This cabinet can contain:

1. A fuse panel.
Provides mounting for circuit fuses which protect auxiliary equipment.
2. A sensor.
Monitors the cabinet temperature.
3. Auxiliary equipment.
Provides features such as radio paging access, recorded telephone dictation access, recorded announcement, etc.
4. A fan assembly.
Maintains interior cabinet temperature.
5. A -48 volt rectifier.
Provides DC power to the auxiliary cabinet.
6. An AC filter for the -48 volt rectifier.

Note: When equipped with extended power reserve a DC filter replaces the AC filter (AC distribution unit).
7. An auxiliary alarm unit and alarm distribution panel.
Detects and reports equipment malfunctions.

8. A DC filter.

Provides extended power reserve.

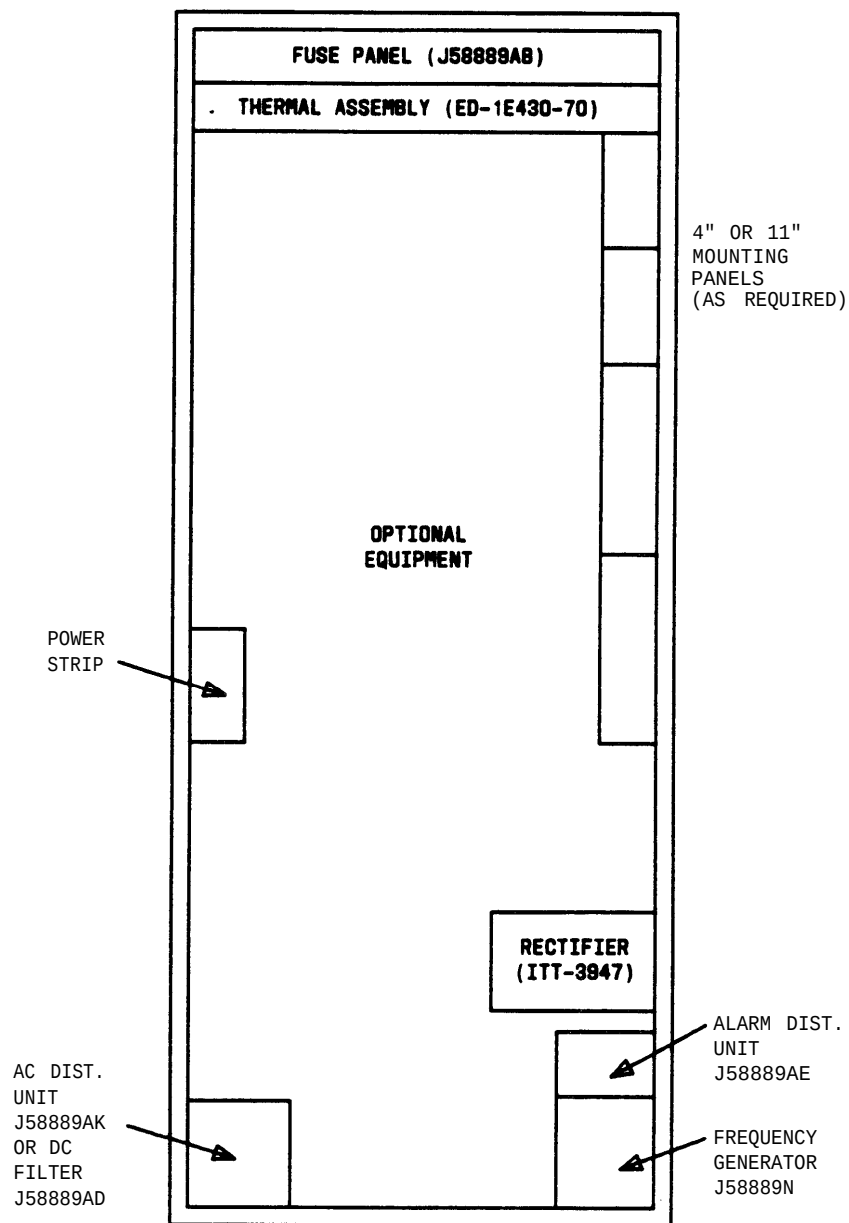


Figure 90. Auxiliary Cabinet

124B, 124B1, or 124B2 FREQUENCY GENERATOR REPLACEMENT

To replace the 124B, 124B1, or 124B2 frequency generator (refer to Figure 91 or Figure 92) in the auxiliary cabinet, perform the following removal and installation steps.

