

Lucent Technologies
Bell Labs Innovations



4ESS™ Switch
1B Processor
4E23 Generic
Maintenance Reference Handbook
Volume 1

234-310-231
Issue 1
December 1997

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Issue 1

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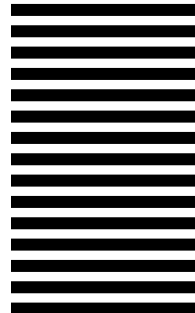
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Overview

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Overview

Purpose

1.01 This handbook is intended to serve as a reference manual for experienced personnel using the **4ESS™ Switch equipped with the 1B24 Processor**. The information in this issue has been prepared to the 4E23 generic program.

Scope

2.01 The data contained in this handbook is organized so that associated information is adjacent whenever possible. Access into a required set of data may be accomplished via the Table of Contents.

2.02 Teletypewriter input messages required to perform various tasks are provided. These input messages are placed in the required order to be entered to perform a task but step-by-step procedures to perform the task are not provided. Therefore, if available, the appropriate Task Oriented Practice that provides the detailed information required is referenced at the end of the messages. Teletypewriter messages of a general nature are also provided. The intent of these messages is to provide groups of messages of a particular nature that are available to the operating personnel. These messages are samples which provide the format and syntax of the message. They may

require modification to suit a particular situation or location.

2.03 Teletypewriter output format precedes the word breakdown of the associated registers when that format is available. If a word breakdown is not provided, the specific word can be located in the COMPOOL. If you do not have access to COMPOOL, contact next higher support organization.

Intended Audience

3.01 The use of this book is recommended only for those familiar with the 4ESS Switch Maintenance and Operations. When in doubt, it is suggested that the appropriate handbook or Task Oriented Practices (TOP) procedure be utilized.

Reason for Reissue

4.01 This handbook is being reissued to include the 4E23 generic program and correct erroneous information included in the last issue.

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Audit Descriptions

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Audit Descriptions

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Audit Descriptions

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Audit Descriptions

The following table contains Audit Descriptions.

Table 1-A. Audit Descriptions

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
1 CR Idle Link List	AUDSMDS2	PU32	2-Way linkage of full address Link lists occupancy counts	The head cell and the last register are passed to mutilation correction. The occupancy count is corrected by adjusting the remove-from list peg count.	H
2 CR Audit		PU9	Call register Idles audit state CRs Linkage checks for: —Link listing or CIRs —TR Linkage —DTCR Linkage —ACR Linkage	CRs in error are reported to mutilation correction.	H
3 CR/TMR Interject Level Timing Link List		PU32	Same as Audit 1	Same as Audit 1	H
4 CR/TMR Base Level Timing Link List					
5 CR Queue for MF Receivers					
6 CR Queue for MF Transmitter					
7 CR Queue for Operator Position		PU2		Same as Audit 1	M
See Notes, Footnotes and Legend at end of table.					

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
8 TR Audit	AUDSMDS1	PU1	Trunk Register CCIS bit confirmed B/I status checked State code dependent data: —TR to TR linkage —Network path information —DTCR linkage Translation data (indirectly) TSN to TBMN translation	The TR in error is sent to mutilation correction.	H
9 TR Interject Level Engineered Timing List	AUDSMS1	PU6	Engineered list for TRs TR engineered list occupancy counter	TSN or TRA is out of range. Mutilation correction TR does not point to link list entry—Mutilation correction. Occupancy count errors are reported and corrected by setting the remove peg count to the add peg count minus the occupancy found by the audit. Link list Max—256 entries.	H
10 TR Base Level Engineered Timing List	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
11 TR Interject Level Timing Link List	AUDSMDS1	PU3	TR Link lists Detect broken link lists Check TR link list occupancy counters	Counters errors are corrected by setting address +2 (release count) to address +0 (add count) minus the occupancy counted by the audit. All others sent to mutilation correction.	H
12 TR Base Level Timing Link List		PU3	Same as Audit 11	Same as Audit 11	H
13 TR Trunk Maintenance High & Wet Timing Link List					
14 Network Path Annex Engineered List	AUDSMDS3	PU13	Network path annex B/I bits for annex slots Table to register (TR, CR) linkage	A link failure results in an error print via an audit call and the immediate idling of the entry.	M
15 TMR Audit	AUDSMDS4	PU33	TMR Register ID Link listing TR Linkage CR Linkage Timing	First the register identification item (TM4SVRID) is checked. Then, the audit state vector (TM4SVAUD): if the TMR is in the audit state (nonzero), the TMR is idled; but if any other state vector is in its audit state, the TMR is reported in error via the audit macro.	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
16 Trunk Status B/I Bits	AUDSMDS2	PU19	Trunk block B/I bits status	Both TR and TBN are passed to mutilation correction if in error. If the B/I bit should be busy, but is not, it is set to busy.	M
17 Input/output System	AUDSMADIO	—	OMR idle link list OMR translate link list OMR output link list OMR final link list Channel status channel memory block to OMR linkage OMR data timing idle OMR occupancy counter IOUC IOUS activity masks	K-register address of audit control/block exit PATTAS11 is used to report the errors with the IOUS number printed as a data word. Correction is performed before the exit is made.	L
18 TR Link List Trace to Detect Circular Link Lists	AUDSMDS1	PU2	TR link list Check for lost link list (circular lists, no head cell defined) Check for broken link lists	TRs are checked until one, with a state code indicating a link list, is detected. The last TR encountered is sent to mutilation correction in case of an error.	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
19 Maintenance Status of Trunks	AUDSMDS4	PU20	Trunk OOS list duplex failed equipment list	The mismatch error print contains the TR, disk to SL data, converted TR data, and converted to SL data. After the TR is put on the audit list, PU20 inserts code 4, TRAUD MTCE 1 into item TR4 and MTC of this TR to indicate to the audit list program that this trunk should not be idled but put in the maintenance state.	H
20 Ringing and Tone Plant (RTP)	SVCTRTAD	—	Scan point T-bits in ringing and tone plant SD Points Active RTP side determination Determine active tone appearance to dedicated TSI Memory influence by RTP	Scan point T-Bits in the RTP are initialized based upon scan point states. SD Points are initialized to normal state. A hierarchy of tones is examined to determine which side of the RTP to make active. The tone appearance, nailed up to the dedicated TSI, is made active. Memory influenced by the RTP is initialized test queues.	L
21 TMR Idle Link List	AUDSMDS2	PU32	Same as Audit 1	Same as Audit 1	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
22 MF Transmitter MF Receiver CCIS Transceiver Trunk Block Status Linkage Idle Trunks Counter	AUDSMDS2	PU18	Trunk subgroup head cell Idle trunk count Trunk block status link list	Link list errors result in rebuilding the list. Idle counts in error are corrected.	H
23 Audit List B/I Status	AUDSMCAL	PU31	Audit list Audit list B/I bits	The entry must be active and the timing flag set. If both conditions are not met, the entry is idled and an audit call made.	H
24 TR MF Origination Queue for a CR	AUDSMDS1	PU3	Same as Audit 11	Same as Audit 11	H
25 SP/DIF Dial Pulse Work List and Outpulsing Counters Audit	AUDSMDS7	PU15	Dial pulse outputter work list	Errors are reported to mutilation detection and the counters are corrected.	H
26 Network audit	AUDSMDS3	PU10	Network map TR Path information Hardware switching memories	The error is reported via the audit macro passing the TRA.	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
27 SP/DIF Universal T-Bits	AUDSMDS7	PU14	Universal T-Bits set to ignore state Validate ignore setting Detect invalid T6 bit timing control	Any errors pass the TR to mutilation correction. T6 errors do not cause the TR to be placed on the audit list; however, this does not necessarily indicate bad call handling. The audit corrects these states. The T2T3 illegal ignore states are corrected by audit list action.	H
28 SP Miscellaneous T-Bits	AUDSMDS7	PU24	Miscellaneous T-bits to ignore state Validate ignore setting Check T6 timing control	Errors are reported via the audit macro with a print of the MSN in error. The T-bits are then corrected.	M
29 Trunk Block Status Linkage and Idle Trunks Counter	AUDSMDS2	PU18	See Audit 22	See Audit 22	H
30 Trunk Error Analysis Data Structures	TERA00	PU48		Audit message printed	L
See Notes, Footnotes and Legend at end of table.					

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
31 Disk Administration (DKAD)	SADK		DKAD memory Outstanding disk request High and low priority disk queues AMA buffers pointers Check DMA job buffers for timeout Check CNI stream status	Audit message printed	H
32 SP/DIF SCS Polling Mask Stack Configuration Integrity Monitor Audit Request List	AUDSMDS1	PU5	SP polling mask (SP4 legal) SCS polling mask (PF4CPPUCPOL) CC stack (ability of system to perform an audit-functional test by SIMR)	Errors are reported to mutilation correction; the old mask is replaced by the new; or, the stack is reconfigured to start base level executive control.	H
33* Traffic Separations Counters	AUDSMDS4	PU28	Traffic separations counters	Message printed (do not ask for this audit manually. Length of time).	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
34 Trunk Subgroup Head Cell Information (Satellite Bit, Adjunct Linkage, MB Counters)	AUDSMDS2	PU22	Trunks subgroup head cell Link word to adjunct head cell Satellite bit Number of MB trunks Total number of MB and active trunks in TGS	Errors reported via the audits macro print the head cell, the good MB count, and the good ACTMB count. The head cell is corrected after the audit call.	H
35 Overload Timing Control	AUDSMDS2	PU25			H
36 CAMA Operator Position Occupancy Counter	AUDSMDS4	PU29	CAMA position occupancy/service counter	Audit message printed.	L
37 Miscellaneous CR Occupancy Counter Audit	AUDSMDS4	PU30	CR occupancy count	Audit message printed. System count is data words, and the Y register contains the audit count.	M
38 TR Queue for a CR (Dial Pulse In)	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H
See Notes, Footnotes and Legend at end of table.					

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
39 Files Store Paging Supervisor	PAGS4WAP		MACP client entries in page loading state	Audit message printed (page loading state checked.)	L
40 Lost Idle CRs List	AUDSMDS2	PU12	2-way link lists using full address (CRs and TMRs) Find lost CRs and TMRs	Idle link errors are reported to mutilation detection which places them in the audit state.	H
41 Quick Check of All TR Link List Head Cells	AUDSMDS1	PU4	TR link list (quick check)	Head cells and TRs are passed to mutilation correction program in case of errors.	M
42 Lost Idle TMRs	AUDSMD2	PU12	Same as Audit 40	Same as audit 40	L
43 File System-to-Core Generic	SAWSCMMN		Matching and hashing for generic only data, file system-only generic, and library program	Detects memory errors and if possible correct	L
44 Core Resident Generic Data Hash			Hashes core resident generic data		L
45 Nongeneric Core Resident and Extended Store (XS) Data Hash Check			Hashes core and extended store resident nongeneric data		L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
46 Network Management Data Structures	NMGTTINIT		ATSG head cell Linkage of ATSG and TSGHC Event counters and their associated exception panel lamps	Audit message printed	M
47 Recorded Announcement (RA) System	SVCTRAUD		RA channel status RA channel call store tables	If neither the channel nor its backup can be activated, the channel is replaced by reorder.	L
48 Trunk Maintenance Structures	TMADAUDS				H
49 CCIS Link Security Structures	CCISCHI	PU21	Operational CCIS link status table Consistency with unit-type translators Validate link security terminal register (LSTR) B/I bits Check consistency between LSTRs and restrict and prohibit counters. Ensure that double prohibit A-link bands are out of service.	Terminal checks corrections are accomplished by calling the subroutine CCISINIT which must completely rebuild the data base for the input terminal number. If a double prohibit exists and none are marked OOS, an audit call is made printing the terminal and band involved.	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
50 Dedicated TSI	AUDSMDS3	PU16	Dedicated TSI nailed-up connection Idle time slot	Trunk TR is printed. A correction sequence is immediately begun to re-establish the nailed-up connection.	L
51 TR Queue for a CR Audit	AUDSMDS1	PU6			H
52*† CCIS Trunk Query	CCISAUDT		CCIS trunk status	A list of trunks with disagreeing blocking status is printed.	L
53 MAC Control Tables	MACPAUD4				L
54 TMR Job Buffer Link List	AUDMDS2	PU32	Same as Audit 1	Same as Audit 1	L
55 ITUP Origination Queue for CR(s) Audit	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H
56 Long TR Base Level Engineered Timing List					M
57 TR Queue for CR (CCITT 6)					H
58 CR Queue for MF Receiver (Two-Stage)	AUDSMDS2	PU32	Same as Audit 1	Same as Audit 1	H
59 TR MF Origination Queue for CR (CCITT 5)	AUDSMDS1	PU3	Same as Audit 11	Same as Audit 11	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
60 ADS SADC Link Status Audit	AUDSMDS6	PU73	ANI delivery service translators	ANI delivery service translators are searched for their vendor whose SADC links are then validated.	M
61 Auxiliary CR Idle Link List	AUDSMDS2	PU32	Same as Audit 1	Same as Audit 1	H
62 ACR Audit	AUDSMDS4	PU50	ACR Idling audit state ACRs Link listing of ACRs CR Linkage TMR Linkage	ACRs in error sent to mutilation correction.	H
63 Dedicated TSI Connection Register	AUDSMDS5	PU51	Dedicated TSI connection registers TR Linkage CR Linkage TMR Linkage Timing list linkage checks	DTCRs in error are reported to mutilation correction.	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
64 CR Queue for GETS DTMF Receiver	AUDSMDS2	PU32	Same as audit 1	Same as audit 1	H
65* TAN-to-TAN Audit	TANTOTAN	PU53	Disk plus core version of TAN-to-TAN nail-up table TR linkage	Connections found invalid are zeroed in TAN-to-TAN nail-up table and reported to mutilation correction after phases. Audit rebuilds any torn down or lost connections.	L
66 File System-to-Core Nongeneric Audit	SAWSCMMN		Matching and hashing over nongeneric data. This audit also checks file system-only data.	Detects memory errors and if possible correct	L
68 Not Assigned Thur 71					
72‡ 1B Memory Fault Audit	SAWSSUBR	PU21	Check accessibility and parity of all CS and PS memory	None. Fault recovery invoked if D and E level is not PESTed.	L
74‡ 1B MUP Hardware/ Software Activity Audit	MCFRILEV		Check Hardware/ Software Activity status for consistency on nontroubled MUPs	Update software force bit from hardware for nontroubled MUPs.	L

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
75 CR Held for PCP, GETS, CPA	AUDSMDS4	PU30	CR occupancy count	Audit message printed. System count is data words; the Y register contains the audit count.	M
76 IR Audit	AUDSMDS2	PU74	Range checked for IR and linkage check between IR and CR	Correct wrong IR linkage. Audit message is printed.	H
77 TQR Audit	AUDSMDS6	PU60	B/I status of TQR, and linkage check between TQR and IR	Audit message printed and error is corrected for TQR.	H
80 Meet-me Teleconferencing Status	MMTCCNTL				L
84 Blue Box Fraud	BBFPCTRL				L
85 Large Scale Nail-Up Connection	AUDSMDS6	PU66	Large scale nail-up subtranslator table	Re-establish large scale nail-up connection correct count.	L
86 TR Origination Queue for IDTS DTMF Receiver	AUDSMDS1	PU3	Same as Audit 11	Same as Audit 11	H
87 IDTS DTMF Origination Queue for call Registers	AUDSMDS6	PU67	IDTS CR queue occupancy count	Correct count	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
88 TR Origination Queue for IWS—DTMF Receiver and CR	AUDSMDS1	PU3	Same as Audit 11	Same as Audit 11	H
89 CR Queue for DTMF	AUDSMDS2	PU32	Same as Audit 1	Same as Audit 1	H
90 ISUP Origination Queue for CRs Audit	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H
91 Q.931 Origination Queue for CR's Audit	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H
92 Q.931 Trunks Marked Total Signaling Failure (TSF) Audit	AUDSMDS6	PU70	Loops through all TRs associated with a D-channel or LACID looking for a trunk marked TSF	Upon a find, the audit queries the 3B RINGMON for the status of the LACID; then correct the associated TR, if necessary.	M
95* ISUP Trunk Query Audit	ISUPAUDT	ISUPAAUD	Checks all ISUP trunks in the office	Can correct an error condition with more specific action.	L
96 Quick ISUP Trunk Query Audit	ISUPAUDT	ISUPAAUD	Checks one TSN per TSG	Can correct an error condition with more specific action.	L
97 Noncall-Associated Trunks (NCAT) Register Idle Count	AUDSMDS6	PU75	Checks the number of NCAT register(s) that are in use	Can correct an error condition with more specific action.	H

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
98 NCAT Trapping Structure	AUDSMDS6	PU76	Checks the new data structures used by NCAT anomaly trapping including the trap head cells and raw data blocks used to store trap information	Can correct an error condition with more specific action.	H
99 INUP Origination Queue for CR(s) Audit	AUDSMDS1	PU6	Same as Audit 9	Same as Audit 9	H
100 CR queue for DTMF Receiver	AUDSMDS2	PU32	Same as Audit 1	Same as Audit 1	H
101 RTNR Transport Capabilities (TC) Idle Channel Count	AUDSMDS2	PU80	Counts idle channel of each TC for each NSN and compares count with that which is stored in idle channel count of TC structure	Can correct an error condition with more specific action.	H
102 RTNR Routing Pattern Index (RPI) Calls in Progress Count	AUDSMDS2	PU81	Validates the routing pattern index calls in progress count	Can correct an error condition with more specific action.	H
103 ECOS Idle Channel Count Audit	AUDSMDS2	PU82	Validates the ECOS TC idle channel count	Calls subroutine to get the sum of idle counts for the TCs for all TSGs in an area TSG list.	

See Notes, Footnotes and Legend at end of table.

Table 1-A. Audit Descriptions (Contd)

Audit Number and Description	PIDENT	Program Unit (PU)	Memory Checked	Action Taken (By Audit)	Inhibit Risk (Note)
103 ECOS Idle Channel Count Audit (Contd)				Then these counts are used to validate the counts that are stored in XL4ECOSTCA. Any incorrect counts are reported by audit and corrected	H
104 ECOS Calls-in-Progress Counts Audit	AUDSMDS2	PU83	Validates the ECOS calls in progress count for each ERPI-area	Calls subroutine to collect and compare the accumulated occurrences of each ERPI-area index in the ECOS trunk data table with the call processing counts. The ECOS trunk data number is stored in a call processing interface word so that call processing can update the audit CIP if it operates on a trunk that the audit already counted. Any incorrect counts are reported by audit and corrected	H

Note: High (H), Medium (M), or Low (L) indicate the risk to basic call processing if the audit is inhibited and other problems exist. If "open defensive check" audit printouts are occurring or other numbered audits and TRs or CRs are in the output message, then any number of the High Risk Audits may be needed to achieve sanity.

* Audit cannot be demanded. Input message is not accepted.

† This audit is used by NESAC to test if audits are printing.

‡ This audit is 4E19 generic and later.

Table 1-A. Audit Descriptions (Contd)**Legend:**

ACR	Auxiliary Call Register	MF	Multifrequency
ACTMB	Active Maintenance Bus	MUP	Maintenance and Utility Processor
ANI	Automatic Number Identification	NCAT	Noncall-Associated Trunk
ATSG	Adjunct Trunk Subgroup	NESAC	National Electronic Systems Assistance Center
B/I	Busy/Idle	NSN	Network Switching Number
CAMA	Central Automatic Message Accounting	ODA	Office Data Assembler
CC	Central Control	OMR	Output Message Record
CCIS	Common Channel Interoffice Signaling	OOS	Out-Of-Service
CCITT	International Telegraph and Telephone Consultative Committee	PCP	Positive Call Process
CIP	Call in Progress	PEST	Prevent Error Source Transmission
CNI	Common Network Interface	PS	Program Store
CPA	Common Platform Adjunct	PU	Program Unit
CR	Call Register	RA	Recorded Announcement
CS	Call Store	RINGMON	Ring Monitor Kernel Process
DIF	Digital Interface Frame	RPI	Routing Pattern Index
DKAD	Disk Administration	RTNR	Real Time Network Routing
DTCR	Dedicated TSI Connection Register	RTP	Ringing and Tone Plant
DTMF	Dual Tone Multifrequency	SCS	Service Circuit System
ECOS	End to End Class of Service	SD	Signal Distributor
GETS	Government Emergency Telecommunication Service	SIMR	System Integrity Monitor Register
IDTS	Immediate Dial Tone Start	SP	Signal Processor
INUP	International Integrated Services Digital Network User Part	TAN	Trunk Appearance Number
IOUC	I/O Unit Controller	TBMN	Trunk Block and Member Number
IOUS	I/O Unit Selector	TBN	Trunk Block Number
ISUP	Integrated Services Digital Network User Part	TC	Transport Capabilities
ITUP	International Telephone User Part	TMR	Trunk Maintenance Register
LACID	Link Access Identification	TR	Trunk Register
LSTR	Link Security Terminal Register	TRA	Terminal Resource Allocator
MACP	Maintenance Administration Control Program	TSF	Total Signaling Failure
MB	Maintenance Busy	TSG	Trunk Subgroup
		TSGHC	Trunk Subgroup Head Cell
		TSI	Time Slot Interchange
		TSN	Trunk Scanner Number

Conditional All Test Pass (CATP) Layouts

2

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Conditional All Test Pass (CATP) Layouts

2

API—Attached Processor Interface

Reason for Tests Skipped:

- Bit 5 = Kill request message (MSG) to 3B20D Computer not accepted
- 7 = Command sent to the API was not acknowledged
- 8 = Diagnostic (DGN) request MSG to 3B20D Computer not accepted
- 9 = APDMI process at 3B20D Computer not started
- 10 = DGN request MSG to 3B20D Computer timed out
- 11 = Diagnostics inhibited at 3B20D Computer
- 12 = Second start dial (SSD) out-of-service
- 33 = GCP reply was all zeros
- 43 = Power monitor (PWRMON) test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

AUB—Auxiliary Bus

Reason for Tests Skipped:

Bit 13 = Auxiliary Unit (AU) helper out-of-service

20 = Unit not in normal or ROS state

22 = AU unit KCode trouble bit set

23 = AU unit "do not restore" bit set

AUI—Auxiliary Unit Interface

Reason for Tests Skipped:

Bit 6 = AUB 0 out-of-service

7 = AUB 1 out-of-service

12 = SSD out-of-service

13 = API 0 or data unit selector (DUS) 0 are not available
to use as helper

14 = API 1 or DUS 1 are not available to use as helper

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

CC—Central Control

Reason for Tests Skipped:

- Bit 0 = Call store bus (CSB) 0 out-of-service
 - 1 = CSB 1 out-of-service
 - 2 = Duplex Master Control Complex utility processor (MUP) failure
 - 3 = Program store bus (PSB) 0 out-of-service
 - 4 = PSB 1 out-of-service
 - 6 = AUI 0 helper out-of-service
 - 7 = AUI 1 helper out-of-service
 - 8 = Direct memory access (DMA) failure on active MUP
- 12 = SSD out-of-service
- 13 = SSD 0 helper out-of-service
- 14 = SSD 1 helper out-of-service
- 16 = Interface Bus (IFB) 0 helper out-of-service
- 17 = IFB 1 helper out-of-service
- 18 = MUP 0 helper out-of-service
- 19 = MUP 1 helper out-of-service
- 20 = CC forces in effect
- 22 = MUP forces in effect
- 23 = Disable AUTO PC in effect
- 24 = MUP executed code reports CATP
- 25 = Reserved for utility system DGN
- 26 = Call store helper unit not available
- 27 = Program store helper unit not available
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

CS—Call Store

Reason for Tests Skipped:

- Bit 0 = CSB 0 out-of-service
- 1 = CSB 1 out-of-service
- 12 = SSD out-of-service
- 15 = Standby CC out-of-service
- 21 = MCC override in effect (ON)
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

CSB—Call Store Bus

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

15 = Standby CC out-of-service

23 = Disable auto processor configuration (PC) in effect

36 = Call store helper unit not available

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

DIF/DIFE1—Digital Interface Frame/-Export 1

Reasons for Tests Skipped:

Bit 0 = Peripheral Unit Bus (PUB) 0 or IPUB 0 out-of-service

1 = PUB 1 or IPUB 1 out-of-service

2 = Base signal processor (SP) frame out-of-service

3 = Duplicated sp frame out-of-service

4 = Mate out-of-service

5 = Power switch in ROS state

6 = CC 0 out-of-service

7 = CC 1 out-of-service

8 = Another frame responding to CI

9 = Another frame responding to this frames member interrogate (MI)

10 = Another frame responding to this frames GI

11 = Peripheral Unit Bus (PUB) not duplex

12 = Another frame responding to autonomous peripheral unit failure
(APUF) CI

13 = Another frame responding to autonomous peripheral unit trouble
(APUT) CI

14 = Controller not duplex

15 = Another frame responding to autonomous peripheral unit base
(APUB) CI

DIF/DIFE1—Digital Interface Frame/-Export 1 (Contd)

- Bit 16 = Protection switch has taken place
- 17 = Another frame responding to high priority polling
- 18 = Another frame responding to low priority polling
- 19 = Another frame responding to digit buffer polling
- 20 = Another frame responding to seizure buffer polling
- 21 = PSW TTY keyboard for requesting PSW tests is not specified
- 22 = Controller 0 out-of-service
- 23 = Controller 1 out-of-service
- 24 = Signal processor (SP) frame duplex failed
- 25 = SP frame configuration failed
- 26 = Bus at unit (IPUB) out-of-service
- 41 = Network clock (NCLK) 0 out-of-service
- 42 = NCLK 1 out-of-service
- 43 = No spare digital interface units (DIU) (DIFE1 only)
- 44 = No available DIU
- 45 = Frame member number greater than 23; buffer polling tests not run
- 46 = Memory TTY keyboard for optional memory phases not specified (DIFE1 only)
- 47 = Select TTY keyword for requesting DIU bus selection tests is not specified

DT—Digroup Terminal

Reasons for Tests Skipped:

- Bit 36 = SP-2 Simplex or some in-service DT in this community
has DT controller out-of-service
- 37 = Some time slot interchange (TSI) controller is out-of-service
- 38 = Some DTU on this DT is on a protection switch

DUS—Data Unit Selector

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

25 = Both DUS's not INS or can not configure all INS tape unit controller (TUC) to same DUS

26 = No TUC helper available

29 = Incorrect or no tape mounted

30 = Some TUC in SR mode

31 = TUC out-of-service (OOS) select verify test skipped

37 = TUC not assigned DGN function or TUC equipped with ADT

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

EST—Echo Suppressor Terminal

Reasons for Tests Skipped:

- Bit 0 = PUB 0 or IPUB 0 out-of-service
- 1 = PUB 1 or IPUB 1 out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = CC 0 out-of-service
- 7 = CC 1 out-of-service
- 8 = CI has other units responding
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = Autonomous peripheral unit failure (APUF)
CATP flag
- 13 = APUT CATP flag
- 14 = Simplex mode
- 15 = User saved by EUFR not zero
- 16 = PSW occurred
- 17 = TSI out-of-service
- 24 = SP scan/distribute point out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service

IFB—Interface Buffer

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

15 = Standby CC out-of-service

24 = MUP helper client not responding

29 = AUI helper client not responding

35 = SSD helper client not responding

42 = TIC helper client not responding

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

I/O—Input/Output

Reason for Tests Skipped:

- Bit 9 = PUB 0 out-of-service
- 10 = PUB 1 out-of-service
- 12 = SSD out-of-service
- 35 = Requires both PUBS in service
- 41 = Helper PUB not out-of-service
- 42 = Can not CONFIG all INS IOUS to same PUB
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

IOP—Input/Output Processor (IOP)

Reason for Tests Skipped:

- Bit 5 = Invalid peripheral controller circuit pack
- 7 = IOP TN82 PC port equipage is not right
- 9 = PUB 0 out-of-service
- 10 = PUB 1 out-of-service
- 11 = ASWEPU bit set
- 12 = SSD out-of-service
- 13 = CPD CNTL pulse order caused F-SRC
- 41 = Helper PUB not out-of-service
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

IOUS—Input/Output Unit Selector

Reasons for Tests Skipped:

- Bit 5 = Invalid peripheral controller circuit pack
- 7 = TN82 PC Port equipage is incorrect; on-board DGN not run
- 9 = PUB 0 out-of-service
- 10 = PUB 1 out-of-service
- 11 = Peripheral unit all-seems-well error summary (ASWEPU)
inhibit set
- 12 = SSD out-of-service
- 13 = CPD CNTL pulse order caused F-SRC
(expanded IOP)
- 33 = Both IOUC helpers not out-of-service
- 34 = An IOUC port is in trouble
- 35 = Requires duplex PUBS
- 41 = Helper PUB not out-of-service
- 42 = Cannot configure all in-service IOUSs to same PUB
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs active — try again
- 45 = PWRMON work table full — try again
- 46 = Frame request for PWRMON active
- 47 = Unit not in normal state

MUP—Master Control Complex and Utility Processor

Reason for Tests Skipped:

- Bit 6 = AUI 0 helper out-of-service
- 7 = AUI 1 helper out-of-service
- 8 = DMA failure on active MUP
- 12 = SSD out-of-service
- 13 = SSD 0 helper out-of-service
- 14 = SSD 1 helper out-of-service
- 22 = MUP forces in effect
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

NCLK—Network Clock

Reasons for Tests Skipped:

- Bit 0 = PUB 0 out-of-service
- 1 = PUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = CC 0 out-of-service
- 7 = CC 1 out-of-service
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = Chain 0 out-of-service — tests skipped
- 13 = Chain 1 out-of-service — tests skipped
- 14 = Chain 2 out-of-service — tests skipped
- 15 = Chain 3 out-of-service — tests skipped
- 16 = Chain 3 tests skipped, bad OSC
- 17 = Chain 2, 3 tests skipped, bad OSC
- 18 = Chain 1, 2, 3 tests skipped, bad OSC
- 19 = OSC 0 out-of-service — tests skipped
- 20 = OSC 1 out-of-service — tests skipped
- 21 = OSC 2 out-of-service — tests skipped
- 22 = OSC 3 out-of-service — tests skipped
- 24 = SP Scan/distribute points out-of-service
- 25 = SP bus out-of-service

PS—Program Store

Reason for Tests Skipped:

- Bit 3 = PSB 0 out-of-service
- 4 = PSB 1 out-of-service
- 12 = SSD out-of-service
- 15 = Standby CC out-of-service
- 21 = MCC override in effect (ON)
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

PSB—Program Store Bus

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

15 = Standby CC out-of-service

23 = Disable auto peripheral controller (PC) in effect

36 = Store helper unit not available

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

PUB—Peripheral Unit Bus

Reason for Tests Skipped:

- Bit 0 = PUB 0 out-of-service
- 1 = PUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = CC 0 out-of-service
- 7 = CC 1 out-of-service
- 12 = Helper controller 0 out-of-service
- 13 = Helper controller 1 out-of-service
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service

SCLK—System Clock

Reason for Tests Skipped:

- Bit 0 = PUB 0 or IPUB0 out-of-service
- 1 = PUB 1 or IPUB1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = CC 0 out-of-service
- 7 = CC 1 out-of-service
- 11 = PUB not duplex
- 12 = Network Clock Sync Unit (NCSU) out-of-service
(if diagnosing SYNC unit or IPUB)
- 12 = System clock controller 0 out-of-service
(if diagnosing controller)
- 13 = System clock controller 1 out-of-service
- 14 = NCLK chain 0 out-of-service

SCLK—System Clock (Contd)

- Bit 15 = NCLK chain 1 out-of-service
- 16 = NCLK chain 2 out-of-service
- 17 = NCLK chain 3 out-of-service
- 18 = NCLK mate/chain 0-1 out-of-service
- 19 = NCLK mate/chain 2-3 out-of-service
- 20 = DS1A T1 unequipped
- 21 = DS1B T1 unequipped
- 22 = BSRF unequipped
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service
- 28 = Controller firmware in update mode
- 29 = BSRF reference not in use
- 30 = DS1A reference not in use
- 31 = DS1B reference not in use

SCS—Service Circuit System

Reason for Tests Skipped:

- Bit 0 = PUB 0 or IPUB 0 out-of-service
- 1 = PUB 1 or IPUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = Power monitor tests skipped on manual ROS test
- 7 = CC 0 out-of-service
- 8 = CC 1 out-of-service
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = APUF CATP flag
- 13 = APUT CATP flag
- 15 = APUB CATP flag

If subunit type is bus:

- Bit 12 = Helper controller 0 out-of-service
- 13 = Helper controller 1 out-of-service

SCS—Service Circuit System (Contd)

- Bit 16 = Hard disk unit not equipped
- 17 = Some other frame responding to PHP polling
- 18 = Some other frame responding to PLP polling
- 19 = Some other frame responding to PDG polling
- 20 = Some other frame responding to PSZ polling
- 21 = Unused EBI link tests skipped—Unequipped SCU ports on KCN3 circuit pack have been skipped. Restore equipment using the normal procedure.*
- 22 = Controller 0 out-of-service
- 23 = Controller 1 out-of-service
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service
- 30 = SCU powered down

* Diagnostics on the SCS Controller test all ports on the KCN3 circuit pack. Some of these ports may not be equipped with a SCU. A diagnostic failure indicates that one or more ports on the KCN3 have failed or a looping plug on the optical cross connect panel has failed. If this occurs, the controller may be restored to service using a normal procedure. The KCN3 or looping plug(s) should be replaced at the earliest possible convenience.

SP—Signal Processor

Reason for Tests Skipped:

Bit 0 = PUB 0 or IPUB 0 out-of-service

1 = PUB 1 or IPUB 1 out-of-service

2 = Primary SP pulse points out-of-service

3 = Secondary SP pulse points out-of-service

4 = Mate unit out-of-service

5 = Power control switch in ROS position

6 = CC 0 out-of-service

7 = CC 1 out-of-service

8 = CI has other units responding

9 = MI has other units responding

10 = GI has other units responding

11 = PUB not duplex

12 = Low buffer poll has other units responding

13 = Digit buffer poll has other units responding

14 = High buffer poll has other units responding

If subunit type is bus:

Bit 12 = Helper controller 0 out-of-service

13 = Helper controller 1 out-of-service

SP—Signal Processor (Contd)

- Bit 15 = Seizure buffer poll has other units responding
- 16 = GI, CI, MI has other units responding on bus 0
- 17 = GI, CI, MI has other units responding on bus 1
- 18 = SP bus circuit out-of-service
- 19 = DT out-of-service
- 20 = DT absolute alarms
- 21 = Patch overwrites in system
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service
- 27 = DTs (on SP) failed "Ignore" routine (DTFRSGAL)
- 28 = Firmware activity bit = 0 (Inactive)

SSD—Scan and Signal Distributor

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

TGR—Terminal Grouping Frame

Reason for Tests Skipped:

- Bit 0 = PUB 0 or IPUB 0 out-of-service
- 1 = PUB 1 or IPUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 8 = CI has other units responding
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = TGR A, controller 0 out-of-service
- 13 = TGR A, controller 1 out-of-service
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service

TGR—Terminal Grouping Frame (Contd)

Bit 26 = Bus at unit (IPUB) out-of-service

27 = Terminal 00 out-of-service

28 = Terminal 01 out-of-service

29 = Terminal 02 out-of-service

30 = Terminal 03 out-of-service

31 = Terminal 04 out-of-service

32 = Terminal 05 out-of-service

33 = Terminal 06 out-of-service

34 = Terminal 07 out-of-service

35 = Terminal 08 out-of-service

36 = Terminal 09 out-of-service

37 = Terminal 10 out-of-service

38 = Terminal 11 out-of-service

39 = Terminal 12 out-of-service

40 = Terminal 13 out-of-service

41 = Terminal 14 out-of-service

42 = Terminal 15 out-of-service

43 = TGR group in growth

TMSP—Time-Multiplex Switch Port

Reason for Tests Skipped:

- Bit 0 = PUB 0 or IPUB 0 out-of-service
- 1 = PUB 1 or IPUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 8 = CI has other units responding
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = Some time slot interchanges (TSI) are out-of-service
- 13 = Duplex failure in TMSP—repair other controller first
- 14 = Mate and unit cannot be configured on same bus
- 15 = Controller must be in special growth
- 16 = Cannot place TSI's on out-of-service bus
- 17 = Bus 0 power control switch in ROS position
- 18 = Bus 1 power control switch in ROS position
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service
- 36-41 = Count of TSIs used—given that some TSIs were out-of-service

TSI—Time-Slot Interchange

Reason for Tests Skipped:

- Bit 0 = PUB 0 or IPUB 0 out-of-service
- 1 = PUB 1 or IPUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 8 = CI has other units responding
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = TMSP out-of-service
- 13 = One or more parts on voiceband interface frame
or digroup terminal unit (VIF/DTU) out-of-service
- 14 = Network blockage encountered
- 15 = Time slot interchange frame (TSIF) in growth
- 16 = Echo suppressor unit (ESU) out-of-service
- 24 = SP scan/distribute points out-of-service
- 25 = SP bus out-of-service
- 26 = Bus at unit (IPUB) out-of-service

TUC—Tape Unit Controller

Reason for Tests Skipped:

- Bit 12 = SSD out-of-service
- 24 = DUS helper out-of-service
- 25 = Both DUSs not INS or can't config all INS TUCs to same DUS
- 27 = Series 20-40 TUC phases not run
- 28 = Series 30-50 TUC phases not run
- 29 = Incorrect or no tape mounted
- 30 = Some TUC in software reinitialization (SR) mode
- 32 = No auto tape motion tests run
(tape not at valid write point)
- 37 = TUC not assigned DGN function or TUC equipped with ADT
- 43 = PWRMON test timed out — try again
- 44 = Two PWRMON jobs already active — try again
- 45 = Work table full — try again
- 46 = Frame request active — try again
- 47 = Unit not in normal state

VIF—Voiceband Interface Frame

Reason for Tests Skipped:

- Bit 0 = PUB 0 out-of-service
- 1 = PUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 8 = CI has other units responding
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = No SM flywheel tests
- 13 = PSW tests skipped
- 14 = Simplex mode
- 15 = Voiceband interface unit (VIU) unavailable
- 16 = VIU 7 unavailable
- 17 = APUF—CI has other units responding
- 18 = APUT—CI has other units responding
- 24 = SP scan/distribute points out-of-service
- 40 = Phase 1 fails test
- 41 = Greater than 9 test fail

XPWR—Miscellaneous Power

Reason for Tests Skipped:

Bit 12 = SSD out-of-service

43 = PWRMON test timed out — try again

44 = Two PWRMON jobs already active — try again

45 = Work table full — try again

46 = Frame request active — try again

47 = Unit not in normal state

XTSI—Expanded Time-Slot Interchange

Reason for Tests Skipped:

- Bit 0 = PUB 0 out-of-service
- 1 = PUB 1 out-of-service
- 2 = Primary SP pulse points out-of-service
- 3 = Secondary SP pulse points out-of-service
- 4 = Mate unit out-of-service
- 5 = Power control switch in ROS position
- 6 = Power monitor tests skipped on manual ROS test
- 7 = CC 0 out-of-service
- 8 = CC 1 out-of-service
- 9 = MI has other units responding
- 10 = GI has other units responding
- 11 = PUB not duplex
- 12 = APUF CATP flag
- 13 = APUT CATP flag
- 14 = Network blockage encountered
- 15 = TSI frame is in growth
- 17 = Some other frame responding to PHP polling
- 18 = Some other frame responding to PLP polling
- 19 = Some other frame responding to PDG polling
- 20 = Some other frame responding to PSZ polling
- 22 = Controller 0 out-of-service
- 23 = Controller 1 out-of-service
- 24 = SP scan/distribute point out-of-service
- 25 = SP bus out-of-service
- 26 = Some PSC is protection switched
- 27 = Controller not duplex
- 28 = One or both controller power feeds is not available

XTSI—Expanded Time-Slot Interchange (Contd)

- Bit 30 = Some PSC port is PESTed
- 31 = Network clock 0 out-of-service
- 32 = Network clock 1 out-of-service
- 33 = TMS is out-of-service
- 34 = ALC powered down
- 35 = Controller 0 powered down
- 36 = Controller 1 powered down
- 37 = Some PSC power control switch is in ROS position
- 38 = Some PSC port is not running operational load
- 39 = D3U is not in growth or special growth
- 40 = D3U not protection switched

Master Control Console Terminal

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Master Control Console Terminal

3

Video Display Pages

The functional areas of the MCC is presented as pages on a video display terminal. Pages are selected by entering a numeric command corresponding to the page number. These pages and a brief description of each are as follows:

Table 3-A. Video Display Pages

Number	Name	Description
	Emergency Action Interface	The Emergency Action Interface (EAI) page is selected by pushing the key labeled EA DISP . This key provides access to critical controls and functions needed to perform recovery actions. The EAI page is the default page displayed whenever communication is initialized to the MCC terminal.
100	Page Index	The Index page is selected by entering 100. This page lists all other pages and identifies the page selection number of each.

Table 3-A. Video Display Pages (Contd)

Number	Name	Description
101-105	Reserved	
106	MUP Status and Control	The MUP Status and Control page is selected by entering 106. This page provides specific MUP control and status information.
107	Reserved	
108	System Status	The System Status page provides overall switching status, alarm information and hardware equipment status for the 4ESS™ Switch. The System Status page is selected by entering poke command 108 .
109	Program Store Status and Control	The Program Store Status and Control page provides 1B Processor program store information such as the current program store configuration and program store M-code configuration in addition to program store bus status. The Program Store Status and Control page is selected by entering poke command 109 .
110	Call Store Status and Control	The Call Store Status and Control page provides 1B Processor call store information such as the current call store configuration and call store M-code configuration in addition to call store bus status. The Call Store Status and Control page is selected by entering poke command 110 .

Table 3-A. Video Display Pages (Contd)

Number	Name	Description
111	Client Status and Control	The Client Status and Control page is selected by entering 111. This page provides the status for all IFB clients in addition to bus and client control. The Client Status area contains indicators identifying the status of each IFB Client in addition to maintenance bits.
112-117	Reserved	
118	1B Processor Status	The Processor Status page is selected by entering 118. This page provides information about the processor configuration, including active central control (CC), active program store bus (PSB), active call store bus (CSB), active interface bus (IFB), and active auxiliary unit bus (AUB), and M-Code configurations for all stores. This page toggles between a normal display and a detailed display by entering 499.
119	DDI Key Options	The Direct Data Insert (DDI) Key Options page is selected by entering 119. This page toggles between Modified Recovery Actions DDI key assignments and Inhibit Interrupts DDI key assignments by entering 499. A brief explanation of Modified Recovery Actions or Inhibit Interrupts DDI key assignments is provided on their respective page.

Table 3-A. Video Display Pages (Contd)

Number	Name	Description
120	Data Display	The Data Display page is selected by entering 120. This page provides memory displays, data insert keys, and utility functions.
1990	Dead Start	The Dead Start page is selected by entering 1990. The Dead Start page requires special maintenance capabilities. Page 1990 is designed to restore the 1B hardware into a sane environment if automatic and manual efforts to restore the 1B via the EAI page have not been successful.