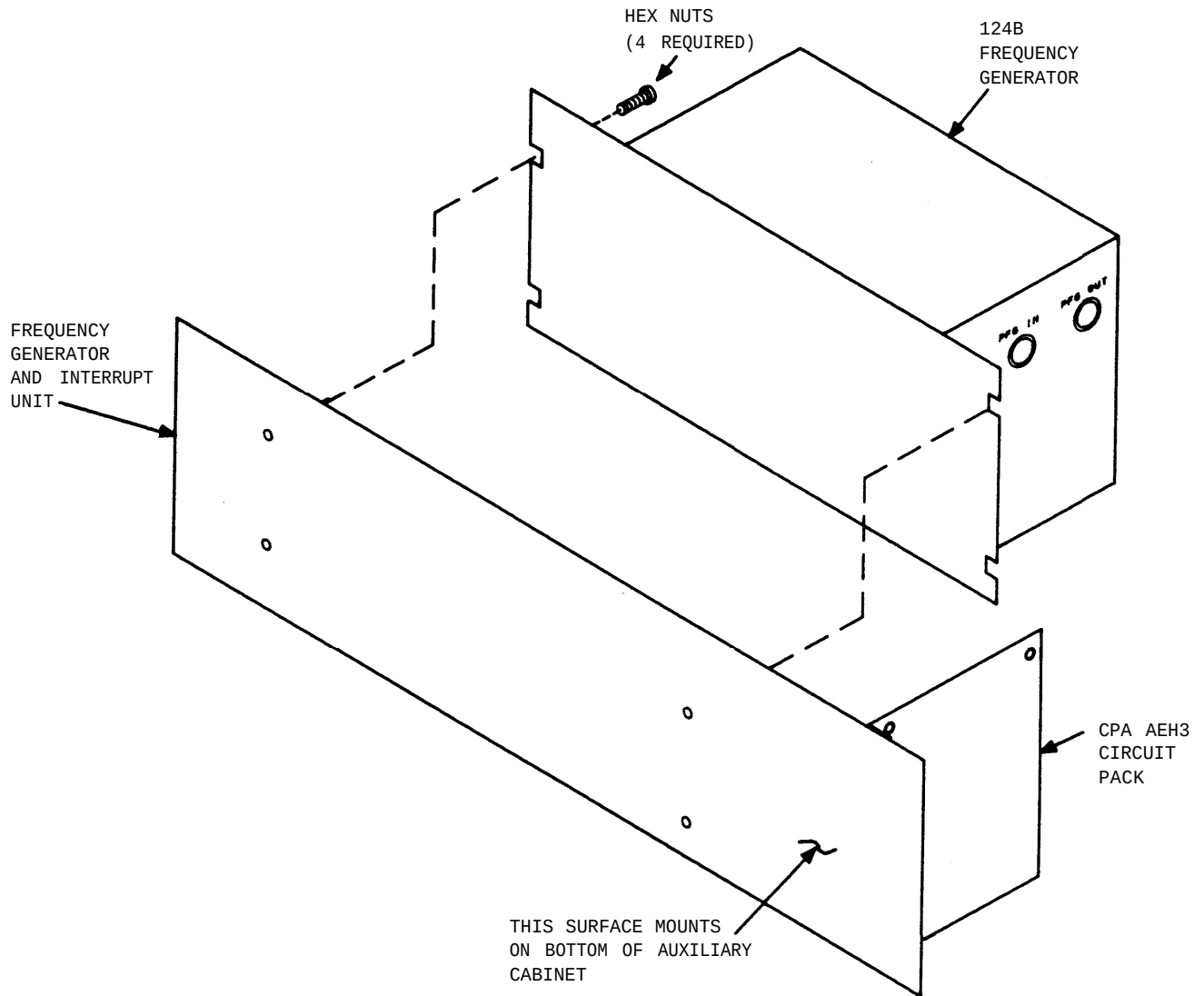


Figure 91. Replacing Auxiliary Cabinet 124B Frequency Generator

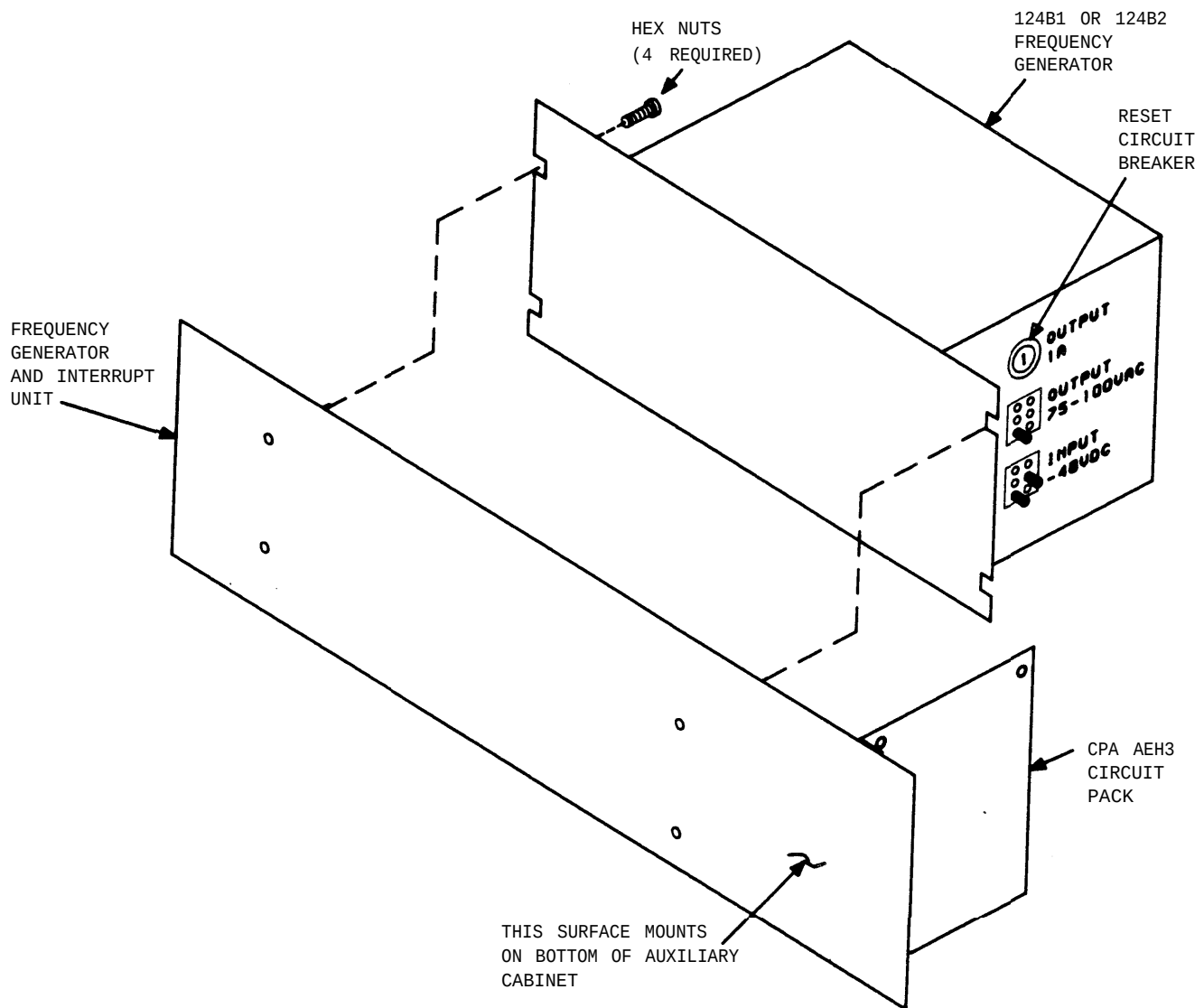


Figure 92. Replacing Auxiliary Cabinet 124B1 or 124B2 Frequency Generator

Removal Steps:

1. Remove the -48 volt fuse associated with the frequency generator.
2. Disconnect the connectors from **PFG IN** and **PFG OUT** (124B frequency generator) or from **OUTPUT** and **INPUT** (124B1 or 124B2 frequency generator).
3. Remove four mounting screws (two from each side) securing the frequency generator to the front panel of the auxiliary cabinet.
4. Remove the frequency generator.

Installation steps:

1. Install the replacement frequency generator into the auxiliary cabinet and secure the frequency generator to the front panel using four mounting screws.
2. Connect the connectors to **PFG IN** and **PFG OUT** (124B frequency generator) or to **OUTPUT** and **INPUT** (124B1 or 124B2 frequency generator).
3. Replace the -48 volt fuse associated with the frequency generator.