Video Display Colors

Different colors are used in the displays to distinguish between problems and normal conditions. The entities in a display referred to as "Indicators" also use different colors to convey information. Indicators are displayed in a foreground and background color. The *foreground* is defined as the colored letters or numbers that make up the indicator while the *background* is defined as the color that surrounds the indicator. In general, background colors have the meanings listed in Table 3-B. Foreground colors are selected for readability and to further subdivide the associated background color into specific functions. Table 3-B lists and describes the different foreground and background colors:

Table 3-B. Video Display Colors

Background	Foreground	Meaning
Black		A black background identifies normal information or text.
	White	Information - Normal Conditions
	Yellow	Instruction - Normal Conditions
White		A white background identifies a selected state.
	Black	Selected for non-force indicators
	Purple	Selected for force indicators

Table 3-B. Video Display Colors (Contd)

Background	Foreground	Meaning
Purple		A purple background identifies an option that has been forced in hardware registers.
	Black	Force has been activated in hardware
	Light Blue	Forced but hardware error present
Yellow		A yellow background identifies a minor problem.
	Black	Minor problem - status verified
	Red	Minor problem - No status is available
Red		A red background identifies a major or critical problem. It is also used for an Out-of-Service (OOS) state.
	White	Major problem
	White (Flashing)	Critical problem
	Black	Unit is OOS
	Yellow	Forced but hardware error present
	Light Blue	Forced but hardware error present

Table 3-B. Video Display Colors (Contd)

Background	Foreground	Meaning
Green		A green background identifies an active unit or system normal condition.
	Black	Active unit or status normal
Blue		A blue background identifies a standby unit.
	White	Standby unit status
Light Blue		A light blue background is for other off-normal unalarmed conditions.
	Black	Situation specific meaning

Page 100—Page Index

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 100	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM	
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP	

CMD:

-4ESS MASTER CONTROL COMPLEX PAGE INDEX-

EA DISP - EMERGENCY ACTION DISPLAY
100 - PAGE INDEX
106 - MUP STATUS AND CONTROL
108 - SYSTEM STATUS
109 - PROGRAM STORE STATUS AND CONTROL
110 - CALL STORE STATUS AND CONTROL
111 - IFB CLIENTS STATUS AND CONTROL
118 - 1B PROCESSOR STATUS
119 - DDI KEY OPTIONS
120 - DATA DISPLAY
1990 - DEAD START

=DGN IN PROG=

EA DISP—Emergency Action Interface

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐ PORT	☐ PAGE EAI	mm/dd/yy	hh:mm:ss	
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP
CMD:							
99 - CLEAR ALL REQUESTS 100 - PAGE INDEX							
-FORCE FNCT-	- MANUAL PROG REQ-	-PC SEQUENCER- -REPEATED PC- -PC ATTEMPT-					
01 - HARD A	02 - SOFT A	03,xx - SET PC STATE: ☐					
10 - CC 0	51 - PHASE 1	04 - INCREMENT PC -PC PROGRESSION-					
11 - CC 1	52 - PHASE 2	70 - DIS AUTO PC CC CS IF AU PS CMPL					
20 - PS 0	53 - PHASE 3						
21 - PS 1	54 - PHASE 4						
22 - PSB 0	81 - CLEAR UTIL	-DIRECT DATA INSERT-					
23 - PSB 1	82 - RESTORE I/O	401/400,xx - SET/RESET xx; 402 - RESET ALL					
30 - CSB 0	83 - INHIBIT INT	CONTENTS: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
31 - CSB 1	84 - MODIFY RECV	-EAI FAIL DATA DISPLAY-					
40 - IFB 0		86 - CODE: B' ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
41 - IFB 1	-FILE SELECT-	87 - DATA: B' ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
42 - AUB 0	61 - NORM FILE	88 - ADDR: B' ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
43 - AUB 1	62 - UPD FILE	89 - CLEAR DISPLAY					
-EMER CFG-	-SYSTEM REINIT-	-INTF HW ENABLED-					
48 - FULL	63 -	-ERRORS ON SR-					
49 - MIN	64 - UTILITY SR	-INVALID SELECTION-					
		-OVERRIDE IN EFFECT-					
		-UPDATE IN PROG-					
		-PHASE IN PROG-					

Phase Progress Display

The progress of Phase 1, Phase 2, Phase 3, or Phase 4 is displayed on the EAI page **DIRECT DATA INSERT** section. While the phases are running, the **PHASE IN PROG** indicator is illuminated, and the following data is displayed on the **CONTENTS** indicator of the **DIRECT DATA INSERT** section:

31	24	23	22	15	14	9	8	0

Bit 0-8 = UTYPE being booted for SICO task 3, 4, 5, or 6

or

Phase module for SICO task (decimal) 8, 9, 10, or 11 decimal values

0 = Idle unprotected generic call store (SISCR)

1 = Zero select areas of disk (SIZDSK)

2 = Stops all SP and initializes SP buffers (SISTC)

3 = Initializes network busy idle maps and initializes CCIS terminals (SIMAP)

4 = Sets bits in all trunk registers for saving calls (SITRC)

5 = Idle TSG headcells, busy TB B-I bits, idle CAMA blocks (SITBN)

6 = Idles MSN(s) and MDN(s) (SIMSN)

7 = Read network controller memories to save calls (SIRNC)

8 = Search for network paths (SISSC)

9 = Write network controller memories after saving calls (SIWNC)

Phase Progress Display (Contd)

- 10 = Idle non-stable trunk registers (SIITR)
- 11 = Phase 2 (SIPHSE2)
- 12 = Correct TSI B-I memory maps (SIBIM)
- 13 = Duplex failure module (SIDPXF)
- 14 = Set up nailed-up connections (SINUC)
- 15 = Idle and relink pooled ODA structures (SILNK)
- 16 = Phase 1 (SIPHS1)
- 17 = Update trunk registers from out of service list (SITOSL)
- 18 = Verifies the state of all saved broadband calls (SIBBC)
- 19 = Verifies connections through the ATP node (SIATP)
- 20 = Return to SICO (SIRET)
- 21 = Error processing (SIERR)



NOTE:

Not all modules are executed on all phases.

Phase Progress Display (Contd)

Bit 9-14 = SICO task - values of K

K = 0 - PCRv to be called by SICO

K = 1 or 2 - Type I or type II RC rollback

K = 3, 4, 5, or 6 - Peripheral recovery level 1, 2, 3, or 4

K = 7 - Dynamic overload controls applied

K = (decimal) 8, 9, 10, or 11 - SINT phase 1, 2, 3, or 4

Bit 15-22 = Phase trigger - (decimal)

0-6 = Interject program(s) not being entered

17 = Interject protection flag failure

18 = Base cycle too long

19 = Software clock inconsistent

20 = Excessive K-level interrupts

21-22 = Multiple SIMR triggers

23 = Base cycle above overload threshold

24 = SICO error count exceeded threshold

25 = Excessive total interrupts

26 = Excessive pulse source B-levels

27 = Excessive C-levels

28 = Excessive stack counter D-levels

29 = Excessive protected area D-levels

Phase Progress Display (Contd)

Bit 15-22 = Phase trigger - [decimal (Contd)]

- 30 = Excessive control unit failures (D-levels)
- 31 = Excessive CS failure (D-levels)
- 32 = Excessive ORD levels (D-levels)
- 33 = Excessive PS failures (E-levels)
- 34 = Excessive PUFs (F-levels)
- 35 = Excessive APUFs (F-levels)
- 36 = Excessive error stops
- 37 = Duplex failure removal or zero start
- 38 = Total out-of-range interrupts for B-, D-, E-, and F-levels
- 39 = SIC error leg in phase control routine was activated (SICOPRE)
- 40 = SIMB re-entry check on SICO failed
- 41 = B-level interrupt
- 42-60 = Base entry failures
- 74-80 = Long-term interject program entry failures
 - 90 = Long-term interject clock failure
 - 91 = Base cycle too short
 - 92 = Adjacent base cycle difference too large
 - 93 = Base cycle time not equal to number or interjects
 - 94 = Inconsistent base cycle time

Phase Progress Display (Contd)

Bit 15-22 = Phase trigger - [decimal (Contd)]

95 = TTY functional check failure

96 = Request I/O mask audit

97 = Disk statistical check failed

98 = Invalid or excessive out-of-range disk requests

99 = Disk read/write failure

103 = Minimum base cycle long-term failure

104 = Base cycle—base cycle long-term failure

105 = Base cycle—interject long-term failure

106 = Inconsistent base cycle time long-term failures

107 = Test call unsatisfactory

108 = Overload check failed

109 = Demand audits not completing

114-132 = Long-time base program entry failures

153 = Recent change time-out

Bit 23 = Flashes at rate of approximately twice per second. If flashing stops and **PHASE IN PROG** indicator is still on, a pump restarted.

Display bit 23 must begin flashing within 20 seconds or system is dead or rolling in PCs.

Bit 24-31 = Unassigned

Page 106—Maintenance Utility Processor Status and Control

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 106	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM	
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP	
CMD:								
MUP STATUS AND CONTROL								
-COMMON CONTROL-			MUP0-S00-ACT ☐☐ AFT MUP1-S01-STBY ☐☐					
410 - SW:MUP								
829 - OP:OOSUNITS:MUP								
-UNIQUE CONTROL-								
601 - PORTS 1&3 INH/ALW								
602 - RLS MCC FORCE								
-UAS MODE-								
610 - DISABLE ALL UTIL								
611 - NORMAL UTIL								
612 - UAS NON-INTF ALW								
613 - UAS INTF ALW								
-UAS: NORMAL UTIL-								
-MUP ALARMS-								
-MCC TIMEOUT-								
-MUP FORCED-								
-INTF HW ENABLED-								

Page 108—System Status

TOWNSTBLSUB	4E<NN>4B.nn	MUP	PORT	PAGE 108	mm/dd/yy	hh:mm:ss	
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP
CMD:							
-SYSTEM ACTIVITY-		-SYSTEM STATUS-		-SYSTEM CONTROLS-			
BASE CYCLE TIME ☐ ☐ ☐ ☐ ms		-RC ACTIVITY-		801 - RESTRICT RC			
TRAFFIC INCOMING ☐ ☐ ☐ ☐ K		-DGN IN PROG-		802 - INH SUP PRINT			
SWITCH INEF ATMP ☐ ☐ %		-ALARMS-		803 - INH INT PRINT			
EQUIP INEF ATMP ☐ ☐ %		-REF STAT- -FREE RUN-		804 - INH AUD PRINT			
NO. CALLS CMPLTD ☐ ☐ ☐ ☐ K		-PWR ROOM- -EQUIP PWR-		805 - ELEV AUD PRINT			
INTERRUPTS ☐ ☐ ☐ ☐		-RB CAP- -MEM REC PH-		806 - REINIT TTY SYS			
AUDITS ☐ ☐ ☐ ☐		810 - SDC		807 - REQ TTY AUDIT			
SPP LINK OCCPNY ☐ ☐ ☐ ☐ %		811 - PGM CNTL OFF NORM		808 - CLEAR INTERRUPTS			
SFI FUTURE MEAS ☐ ☐ ☐ ☐		812 - OVLD CTL IN EFF		809 - CLEAR MEM REC PHASE			
-MCC TIMEOUT-		813 - INTRPT INH					
-INTERRUPT-		814 - REFSTAT		899 - 0P:00SUNITS (ALL)			
-PROCESSOR EQUIPMENT STATUS-				-PERIPHERAL EQUIPMENT STATUS-			
820 - CC	826 - IFB	832 - APS	838 - PCD	850 - TMSP	856 - DT	862 - TGR	
821 - PSB	827 - AUI	833 - API	839 - XPWR	851 - TSI	857 - DIF	863 - SLNK	
822 - CSB	828 - SSD	834 -	840 - SFI	852 - NCLK	858 - VIF	864 - VFL	
823 - PS	829 - MUP	835 -	841 - SPP	853 - NCSU	859 - EST	865 - R&T	
824 - CS	830 - IOUS	836 - AUB		854 - SCLK	860 - SCS	866 - SVC	
825 - FNS	831 - IOUC	837 - PUB		855 - SP	861 - RA	867 - XTSI	

Page 109—Program Store Status and Control

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 109	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM	
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP	

CMD:

- PROGRAM STORE STATUS AND CONTROL PAGE -

-BUS STATUS-	-STORE STATUS-	
-CC-	MRSS	
0 1	10	
ARAR	PS00 ACT M	
PSB 0 ACT	PS01 ACT M	
PSB 1 STBY	PS02 ACT M	
-STORE CONTROL-	PS03 STBY M	
200,xx - RMV:PSB xx	PS04 UPD M	
201,xx - RMV:PS xx	PS05 STBY M	
300,xx - RST:PSB xx	PS06 OOS M	
301,xx - RST:PS xx	PS07 ACT M	
500,xx - DGN:PSB xx	PS08 UNK M	
501,xx - DGN:PS xx	PS09 UNEQ	
723 -OP:PSSTATUS	PS10 UNEQ	
821 -OP:OOSUNITS:PSB	PS11 UNEQ M	
823 -OP:OOSUNITS:PS	PS12 UNEQ	
	PS13 UNEQ	=DGN IN PROG=

Page 110—Call Store Status and Control

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 110	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM	CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP	
CMD:								
- CALL STORE STATUS AND CONTROL PAGE -								
-BUS STATUS-			-STORE STATUS-					
			MRSS		MRSS		MRSS	
-CC-			10		10		10	
0 1			CS00 ACT	M ☐ ☐	CS14 UNEQ		CS28 UNEQ	
ARAR			CS01 ACT	M ☐ ☐	CS15 UNEQ		CS29 UNEQ	
CSB 0 ACT ☐			CS02 ACT	M ☐ ☐	CS16 UNEQ		CS30 UNEQ	
CSB 1 STBY ☐			CS03 STBY	M ☐ ☐	CS17 UNEQ		CS31 UNEQ	
-STORE CONTROL-			CS04 ACT	M ☐ ☐	CS18 UNEQ		CS32 UNEQ	
200,xx - RMV:CSB xx			CS05 OOS	M ☐ ☐	CS19 UNEQ		CS33 UNEQ	
201,xx - RMV:CS xx			CS06 UPD	M ☐ ☐	CS20 UNEQ		CS34 UNEQ	
300,xx - RST:CSB xx			CS07 STBY	M ☐ ☐	CS21 UNEQ	M ☐ ☐	CS35 UNEQ	
301,xx - RST:CS xx			CS08 UNEQ		CS22 UNEQ		CS36 UNEQ	
500,xx - DGN:CSB xx			CS09 UNK	M ☐ ☐	CS23 UNEQ		CS37 UNEQ	
501,xx - DGN:CS xx			CS10 UNEQ		CS24 UNEQ		CS38 UNEQ	
724 -OP:CSSTATUS			CS11 UNEQ		CS25 UNEQ		CS39 UNEQ	
822 -OP:OOSUNITS:CSB			CS12 UNEQ	M ☐ ☐	CS26 UNEQ			
824 -OP:OOSUNITS:CS			CS13 UNEQ		CS27 UNEQ		=DGN IN PROG=	

Page 111—IFB Clients Status and Control

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 111	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM	CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL		SPP

CMD:

-IFB CLIENTS STATUS AND CONTROL PAGE-

-BUS STATUS-	-BUS AND CLIENT CONTROL-							
-CC-								
0 1	UNIT	RMV	RST	Sw	DGN	OOS	STAT	UNIT
ARAR	MUP xx	201,xx	301,xx	401	501,xx	829	726	MUP xx
IFB 0 ACT	SFI xx	202,xx	302,xx	NA	502,xx	840	727	SFI xx
IFB 1 ACT	AUI xx	203,xx	303,xx	403	503,xx	827	NA	AUI xx
	SSD xx	204,xx	304,xx	NA	504,xx	828	NA	SSD xx
-DGN IN PROGRESS-	IFB xx	205,xx	305,xx	NA	505,xx	826	728	IFB xx

-CLIENT STATUS-

MUP 00 ACT AFT	☐	SFI 02 ACT ALL	☐	*** ** UNEQ ***
MUP 01 STBY AFT	☐	SFI 03 OOS ALL	☐	*** ** UNEQ ***
MUPP 00		AUI 00 ACT ATT	☐	*** ** UNEQ ***
MUPP 01		AUI 01 ACT ATT	☐	*** ** UNEQ ***
*** ** UNEQ ***		*** ** UNEQ ***		*** ** UNEQ ***
*** ** UNEQ ***		*** ** UNEQ ***		*** ** UNEQ ***
SFI 00 ACT ALL	☐	*** ** UNEQ ***		SSD 00 ACT
SFI 01 OOS ALL	☐	*** ** UNEQ ***		SSD 01 OOS

Page 118—1B Processor Status

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐	PORT	☐	PAGE 118	mm/dd/yy	hh:mm:ss
CRITICAL	MAJOR	MINOR	SDC	PGM	CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP	
CMD:								
-1B PROCESSOR STATUS-								
-PROCESSOR-	-BUSES-		-IFB BOOT CLIENTS-		-AUXILIARY- -UNITS-			
	-CC- 0 1				AFT		TT	
	PFAMTHD		ARAR					
CC 0 ACTIVE	☐ ☐ ☐ ☐ ☐ ☐		PSB 0 ACT	☐ ☐ ☐ ☐	MUP 0 ACT	☐ ☐ ☐	AUB 0 ACT	☐ ☐
CC 1 STOP	☐ ☐ ☐ ☐ ☐ ☐		PSB 1 STBY	☐ ☐ ☐ ☐	MUP 1 STBY	☐ ☐ ☐	AUB 1 ACT	☐ ☐
PC STATE:	☐ ☐		CSB 0 ACT	☐ ☐ ☐ ☐	ATT		T	
			CSB 1 STBY	☐ ☐ ☐ ☐	AUI 0 ACT	☐ ☐ ☐	API 0 ACT	☐ ☐
			PUB 0 ACT	☐ ☐ ☐ ☐	AUI 1 UNK	☐ ☐ ☐	API 1 STBY	☐ ☐
			PUB 1 STBY	☐ ☐ ☐ ☐				
			IFB 0 ACT	☐ ☐ ☐ ☐				
			IFB 1 ACT	☐ ☐ ☐ ☐				
=DGN IN PROG=								

Page 119—Direct Data Insert Key Options

Page 119 is two pages in length and contains the Direct Data Insert (DDI) keys. One page contains the MRA DDI key assignments; the other page contains the Inhibit Interrupts DDI key assignments. Poke 499 permits toggling between the two pages. Each page is assigned a CC MCD Register [MCD(H) or MCD(L)]. The DDI keys insert data (32 bits) directly into their associated MCD register.

Page 119—Modify Recovery Actions DDI Key Assignments

TOWNSTBLSUB	4E<NN>4B.nn	MUP	PORT	PAGE 119	mm/dd/yy	hh:mm:ss	
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP

CMD:

499 - TOGGLE MRA / INHIBIT INTERRUPT OPTIONS
-MODIFY RECOVERY ACTIONS DDI KEY ASSIGNMENTS-
401,xx,xx,... - SET xx; 400,xx,xx,... - RESET xx; 402 - RESET ALL

00 SET ALL INH	16 ZERO ALL MEMORY
01 RB RC TO TAPE 1	17 SKIP HASHSUM CALCULATION
02 RB RC TO TAPE 2	18 BYPASS CC SANITY TESTS
03 RB RC NO OF ORDRS IN DIS 1 (940)	19 RESERVED
04 RB RC TO ORNU IN DIS 1 (940)	20 INH MAP AUDITS
05 CLEAR SPECIFIC DISK AREAS	21 INH STORE ACCESS TESTS
06 CLEAR NTKW MGMT CONTROLS	22 SPARE
07 INITIALIZE TRK OOS LIST	23 ALW DUPLEX APS FAILURE IN SR
08 RESERVED	24 SKIP MUP RESTART DURING PC/SR
09 RESERVED	25 ALW MUP SUPERVISOR MODE UTIL SR
10 RESERVED	26 INH IFB ACCESS TEST
11 RST DUPLEX FAILED CONTRS	27 INH AUTOMATIC DIAGNOSTICS
12 SPARE	28 SPARE
13 SPARE	29 SPARE
14 ALLOW DUPLEX FAILED PUBB	30 SPARE
15 RESERVED	31 SPARE

The Modify Recovery Actions (MRA) DDI keys control various functions used during System Recovery (SR), Activate Override (AO), Processor Configuration (PC), and Phases (PH) as listed in Table 3-C:

Table 3-C. Direct Data Insert Key Identification

DDI Key	Function	Application
00	Leave all pests set during and after the phase. Leave audits in manual-only mode.	PH 1, 2, 3, 4
01	Roll back to tape 1	PH 3, 4
02	Roll back to tape 2	PH 3, 4
03	Roll back number of orders indicated by Page 120, Poke 940 (Display Section 1)	PH 2, 3, 4
04	Roll back to order number indicated by Page 120, Poke 940 (Display Section 1)	PH 2, 3, 4
05	Clear disk areas specified by system integrity program	PH 3, 4
06	Clear network management controls	PH 2, 3, 4
07	Initialize trunk OOS list (TOSL)	PH 3, 4
08-10	Reserved	
11	Restore duplex failed units	PH 3
11	Restore all units to duplex	PH 4
12-13	Reserved	
14	Allow duplex failed PUBB	PH 2, 3, 4, SR
15	Reserved	

See footnotes at end of table.

Table 3-C. Direct Data Insert Key Identification (Contd)

DDI Key	Function	Application
16	Zero all call or program store memory not backed up on disk	AO, PC (pump)
17	Skip hashsum calculations. Skip ID2FS MAP checks.	SR, AO, PC
18	Bypass CC sanity tests and PU tests	PH 3, PH 4, SR, PC
19	Reserved	SR
20	Inhibit MAP audit failures during an SR	SR
21	Inhibit store maintenance tests	SR, AO, PC (pump)
22	Not Used	
23	Allow duplex API failures during SR	SR (MIN CFG EMER MODE)
24	Skip MUP restart during PC/SR	PC, SR
25	Allow MUP supervisor mode utility SR	SR
26	Inhibit IFB access tests	PH 3, PH 4, SR
27	Inhibit automatic diagnostic	PH 3, PH 4, SR
28-31	Reserved	

* Not support for 4E19 generic program.

Legend:

AO - Activate Override
PC - Processor Configuration
PH - Phase(s)
SR - System Reinitialization

Page 119—Inhibit Interrupts DDI Key Assignments

TOWNSTBLSUB	4E<NN>4B.nn	MUP	PORT	PAGE 119	mm/dd/yy	hh:mm:ss	
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP

CMD:

499 - TOGGLE MRA / INHIBIT INTERRUPT OPTIONS
-INHIBIT INTERRUPTS DDI KEY ASSIGNMENTS-
401,xx,xx,... - SET xx; 400,xx,xx,... - RESET xx; 402 - RESET ALL

00 J LEVEL	16 UNUSED
01 H LEVEL	17 K LEVEL SOURCE 0
02 UNUSED	18 UNUSED
03 UNUSED	19 UNUSED
04 F LEVEL AUTONOMOUS PERIPH (APUFS)	20 UNUSED
05 F LEVEL PERIPH ORDERS (PUFS)	21 UNUSED
06 E LEVEL PGM STORES	22 F LEVEL PERIPH ASW ERROR
07 D LEVEL STACK UNDER/OVERFLOW	23 F LEVEL PERIPH ANSWER PARITY
08 D LEVEL PROT AREA WRITE	24 UNUSED
09 D LEVEL INTERFACE BUS	25 UNUSED
10 D LEVEL CALL STORES	26 UNUSED
11 B LEVEL PULSE POINTS	27 UNUSED
12 A LEVEL UTILITY	28 UNUSED
13 D-LEVEL INVALID INSTRUCTION/ADDRESS	29 UNUSED
14 B LEVEL INTERNAL ERROR	30 UNUSED
15 UNUSED	31 UNUSED

Page 120—Data Display

TOWNSTBLSUB	4E<NN>4B.nn	MUP	☐ PORT	☐ PAGE 120	mm/dd/yy	hh:mm:ss	
CRITICAL	MAJOR	MINOR	SDC	PGM CTRL	PWR/BLDG	MCC	SYS NORM
CC	PS	CS	IF/AU	PU	MISC	MCC DPFL	SPP
CMD:							
-DISPLAY SECTION 1-		-WRITE/GCP ALLOWED-		-DISPLAY SECTION 2-			
911 - CONTENTS MEMORY		991 - ALW WRITE		921 - CONTENTS MEM/BUFFER			
912 - SCAN POINTS		992 - ACTIVATE GCP		922 - MACP CLIENT			
913 - WRITE ADDR/GCP		993 - ACTIVATE WRITE		923 - WRITE DATA			
914 - NMBR BASE TOGGLE		994 - MODE TOGGLE		924 - NMBR BASE TOGGLE			
		-NORMAL-					
-DATA INSERT SECTION 1-				-DATA INSERT SECTION 2-			
940,xx - DATA 0' ☐				950,xx - DATA 0' ☐			
941 - INCREMENT				951 - INCREMENT			
b: ☐				b: ☐			

Reading the Buffer Bus Registers

To read the contents of the CC Buffer Bus registers, complete the following procedure.

- Obtain the Buffer Bus register number from Chapter 9 — "CC Interrupt Data".
- Obtain Buffer Bus address by adding the Buffer Bus register number to the address below for Active, Standby, or Internal CC.

⇒ NOTE:

Read of Internal CC register may cause C-Level interrupts and is not recommended

To Read From Address Number (Octal)

Active CC	7777776200 + Register number from CC Interrupt Data
Standby CC	7777776600 + Register number from CC Interrupt Data

⇒ NOTE:

With the 4E21 and later generic program, the user is able to specify if a 24-bit address or a 30-bit address is to accompany the Poke 950 commands. If bit 30 is set to one (950,1xxxxxxxxx), the 1B Processor expects a 30-bit address. If bit 30 is set to zero (950,0xxxxxxxxx), the 1B Processor expects a 24-bit address.

- At Page 120, select Poke 950,xxxxxxxxxx where xxxxxxxxxxxx equals the address in octal to be read
- Enter Poke 921 (**CONTENTS MEM/BUFFER**)

-
- Read the data at the bottom of the page
 - The data can be displayed in Binary, Octal, Decimal, or Hexadecimal by repeatedly entering Poke 924 (**NMBR BASE TOGGLE**).

Reading Signal Processor Scan and Signal Distributor Points

To read the Signal Processor Scan and Signal Distributor Points for Miscellaneous Scanner Number (MSN), Trunk Scanner Number (TSN), Miscellaneous Distributor Number (MDN), or Trunk Distributor Number (TDN), complete the following procedure.

- Obtain the SP Point address for TSN, TDN, MSN or MDN from Chapter 5 — "Signal Processor Point Location".

⇒ NOTE:

With the 4E21 and later generic programs, the user is able to specify if a 24-bit address or a 30-bit address is to accompany the Poke 940 commands. If bit 30 is set to one (940,1xxxxxxxx), the 1B Processor expects a 30-bit address. If bit 30 is set to zero (940,0xxxxxxxx), the 1B Processor expects a 24-bit address.

- At Page 120, select Poke 940,xxxxxxxx where xxxxxxxxx equals the address in octal to be read
- Enter Poke 912 (**SCAN POINTS**)
- Read the data at the bottom of the page
- The data can be displayed in Binary, Octal, Decimal, or Hexadecimal by repeatedly entering Poke 914 (**NMBR BASE TOGGLE**).

Miscellaneous Information

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Miscellaneous Information

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Interface Bus Client Address

AU Address Range	AU Address Bus					Auxiliary Units	
	15	14	13	12	11		
17600000 17603777	0	0	0	0	0	API-0	API K-Codes
17604000 17607777	0	0	0	0	1	API-1	
17660000 17663777	0	1	1	0	0	DUS-0	DUS K-Codes
17664000 17667777	0	1	1	0	1	DUS-1	

At least one bit 13, 14, 15 must equal zero (0) to be an AU Address

1B Processor Memory Layout

Address Range	Attributes	Range	Type	Memory Use Description
00000000-00027777	P(B&N)A14	LCS	DATA	High Usage - Protected
00030000-00037777	UNA14	LCS	BSS	High Usage - Unprotected
00040000-00047777	UNA21	LCS	BSS	UNA14 Overflow
00050000-01757777	UNA21	LCS	BSS†	Unprotected COMPOOL
01760000-07177777	UNA21	LCS	BSS†	ODA Engineered
07200000-07377777	PNA21	LCS	TEXT	Library Area (CS KCODE 35)
07400000-07777777	PBA21	LCS	DATA	PBAC/PBAL (CS KCODEs 36 & 37)
10000000-13777777	PBA22	PS	TEXT	PS Text
14000000-14237777 14000000 14017740 14020000	PBA22	PS	TEXT	80K Pump Area Beginning of Vector Table Beginning of Utility Execute Table Bonded Interrupt Handlers
14400000-14422677	PNA-Nonzero PNA-Zero	PS	Data	Fault Recovery Data
14422700-14507777	Core-Page	PS	Hole	Paging Areas
14510000-17777777	PBA22	PS	TEXT	PS Text
20000000-20027777	PN23	UCS	DATA	Protected UCS
See legend and footnotes at end of table.				

1B Processor Memory Layout (Contd)

Address Range	Attributes	Range	Type	Memory Use Description
20030000-32357777	UN23	UCS	BSS	Unprotected ODA Unprotected COMPOOL ODA Engineered
	PB23	UCS	DATA	ODA-Translation
32360000-33577777	PB23	UCS	TEXT	PSBX (Protected, Backed Executed Text)
33600000-33777777	Core XS	UCS	Hole	Reserved for XS
34000000-37577777	----	PSE	INT	PS Text
37600000-37657777	----	MMIO	INT	Individual client MMIO O'(37600000)+(O'(1777 *IFB slot#)
37660000-37667777	----	MMIO	INT	Unused
37670000-37670377	----	MMIO	INT	Relocation Region for MMIO
37670400-37677777	----	MMIO	INT	Unused
37700000-37767777	----	ROM	INT	BOOT ROM
37770000-37775777	----	BB	INT	Unused
37776000-37776377	----	BB	INT	Active CC Buffer Bus
37776400-37776777	----	BB	INT	Standby CC Buffer Bus
37777000-37777377	----	BB	INT	Invalid Buffer Bus
37777400-37777777	----	BB	INT	Internal Buffer Bus

See legend and footnotes at end of table.

1B Processor Memory Layout (Contd)

Legend:

P	= Protected	LCS	= Lower Call Store
U*	= Unprotected (via LPA/UPA)	UCS	= Upper Call Store
B	= Disk Backed	ODA	= Office Data Assembler
A	= AUB/API Addressable	MMIO	= Memory Mapped I/O (IFB Access)
N	= Non-disk backed	PBAC	= Common ODA translators
14	= 14-bit Addressable	PBAL	= Programs and tables, loader populated
21	= 21-bit Addressable	BSS	= Uninitialized data
22	= 22-bit Addressable	TEXT	= Executable code
23	= 23-bit Addressable		
INT	= CC Internal Reserved Addresses		
DATA	= Initialized data		
PSE	= Program Store Expansion		

* This area may or may not be protected via the store write protection.

† These BSS areas are more valuable than the BSS area in UCS, which should be allocated first.

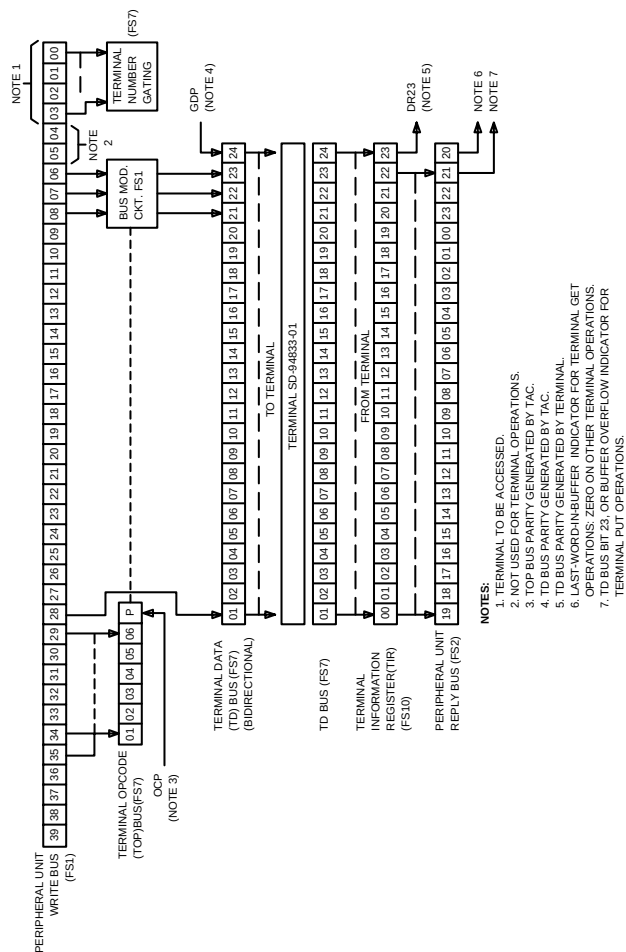
1B Processor MCODE Designations (Note)

MCODE	O'(Address Range)*	Communities
0	00000000-03777777	CS
1	04000000-07777777	CS
2	10000000-13777777	PS
3	14000000-17777777	Base PS PS Power Up
4	20000000-23777777	CS
5	24000000-27777777	CS
6	30000000-33777777	CS
7	34000000-37577777 37600000-37677777 37700000-37767777 37770000-37775777 37776000-37776377 37776400-37776777 37777000-37777377 37777400-37777777	PSE MMIO BOOT ROM Unused Active CC Standby CC Invalid Buffer Bus Internal Buffer Bus

Note: M-code bits 22-20

* All addresses are relative to the base address of O'(7740000000) which is loaded into Transition Address Register (TAR).

Common Channel Interoffice Signaling Terminal Access Controls—Term Data Flow



Digroup Terminal Unit—Terminal Unit Bit/Function Layout

Bit	0	Function 1	2	3 (4, 5, 6, 7)
0	NAME:PKSLPO FS1,0615 FA1114-011 PARITY CHECK ON SLIP SCAN 0616-316 STROBE-118	NAME:1CPDS90 FS2,0213 FA1136-214 *FA1112-106 XMT CONV FRAME BIT COMP (DIGROUP 1) SCAN 0616-007 STROBE-109	NAME:PV1INV1 FS10,0223 FA1125-216 TSI RCV PAIR VIOL 0-6 SCAN 0217-316 STROBE-118	NAME:CPESGLO FS6,0623 FA1120-202 E-SIG STORE COMP (TEST DG) SCAN 0217-007 STROBE-109
1	NAME:PKSLPO FS1,0615 FA1114-011 PARITY CHECK ON SLIP SCAN 0616-214 STROBE-218	NAME:2CPDS90 FS2,0211 FA1136-214 *FA1112-106 XMT CONV FRAME BIT COMP (DIGROUP 2) SCAN 0616-305 STROBE-009	NAME:PV1NVO FS10,0223 FA1125-215 TSI RCV PAIR VIOL 7 SCAN 0217-214 STROBE-218	NAME:CPESGLO FS6,0623 FA1120-202 E-SIG STORE COMP (TEST DG) SCAN 0217-305 STROBE-009
2	NAME:PKDSWRO FS1,0615 FA1114-304 PARITY CHECK ON REC DATA (DG1-5) SCAN 0616-013 STROBE-016	NAME:3CPDS90 FS2,0209 FA1136-214 *FA1112-106 XMT CONV FRAME BIT COMP (DIGROUP 3) SCAN 0616-105 STROBE-308	NAME:ALMCTR1 FS3,0224 FA1143-111 ALARM ON COUNTERS REGISTER *NAME:PV1INV1 *FS10,0223 *FA1125-216 *TSI RCV *PAIR VIOL 0-6 SCAN 0217-013 STROBE-016	NAME:CPESGLO FS6,0623 FA1120-202 E-SIG STORE COMP (TEST DG) SCAN 0217-105 STROBE-308



NOTE:

Asterisk (*) indicates layout for older vintage J68952A DT frame only.

Digroup Terminal Unit—Terminal Unit Bit/Function Layout (Contd)

		Function			
Bit		0	1	2	3 (4, 5, 6, 7)
3		NAME:1PKRCO FS1,1018 FA1110-018 RECEIVE CONVERTER PARITY CHECK (DIGROUP 1) SCAN 0616-315 STROBE-317	NAME:4CPDS90 FS2,0207 FA1136-214 *FA1112-106 XMT CONV FRAME BIT COMP (DIGROUP 4) SCAN 0616-106 STROBE-209	NAME:1PKTCO FS2,0213 FA1136-212 *FA1112-219 XMT CONV PARITY CHECK (DIGROUP 1) SCAN 0217-315 STROBE-317	NAME:ALMUGWC1 FS3,1021 FA1137-208 ALARM GWC CTR *NAME:CPESGLO *FS6,0623 *FA1120-202 *E-SIG *STORE COMP *(TEST DG) SCAN 0217-106 STROBE-209
		NAME:2PKRCO FS1,1012 FA1110-018 RECEIVE CONVERTER PARITY CHECK (DIGROUP 2) SCAN 0616-312 STROBE-219	NAME:PKSLP1 FS1,0615 FA1114-311 PARITY CHECK ON SLIP SCAN 0616-104 STROBE-204	NAME:2PKTCO FS2,0211 FA1136-212 *FA1112-219 XMT CONV PARITY CHECK (DIGROUP 2) SCAN 0217-312 STROBE-219	NAME:PKSGLO FS6,0623 FA1120-003 ACC PARITY CHECK E-SIG (DG1-5) SCAN 0217-104 STROBE-204
		NAME:3PKRCO FS1,1009 FA1110-018 RECEIVE CONVERTER PARITY CHECK (DIGROUP 3) SCAN 0616-115 STROBE-215	NAME:5CPDS90 FS2,0205 FA1136-214 *FA1112-106 XMT CONV FRAME BIT COMP (DIGROUP 5) SCAN 0616-005 STROBE-108	NAME:3PKTCO FS2,0209 FA1136-212 *FA1112-219 XMT CONV PARITY CHECK (DIGROUP 3) SCAN 0217-115 STROBE-215	NAME:CPKSGLO FS6,0623 FA1120-105 ACC PARITY CHECK COMP E-SIG (TEST DG) SCAN 0217-005 STROBE-108
4					
5					



NOTE:

Asterisk (*) indicates layout for older vintage J68952A DT frame only.

Digroup Terminal Unit—Terminal Unit Bit/Function Layout (Contd)

		Function			
Bit		0	1	2	3 (4, 5, 6, 7)
6		NAME:4PKRCO	NAME:PKDSWR1	NAME:4PKTCO	NAME:ALMFRGBC1
		FS1,1006	FS1,0615	FS2,0207	FS3,1021
		FA1110-018	FA1114-105	FA1136-212	FA-1137-210
		RECEIVE	PARITY CHECK	*FA1112-219	ALARM FRAMING
		CONVERTER	ON REC DATA	XMT CONV	GBC COUNTERS
		PARITY CHECK	(TEST DG)	PARITY CHECK	*NAME:CPKSGLO
		(DIGROUP 4)	SCAN 0616-304	(DIGROUP 4)	*FS6,0623
		SCAN 0616-114	STROBE-208	SCAN 0217-114	*FA1120-105
		STROBE-314		STROBE-314	*ACC
					*PARITY CHECK
					*COMP E-SIG
					*(TEST DG)
					SCAN 0217-304
					STROBE-208
					NAME:PKRMAO
					FS5,0620
		NAME:SPKRCO	NAME:PKDSWR1	NAME:5PKTCO	NAME:PKRMAO
		FS1,1003	FS1,0615	FS2,0205	FS5,0620
		FA1110-018	FA1114-105	FA1136-212	FA1122-001
		RECEIVE	PARITY CHECK	*FA1112-219	ACC
		CONVERTER	ON REC DATA	XMT CONV	PARITY CHECK
		PARITY CHECK	(TEST DG)	PARITY CHECK	RMA
		(DIGROUP 5)	SCAN 0616-203	(DIGROUP 5)	(DG1-5)
		SCAN 0616-012	STROBE-204	SCAN 0217-012	SCAN 0217-203
		STROBE-017		STROBE-017	STROBE-204
		NAME:CPPYDFO	NAME:CP1FO	NAME:CPMSGLO	NAME:CFA11
		FS9,0218	FS4,0624	FS7,0215	FS10,0222
		FA1123-105	FA1116-103	FA1115-013	FB241-208
		PARITY CHECK	COMP STAT	M-STORE	TSI RCV
		OVER RBOX-	IN FRAME	SIG COMP	CLOCK FAIL
		TBOXLOOP	(TEST DG)	(TEST DG)	ALARM (A)
		DATA	SCAN 0616-003	SCAN 0217-309	SCAN 0217-003
		SCAN 0616-309	STROBE-204	STROBE-011	STROBE-204
		STROBE-011			
		NAME:PKDEVN1	NAME:CPETMNO	NAME:CPRGPAO	NAME:CFA21
		FS9,0218	FS4,0624	FS7,0215	FS10,0222
		FA1123-003	FA1116-301	FA1115-211	FB241-201
		PARITY CHECK	COMP FRAME	XMT STORE	TSI RCV
		EVEN TRANSM	ERR TMG	MX READ	CLOCK FAIL
		DATA	(TEST DG)	ADD COMP	ALARM (B)
		SCAN 0616-112	SCAN 0616-002	SCAN 0217-112	SCAN 0217-002
		STROBE-015	STROBE-204	STROBE-015	STROBE-204



NOTE:

Asterisk (*) indicates layout for older vintage J68952A DT frame only.

Digroup Terminal Unit—Terminal Unit Bit/Function Layout (Contd)

Bit	Function			
	0	1	2	3 (4, 5, 6, 7)
10	NAME:PKDODD1 FS9,0218 FA1123-001 PARITY CHECK ODD TRANS DATA SCAN 0616-212 STROBE-217	NAME:CPFPFO FS4,0624 FA1116-004 COMP PULSE FRAMING (TEST DG) SCAN 0616-301 STROBE-204	NAME:CPRGPAO FS7,0215 FA1115-211 XMT STORE MX WRITE ADD COMP SCAN 0217-211 STROBE-217	NAME:PKLCAO FS5,0619 FA1121-105 ACC PARITY CHECK LCA (DG1-5) SCAN 0217-301 STROBE-204
	NAME:PK10DR0 FS1,1015 FA1135-015 *FA1113-100 PARITY OUTPUT DATA REC BITS (DIGROUP 1) SCAN 0616-008 STROBE-210	NAME:CPSADEO FS4,0626 FA1118-115 COMP SHIFT ADDRESS ENABLE (TEST DG) SCAN 0616-101 STROBE-004	NAME:PKTP0 FS7,0215 FA1115-207 ACC PARITY CHECK XMT PROC (DG1-5) SCAN 0217-008 STROBE-210	NAME:CPDFAO FS5,0619 FA1121-305 DFA COMPARE (TEST DG) SCAN 0217-101 STROBE-004
12	NAME:PK20DR0 FS1,1015 FA1135-015 *FA1113-205 PARITY OUTPUT DATA REC BITS (DIGROUP 2) SCAN 0616-311 STROBE-014	NAME:CPSAD00 FS4,0626 FA1118-016 COMP SHIFT ADDRESS 0 (TEST DG) SCAN 0616-001 STROBE-004	NAME:PKTP1 FS7,0215 FA1115-007 ACC PARITY CHECK XMT PROC (TEST DG) SCAN 0217-311 STROBE-014	NAME:CPLCAO FS5,0619 FA1121-007 LCA COMPARE (TEST DG) SCAN 0217-001 STROBE-004
	NAME:PK30DR0 FS1,1015 FA1135-015 *FA1113-304 PARITY OUTPUT DATA REC BITS (DIGROUP 3) SCAN 0616-206 STROBE-110	NAME:CPSAD10 FA4,0626 FA1118-011 COMP SHIFT ADDRESS 1 (TEST DG) SCAN 0616-201 STROBE-004	NAME:PK1DTP0 FS7,0215 FA1115-008 DATA PARITY CHECK XMT PROC (DG1-5) SCAN 0217-206 STROBE-110	NAME:CPKLCAO FS5,0619 FA1121-207 ACC PARITY CHECK COMP LCA (TEST DG) SCAN 0217-201 STROBE-004



NOTE:

Asterisk (*) indicates layout for older vintage J68952A DT frame only.

Digroup Terminal Unit—Terminal Unit Bit/Function Layout (Contd)

Bit	Function			
	0	1	2	3 (4, 5, 6, 7)
14	NAME:PK40DRO	NAME:CPSAD20	NAME:PK1DT1	NAME:CPRMA0
	FS1,1015	FS4,0626	FS7,0215	FS5,0620
	FA1135-015	FA1118-108	FA1115-208	FA1122-018
	*FA1113-005	COMP SHIFT	DATA	RMA
	PARITY OUTPUT	ADDRESS 2	PARITY CHECK	COMPARE
	DATA REC	(TEST DG)	XMT PROC	(TEST DG)
	BITS	SCAN 0616-211	(TEST DG)	SCAN 0217-211
	(DIGROUP 4)	STROBE-004	SCAN 0217-006	STROBE-004
	SCAN 0616-006		STROBE-113	
	STROBE-113			
	NAME:PK50DRO	NAME:CPSAG60	NAME:CPY1DTO	NAME:CPKRMA0
	FS1,1015	FS4,0626	FS7,0215	FS5,0620
	FA1135-015	FA1118-106	FA1115-011	FA1122-117
	*FA1113-002	COMP SHIFT	XMT PROC	ACC
15	PARITY OUTPUT	ADDRESS>6	UPDATED	PARITY CHECK
	DATA REC	(TEST DG)	PARITY COMP	COMP RMA
	BITS	SCAN 0616-300	(TEST DG)	(TEST DG)
	(DIGROUP 5)	STROBE-004	SCAN 0217-010	SCAN 0217-300
	SCAN 0616-010		STROBE-213	STROBE-004
	STROBE-213			

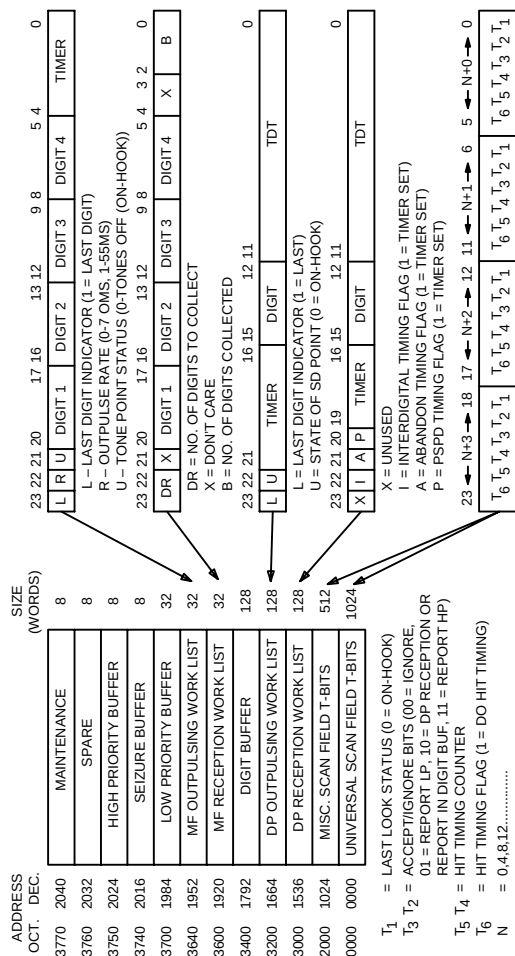


NOTE:

Asterisk (*) indicates layout for older vintage J68952A DT frame only.