DC FAN AND FAN ASSEMBLY REPLACEMENT

DC Fan Replacement

To replace a DC fan (refer to Figure 93), in the auxiliary cabinet, perform the following removal and installation steps.

Removal Steps:

1. Remove the fuse (F1 or F2) associated with the fan to be replaced.

Note: Fuse F1 controls all the fans in the upper fan assembly and Fuse F2 controls all the fans in the lower fan assembly.

2. Disconnect the plug from the fan to be replaced.
3. Remove two mounting screws.
4. Remove the fan from the fan assembly.

Installation Steps:

1. Mount the replacement fan on the fan assembly and secure with the two mounting screws.
2. Install the fan plug to the replacement fan.
3. Install the fuse (F1 or F2) associated with the fan replaced.

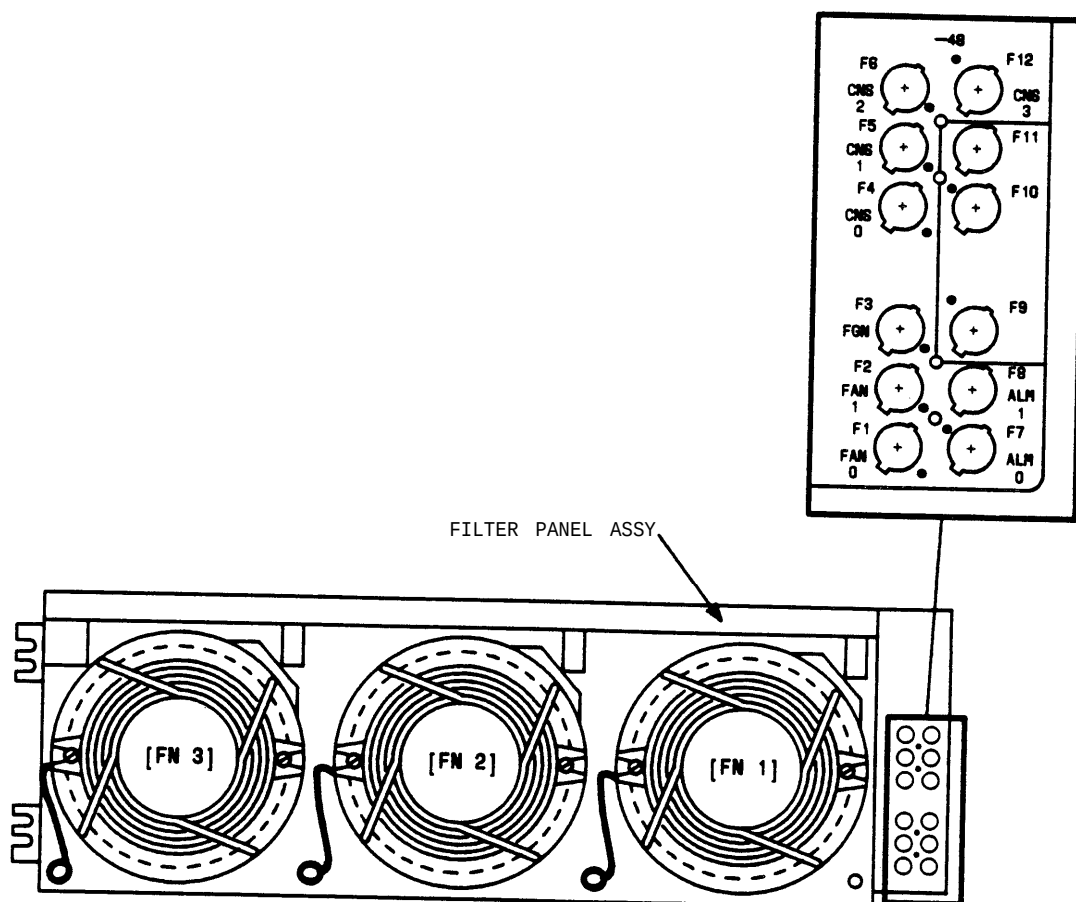


Figure 93. Replacing Auxiliary Cabinet DC Fans

DC Fan Wire Replacement

To replace a fan wire suspected of failing in the auxiliary cabinet, perform the following removal and installation steps.

Removal Steps:

1. Remove the fuse (F1 or F2) associated with the fan wire to be replaced.

Note: Fuse F1 controls all the fans in the upper fan assembly and Fuse F2 controls all the fans in the lower fan assembly.

2. Disconnect the fan wire (plug) to be replaced.
3. Thread the fan wire through the fan assembly toward the rear.
4. Disconnect the fan wire from **TB1** at the rear of the fan assembly.
5. Remove the fan wire from the fan assembly.

Installation Steps:

1. Connect the replacement fan wire to **TB1** at the rear of the fan assembly.
2. Thread the fan wire through the fan assembly toward the front.
3. Install the replacement fan wire (plug) to the appropriate fan.
4. Replace the fuse (F1 or F2) associated with the fan wire replaced.

DC Fan Assembly Replacement

To replace the DC fan assembly in the auxiliary cabinet, perform the following removal and installation steps.

Removal Steps:

1. At the rear of the fan assembly:
 - a. Disconnect four ground straps at the top of the fan assembly.
 - b. Tag and disconnect the alarm leads from AEH4.
 - c. Disconnect two bus bar ground cables.
 - d. Disconnect the JTMP connectors in two places.
2. At the front of the fan assembly:
 - a. Remove four mounting screws (two on the left and right sides) securing the fan assembly to the cabinet.
 - b. Remove the fan assembly from the cabinet.

Installation Steps:

Note: When the DC fan assembly is shipped loose, attach 900658329 vinyl plastic tape (approximately 60 inches) to the top and bottom edges of the unit before installing the DC fan assembly into the cabinet.

1. At the front of the cabinet, mount the replacement fan assembly and secure with the four mounting screws.

2. At the rear of the fan assembly:
 - a. Connect the JTMP connectors in two places.
 - b. Connect two bus bar ground cables.
 - c. Connect the alarm leads to AEH4.
 - d. Connect four ground straps at the top of the fan assembly.

AC DISTRIBUTION UNIT REPLACEMENT

To replace the AC distribution unit (refer to Figure 94) in the auxiliary cabinet, perform the following removal and installation steps.

Removal Steps:

1. Set circuit breakers **CB1** through **CB5** on the AC distribution unit to be replaced to **OFF**.
2. Disconnect the power cord from the AC source.
3. Tag and disconnect the two wires from the grounding block on the left rear side.

Note: One wire is connected to the rectifier, and the other wire is connected to terminal **TS1**.
4. Tag and disconnect the remaining cables from the AC distribution unit to be replaced.
5. At the rear of the auxiliary cabinet, remove two screws from the mounting foot at left side of the AC distribution unit.
6. At the front of the auxiliary cabinet, remove two screws from the mounting bracket.
7. Remove the AC distribution unit from the auxiliary cabinet.

Installation steps:

1. Set circuit breakers **CB1** through **CB5** on the replacement AC distribution unit to **OFF**.
2. Install the replacement AC distribution unit into the auxiliary cabinet and secure the unit to the cabinet using four mounting screws (two in the mounting bracket and two in the mounting foot).
3. Connect the cables (disconnected in Step 4 of removal steps) to the replacement AC distribution unit.
4. Connect the two wires (disconnected in Step 3 of removal steps) to the replacement AC distribution unit grounding block.
5. Connect the power cord of the replacement AC distribution unit to the AC source.
6. Set circuit breakers **CB1** through **CB5** on the replacement AC distribution unit to **ON**.

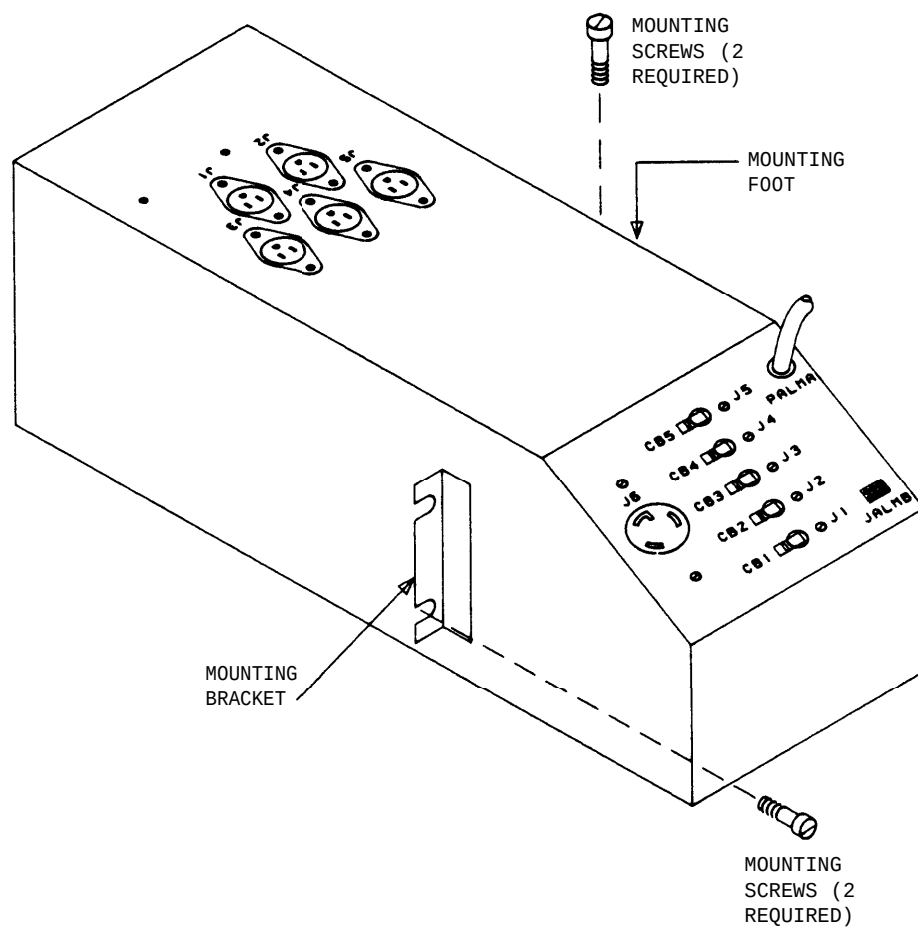


Figure 94. Replacing Auxiliary Cabinet AC Distribution Unit

RECTIFIER REPLACEMENT

To replace the rectifier (refer to Figure 95) in the auxiliary cabinet perform the following removal and installation steps.

Removal Steps:

1. At the front of the rectifier:
 - a. Set the **ON/OFF** switch to **OFF**.
 - b. Remove the connector from the **AC** input jack.
2. At the rear of the rectifier, remove the connectors from the **ALARMS** and **OUTPUT** jacks.
3. At the front of the auxiliary cabinet:
 - a. Remove two hex nuts securing mounting clip to shelf.
 - b. Remove the mounting clip from the shelf.
4. Slide the rectifier forward and remove from the auxiliary cabinet.

Installation steps:

1. At the front of the replacement rectifier, set the **ON/OFF** switch to **OFF**.
2. Install the replacement rectifier into the auxiliary cabinet.
3. At the front of the auxiliary cabinet, replace the mounting clip to the shelf and secure with the two hex nuts.
4. At the rear of the replacement rectifier, connect the two connectors to the **ALARMS** and **OUTPUT** jacks.
5. At the front of the replacement rectifier:
 - a. Connect the connector to the **AC** input jack.
 - b. Set the **ON/OFF** switch to **ON**.