Signal Processor Memory Layout

Signal Processor 1



Signal Processor 2

ADDRESS			SIZE (WORDS)
OCT.	DEC.		
5400	2816	ECHO SUPPRESSION DATA (DT4-7)	256
5100	2624	ECHO SUPPRESSION DATA (DT1-3)	192
5000	2560	SPARE	64
4400	2304	UNIVERSAL SD FIELD	256
4000	2048	UNIVERSAL SCAN FIELD	256
3770	2040	MAINTENANCE	8
3760	2032	SPARE	8
3750	2024	HIGH PRIORITY BUFFER	8
3740	2016	SEIZURE BUFFER	8
3700	1984	LOW PRIORITY BUFFER	32
3640	1952	MF OUTPULSING WORK LIST	32
3600	1920	MF RECEPTION WORK LIST	32
3400	1792	DIGIT BUFFER	128
3200	1664	DP OUTPULSING WORK LIST	128
3000	1536	DP RECEPTION WORK LIST	128
2400	1280	DT MAINTENANCE DATA	256
2000	1024	MISCELLANEOUS SCAN FIELD T-BITS	256
0000	0000	UNIVERSAL SCAN FIELD T-BITS	1024

SAME LAYOUT AS SPI

SAME LAYOUT AS SPI

ADDRESS			SIZE (WORDS)
OCT.	DEC.		
2700	1472	UNUSED	64
2660	1456	INCOMING MESSAGE HALF 2	16
2640	1440	INCOMING MESSAGE HALF 1	16
2620	1424	OUTGOING MESSAGE HALF 2	16
2600	1408	OUTGOING MESSAGE HALF 1	16
2520	1360	UNUSED	48
2500	1344	STATUS WORDS	16
2400	1280	STATUS WORD T-BITS	64

Signal Processor

Port Selection

PM = 000040XX
 └──┘
 OP CODE

ADDRESS BUS OP CODE = 4000/4037
PORT = OP CODE MINUS 4000

DATA BUS OP CODE = 4040 & UP
PORT = OP CODE MINUS 4040

Signal Processor Point Location

To check the SPs scan or SD points for a failing circuit, first the TSN or TDN must be determined. Use the following verify message.

VER:TRKNAME,CIN a!

Where *a* is a valid CIN

VER:TRKNAME,CIN 1GNBONCEUDSD03T!

```
M 12 VER:TRKNAME,CIN 1 GNBO NC EU DSD 03T: ISC DOMCCIS OSC DOMCCIS
  OTAN 036601 - TAN 07 1 3 001 <- OCTAL AND DECIMAL TAN
  CIN 1 GNBO NC EU DSD 03T - BTFN 1
  TSN 1324801 - TSN 0'157601 <- DECIMAL AND OCTAL TSN
  DIF 13,DIU 31, DG 1 <- DT, DIF, or VIF
  10/27/96 14:12:44
  #752
```

TST or TDT (Lower 12 bits) of the	SP Point address	K
TSN or TDN	0000-1023	0
	1024-2047	1
	2048-3071	2
	3072-4095	3
MSN or MDN	0000-1023	4
	1024-2047	5

Subtract the lowest address in the K from the given address; divide the result by 16 (decimal) to find the row (the remainder in this division is the column); convert the row to octal, and access the appropriate SP pack location table.

Signal Processor Point Location (Contd)

TSN, TDN, MSN, OR MDN Binary Format

16 - - - 12 SP Member Number	11 10 K	9 - - - 4 Row	3 - - 0 Column
	SP Point TST—Trunk Scanner Tag TDT—Trunk Distributor Tag		

Scan Point Pack Locations FB 230

	0 - 3	4 - 7	10 - 13	14 - 17	
	0 - 3	4 - 7	8 - 11	12 - 15	
*00-*03	-04	-05	-06	-07	← COLUMN (OCTAL) ← COLUMN (DECIMAL)
*04-*07	-08	-09	-10	-11	
*10-*13	-12	-13	-14	-15	150-K0 } UNIV 650-K1 } TSN 163-K2 } 663-K3 } MISC 168-K4 } MSN 668-K5 }
*14-*17	-16	-17	-18	-19	
*20-*23	-26	-27	-28	-29	
*24-*27	-30	-31	-32	-33	
*30-*33	-34	-35	-36	-37	
*34-*37	-38	-39	-40	-41	250-K0 } UNIV 750-K1 } TSN 263-K2 } 763-K3 } MISC 268-K4 } MSN 768-K5 }
*40-*43	-04	-05	-06	-07	
*44-*47	-08	-09	-10	-11	
*50-*53	-12	-13	-14	-15	
*54-*57	-16	-17	-18	-19	
*60-*63	-26	-27	-28	-29	
*64-*67	-30	-31	-32	-33	
*70-*73	-34	-35	-36	-37	
*74-*77	-38	-39	-40	-41	

↑
ROWS
(OCTAL)

↑
FRAME
LOCATION
ROWS

NOTES:

1. SINCE THERE ARE ONLY 2 BINARY BITS AVAILABLE FOR THE K, MISCELLANEOUS K'S 4 AND 5 MUST BE DERIVED BY ADDING 4 TO THE 0 AND 1K VALUES IN MSN'S & MDN'S.
2. NUMBERS IN CHART REPRESENT PACK LOCATIONS IN MATRIX FRAMES OF FB 230 PACKS.

* = USED TO TELL WHICH FRAME LOCATION ROW TO SELECT.

Distribute Applique Pack Locations FB 228

	0 1	2 3	4 5	6 7	10 11	12 13	14 15	16 17	
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	
*00,*02 *04,*06	-2P	-04	-38P	-40	-08P	-10	-44P	-46	COLUMNS (OCTAL)
*01,*03 *05,*07	-5P	-07	-41P	-43	-11P	-13	-47P	-49	
*10,*12 *14,*16	-21P	-23	-57P	-59	-27P	-29	-63P	-65	COLUMNS (DECIMAL)
*11,*13 *15,*17	-24P	-26	-60P	-62	-30P	-32	-66P	-68	
*20,*22 *24,*26	-2P	-04	-38P	-40	-08P	-10	-44P	-46	024-K0 524-K1 040-K2 540-K3 056-K4 556-K5
*21,*23 *25,*27	-5P	-07	-41P	-43	-11P	-13	-47P	-49	
*30,*32 *34,*36	-21P	-23	-57P	-59	-27P	-29	-63P	-65	UNIV TDN
*31,*33 *35,*37	-24P	-26	-60P	-62	-30P	-32	-66P	-68	
*40,*42 *44,*46	-2P	-04	-38P	-40	-08P	-10	-44P	-46	MISC MDN
*41,*43 *45,*47	-5P	-07	-41P	-43	-11P	-13	-47P	-49	
*50,*52 *54,*56	-21P	-23	-57P	-59	-27P	-29	-63P	-65	028-K0 528-K1 044-K2 544-K3 060-K4 560-K5
*51,*53 *55,*57	-24P	-26	-60P	-62	-30P	-32	-66P	-68	
*60,*62 *64,*66	-2P	-04	-38P	-40	-08P	-10	-44P	-46	UNIV TDN
*61,*63 *65,*67	-5P	-07	-41P	-43	-11P	-13	-47P	-49	
*70,*72 *74,*76	-21P	-23	-57P	-59	-27P	-29	-63P	-65	MISC MDN
*71,*73 *75,*77	-24P	-26	-60P	-62	-30P	-32	-66P	-68	

NOTES:

1. SINCE THERE ARE ONLY 2 BINARY BITS AVAILABLE FOR THE K, MISCELLANEOUS K'S 4 AND 5 MUST BE DERIVED BY ADDING 4 TO THE 0 AND 1K VALUES IN MSN'S AND MDN'S.
2. NUMBERS IN SQUARES REPRESENT PACK LOCATIONS IN APPLIQUE FRAME OF FB228 PACKS.

* = K, USED TO TELL WHICH FRAME LOCATION ROW TO SELECT.

Distribute Matrix Pack Locations FA 605

	0 - 3 0 - 3	4 - 7 4 - 7	10 - 13 8 - 11	14 - 17 12 - 15	← COLUMN (OCTAL) ← COLUMN (DECIMAL)
*00-*07	-08	-14	-09	-15	128-K0 628-K1 UNIV 132-K2 TDN 632-K3 145-K4 MISC 645-K5 MDN
*10-*17	-11	-17	-12	-18	
*20-*27	-28	-34	-29	-35	
*30-*37	-31	-37	-32	-38	
*40-*47	-08	-14	-09	-15	228-K0 728-K1 UNIV 232-K2 TDN 732-K3 245-K4 MISC 745-K5 MDN
*50-*57	-11	-17	-12	-18	
*60-*67	-28	-34	-29	-35	
*70-*77	-31	-37	-32	-38	

↑
ROWS
(OCTAL)

↑
FRAME
LOCATION
PACKS

NOTES:

1. SINCE THERE ARE ONLY 2 BINARY BITS AVAILABLE FOR THE K, MISCELLANEOUS K'S 4 AND 5 MUST BE DERIVED BY ADDING 4 TO THE 0 AND 1 K VALUES IN MSN'S AND MDN'S.
2. NUMBERS IN CHART REPRESENT PACK LOCATIONS IN APPLIQUE FRAMES OF FA 605 PACKS.

* = K, USED TO TELL WHICH FRAME LOCATION ROW TO SELECT

Signal Distribute Pulse Points Locations

Matrix Pack Locations FA 610

	0 - 3 0 - 3	4 - 7 4 - 7	10 - 13 8 - 11	14 - 17 12 - 15	← COLUMN (OCTAL) ← COLUMN (DECIMAL)
*40-*47	-08	-14	-09	-15	245-K4 745-K5 ↑ FRAME LOCATION ROWS
*50-*57	-11	-17	-12	-18	
*60-*67	-28	-34	-29	-35	
*70-*77	-31	-37	-32	-38	

↑
ROW
(OCTAL)

NOTES:

1. SINCE THERE ARE ONLY 2 BINARY BITS AVAILABLE FOR THE K, MISCELLANEOUS K'S 4 AND 5 MUST BE DERIVED BY ADDING 4 TO THE 0 AND 1K VALUES IN MSN'S AND MDN'S.
2. NUMBERS IN CHART REPRESENT PACK LOCATIONS IN MATRIX FRAMES OF FA 610 PACKS.

Pack Locations FB 229

	0 1	2 3	4 5	6 7	10 11	12 13	14 15	16 17	
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	
*40,*42 *44,*46	-02P	-04	-33P	-35	-08P	-10	-39P	-41	COLUMN (OCTAL) COLUMN (DECIMAL)
*41,*43 *45,*47	-05P	-07	-36P	-38	-11P	-13	-42P	-44	
*50,*52 *54,*56	-17P	-19	-48P	-50	-23P	-25	-54P	-56	064-K4 564-K5
*51,*53 *55,*57	-20P	-22	-51P	-53	-26P	-28	-57P	-59	
*60,*62 *64,*66	-02P	-04	-33P	-35	-08P	-10	-39P	-41	068-K4 568-K5
*61,*63 *65,*67	-05P	-07	-36P	-38	-11P	-13	-42P	-44	
70,*72 *74,*76	-17P	-19	-48P	-50	-23P	-25	-54P	-56	FRAME LOCATION ROWS
*71,*73 *75,*77	-20P	-22	-51P	-53	-26P	-28	-57P	-59	

↑
ROW
(OCTAL)

NOTES:

1. SINCE THERE ARE ONLY 2 BINARY BITS AVAILABLE FOR THE K, MISCELLANEOUS K'S 4 AND 5 MUST BE DERIVED BY ADDING 4 TO THE 0 AND 1K VALUES IN MSN'S & MDN'S.
2. NUMBERS IN CHART REPRESENT PACK LOCATIONS IN APPLIQUE FRAMES OF FB 229 PACKS.

Breakdowns

Trunk Appearance Number Breakdown (TAN)

Bit 0-6 = Time slot
7-9 = TSI level (Buffer A)
10 = SPC in TSI
11-16 = TSI member number

**NOTE:**

The relationship of buffer A in TAN to buffer B in TN is as follows:

$BUFB = BUFA + \text{CHAN number MOD } 8$

Trunk Number Breakdown (TN)

BIT 0-6 = Time slot
7-9 = Buffer B (TSI Level after decorrelation)
10 = SPC in TSI
11-16 = TSI member number

Trunk Scanner Number Breakdown (TSN)

BIT 0-3 = Column in SP matrix
4-9 = Row in SP matrix
10-11 = Block in SP matrix
12-16 = SP member number

Memory Connect/Disconnect Instruction Layout

Time-Multiplex Switch (TMS)

BIT 1-7 = Time Slot
10-16 = Source switching and permuting circuit (SPC)
17-23 = Destination SPC
24-27 = Path
29-35 = Operation code

Time-Multiplex Switch OPCODEs

Octal:

10 = Full connect
20 = Full disconnect
30 = Long memory read
40 = Memory write

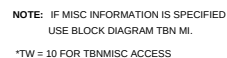
Time-Slot Interface (TSI)

BIT 0-6 = Channel
7-9 = BMB or BMC level
10-16 = Time slot
19-21 = Serial switch level
29-35 = Operation code

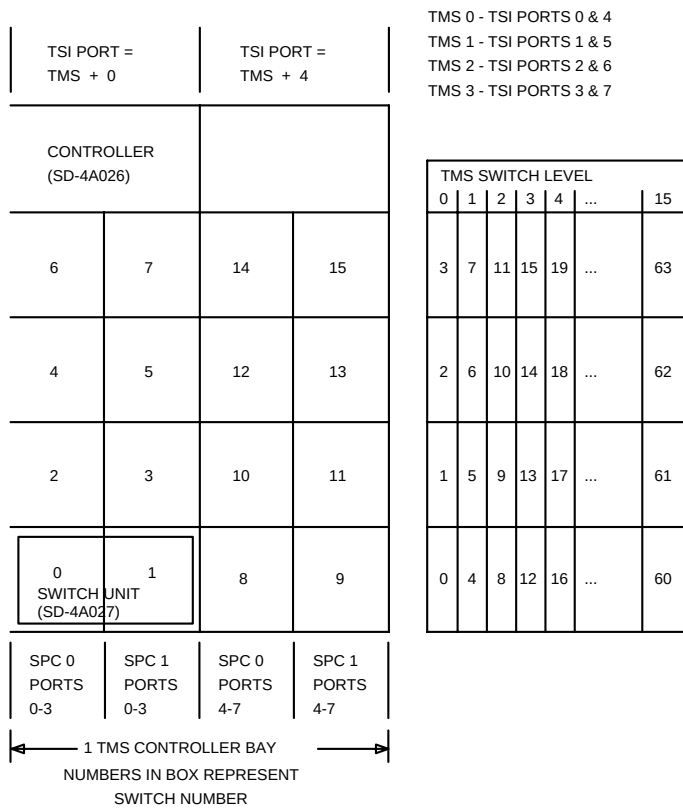
Time-Slot Interface OPCODEs

Octal:

10 = Set up input
11 = Set up both
12 = Set up output
13 = Read both
15 = Read BIMM
20 = Take down input
21 = Take down both
22 = Take down output
52 = Write RTSI
53 = Write TTSI
55 = Write BIMM

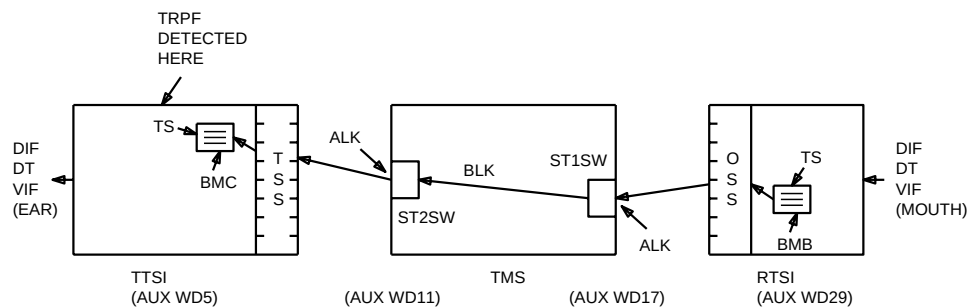


Time-Multiplex Switch Port to Time-Slot Interface Port Translator for 4 Time-Multiplex Switch Office



NOTE: XMT JACK ON TMS
CONNECTS TO XMT ON
TSI. XMT AND RCV
ARE RELATIVE TO TMS.

Time-Division Number Path for Transit-Parity Failure Analysis (TRPF)



Legend:

ALK = A-Link	SW = Block
AUX = Auxiliary	TMS = Time-Multiplex Switch
BLK = B-Link	TRPF = Transit-Parity Failure
BMB = Buffer Memory B	TS = Time-slot
BMC = Buffer Memory C	TTSI = Transmit Time-slot Interchange
DIF = Digital Interface Frame	VIF = Voiceband Interface Frame
DT = Digital Trunk	
RTSI = Receive Time-slot Interchange	

Location Data

Receive Time-Slot Interchange FA533

TMS CONTR	SPC	TSI-1 EQL	TSI-2 EQL
0	0	076-03	076-23
0	1	076-04	076-22
0	2		076-07
0	3		076-06
1	0	176-03	176-23
1	1	176-04	176-22
1	2		176-07
1	3		176-06

Receive Time Slot Interchange FA533 (Contd)

Data Present at Following Pins:

RPORT	FA533 Inputs* (True Data)	FA533 Output (True Data, 2 V)
0	202 002	106
1	118 317	213
2	204 104	107
3	301 101	108
4	314 015	110
5	117 017	211
6	005 304	209
7	115 215	212

* First entry input from RCONTR 0, second from RCONTR 1.

Receive Time-Slot Interchange

FA544, FA1198, and FA545 (TSI-1)

DSR Level From Trace	Horizontal EQL			Vertical EQL	
	FA544 (4A024-01)	FA1198 (4A024-01)	FA545	SPC0	SPC1
0	26	26	27,28	50	72
1	25	26	27,28	50	72
2	24	24	27,28	50	72
3	23	24	27,28	50	72
4	22	22	27,28	50	72
5	21	22	27,28	50	72
6	20	20	27,28	50	72
7	19	20	27,28	50	72

Notes:

1. Data present at PIN 219 of FA544 (inverted polarity).
2. Data present at PIN 314 (even levels) and PIN 219 (odd levels) of FA 1198 (inverted polarity).
3. TSI bay is the same as RCONTR.

FA1780 (or FA1816) and FA545 (TSI-2)

RTSI Level From F-Level TRACE	Horizontal EQL		Vertical EQLS			
	FA1780 or FA1816	FB545	SPC0	SPC1	SPC2	SPC3
0	58	47,49	28	40	52	64
1	56	47,49	28	40	52	64
2	54	47,49	28	40	52	64
3	51	47,49	28	40	52	64
4	43	47,49	28	40	52	64
5	41	47,49	28	40	52	64
6	39	47,49	28	40	52	64
7	37	47,49	28	40	52	64

Notes:

1. Data present at PIN 100 of FA1780 or FA1816 (inverted polarity).
2. TSI bay is the same as RCONTR.

Transmit Time-Slot Interchange

Location Data

TMS CONTR	SPC	FA524 TSI-1 EQL	FA1808 TSI-2 EQL
0	0	076-06	076-26
0	1	076-07	076-25
0	2		076-10
0	3		076-09
1	0	176-06	176-26
1	1	176-07	176-25
1	2		176-10
1	3		176-09

Location Data (Contd)

The data is present at the following pins:

TPort	FA524 Inputs (INV Data, 2 V)	FA524 Output* (INV Data)
0	018	013 312
1	105	005 104
2	007	303 102
3	307	304 302
4	217	214 213
5	017	015 314
6	316	215 016
7	108	003 301

* First entry output to TCONTR 0, second to TCONTR 1.

FA1190, FB589, and FA546 [TTSI (TSI-1)]

L.O.D. Level From F-Level Trace	Horizontal EQL			Vertical EQL	
	FA1190	FB589	FA546	SPCO	SPC1
0	57	49	38	50	72
1	56	49	38	50	72
2	55	49	38	50	72
3	54	49	38	50	72
4	53	48	37	50	72
5	52	48	37	50	72
6	51	48	37	50	72
7	50	48	37	50	72

Notes:

1. Data present at FA1190 PINS 100, 300, and 203 with inverted polarity (See SD-4A024-01, -02, FS 20).
2. TSI bay is the same as TCONTR.

FA1784 and FA1785 (TSI-2)

L.O.D. Level From F-Level Trace	Horizontal EQL		Vertical EQLS			
	FA1784	FB1785	SPC0	SPC1	SPC2	SPC3
0	26	15	28	40	52	64
1	26	15	28	40	52	64
2	21	15	28	40	52	64
3	21	15	28	40	52	64
4	12	14	28	40	52	64
5	12	14	28	40	52	64
6	07	14	28	40	52	64
7	07	14	28	40	52	64

Notes:

1. Data present at FA1784 PIN 214 (even levels) and PIN 014 (odd levels) with inverted polarity (See SD-4A08401, FS 5).
2. TSI bay is the same as TCONTR.