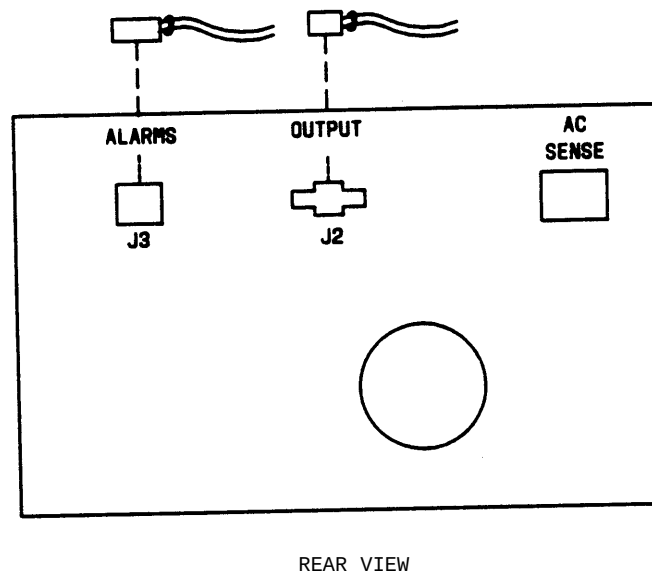
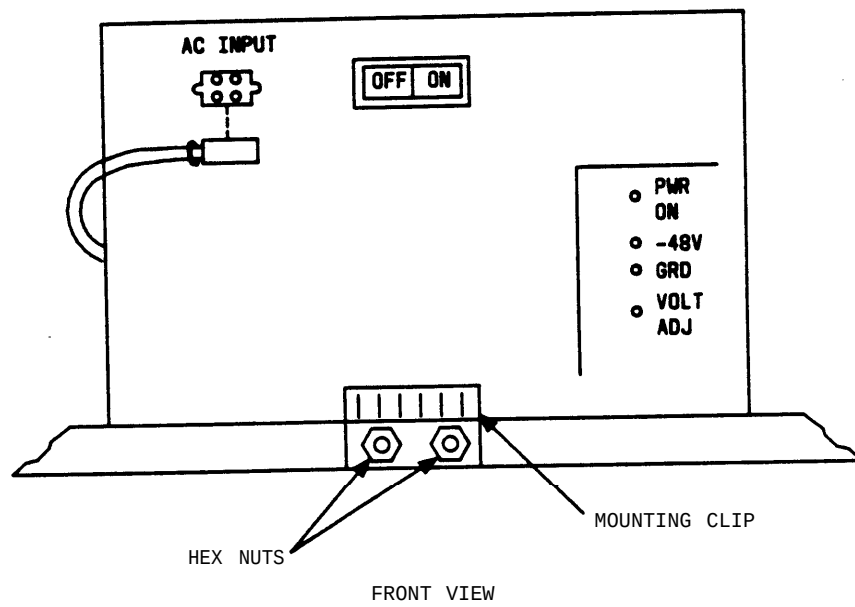


Figure 95. Replacing Auxiliary Cabinet Rectifier

MAINTENANCE AND ADMINISTRATION PANEL (MAAP)

DESCRIPTION OF MAAP

Overview

The various components of the **MAAP** (refer to Figure 96), are described in the following paragraphs.

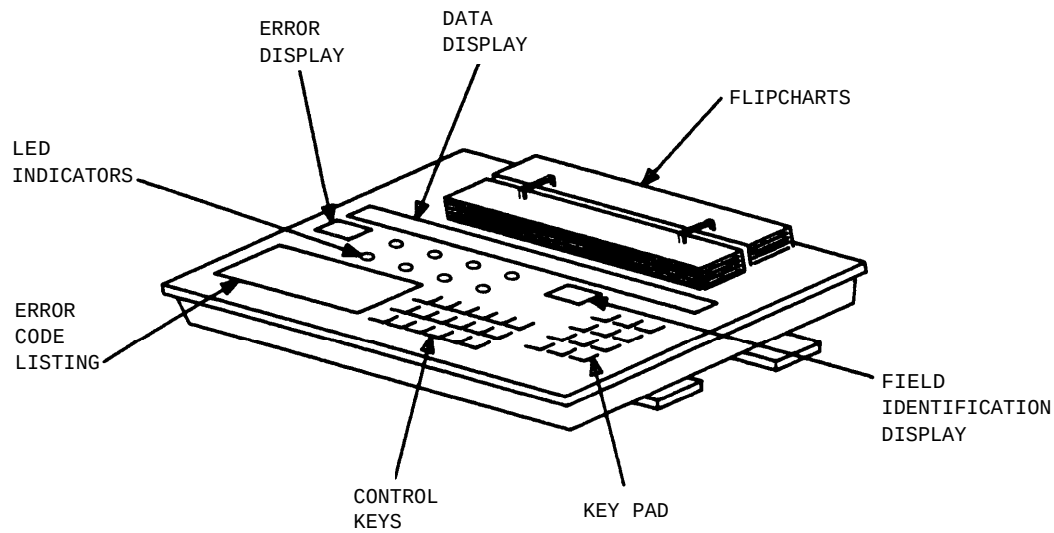


Figure 96. MAAP

LED Indicators

The Light Emitting Diode (LED) indicators (refer to Figure 97), function as follows.

MAJOR	0	0	IN USE	0	SEE NOTE	0
MINOR	0	1	BUSY OUT	0	WAIT	0
ALARM		PROCESSOR				

Figure 97. LED Indicators

- a. The **MAJOR** and **MINOR** alarm lamps (in parallel with the alarm panel) display the existence of alarm conditions.
- b. The **0** or **1** lamp denotes which common control (processor) in a duplicated system is on-line.
- c. The **IN USE** lamp denotes that a circuit selected for testing is in use and cannot be tested.
- d. The **BUSY OUT** lamp is lighted at all times when any circuit in the switch is maintenance or software busied out.
- e. The **SEE NOTE** lamp serves as a reminder that translation changes have been made in memory and **must** be transferred to the tape.
- f. The **WAIT** lamp is lighted when the tape is in motion selecting the requested procedure or when a maintenance procedure is being run.

Key Pad

The key pad (refer to Figure 98), is used to enter data into the procedure fields.

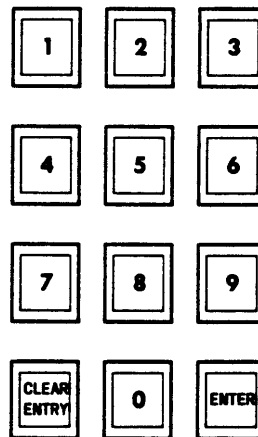


Figure 98. Key Pad

- a. The **CLEAR ENTRY** button clears existing data if depressed before the **ENTER** button. Depressing the **ENTER** button after depressing **CLEAR ENTRY** places a dash (-) in the blinking field.
- b. The **ENTER** button is depressed when a number entered in a field is complete; when a number already displayed is to be used as it appears; or to advance to the next higher numbered field.

Flipcharts

Each maintenance procedure is represented by one or more flipcharts. Each flipchart is used to:

- a. Identify the fields required for display or entry purposes.
- b. Identify information unique to that particular maintenance procedure.

Flipcharts are identified by the function of the procedure (procedure name) and a 3-digit procedure number. The 25-digit data portion of each flipchart is segmented into fields identified by a number and a name.

Many maintenance procedures require that data be entered in specific field(s). These fields are called **entry** fields and are identified by black triangles on the flipchart.

All data entered into a maintenance procedure is displayed at the moment it is entered. The display may be used to denote all data contained in memory for a particular flipchart.

Flipchart field boundaries are delineated in the data display by a dot (decimal point) located in the bottom right-hand corner of each field. The decimal point for a particular field flashes as an indication that the field is ready for data entry.