Octal-Decimal Conversions

Table 4-A. Octal-Decimal Integer Conversion Table

OCT X=	0	1	2	3	4	5	6	7
000X	0000	0001	0002	0003	0004	0005	0006	0007
001X	0008	0009	0010	0011	0012	0013	0014	0015
002X	0016	0017	0018	0019	0020	0021	0022	0023
003X	0024	0025	0026	0027	0028	0029	0030	0031
004X	0032	0033	0034	0035	0036	0037	0038	0039
005X	0040	0041	0042	0043	0044	0045	0046	0047
006X	0048	0049	0050	0051	0052	0053	0054	0055
007X	0056	0057	0058	0059	0060	0061	0062	0063
010X	0064	0065	0066	0067	0068	0069	0070	0071
011X	0072	0073	0074	0075	0076	0077	0078	0079
012X	0080	0081	0082	0083	0084	0085	0086	0087
013X	0088	0089	0090	0091	0092	0093	0094	0095
014X	0096	0097	0098	0099	0100	0101	0102	0103
015X	0104	0105	0106	0107	0108	0109	0110	0111
016X	0112	0113	0114	0115	0116	0117	0118	0119
017X	0120	0121	0122	0123	0124	0125	0126	0127
020X	0128	0129	0130	0131	0132	0133	0134	0135
021X	0136	0137	0138	0139	0140	0141	0142	0143
022X	0144	0145	0146	0147	0148	0149	0150	0151
023X	0152	0153	0154	0155	0156	0157	0158	0159
024X	0160	0161	0162	0163	0164	0165	0166	0167
025X	0168	0169	0170	0171	0172	0173	0174	0175
026X	0176	0177	0178	0179	0180	0181	0182	0183
027X	0184	0185	0186	0187	0188	0189	0190	0191
030X	0192	0193	0194	0195	0196	0197	0198	0199
031X	0200	0201	0202	0203	0204	0205	0206	0207
032X	0208	0209	0210	0211	0212	0213	0214	0215
033X	0216	0217	0218	0219	0220	0221	0222	0223
034X	0224	0225	0226	0227	0228	0229	0230	0231
035X	0232	0233	0234	0235	0236	0237	0238	0239
036X	0240	0241	0242	0243	0244	0245	0246	0247
037X	0248	0249	0250	0251	0252	0253	0254	0255

DECIMAL

Table 4-A. Octal-Decimal Integer Conversion Table (Contd)

OCT X=	0	1	2	3	4	5	6	7
000X	0000	0001	0002	0003	0004	0005	0006	0007
041X	0264	0265	0266	0267	0268	0269	0270	0271
042X	0272	0273	0274	0275	0276	0277	0278	0279
043X	0280	0281	0282	0283	0284	0285	0286	0287
044X	0288	0289	0290	0291	0292	0293	0294	0295
045X	0296	0297	0298	0299	0300	0301	0302	0303
046X	0304	0305	0306	0307	0308	0309	0310	0311
047X	0312	0313	0314	0315	0316	0317	0318	0319
050X	0320	0321	0322	0323	0324	0325	0326	0327
051X	0328	0329	0330	0331	0332	0333	0334	0335
052X	0336	0337	0338	0339	0340	0341	0342	0343
053X	0344	0345	0346	0347	0348	0349	0350	0351
054X	0352	0353	0354	0355	0356	0357	0358	0359
055X	0360	0361	0362	0363	0364	0365	0366	0367
056X	0368	0369	0370	0371	0372	0373	0374	0375
057X	0376	0377	0378	0379	0380	0381	0382	0383
060X	0384	0385	0386	0387	0388	0389	0390	0391
061X	0392	0393	0394	0395	0396	0397	0398	0399
062X	0400	0401	0402	0403	0404	0405	0406	0407
063X	0408	0409	0410	0411	0412	0413	0414	0415
064X	0416	0417	0418	0419	0420	0421	0422	0423
065X	0424	0425	0426	0427	0428	0429	0430	0431
066X	0432	0433	0434	0435	0436	0437	0438	0439
067X	0440	0441	0442	0443	0444	0445	0446	0447
070X	0448	0449	0450	0451	0452	0453	0454	0455
071X	0456	0457	0458	0459	0460	0461	0462	0463
072X	0464	0465	0466	0467	0468	0469	0470	0471
073X	0472	0473	0474	0475	0476	0477	0478	0479
074X	0480	0481	0482	0483	0484	0485	0486	0487
075X	0488	0489	0490	0491	0492	0493	0494	0495
076X	0496	0497	0498	0499	0500	0501	0502	0503
077X	0504	0505	0506	0507	0508	0509	0510	0511

DECIMAL

ASCII/Teletypewriter/Hexadecimal Conversion Table

		1st Hexadecimal Character							
2nd H e x a d e c i m a l C h a r a c t e r	H E X	0	1	2	3	4	5	6	7
	0	NUL	D L	SPACE	0	@	P	'	p
	1	S H	D 1	!	1	A	Q	a	q
	2	S X	D 2	"	2	B	R	b	r
	3	E X	D 3	#	3	C	S	c	s
	4	E T	D 4	\$	4	D	T	d	t
	5	E Q	N K	%	5	E	U	e	u
	6	A K	S Y	&	6	F	V	f	v
	7	△	E B	'	7	G	W	g	w
	8	B S	C N	(	8	H	X	h	x
	9	➤	E M	)	9	I	Y	i	y
	A	≡	S B	*	:	J	Z	j	z
	B	V T	E C	+	;	K	[	k	{
	C	F F	F S	,	<	L	\	l	!
	D	←	G S	—	=	M	]	m	}
	E	S O	R S	.	>	N	^	n	~
	F	S I	U S	/	?	O	—	o	//

Peripheral Unit Bus (PUB)

Introduction

The PUB is the primary means of communication between the central controls (CCs) and the 4ESS switch peripheral frames. The PUB is duplicated (PUB0, PUB1) for reliability. Normally, one PUB is designated active, and the other is standby. The CCs are configured to send/receive on the PUBs according to the states of PUB0, PUBA, PUBT and PUBR (See Interrupt Data Layout Register—CSC Register).

Each PUB consists of twelve 8-pair cables or 96 twisted pair. Eight cables (64 pair) are used to send data to the peripheral frames and form the PUEA, PUWB and PUCB portions of the PUB. Four cables (32 pair) are used to receive data from the peripheral frames and form the PURB portion of the PUB. Each twisted pair acts as an ungrounded, balanced transmission line and is terminated in a 100 OHM bus terminating resistor (BTR).

The PUBs originate at the CC and are fanned-out into a maximum of 8 bus branch pair (for example, branches A/B, C/D, ' ' , O/P) via the peripheral bus branching frame (PUBB). The PUBB controls PUB power via the power control switches (PUB0, PUB1) and also provides a loop-around register for testing the PUB (see peripheral unit bus branching frame—Loop-around Mappings). Each bus branch is wired serially to all the peripheral frames connected on that branch and terminates in a BTR (100 ohm).

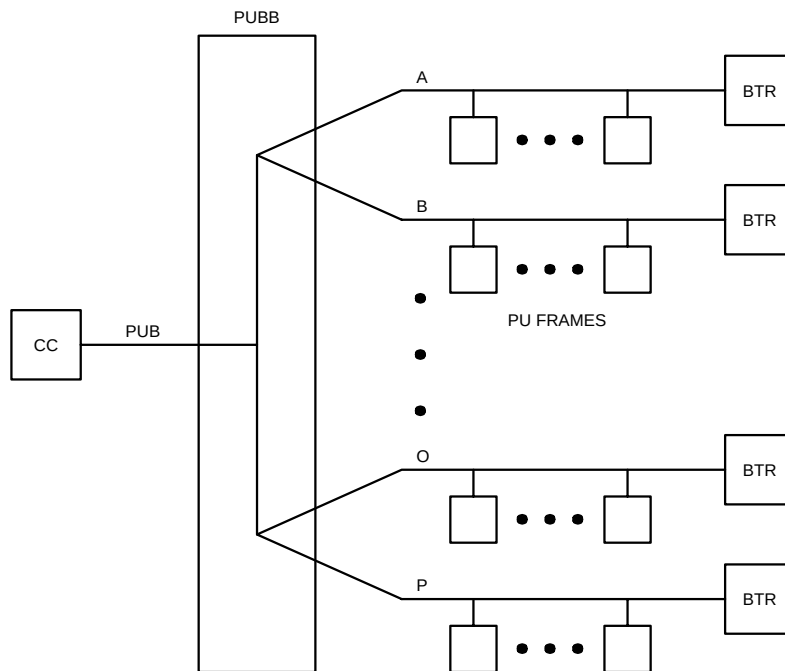
The peripheral frames connect to the PUB via cable drivers (PURB) and cable receivers (PUEA, PUWB, PUCB). The cable driver transformers are connected in parallel across each twisted pair and can be removed during circuit pack replacement with no disruption to the integrity of the bus. The cable receivers, on the other hand, use a serially connected balanced pickoff transformer (one coil in each side of the twisted pair) which, if removed, could open up the bus.

Introduction (Contd)

This is prevented by installing a permanent 4.99 ohm bypass resistor across each of the transformer coils. If the cable receiver circuit pack is removed, the bypass resistor maintains the integrity of the bus. Some bus problems can be traced to a missing or defective bypass resistor and shows up as a missing bit(s) on the PUB when a cable receiver circuit pack is removed.

See AT&T 234-110-010—*Peripheral Unit Bus System Description* for additional information.

Fanout

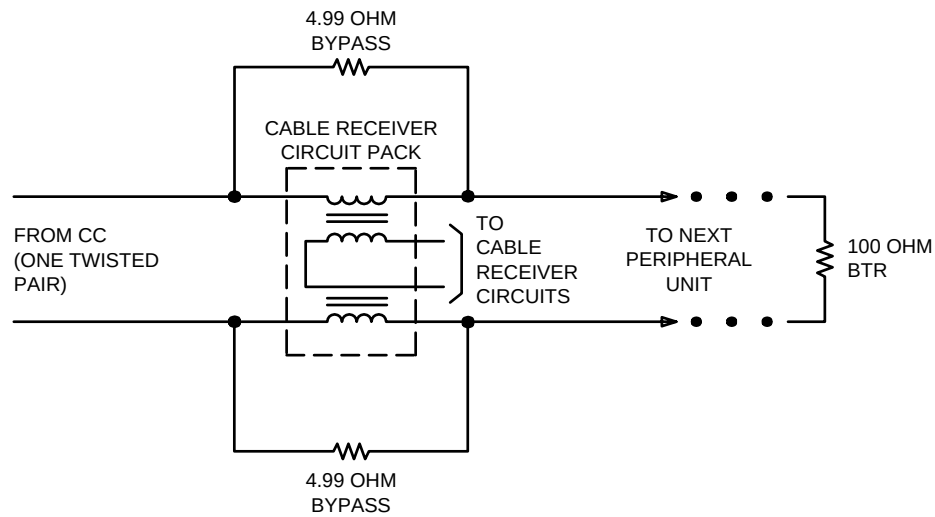


Legend:

BTR = Bus Terminating Resistor
CC = Central Control

PU = Peripheral Unit
PUBB = Peripheral Unit
Bus Branching

Bypass Resistors



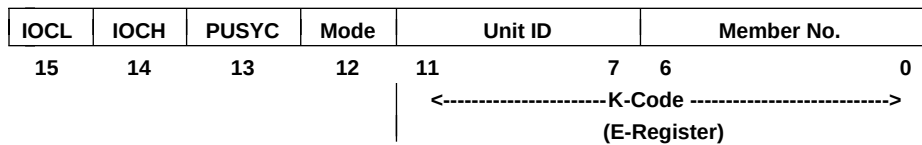
Four Divisions of the Peripheral Unit Bus

The following are the four divisions of the PUB:

Bus	Acronym	Function	Size (Pairs)
Peripheral Unit Enable Address Bus	PUEA	Sending orders	16
Peripheral Unit Write Bus	PUWB	Sending orders	40
Peripheral Unit Reply Bus	PURB	Receiving replies	32
Peripheral Unit Control Bus	PUCB	Interrogating frames	8

A description of each bus follows.

Peripheral Unit Enable Address (PUEA) Bus Format



(See Interrupt Data Layouts for register descriptions)

Bit 0-11 = K-Code from E-register (See "K-Codes" in Volume 2)

0-6 = Member No. (Frame member number)

7-11 = Unit type identification

12 = Mode (0 = Operational order, 1 = Maintenance order) from CC PSC register Bit 8 (MTCPU)

13 = PUSYC — SYNC pulse for oscilloscope, sent .5 microsecond ahead of every peripheral order to all frames to clear their input register.

14 = IOCH — Input/output clock high pulse generated by 1B CC

15 = IOCL — Input/output clock low pulse generated by 1B CC

Peripheral Unit Write Bus (PUWB) Format

P2	P1	NC	DSYNC	OPCODE	Address Subfield	Instruction Data
39	38	37	36	35	29 28 24	23 0
				<-----MOPCODE-----> (PRM)		<-----Data-----> (PRL)
				<-----P-Register----->		

(See Interrupt Data Layouts for register descriptions)

Bit 0-35 = P-Register

0-23 = PRL (P-register least significant bits) — Data for PU frame

24-35 = PRM (P-register most significant bits) — MOPCODE (Modified OPCODE) contains OPCODE (29-35) and address subfield/supplementary OPCODE (24-28)

36 = DSYNC (Diagnostic SYNC pulse)

37 = No connect (Not presently used)

38 = P1 — Parity bit over odd bits of E and P-registers (odd parity)

39 = P2 — Parity bit over even bits of E and P-registers (odd parity)

Peripheral Unit Reply Bus (PURB) Format

NC	NC	NC	APUB	APUT	APUF	PAR	ASW	Reply Data
31	30	29	28	27	26	25	24	23
			<---- Response ---->					0
			TO CLKI					

(See Interrupt Data Layouts for register descriptions)

Bit 0-23 = Reply data from frame in response to a peripheral order. Destination is the CC L-register. If the reply data is not identical on both PUBs, the CCs mismatch causing an F-level interrupt (PUF) (RMEGCP, RMEPU — see CC PES-register bits 16 and 17)

24 = ASW—All seems well from frame if order is successful. Otherwise, the frame inhibits ASW and causes an F-level interrupt (PUF) (ASWEPU — See CC PES-register bit 6 and CC INS-register bit 5)

25 = PAR—Answer parity (odd parity) over reply data bits 0-23. IF CC receives bad parity it generates an F-level interrupt (PUF) (APEPU, AP0PU, AP1PU — See CC PES-register bits 2, 3, 7 and CC INS-register bit 5)

26 = APUF—Autonomous peripheral unit failure. Response to CLKI interrogate pulse on PUCB. Causes an F-level interrupt (APUF) (See CC INS-register bit 4)

27 = APUT—Autonomous peripheral unit trouble. Response to CLKI interrogate pulse on PUCB. Causes an interject (APUT — See CC PES-register bit 9 and APINJ — See CC INJ-register bit 13)

28 = APUB — Autonomous peripheral unit base (not presently used) (APUB — See CC PES-register bit 8)

29-31 = No connect (not presently used)

Peripheral Unit Control Bus (PUCB) Format

PIO	PDG	PSZ	PLP	PHP	CLKI	GI	MI
7	6	5	4	3	2	1	0
<----- Interrogation Control Group ----->							

(Bits generate reply data on PURB)

Bit 0 = MI—Member interrogate pulse. Frames with errors respond with a member no. Bit on the PURB (See MI/GI responses).

1 = GI—Group interrogate pulse. Frames with errors respond with a group number on the PURB (See MI/GI responses).

2 = CLKI—Clock interrogate pulse. Frames with errors respond with APUF, APUT, or APUB bit on the PURB. These bits cause F-level, interject, or base level interrupts, respectively. CC sends the clock I pulse every 16 cycles.

3 = PHP—Poll high priority buffer (DIF/SP 0-23). All frames respond with 0 = buffer not empty or 1 = buffer empty.

4 = PLP—Poll low priority buffer (DIF/SP 0-23). All frames respond with 0 = buffer not empty or 1 = buffer empty.

5 = PSZ—Poll seizure buffer (DIF/SP 0-23). All frames respond with 0 = buffer not empty or 1 = buffer empty.

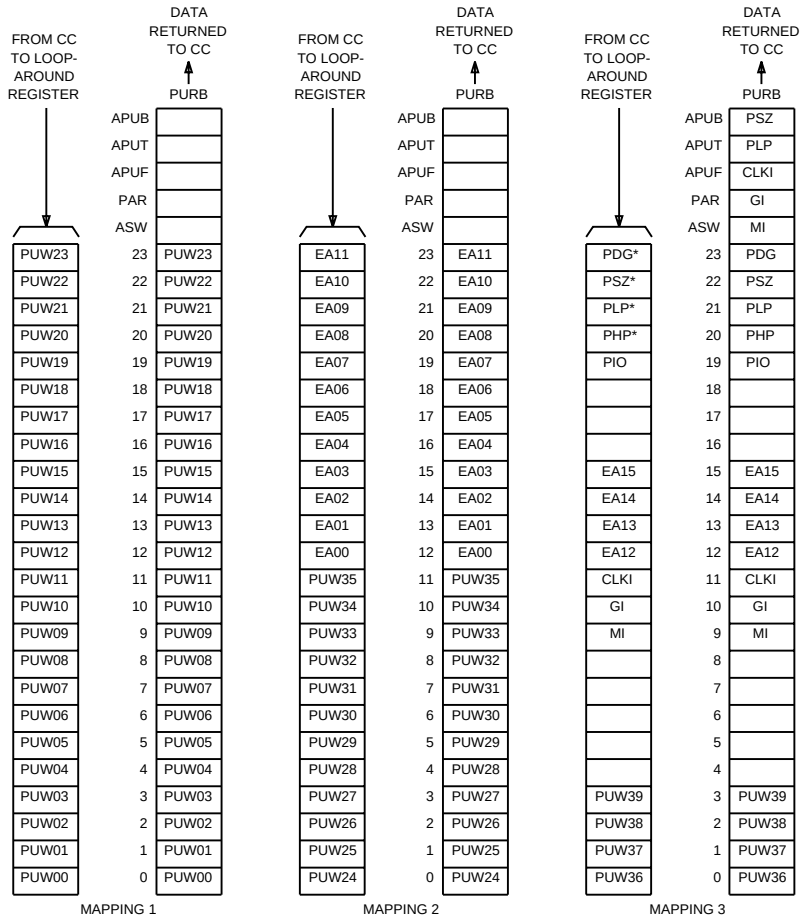
6 = PDG—Poll digit buffer (DIF/SP 0-23). All frames respond with 0 = buffer not empty or 1 = buffer empty.

7 = PIO—Poll IO frames.

⇒ NOTE:

DIF/SP 24-31 and SCS 0-7 use 4 special GCP interrogation pulses (PDG' PSZ' PUP' PHP') for polling the buffers. These frames are isolated on a special branch of the PUB.

Peripheral Unit Bus Branching Frame (PUBB) Loop-Around Mappings



Refer to Notes 1 and 2.

Peripheral Unit BUS Branching Frame (PUBB) Loop-Around Mappings (Contd)

**NOTE 1:**

PUB Data is sent from the CC via the PUEA, PUWB, PUCB and is intercepted by the loop around register, as shown. The loop around register sends the PUB data back to the CC via the PURB.

**NOTE 2:**

PUW__ Symbols represent bits sent on PUWB

EA__ Symbols represent bits sent on PUEA

The remaining bits are sent on the PUCB.

- * For expanded polling branch(es), only the original PDG, PSZ, PLP, PHP bits are looped and checked by the PUB diagnostic. The new expanded PDG', PSZ', PLP', PHP' bits are not looped and must rely on the DIFE1 (24-31) and SCS (0-7) diagnostics for integrity check.

Schematic Diagram List

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Schematic Diagram List

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Processor Equipment Schematic Diagrams

⇒ **NOTE 1:**

An "F" following a schematic diagram number indicates a unit interconnection drawing.

⇒ **NOTE 2:**

Appropriate dash numbers which correspond with local equipment must be utilized.