LED Data Display

The LED data display field is an operational display which functions with a flipchart. The display consists of 28-digits which correspond to the 25-digit locations of a flipchart and the 3-digit number of the procedure.

Error Display

A 2-digit display (refer to Figure 99), allows the display of error codes informing the user that an invalid operation was attempted or that invalid data is entered in a field.

Field Identification

A 2-digit display (refer to Figure 99), which denotes the number of the **MAAP** field which is ready for data entry.

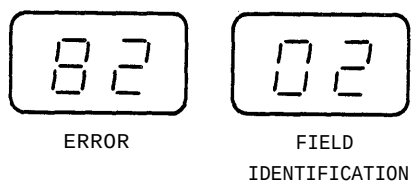


Figure 99. Error Display and Field Identification

Error Code Listing

The error code listing (refer to Figure 100), is an abbreviated listing of the most common error codes that may be displayed when performing procedures.

RESTART-SEQUENCE (EG 'CHANGE FIELD' ETC.) 00- WRONG CONTROL KEY. 01- FLD DISP ONLY OR NOT ON FLIPCHART. REENTER DATA 02- DATA OUT OF LIMITS (EG SLOT NO. TOO LARGE). 03- DATA WRONG (EG WRONG SLOT NO. FOR CP TYPE). 04- DIGITS 8 AND 9 NOT ALLOWED. 05- TOO MANY DIGITS DIALED, IF OK, PRESS 'ENTER' IF NOT, REENTER DATA. 06- WRONG KEY. PRESS RIGHT KEY AND CONTINUE. 07- D0 NOT PRESS KEYS WHEN WAIT LAMP IS ON. 08- IN USE LAMP ON OR FEATURE/SVC ACTIVE. 09- PROC MUST RUN ON ON-LINE PROCESSOR.	CHECK DATA-CORRECT AND TRY AGAIN 10- EQPT LOC TYPE WRONG. 11- IS NOT ASSIGNED. 12- IS ASSIGNED. 13- PORT 0 OF EACH MOD UNASSIGNABLE. 15- CHECK FIRST DIAL DIGIT. 16- DAC/EXT NOT IN DIAL PLAN. 18- IS NOT ASSIGNED TO GPP. 19- IS NOT ASSIGNED TO MLP. 20- TEST LINE BUSIED OUT. 21- CKT BUSIED OUT. 22- CKT NOT BUSIED OUT.	FOLLOW LOCAL PRACTICES 60- SPECIAL EXT TO DAC NOT ADMINISTERABLE THIS PROC. 70- INVALID PROCEDURE. 71- FEATURE NOT IN PROGRAM. 72- MEMORY SPACE TOO SMALL. 73- PROG/MEMORY FAULT. 74- EQPT NOT PART OF SYSTEM. 75- MEMORIES MISMATCH. 99- D0 NOT RUN TAPE. RELOAD AND START OVER. NOTE: AFTER ALL TRNSLTN CHGS "RUN TAPE," "EXECUTE".

Figure 100. Error Code Listing

Control Keys

The control keys in the center of the **MAAP** are used to select the various modes and functions. They are identified as translation, common, and maintenance keys and are color-coded. Figure 101 illustrates the key designations and color coding of the control keys.

- The translation (blue) keys are used with the common (white) keys to execute translation procedures.
- The common keys are used with both translation and maintenance procedures.
- The maintenance (yellow) keys are used in conjunction with the common keys to execute maintenance procedures.

Use of Control Keys When Performing Maintenance Procedures

The control keys allow maintenance personnel to use and control the **PROC**s. Many of the control keys work basically the same in every situation (e.g., **NEXT TEST**, **STOP**, etc.) but some produce different responses depending upon the procedure being used and the function being performed.

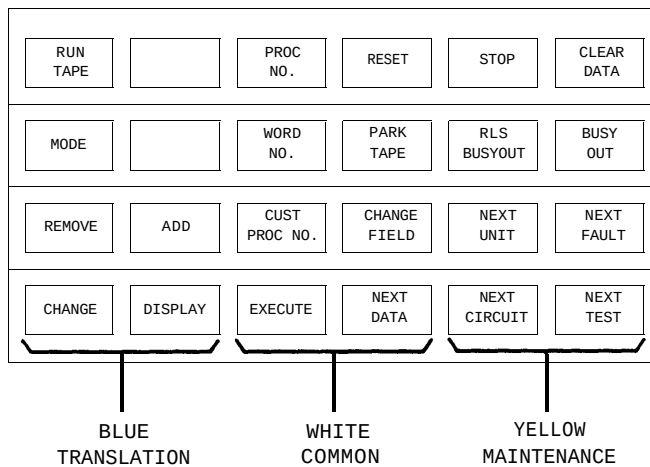


Figure 101. Control Keys

The maintenance control keys, those common control keys required for maintenance functions, and some of their uses are described in the following paragraphs.

1. **MODE** is used to display or set a port's current mode(s) at any time. Depressing **MODE** will immediately give a status display.
 - a. Operationally, activating the **MODE** button is equivalent to calling in a new procedure, although no procedure source code is required.
 - b. The **MODE** display button will interrupt any current MAAP task in the same way that depressing **PROC** does.
 - c. The mode status display may be exited by calling in another procedure.
2. **BUSY OUT** is used to place a circuit location in maintenance busy out status. It can be used either during a maintenance procedure which allows a circuit to be busied out (not all procedures allow this capability) or in one of the following four busy out **PROC**s.
 - a. **PROC 630** - Busy out/release busy out.
 - b. **PROC 631** - Trunk group busy out.
 - c. **PROC 632** - Carrier busy.
 - d. **PROC 635** - Cause of busy out.

Busy out of an individual ISDN trunk at the System 85 switch (local end) causes the associated trunk at the far end to also be busied out. Busy out of the far end does not happen instantaneously.

Busy out of a range of ISDN trunks takes a short period of time for the last few trunks to be made busied at the far end.

- a. Depressing **BUSY OUT** does **not** mean that both sides of the the ISDN trunk(s) are busied out.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk(s) is busied out by checking the circuit status of the ISDN trunk(s).