1B Cabinet

4A145	1B Processor Frame Circuit
4A146	Bus Driver/Receiver Unit Circuit
4A147	Interface Bus Unit Circuit
4A148	Central Control and Store Unit Circuit
4A149	Call Store Unit Circuit
4A150	Fuse and Interframe Communication Circuit
4A180	Filter Unit Circuit

Attached Processor Interface (API)

5A056(F)	API Frame
5A055	API Unit Circuit
5A024	Data Unit Selector Circuit

Input/Output (I/O)

5A021(F)	I/O Unit
5A023	I/O Peripheral Bus Circuit
5A049	Microprocessor Community Circuit
5A052(F)	I/O Processor Frame Circuit
4C049	I/O Processor Growth Unit Circuit

Tape Frame

5A025(F)	Tape Unit Controller

4ESS Switch Equipment Schematic Diagrams

Common Channel Interoffice Signaling (CCIS)

4A054(F)	Terminal Basic Frame Circuit
4A055(F)	Terminal Supplementary Frame Circuit
4A056	Peripheral Bus Interface Circuit
4A057	Terminal Access Circuit
4A058	Terminal Basic Power Control Circuit
4A059	Terminal Power Control Circuit (SUPP Frame)
4A064	Continuity Check Transceiver Circuit
4A098	Amplifier and Pad Circuit
94833	Common Channel Interoffice Signaling (CCIS) Terminal
73090	Data Set 201D
94872	CCIS Terminal Modem Interface Circuit
94874(F)	Data Set Frame Circuit
1D295	Data Set Mounting Unit
1D301	Data Set 2048A

Common Channel Signaling System 7 (CCS7)

3F006	Digital Facility Access Frame Circuit
3F007	Ring Node Frame Circuit
3F008	3B Interface Unit Circuit
3F009	Link Node Unit A Circuit
3F010	Link Node Unit B Circuit
3F019	Application Schematic
3F022	Fuse Panel and Alarm Control Unit
3F028	Digital Facility Access (DFA) Frame
3F029	Digital Facility Access Unit
3F037	Ring Node Circuit
3F038	DS1 Unit A
3F039	DS1 Unit B
3F048	High Density Integrated Ring Node (IRN) Unit
94874	Data Frame Circuit

Digital Interface Frame (DIF)

5G208	Digital Interface Circuit

Digital Interface Frame-Export 1 (DIF-E1)

5X400	Digital Interface Circuit-Export 1

Digroup Terminal (DT)

6G114	Digroup Terminal

Expanded Time-Slot Interexchange (XTSI)

4A080	4ESS Scan and Distribution Point Rules
4A196	XTSI Cabinet
4A197	XTSI Fuse and Fan Unit
4A198	XTSI Control (XTC) Unit
4A199	XTSI Fabric (XTF) Unit
4A209	XTSI Fan Unit Schematic

Echo Suppressor Terminal (EST)

5G168	Echo Suppressor Terminal Circuit
5G169	Echo Suppressor Terminal Circuit Pack INFO

Network Clock (NCLK)

4A014(F)	NCLK Frame Circuit
4A036	NCLK Unit Circuit
4A037	System Clock and Bus Controller Circuit
4A105	NCLK Synchronization Circuit

Network Management (NM)

4A073	Display Console Circuit
4A074	Display Wall Unit
4A075	Remote and Distributor Circuit
4A076	Dynamic Overload Control Transmitter Circuit
4A077(F)	Display Frame
4A079(F)	Display Frame Circuit
4A082	43A1 Carrier Telegraph IF Circuit

Peripheral Unit Bus Branching (PUBB)

4A019(F) Peripheral Unit Bus Branching Circuit
4A038 Bus Branching and Loop-Around Circuit
4A091 PUBB Access Circuit

Remote Measurement System-Digital 2 (RMS-D2)

1P212 Remote Measurement System—Digital 2

Remote Office Test Line (ROTL)

4A021(F) ROTL Frame Circuit
4A061 ROTL Unit Circuit
4A062 Test Line Circuit

Service Circuit System (SCS)

4A170 SCS Applications Schematics

Signal Processor 1 (SP1)

4A013	Control Circuit
4A018	Control Circuit
4A028(F)	Control Frame Circuit
4A046(F)	Distributor and Scanner Matrix Frame
4A047(F)	Distributor Applique Frame
4A048	Scanner Matrix
4A049	Distributor Matrix
4A050	Distributor Applique Relay Point Circuit
4A051	Scanner Access
4A052	Distributor Access
4A063	Distributor Applique Pulse Point Circuit
4A093	Distributor and Scan Matrix Frame Circuit
4A094	Distributor and Scan Matrix Access Circuit
4A095	Distributor and Scan Matrix Point Circuit

Signal Processor 2 (SP2)

4A063	Distributor Applique Pulse Point Circuit
4A065(F)	Control Frame
4A066	Peripheral Bus Access Circuit
4A067	Control Circuit
4A068(F)	Supplementary Matrix Frame Circuit
4A069	Supplementary Matrix Access Circuit

Time Multiplex Switch (TMS)

4A012(F)	TMS-A Frame Circuit
4A026	Controller and Bus Interface Circuit
4A027	Switch Unit Circuit
4A087(F)	TMS-B Frame Circuit
4A088	Controller and Bus Interface Circuit
4A089	Switch Unit Circuit
4A090	Peripheral Bus Access Circuit

Time Slot Interchange (TSI)

4A011(F)	TSI Frame Circuit
4A022	Peripheral Bus Interface Circuit
4A023	Timing and Control Circuit
4A024	7 X 8 Switching and Permuting Circuit
4A083(F)	TSI-2 Frame Circuit
4A084	7 X 8 Switching and Permuting Circuit (TSI-2)
4A085	TSI-2 Controller

Voiceband Interface Frame (VIF)

5G156(F)	Voiceband Interface Frame
5G157(F)	Voiceband Interface Unit
5G158(F)	Voiceband Interface Circuit
5G159	Voiceband Interface Unit Control Point Switches (CPS)
5G160	Voiceband Interface Controller and Miscellaneous Frame CPSs

Miscellaneous Circuit (Numerical Order)

4A001	Key Sheet
4A002-02	Current Drain Data
4A004	Circuit Pack Information
4A007	Interframe Communication Circuit
4A008	DC Power Distribution Circuit
4A009	AC Power Distribution Circuit (MISC A Frame)
4A010	Office Alarm Grid Circuit (MISC A/B Frame)
4A016	I/O Terminals Connections Circuit
4A025(F)	Miscellaneous Frame Circuit A
4A062	105 Test Line
4A078(F)	Miscellaneous Frame Circuit B
4A080	Assignment Rules for SP Frames
4A109(F)	Miscellaneous Frame Circuit C

Miscellaneous Equipment Schematic Diagrams

Drawing Number	Part of	Drawing Title
1C585		71J Access Panel
1P105		CMS 1B AND 1C
1P015	51A	Key Set Circuit
1P016	51A	Key Set Register and MF Generator Control Circuit
1P017	51A	Communication and Alarm Circuit
1P019	51A	Test Equipment Access Circuit
1P020	51A	Test Access Trunk Circuit
1P021	51A	2600-HZ Supply Circuit
1P022	51A	Transmission Measuring SYS Circuit
6G048	51A	58C Loop-Around Unit
81975	820A	Inverter Circuit
82156	820A	Circuit Pack Schematics
82157(F)	820A	Ring and Tone Frame
94800		Tone Detector
95277-02		Milliwatt Tone Gen. and Panel
96613		Precision Amplifier Circuit
97723	RA	Drum Storage Unit Circuit
97724	RA	Circuit Pack Schematic
97725(F)	RA	Recorded Announcement Circuit
NS-00291	PAS	Phased Announcement System
1C155		Multifrequency (MF) Signaling Test Circuit
1C378		Carot
1C453(F)		Metallic Trunk Frame

Miscellaneous Equipment Schematic Diagrams (Contd)

Drawing Number	Part of	Drawing Title
1C476		Circuit Maintenance System (CMS) Interface Register Bank Circuit
1C488		MF Transmitter
1C489		Common Tone Supply Circuit
1C490		MF Receiver
7C013(F)		Direct Formed Supergroup Frame W/F Signaling
1C498(F)		MF Frame
7C015(F)		Direct Formed Supergroup Frame W/O F Signaling
99480		D3 Channel Bank
3C304		D4 Channel Bank
99552		A-6 Unitized Terminal Equipment (UTE)
82047		-48 V BDFB
82097	620A	Converter Circuit
82098	620A	Discharge Circuit
82106		DC-DC Converter
82107	620A	Converter Control Circuit
82188-01		+140 V Area Bus Center
82194-01		DC Power DIST Circuit
82348-01	526A	Power Plant - Application Schematic Diagram
82349-01	526A	Inverter Circuit
51893	LT-1	LT-1 Connector Digital Access Unit

Teletype Messages

6

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Teletype Messages

6

Common Channel Interoffice Signaling Messages

ALW:TGR a,TER c!
DGN:TGR a,TER c!
EX:TGR a,TER c;START!
RMV:TGR a,TER c!
RST:TGR a,TER c!
SW:TGR a!
DUMP:TGR a,TER c,CREG!
DUMP:TGR a,IREG!
DUMP:TGR a,TER c,MEM d-e!

d-e = First address minus last address

Common Channel Interoffice Signaling Messages (Contd)

CFR:SIGLK a,VFL b!
OP:SVCSSTAT!
RMV:SIGLK a!
RST:SIGLK a!
TEST:SIGLK a,VFL b!
OP:SLKSTAT a!
MON:SUTRAP; { Send | Receive | Send,Receive }:
 {SIGLK[,Illegal] | CIN } ! (CCITT6 Only)
STOP:MON;SUTRAP;{ Send | Receive | Send,Receive }:
 {SIGLK[,ILLEGAL] | CIN } ! (CCITT6 Only)
OP: SLCSTAT; SLC a! (CCITT6 compliment SLC)
OP: BANDSTAT; SIGLK a!
TEST:TRK,TSN a,TIC!

STOP: MON; SUTRAP!

Circuit Identification Number Information

VER:TSG:CIN OATM* RTOT ****aaa*!

BTFN **MC** **SC**

This example specifies the circuit identification number (CIN) for a nonmessage trunk subgroup that is to be verified. Asterisks are used where no information is necessary. The CIN is made up of the following components:

BTFN = Base traffic number—The BTFN is equal to zero for all nonmessage trunk subgroups.

MC = Major category—This field is used to define the major category of a nonmessage trunk. (See CIN keywords.)

SC = Subcategory—This field is used to further define the function of the nonmessage trunk. (See CIN keywords.)

aaa = Local alphanumeric office code

Circuit Identification Number Keywords

Nonmessage Trunk Subgroup

ATM*—Automatic Trunk Measuring

RT0T	=	Remote office test line (ROTL) Port 0 test trunk
RT1T	=	ROTL Port 1 test trunk
RT0A	=	ROTL Port 0 access circuit
RT1A	=	ROTL Port 1 access circuit
RPCS	=	ROTL Port access circuit secure
RPCU	=	ROTL Port access circuit unsecure

CLN*—Code Line Test Circuit

TAT*	=	51A Testboard, test access trunk
105*	=	The 105 code is associated with the ATMS responder.
108T	=	108 Test trunk for echo suppressor test
108A	=	108 Access trunk for echo suppressor test
TND*	=	Tone detector test circuit

MIS*—Miscellaneous

CKEY	=	Centralized automatic message accounting (CAMA) keying
CTLK	=	CAMA talking
CCWS	=	CAMA call waiting/suspension
TERM	=	CCIS terminal
OBS0	=	Service observing trunk A (Circuit 0) connects to the outgoing trunk
OBS1	=	Service observing trunk B (Circuit 1) connects to the outgoing trunk

SVC*—Service Circuit

MFR*	=	Multifrequency receiver
MFx*	=	Multifrequency transmitter
XCVR	=	CCIS transceiver
XCVT	=	CCIS transceiver test circuit
MFRT	=	Multifrequency receiver test circuit
MFXT	=	Multifrequency transmitter test circuit

TAS*—Tone and Announcement Circuits

ANN*	=	Recorded announcement circuit
TONE	=	Tone circuit
MWAT	=	Milliwatt test is a 1000-HZ tone at one milliwatt power level.

Error Analysis Program

Sort—Frame Type or Specific Frame

IN:ERAPCOND SP:DATA1 RCNTHIST,ITEM1 DUTYP,EQ,VALUE 002!

Frame Type	Value
DT	014
EST	007
NC	003
PUBB	160
SC	015
SP	002
TGR	006
TMSP	004
TSI	005
VIF	013
DIF	010

Messages

ALW:ERAP *a*!

a = Function to be allowed

AUD:ERAPDATA *a*!

a = Function to be audited

CLR:ERAPCOND *a*!

CLR:ERAPCOND *a*;UCL!

CLR:ERAPDATA *a*:MFNUM *b*!

CLR:ERAPSRES *a*!

CLR:*a*;UCL!

IN:ERAPCOND *a*:DATA1 *b*,ITEM *c*,GE,VALUE *d*!

IN:ERAPDATA REPAIREC:*a*,MFNUM *c*,TRNUM *d*!

INH:ERAP *a*!

OP:ERAPCOND *a*!

OP:ERAPCOND;SUM!

OP:ERAPDATA *a*:ITEM *d*:MFNUM *b*!

OP:ERAPDATA *a*:ITEM *d*:SRES *c*!

OP:ERAPDATA *a*:MFNUM *b*!

OP:ERAPDATA *a*:SRES *c*!

OP:ERAPDATA *a*:WORD *e*:MFNUM *b*!

OP:ERAPDATA *a*:WORD *e*:SRES *c*!

OP:ERAPDATA:MRNUM *a*!

OP:ERAPSRES *a*!

OP:ERAPSRES;SUM!

OP:ERAPSUM!

OP:ERAPSUM;DETL:MFNUM *a*,FILEDATE *b*!

STOP:OP;ERAP!

UPD:ERAP FSDATA!

Copy Generic 1600 BPI and 4MM on APS (Does Not Include Tape-Only Program)

If normal file is to be copied—

AUD:NUM (43,44,45,66,72)!
COPY:UPDATE:GEN *a*,MT *b*!

If update file is to be copied—

VER:APPFILE UPD!
COPY:UPDATE: GEN *a*,MT *b*!

a = NORM (Write from normal file)
or

UPD (Write from update file)

b = Tape unit number (0 or 1)

Library Programs

Package	Program	Description
LG23FLDS	TGAP	Trunk Group Assignment Program
	LIB1	Field Support Library Program 1
LG23NETX	NETX	Network Exercise Library Program
LG23PGRO	XAPP	1B Processor Translation Alteration and Print Program
LG23PKG1	ERLI	Error Analysis Library Program
LG23TMSG	TMSG	Time-Multiplexed Switching Growth Program
23 = Generic Number		

Example messages:

```
LOAD:LIBSYS, FS;TAPE:PKG LG23PKG1!  
EX:LIBSYS:PKG LG23PKG1, PGM ERLI, TASK 0, CLIENT 0!  
IN:LIBSYS:CLIENT 0, WORD 0, BCD (01 2380,000000,012480,240000)!  
IN:LIBSYS:CLIENT 0, OCT (0,0,0)!
```

Load Library Tape

Write Library Tape

COPY:UPDATE LIB NORM, MT A!

Load Library Tape From Tape

OP:LIBSTAT,FS!
LOAD:LIBSYS,FS;TAPE:TD a!

Load Library Tape From Backup Tape

VER:UPDATE:TAPE,MT a!
AUD:LIBSYS,TD a;UCL!

Loop Messages

EX:SP 0, CONTR 1;START:PUB 1!
EX:SP 0:SYNC 1435,ENABLE 250!
EX:SP 0:PH 17,ADR 1420-1437!

Stop the loop
EX:SP 0!

Multifrequency Test

Receiver Test

TEST:TRK,CIN *bbcc*SVC*MFR*****ddd*;SVC:TSG,STAT
MTC.DSA<AUT>,PALL!

bb = 0 TO 23, DIF Member number

cc = 0 TO 63, DIF MF Receiver number

ddd = Local alphanumeric office code

Transmitter Test

TEST:TRK,CIN *bbcc*SVC*MFx*****ddd*;TSG,STAT
MTC.DSA<AUT>,PALL!

bb = 0 TO 23, DIF member number

cc = 0 TO 63, DIF MF transmitter number

ddd = Local alphanumeric office code

Maintenance Operating Center Messages

ALW:FC *a*!
ALW:FLEV (APUFS PUFs)! INH:
ALW:AUD:NUM 43,66! INH:
ALW:INFCRCD! INH:
ALW:MACLI,CLASS MTCE!
ALW:MUPAUD,MUP*a*;BANK *b*,[NUM {*c* | (*c*,*c*[*c*...])}]!
ALW:DGRPT!
ALW:NCATANOM,TRAPN *a*!
ALW:RINGOVLd!
ALW:UPAD!
CLR:ADSFUNC SRM!
CLR:MACLI,CLASS *a*!
CLR:MSGRCd,FS!
COPY:OWBUF!
DGN:CC *a*;RPT 5,RAW,UCL:PH 1-21,TLP!
DUMP:PSS,ADR 14601416,L 24!
DUMP:MUP,ACT,ADR *a*[,SIZE *b*,DISP *c*][,L *d*]!
IN:OWBUF:ADR *a*,DATA *b*!
INH:MACLI,CLASS MTCE; REX ALL!
INH:DGRPT!
INH:FC *a*!
INH:NCATANOM,TRAPN *a*!
INH:RINGOVLd!
INH:UPAD!
INIT:ALM!
LOAD:MUP,ACT,ADR *a*[,SIZE *b*,DISP *c*][,L *d*]:*e*!
MON:CHAN *a*(;CHAN *b*)!
OP:ALMSTAT!
OP:CLK!
OP:CSSTATUS!
OP:DUSTATUS!

Maintenance Operating Center Messages (Contd)

OP:ERAPDATA:MRNUM *a*!
OP:ERAPDATA [*b*]:{MFNUM *c*| SRES *d*}!
OP:ERAPDATA *b*;{ITEM *e*| WORD *f*}:{MFNUM *c*| SRES *d*}!
OP:INHINT!
OP:FERAHIST,ALL!
OP:FERAHIST,SCLK*a*,NCSUB*b*!
OP:MACLI,CLASS MTCE,SUBCLASS 0!
OP:MSGRCD,FS!
OP:MUPAUD!
OP:MUPSTAT!
OP:NCATANOM,TRAPN *a*!
OP:PERIFINH!
OP:PHSEHST,CORE!
OP:PHSEHST,FS!
OP:PSSTATUS!
OP:RINGMNTR!
OP:TERAWTSG!
OP:TLPQUEUE;ALL!
OP:TONESTAT,BT60 1!
OP:UTILMTCH!
OP:XPWRSTAT!
ORD:TBITS;READ:CIN *a*!
RMV:CC 0!
RMV:CS *a*!
RMV:CSB *a*!
RMV:CS,MCODE *a*;FREEZE!
RMV:CS,MCODE *a*;FREEZE;OC,PH *b*!
RMV:PS *a*!
RMV:PSS,MCODE *a*;FREEZE!
RMV:PSS,MCODE *a*;FREEZE;OC,PH *b*!
RMV:PSB *a*!

Maintenance Operating Center Messages (Contd)

RMV:SSD *a*!
RST:CC 0(;UCL)!
RST:CS *a*[{;UCL | :TLP}]!
RST:CSB *a*[{;UCL | :TLP}]!
RST:MUP *a*[{;UCL | :TLP}]!
RST:PSB *a*[{;UCL | :TLP}]!
RST:RA *a*!
RST:SSD *a*[{;UCL | :TLP}]!
RST:TONE!
RST:XPWR *a*[;UCL | :TLP]!
RTE:CHAN *a*(;CHAN *b*)!
RTR:ALM!
SET:AUD:MAN!
SET:AUD:NORM!
SET:CLK:DAY MON,DATE 033176,TIME 105059!
SET:CS *a*;{NORM | MCODE *b*}[;UCL]!
SET:PS *a*;{NORM | MCODE *b*}[;UCL]!
SET:TUC *a*;FUNCTION *b*!
STOP:MUPAUD!
SW:CC!
SW:CC;UCL!
SW:MUP[;UCL]!
TEST:CC *a*[;RPT][TSTNO *b*]!
TEST:FC *a*!
TEST:MUPAUD,MUP *a*;BANK *b*,[NUM {*c* | (*c*,*c*[*c*...])}]!
TEST:SSD *a*!

Maintenance Operating Center Messages (Contd)

STOP:AUD;GEN!
STOP:MACLI,CLASS MTCE,SUBCLASS 0!
STOP:MON;CHAN *a*(;CHAN *b*!)
STOP:MSG!
STOP:OP;ERAP!
STOP:OP;MSGRCD,FS!
STOP:OP;TRKSTAT!
STOP:OP;TSGSTAT!
STOP:OVRWRT!
STOP:SET;TRKSTAT!
STOP:TEST;COREUPD!
STOP:TEST;PUSYS!
STOP:TEST;TRK!
STOP:UPD;CORE!
STOP:VERMSG!
SW:CC(;UCL)!
SW:DT *a*!
SW:PUB!
SW:SCLK *a*(;UCL)!
SW:SP *a*(;UCL)!
SW:VIF *a*(;VIU *b*)(;UCL)!
TEST:PUB *a*!
TEST:SYSPRFTO!
UPD:HDATA! (MTC ONLY)
VER:TRKNAME,CIN *c*;DETL!

Network Management (NWM)

Copy Network Management (1600 BPI and 4MM) on Attached Processor System

Copy:Update:NWM *a*,MT *b*!

a = NORM (Write from normal file)

or

UPD (Write from update file)

b = Tape unit number

Office Data Assembly

Copy Office Data Assembler (1600 BPI and 4MM) on Attached Processor System

COPY:UPDATE:ODA *a*,MT *b*!

a = NORM (Write from normal file)

or

UPD (Write from update file)

b = Tape unit number

On-Site Operational Report

Backup Tape—Re-enter on Attached Processor System

LOAD:APPTAPE:LTS, MT *a*! (Re-enters all blocks)

a = Tape unit number

LOAD:APPTAPE:ODIL, MT *a*!
(Re-enters 50 blocks)

a = Tape unit number

(This command restores office-dependent initial lists, 50 blocks [86-135])

Backup Tape—Write on Attached Processor System

COPY:APPTAPE:LTS, MT *a*!

a = Tape unit number

Peripheral Maintenance Operating System Messages (PMOS)

OP: PMOS; TCB! (Current PMOS executing tasks)
OP: PMOS; TRC! (PMOS Timed routine tasks)
OP: PMOS; CHAIN! (Current executing task & linkages)
INIT: PMOS, TCRTNUM *a*; ACTIVATE!
INIT: PMOS, TCRTNUM *a*; DEACT!

a = Timed routine task to be run or aborted



CAUTION:

Stops all PMOS tasks, and may cause system to hang up.

INIT:PMOS; ALL!
INIT:PMOS; UTIL, LVSAUD!
INIT:PMOS; UTIL, LVSAUD: DEPTH *b*!
INIT:PMOS; UTIL, LVSAUD: TASKID *c*!
INIT:PMOS; UTIL, LVSAUD: DEPTH *b*, TASKID *c*!

b = LVS Depth percentage

c = Specified task

INIT:PMOS; UTIL, FRMROUT!
INIT:PMOS; UTIL, END!

Recent Change Messages

OP:RCFORM *a*! Used to call up one of the recent change data (RCDM) forms. Forms are referenced by 3 digits.

Where *a* = 100 series TSG
 = 200 series TRK
 = 300 series Code
 = 400 series CAMA
 = 500 series RDB
 = 600 series MISC
 = 700 series Unit Type
 = 800 series Special

OP:RCBMSG,ORNU *d*! Prints a copy of a buffered message identified by an order number *a*:

Where *a* = 1 to 999999

OP:RCBORNU! Lists all order numbers in the recent change buffer area

OP:RCBSPACE! Prints the available buffer space

OP:RCRORNU,ALL!

OP:RCRORNU,LAST *a*! Lists the order numbers in the rollback area in reverse chronological order:

Where *a* = A decimal number or the word tape

RCCNL:RCBORNU *a*! Cancels a previously buffered MSG:

Where *a* = 1 to 999999

Recent Change Messages (Contd)

RCCNL:ROLLBACK;UCL! Rolls back the last entered recent change order number to its previous state.

RCTST:ORNU *a*! Performs defensive tests on the RCDM:
Where *a* = 1 to 999999

RCACT:ORNU *a*! Activates a previously entered recent change:
Where *a* = 1 to 999999

CLR:RCB! Causes all messages on the recent change disk buffer to be cleared.

CLR:CHAN! Clears any and all forms or MSGs from the channel on which it is input.