The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

3. **CHANGE FIELD:** If a data entry field must be changed but is not currently selected by the maintenance procedure for entry, **CHANGE FIELD** is used to change it. **Data entry field** means any display field in which the procedure allows or requires digit entry.
4. **CLEAR DATA:** The control key sequence **CLEAR DATA; EXECUTE** can be used to clear the alarm sent bits in the error log without clearing the record itself.
 - a. Clearing the alarm sent bit of an error record in PMIDS causes the associated alarm indication on the alarm panel to turn off.
 - b. In **PROC 600** and **PROC 612**, the **CLEAR DATA; EXECUTE** sequence is used to clear (zero) error records in PMIDS. This is the only method available to clear PMIDS records.
5. **ENTER** is used to indicate that a number which is entered in a field is complete or that a number already displayed in a field is used as is. A typical entry sequence would be the specification of an equipment location for display or testing.
 - a. If the location is required, the first field (usually the module field) is blinked to indicate that an entry is necessary or can be done.
 - b. If the field is blank, the entry is mandatory. If the field is occupied, it can be accepted as is or changed.
 - c. To accept the data as is, depress **ENTER** with no data number entry.
6. **EXECUTE:** There are two main uses of **EXECUTE**.
 - a. One use is with **CLEAR DATA** (see above) in clearing failure history, resolving alarmed entries, and turning off fault indicators.
 - b. The second use causes the procedure being used to start the selected test. The test could be a hardware test, a test call, or a failure history snapshot and sort for display, etc.
 - c. When testing multiple circuits, the **STOP; EXECUTE** key sequence works in two ways depending upon which maintenance procedure is being performed.
 1. The first method is for the test to begin again from the first appropriate circuit (circuit of the correct type for the maintenance procedure and test being run) in the switch.
 2. The second method is for the test to start from a displayed location (the last circuit which was tested) and cycle to the end of the range of circuits being tested.

7. **NEXT CIRCUIT** causes a new circuit location to be selected and displayed by the maintenance procedure. There are two uses of **NEXT CIRCUIT**: to display stored circuit information or to select a circuit location for testing.
 - a. To display test results or failure history one circuit location at a time, **NEXT CIRCUIT** is depressed once for each new circuit location.
 - b. If maintenance personnel wish to test a single circuit location, **NEXT CIRCUIT** allows the appropriate circuit locations to be stepped through and displayed one at a time until the circuit to be tested is displayed.
8. **NEXT DATA** is used to display demand test results, periodic failure history data, and call processing failure history data which are arranged by circuit location in records, one location per record. Successive uses of **NEXT DATA** allow data records to be displayed one part at a time.
9. **NEXT FAULT** is used to step through error records, which have different fault codes, one at a time.
10. **NEXT TEST** causes the procedure to automatically advance to the next test that can be run. If the current test displayed is the last test the procedure can run, the test selected is test number 1. The new test selected will not start until **EXECUTE** is depressed.
11. **NEXT UNIT**: When a hardware test is selected, **NEXT UNIT** causes the next unit type to be selected and displayed for testing. The first circuit of that unit type can be selected and displayed for testing by depressing **NEXT CIRCUIT**. When displaying failure history or test results, **NEXT UNIT** is used to look at the first circuit location recorded for the next unit type (numerically) in the failure history list.
12. **PROC NO** is used to call in a maintenance procedure. The default test (Test number 1) is automatically selected.
13. **RESET**: When **RESET** is depressed, the maintenance procedure executing or ready to be executed is returned to its initial nominal start configuration (e.g., Test number 1, initial display).
14. **RLS BUSY OUT**: Prior to maintenance personnel leaving the customer's premises all busied out circuits should be released from busy after corrective action is performed to restore the circuit to operation.

Releasing ISDN trunks requires both switches (local and far end) to agree on releasing the ISDN trunks from busy out. If the far end does not agree, the trunk(s) will stay in T_limbo (trunk is in a limbo state). If the far end switch has the trunk(s) in a maintenance busy state the trunk(s) will return to a busy out state at the far end, even though **RLS BUSY OUT** is depressed at the local switch.

- a. Depressing **RLS BUSY OUT** does **not** mean the ISDN trunk(s) is available for use.
- b. **PROC 635** and/or **PROC 648** can be used to ensure that the ISDN trunk(s) are released from busy by checking the circuit status of the ISDN trunk(s).

The circuit status of the ISDN trunk(s) is independent of the busy out status and/or the busy out lamp indication on the **MAAP**.

- a. Whenever the **BUSY OUT LED** is lighted on the **MAAP**, **RLS BUSY OUT** is used to release a circuit location from maintenance busy status.
 - b. When the **BUSY OUT LED** remains lighted after all circuits are released from busy using individual maintenance procedures and the four busy out/release busy maintenance procedures (i.e., **PROC 630**, **631**, **632** and **PROC 635**), **PROC 621**, **PROC 650**, **PROC 651**, and/or **PROC 652** should be used to determine the cause of the **BUSY OUT LED** remaining lighted.
15. **STOP:** The use of **STOP** halts test execution when a test is running.

HOW TO USE THE MAAP

Overview

This section describes how the **MAAP** is used to perform maintenance procedures, port contention (blocking), and how to respond to error displays in the **MAAP** error code-field.

Connect MAAP

1. Remove the **MAAP** from the common control cabinet, module control cabinets housing module control carriers in a multi-module switch, or a remote module control cabinet.
2. Connect the **MAAP** to the appropriate connector.
 - a. Connectors are designated **MAAP** for an unduplicated common control switch and **ON LINE**, **CC0**, or **CC1** for a duplicated common control switch.
 - b. Connectors are also designated **MAAP** for module control cabinets housing module control carriers in a multi-module switch or a remote module control cabinet.
3. When the **MAAP** is connected, the **MODE** status procedure is displayed.
 - a. The **MODE** procedure displays the status of the current port and determines which activities can be performed at that port.
 - b. Only one port may be active on a given mode at one time. This means that only one **active** port may run maintenance at a time, only one **active** port may run administration at a time, etc.

Modes Required to Perform Maintenance

The **MAINT** mode (Field 2) on the current port is required to be set to perform all maintenance procedures.

In addition, the **ADMIN** mode (Field 1) on the current port is required to be set when performing **PROC 642**, **643**, **644**, **646**, and **647**.

The **TAPE** mode (Field 3) on the current port is required to be set when performing **PROC 610**, **614**, **999** and **RUNTAPE**.

Note: The ADMIN mode (Field 1) and the TAPE mode (Field 3) **should not be set** until the mode is required to perform maintenance tasks. If the ADMIN and TAPE modes are prematurely set, other facilities would be blocked from using these modes.

Some indication of when to set the modes on the current port are:

1. When the **MAAP** is first connected and the **MODE** procedure is displayed.
2. After a tape reload and the **MODE** procedure is displayed.

Note: The MODE status display indicates whether another agent has control of the mode required to perform maintenance tasks.

3. During maintenance tasks, when standard error code 76 (**MODE** required by **PROC** in use) is displayed as soon as the maintenance procedure is called in.
4. During administration tasks, when standard error code 76 (**MODE** required by **PROC** in use) is displayed when **EXECUTE** is depressed after an Add, Change, Display, or Remove operation.

Note: If standard error code 76 (**MODE** required by **PROC** in use) is displayed in the **MAAP** error code field, it indicates that the **MAAP** port is being utilized by another facility for the mode requested.

Setting Required Mode(s)

Ports may attempt to change modes at any time, based on planned task activity. Requests are blocked if another port currently has control of a mode requested.

A port may display or set its current mode(s) by depressing **MODE**.

1. Current port is defined as the port (**local or remote**) that **activated** the **MODE** button.

Note: For example, if the craft is using the local MAAP, the current port fields (Fields 1 through 3) provide information on the local MAAP modes.

2. Current port fields (Fields 1 through 3) display a 1 if the mode is active and 0 if it is inactive for the current port.
3. The current port fields (Field 1 = ADMIN, Field 2 = MAINT, Field 3 = TAPE) can be set by activating the corresponding field number (1 through 3) on the key pad.

Note: If a mode switch is not allowed, standard error code 76 (**MODE** required by **PROC** in use) is displayed in the **MAAP** error code field.

Local MAAP Port Contention Blocks

The local **MAAP** may be blocked when a mode switch is attempted. This results in standard error code 76 being displayed.

1. Tasks may also be blocked when they attempt to do things that require modes which are not available to the port.

2. This blocking is done at the time of the **EXECUTE** button being depressed for administration procedures and at the time of procedure entry (calling in the procedure); i.e., **PROC NO.; 6XX; ENTER** for maintenance procedures.
3. Examples of blocking are:
 - a. Trying to enter a maintenance procedure when the maintenance mode is not active.
 - b. Trying to Add, Change, Display, or Remove in an administration procedure when the administration mode is not active.
 - c. Trying to perform a task requiring the tape when the tape mode is not active.

Steps To Perform When Blocking Occurs

Any time blocking occurs, determine from the current **MODE** status display which port and agent has control of the mode.

1. When the **MODE** display is active, fields **other** than the current port fields (first three fields in the display) are display only of status and are not controllable.
2. Fields 9 through 13 display an encode that tells which port has control of the given mode.
3. Fields 4 through 8 display an encode that tells which agent has control of the given mode.
4. The **MODE** status display is continuously updated when the display is active.

Note: If the **MAAP** is left connected when inactive, the **MODE** display continues to show current mode status.

Wait for a few minutes to determine if the required mode changes on the **MODE** display. If the mode is released, activate the required mode for maintenance by depressing the appropriate number on the key pad.

If the required mode does not change after a few minutes, refer to local records and determine the contact point for the agent having control of the mode required for maintenance.

Note: If Fields 9 through 11 display a 0 indicating the local **MAAP** has control of the mode, it indicates that the **SMT** is connected and has the port blocked out.

Request the agent having control of the mode to release the mode in order that maintenance of the switch can be performed.

As soon as the mode is released, activate the required mode(s) for maintenance by depressing the appropriate number on the key pad.

Duplication

Soft Switch:

1. Demand procedure **PROC 613** **must not** perform a soft switch if any of the following ports are active (other than the access point **PROC 613** itself is using).

- a. Local **MAAP**.
 - b. Remote Ports.
 - c. Run Tape.
2. If **PROC 613**, Test 3 attempts a soft switch without the port contentions being release, special error code 80 (illegal switch attempt) is displayed in the **MAAP** error code field.
 3. When **PROC 613** invokes a soft switch, the port it is using to perform the soft switch is dropped.
 4. A new port must be activated by using the **MODE** status display in the new on-line side of the common control.

Off-line Processor Maintenance:

When maintenance in the on-line common control is completed and it is desired to check the off-line common control in a duplicated system, the local MAAP must be connected to the off-line common control and the mode(s) required for maintenance must be activated using the **MODE** status display procedure.

Note: Mode information is **not** carried across from one common control to the other.

Call Up Procedures

1. Turn the flipcharts to the procedure to be used.
2. Depress the **PROC NO** button.
The procedure number fields go blank and dashes appear in the data fields.
3. Enter the procedure number using the data entry pad. All three digits must be entered.
The entered procedure number is displayed in the procedure display field.
4. Depress the **ENTER** button.
When the **WAIT** lamp goes off, the procedure is ready to be used.
5. Field indicator decimal points displayed in the data display should correspond to the field identifiers on the flipchart. Deviations may indicate that the flipchart issue is not compatible with the tape issue.

Responding to Error Displays

An error code is displayed in the 2-digit error code display field if an invalid operation is attempted or if invalid data is entered into a field on the **MAAP**.

Standard error codes common to all procedures are displayed on the decal on the faceplate of the **MAAP**. The error codes encompass three basic areas.

1. If standard error code 76 (**MODE** required by **PROC** in use) is displayed in the **MAAP** error code field, it indicates that the **MAAP** port is being utilized by another facility for the mode or required task to be performed by craft personnel (i.e., maintenance, administration, tape) requested.

2. Operator error: Invalid button operation for the procedure involved. The error code decal identifies the invalid operation and the necessary corrective action.
3. Input data incompatible with existing translations or program tape. Corrective action requires a review of the input data and the service requirements of the customer.

Special error codes 80 through 98 are unique to the particular procedure being used. The codes are explained by notes on the flipchart associated with the procedure. The error codes identify problems with maintenance procedure operation. Resolution of these errors requires a review of the maintenance procedure being performed.

Disconnecting the MAAP

When maintenance activities are completed, the **MAAP** should be unplugged to allow other facilities access to the maintenance mode (or any other mode being used to perform maintenance activities). The **MAAP** should **not** be left in mode status display or with dashes or a **PROC** displayed.

If the **MAAP** is left connected or in mode status display, other facilities are blocked out for the following time intervals.

1. **Ten Minutes:** When in mode status display, the **MAAP** will default current port mode status to all zeros (display only) **only after 10 minutes** of inactivity.
2. **24 Hours:** If the **MAAP** is not left in mode status display (dashes or a procedure displayed), the **MAAP** display will default current port mode status to all zeros (display only) **only after 24 hours** of inactivity (no buttons depressed).

If the **MAAP** is disconnected, the local modes are immediately deactivated.

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