VER:ABSOLUTE Verifies messages that have many Variables. See input manual for exact format.

VER:CAMASCRN

VER:CODEGRP

VER:CODELIST

VER:RDB

VER:RDBLIST

VER:TRK

VER:TRKNAME

VER:TSG

VER:TSGLIST

VER:TTTE

VER:UTYPE

VER:MSG

Trunk Maintenance Messages

INIT:TPDT!
MON:IAOFC,NEW:IA *b*,TIMEON *c*,TIMEOFF,RPT!
OP:DGSTAT,DT 1,DTU 0,DG 0,NUM 999,STAT SLH!
OP:DGSTAT,DT 1,DTU 0,DG 0,NUM 999,STAT SLL!
OP:TPMAP!
OP:TRKSTAT,ALL:STAT MTC.DSA <NIU>!
OP:TRKSTAT,CIN *a*!
OP:TSGSTAT,SUM:ALL!
ORD:ALTIDMWF,OPR:CIN *a*!
ORD:ALTIVU;RLS:CIN *a*!
ORD:DLOOP;OPR,DURATION *a*:CIN *b*!
ORD:MWTF;OPR:CIN *a*!
ORD:MW;OPR,DURATION *a*:CIN *b*!
RTE:C101;TPAT *a*, TP *b*!
RTE:TP *a*;TP *b*!
SCHED:TRK TEST:TIMEON 2000,TIMEOFF 0600!
SET:CONN *a*;TP*b*:CIN *e*,MODE 9(DNBR *h*)!
SET:DCON *a*; CIN *b*, MODE *c* (DNBR *d*)!
SET:DCON *a*; RLS!
SET:TP *a*; ON!
SET:TRKSTAT *a*,ALL;SUM (:STAT *h*)!
SET:TSGATC,CIN OSVC*MFR*****ddd*:NORM!
ddd = Office code
SET:TSGEAC,CIN OSVC*MFR*****ddd*:NORM!
TRC:TRK,CIN *c*;HLD!
TRC:TRK,CIN *c*;RLS!
TRC:TRK,CIN *c*;TRC!

Tone Detector Circuit Test

RESTORE RT

RST:TONE,TPT *a*!

RST:TONE, AR *a*!

RST:TONE,BT60 *a*!

RST:TONE,BT120 *a*!

a = 0 or 1

RESTORE RA

RST:RA *a*,RACHAN *b*!

a = 0 or 1

b = 0 through 5

or

RST:RA *a*, ALL!

Output RA Status

OP:RASTAT *a*!

a = 0 or 1

Test Automatic Tone Detector

TEST:TRK,CIN *aaa* CLN*TDN*****ddd*;SVC:TSG,STAT MTC,PALL!

aaa = 0 through 3

ddd = Local alphanumeric office code

Trunk Out-of-Service List (TOSL)

Backup Tape—Re-enter on Attached Processor System

LOAD:APPTAPE:TOSL, MT *a*!

a = Tape unit number

Backup Tape—Write on Attached Processor System

COPY:APPTAPE:TOSL, MT *a*!

a = Tape unit number

Error Analysis Procedure

Backup Tape—Re-enter

LOAD:APPTAPE:ERAP,MT *a*!

a = Tape unit number

Backup Tape—Write

COPY:APPTAPE:ERAP,MT *a*!

a = Tape unit number

Load Trouble Locating Procedure from Tape

VER:UPDATE:TAPE,MT a!
LOAD:TLP;GEN "a";MT b!

Traffic and Plant Measurements (1600 BPI and 4MM)

COPY:UPDATE:TPM NORM,MT a!

4ESS™ Switch System Recovery Procedures

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4ESS™ Switch System Recovery Procedures

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System Recovery Procedures

Introduction

Purpose

These are procedures to restore 4ESS™ Switch service when a MAJOR service affecting incident has occurred. These procedures do not guarantee service restoral because many hardware and software failures can occur that can not be resolved by following these procedures. However, if these procedures are followed, service has a high probability of being restored.



WARNING:

*These procedures **should not** be used to replace the normal escalation maintenance procedures. These procedures are intended to be used only if assistance from higher levels of technical support can not be obtained quickly.*

The 4ESS Switch System Recovery Procedures should be reviewed at least once every six months by all 4ESS Switch maintenance personnel. Many of the recovery procedures, along with additional maintenance procedures, are provided in more detail in Task Oriented Practice (TOP) 234-351-002 — 4ESS Switch With 1B Processor System Maintenance Operations Center. These procedures should be reviewed periodically by all maintenance personnel to familiarize themselves with the maintenance procedures available.

Guidelines

These procedures are divided into six parts:

- (1) Introduction
- (2) 4ESS Switch Modified Recovery Procedures
- (3) 4ESS Switch Emergency Recovery Procedures
- (4) 4ESS Switch Manual Recovery Procedures
- (5) Attached Processor System Manual Recovery Procedures
- (6) Attached Processor System Emergency Recovery Procedures.

Each procedure identifies **Recovery Actions** that may clear the system problem. To use the recovery procedures contained in this document, follow the identified **Recovery Actions** in the order presented.

Modified Recovery Procedures

This procedure is for recovering the 4ESS Switch using modified recovery action phases. Phase completion times are dependent on call load, number of equipped trunks, etc.

Perform **Recovery Actions** in the order listed:

Recovery Action 1

Identify functions to be performed and applicable MCC Direct Data Insert keys using the following Direct Data Insert Key Identification table. At MCC terminal: Enter EAI page. Enter poke command 401,xx (xx = DDI key).

DDI Key	Function	Application
00	Leave all pests set during and after the phase. Leave audits in manual-only mode.	PH 1, 2, 3, 4
01	Roll back to tape 1	PH 3, 4
02	Roll back to tape 2	PH 3, 4
03	Roll back number of orders indicated by Page 120, Poke 940 (Display Section 1)	PH 2, 3, 4
04	Roll back to order number indicated by Page 120, Poke 940 (Display Section 1)	PH 2, 3, 4
05	Clear disk areas specified by system integrity program	PH 3, 4
06	Clear network management controls	PH 2, 3, 4
07	Initialize trunk OOS list (TOSL)	PH 3, 4
08-10	Reserved	
11	Restore duplex failed units	PH 3
11	Restore all units to duplex	PH 4
12-13	Reserved	
14	Allow duplex failed PUBB	PH 2, 3, 4, SR
15	Multiple tape SR *	SR

See notes at end of table.

DDI Key	Function	Application
16	Zero all call or program store memory not backed up on disk	AO, PC (pump)
17	Skip hashsum calculations. Skip ID2FS MAP checks.	SR, AO, PC
18	Bypass CC sanity tests and PU tests	PH 3, PH 4, SR, PC
19	Inhibit tape error correction procedure during an SR	SR
20	Inhibit MAP audit failures during an SR	SR
21	Inhibit store maintenance tests	SR, AO, PC (pump)
22	Not Used	
23	Allow duplex API failures during SR	SR (MIN CFG EMER MODE)
24	Skip MUP restart during PC/SR	PC, SR
25	Allow MUP supervisor mode utility SR	SR
26	Inhibit IFB access tests	PH 3, PH 4, SR
27	Inhibit automatic diagnostic	PH 3, PH 4, SR
28-31	Reserved	

* Not support for 4E19 generic program.

Legend:

AO - Activate Override
PC - Processor Configuration
PH - Phase(s)
SR - System Reinitialization

Recovery Action 2

Enter poke 84 (**MODIFY RECV**).

Recovery Action 3

Enter applicable **PHASE 1, PHASE 2, PHASE 3, or PHASE 4** (Poke 51-54).

Recovery Action 4

- Select applicable **SOFT A** key (Poke 02) or **HARD A** key (Poke 01).
- Allow sufficient time (_____ seconds) for system to recover.

Emergency Recovery Procedures

The use of this procedure should not circumvent any normal escalation strategy. Check for obvious problems and abnormal conditions before attempting 4ESS Switch emergency recovery:

- Power problems
- Work being performed on frames (CNS, Repairs, Growth, and others)
- Current recent change activity
- MCC terminal **EAI PC PROGRESSION CMPL** lamp remains unlighted
- Current overwrite installation [software change package (SCP), broadcast warnings Message (BWM), office data assembler (ODA), or Big generic utility program (GULP)]
- Sudden environmental changes (Air conditioning problems, electrical storm, etc.)
- Activity preceding incident
- APS MCRT Terminal **SYS EMER INDICATOR** remains lighted.



NOTE:

Contact your support organization within 5 minutes if the 4ESS Switch cannot be recovered.

PHONE NUMBER _____.

Identify system **Symptoms** and perform applicable **Recovery Actions** to restore system:

Symptom 1

1B Processor Repeated PC	— REPEATED PC lamp lighted on master control console (MCC) terminal EAI page
	— Continuous PCRV:B messages received
	— PC STATE continues to change on MCC EAI page
1B Processor Repeated Phases	— PHASES 1, 2, 3, and 4 remain highlighted on MCC EAI page.
1B Processor Rolling Phases	— A Phase 2 or 3 follows a previous phase within 15 minutes.

Recovery Actions

- Clear any major problems.
- If 3B Computer is down, perform **Recovery Actions** for **Symptom 2**.
- If 3B Computer is in Disk Independent Operation (DIOP), use 120 page to repair MHD subsystem.
- If work is being performed on a peripheral frame, power down frame IPUBs.
- If work is being performed on a 1B processor frame, power down processor unit.
- If problem develops with active peripheral unit bus (PUB), control console (CC), program store bus (PSB), call store bus (CSB), or auxiliary unit bus (AUB) unit while repairs are being performed on mate:

Recovery Actions (Contd)

1. Attempt 4ESS Switch Manual Recovery Procedures
 2. If 4ESS Switch Manual Recovery fails, continue repairs.
- If an overwrite, recent change, growth, or 1B file is suspect, select the following MCC keys:
 1. Display active units (Poke 118)
 2. Obtain EAI Page (Depress EAI Key)
 3. Force active configuration [Poke 01 (twice)]
 4. If **NORM FILE**, enter Poke 61
 5. If **UPDATE FILE**, enter Poke 62
 6. Select **MODIFY RECV** (Poke 84)
 7. **DIS AUTO PC** (Poke 70)
 8. Reset **DDI** Keys to **0** (Poke 402)
 9. Set **DDI** Key 17 to **1** (Poke 401, 17)
 10. **Hard A** (Poke 01)
 11. If **NORM FILE**, enter **UPD:COMMIT;NORMFILE!**
 12. If **UPDATE FILE**, enter **UPD:COMMIT;UPDFILE!**
 - If both 1B files contain a suspect overwrite, contact support organization.
 - If previous **Recovery Actions** do not apply or system does not recover, perform 4ESS Switch Manual Recovery Procedures.

Symptom 2

APS MCRT Terminal Repeated Boots	— System Emergency indicator on EAI page remains lighted — Continuous failing PRMs received on 3B printer — Continuous PRMs received where major “boot steps” count up and start over.
APS MCRT Terminal Repeated Phases	— Active CU on EAI page switches between CU 0 and CU 1 repeatedly.
3B Computer Terminal Rolling Boots	— A 52 Boot or 53 Boot follows a previous boot within 15 minutes.

Recovery Actions

- Clear any major problems.
- If work is being performed on an IOP, DFC, MHD, CU, or API, power down unit.
- If problem develops with active CU, DFC, MHD, or IOP while repairs are being performed on mate:
 1. Attempt 4ESS Switch Manual Recovery Procedures
 2. If 4ESS Switch Manual Recovery fails, continue repairs.

Recovery Actions (Contd)

- If BWM is suspect:
 1. At 3B Computer terminal, force active CU on-line (Poke 12)
 2. Force active Disk on-line (Poke 20 or 22)
 3. If 3B Computer is operating on ROOT, force BROOT (Poke 30)
 4. If 3B Computer is operating on BROOT, force ROOT (Poke 31)
 5. Perform a 53 Boot (Poke 53).

- If previous **Recovery Actions** do not apply or system does not recover, perform Attached Processor System Manual Recovery Procedures.

Symptom 3

Ring in Quiet Mode	— ROP printout reports Ring is in QUIET mode.
No Active RPCNs	— 1105 page shows no active RPCNs in group 00 and 32.
Rolling Ring Initializations	— Initialization level 2 or higher follows a previous initialization level within 15 minutes.
NO ACTIVE DLNs	— 1107 Page shows no active DLNs in Group 00 and 32.

Recovery Actions

- On 3B Computer terminal emergency action interface (EAI) page, perform a 53 Boot (Poke 53).
- If the Ring does not recover within 3 minutes, on 3B Computer terminal EAI page perform the following steps:
 1. Force active CU on-line (Poke 12)
 2. Force active Disk on-line (Poke 20 or 22)
 3. If 3B Computer is operating on ROOT, force BROOT (Poke 30)
 4. If 3B Computer is operating on BROOT, force ROOT (Poke 31)
 5. Perform a 54 Boot (Poke 54).
- If system does not recover, perform **Recovery Actions** for **Symptom 2**.

Symptom 4

Duplex-Failed APIs



NOTE:

Never request a 1B Processor phase or attempt processor configuration if the attached processor interfaces (API) are duplex failed and the 1B Processor is processing calls of any type.

Recovery Actions

- If 3B Computer is down, perform **Recovery Actions** for **Symptom 2**.

- At 1B Processor MCC terminal, enter:

1. **RST:IFB 0;UCL!**
2. **RST:IFB 1;UCL!**
3. **RST:AUI 0;UCL!**
4. **RST:AUI 1;UCL!**
5. **RST:API 0;UCL!**
6. **RST:API 1;UCL!**

- If APIs are still duplex failed:

1. At 3B Computer MCRT terminal, enter:

INIT:APDRV:FPI!

2. At 1B Processor MCC terminal, enter:

- a. **RST:API 0;UCL!**
- b. **RST:API 1;UCL!**

Symptom 4

Recovery Actions (Contd)

- If APIs are still duplex failed, on 3B Computer EAI page perform a 53 Boot (Poke 53).
- After 2 minutes, if APIs are still duplex failed:
 1. Power cycle both APIs (0 and 1)
 2. At 1B Processor MCC channel, type and enter:
 - a. **RST:API 0;UCL!**
 - b. **RST:API 1;UCL!**
- If the system does not recover, perform **Recovery Actions** for **Symptom 2**.

Symptom 5A

1B Processor Auto
Recovery Completed
And Major Units
Duplex-Failed

— 50 percent of digital interfaces (DIF) and digroup terminals (DT); 50 percent of signal processors (SP) or time slot interchange (TSI) lost, or 50 percent of time multiplexed switch processors (TMSP) lost.

Recovery Actions

- Clear any major power problems.
- Clear any PUB or base SP problems.
- Select the following MCC terminal EIA keys:
 1. **MODIFY RECV** (Poke 84)
 2. **DIRECT DATA INSERT 11** (Poke 401,11)
 3. **PHASE 3** (Poke 53)
 4. **SOFT A** (Poke 02)
- If the percent of major units duplex-failed does not improve after Phase 3 completes, perform a manual check for units with power off. Check, specifically, for power off the PUB (PUBB Frame) and the base SP Pulse Points (SP0/PPL, SP1/PPL). Repeat **Symptom 5A** if a major power problem is corrected; otherwise, perform **Recovery Actions** for **Symptom 1**.

Symptom 5B

1B Processor Auto Recovery Completed And Major Units Duplex-Failed	— 80 percent of DIFs, DTs, and VIFs lost; 80 percent of SPs or TSIs lost, or all TMSPs lost.

Recovery Actions

- Clear any major power problems.
- Clear any PUB or base SP problems.
- Select the following MCC terminal EIA keys:
 1. **MODIFY RECV** (Poke 84)
 2. **DIRECT DATA INSERT 11** (Poke 401,11)
 3. **PHASE 4** (Poke 54)
 4. **SOFT A** (Poke 02)
- If major units remain duplex-failed after Phase 4 completes, select the following MCC terminal EIA keys:
 1. **PHASE 4** (Poke 54)
 2. **SOFT A** (Poke 02)
- If the percent of major units duplex-failed does not improve after Phase 4 completes, perform a manual check for units with power off. Check, specifically, for power off the PUB (PUBB Frame) and the base SP Pulse Points (SP0/PPL, SP1/PPL). Repeat **Symptom 5B** if a major power problem is corrected; otherwise, perform **Recovery Actions** for **Symptom 1**.

Symptom 6

All 1B Processor Input/Output Lost



NOTE:

Unless there are other service problems, an Input/Output problem should be suspected when the MCC is functioning and **MCC TIMEOUT** has not occurred. If no Input/Output problem is suspected, perform 4ESS Switch Manual Recovery Procedures.

Recovery Actions

- If system is in a phase, allow sufficient time for system to recover.



NOTE:

System is in a phase if MCC **NUMERIC DISPLAY** is counting or **PHASE IN PROGRESS** lamp is lit and bit **23** is flashing.

- If system does not recover from phase, perform **Recovery Actions** for **Symptom 1**.
- If system is not in a phase, select the following MCC terminal EAI keys:
 1. Clear any Phase request selections
(**PHASE 1, PHASE 2, PHASE 3, PHASE 4**)
 2. Clear **MODIFY RECV** if selected
 3. **RESTORE I/O** (Poke 83)
 4. **SOFT A** (Poke 02)
- If previous **Recovery Actions** do not apply or system does not recover, perform 4ESS Switch Manual Recovery Procedures.

Symptom 7

All 3B Computer Input/Output Lost

Recovery Actions

- If 3B Computer is in Disk Independent Operation (DIOP), use the 3B Computer terminal 120 Page to repair MHD subsystem.
- If 3B Computer terminal EAI page can be obtained, request Craft Initialization (Poke 15).
- If 3B Computer EAI page cannot be obtained, switch port switch.
- If Input/Output does not return, check 1B Processor to determine if 3B Computer is active.
- If 3B Computer is not active, perform **Recovery Actions** for **Symptom 2**.

Symptom 8

1B MCC Access is Lost

Recovery Actions

- Perform the following actions until MCC capability is restored:

1. If IFBs are not duplex, attempt to restore the IFBs. At MTC terminal, enter:

RST:IFB a!

2. Attempt to switch the MUPs via the MCC 106 page poke (410)
3. If the system has basic Input/Output capability, at MTC terminal enter:

SW:MUP!

4. Remove and restore the standby MUP. At MTC terminal, enter:

RMV:MUP a!

RST:MUP a!

5. Repeat steps 3 and 4

Symptom 8

Recovery Actions (Contd)

- If no MCC functionality is restored:

1. Force a MUP switch. At MCC terminal, enter:

esc-esc-ctrl-x:

2. Remove and restore the standby MUP. At MTC terminal, enter:

RMV:MUP a!

RST:MUP a!

3. Force a MUP reset. At MCC terminal, enter:

esc-esc-ctrl-r

4. Repeat steps 1 through 3
5. Power cycle both MUPs
6. Switch the RS232 port on the back of the CC back plan to which the MCC terminal connects.
7. Replace the cable and the MCC terminal
8. Repeat steps 1 through 5.

Symptom 9

Reports of No Call Processing

Recovery Actions

- At 1B Processor MCC terminal, enter:

OP:SDC!

- If system has basic Input/Output sanity, work with MOC to isolate common failure point.
- If system has no basic Input/Output sanity, perform **Recovery Actions** for **Symptom 6**.

Symptom 10

Critical Alarm

Recovery Actions

- Analyze output message if available.
- If phase is in progress, allow sufficient time for phase to complete.
- If phase does not complete, perform **Recovery Actions** for **Symptom 1**.
- If system has no basic Input/Output sanity, perform **Recovery Actions** for **Symptom 6**.

Manual Recovery Procedures

Read the following before attempting 4ESS Switch Manual Recovery:

- Automatic recovery is not progressing if:
 1. The MCC **NUMERIC DISPLAY** is not counting, or **BINARY DISPLAY** bit **23** lamp is not flashing.
 2. **PCRV:B FAILED** message is received.
- The MCC **FAIL ADDR/DISPLAY** poke:
 1. Provide program fail data in the MCC **NUMERIC DISPLAY** and **BINARY DISPLAY**
 2. Disable recovery progress indicators.
- Three consecutive automatic Phase 3 occurrences automatically PEST all interrupts and disable audits.
- The MCC **CLR UTIL** key inhibits **PCRV:B** messages and speeds up automatic recovery if the system is stepping through processor configuration (PC) states.
- Average Phase 3 time for this office is _____ seconds.

Perform **Recovery Actions** in the order listed:

Recovery Action 1

- Bring up and clear the MCC terminal EAI page (Poke 99)
- Select the following MCC EAI key:

DIS AUTO PC (Poke 70)

- Select MCC keys for the first manual configuration listed in the Manual Configuration Table that follows this procedure. Enter the pokes from left to right. The word "off" means that this unit should be powered down for this configuration attempt.
- Allow sufficient time (_____ seconds) for system to recover.
- If system does not recover, select next manual configuration listed in the Manual Configuration Table until all possible configurations have been exhausted.
- If 3B Computer read-only printer (ROP) contains failing PRMs or rolling APDRV error messages, perform Attached processor System Manual Recovery Procedures.
- If all 3B Computer Input/Output is lost, perform Attached Processor System Manual Recovery Procedures.

Recovery Action 1 (Contd)

Manual Configuration Table										
Unit	Processor Configuration States									
	1	2	3	4	5	6	7	8	9	10
CC0	10				10	10	10	10	10	off
CC1		11	11	11				off	off	11
PS0	20		20			20		20		
PS1		21		21	21		21		21	21
PSB0	22			22		22		22		
PSB1		23	23		23		23		23	23
CSB0	30			30		30		30		
CSB1		31	31		31		31		31	31
IFB0	40		40	40		40				
IFB1		41			41	41			41	41
AUB0	42			42	42		42	42		
AUB1		43	43			43			43	43
API0									off	off
API1								off		
Norm File	61	61	61	61	61	61	61	61	61	61
DDI	16,17	16,17	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00
HARD A*	01	01	01	01	01	01	01	01	01	01

* Hard A (Poke 01) must be entered last.

Recovery Action 1 (Contd)

Manual Configuration Table									
Unit	Processor Configuration States								
	11	12	13	14	15	16	17	18	19
CC0	10				10	10	10	10	off
CC1		11	11	11				off	11
PS0	20		20			20		20	
PS1		21		21	21		21		21
PSB0	22			22		22		22	
PSB1		23	23		23		23		23
CSB0	30			30		30		30	
CSB1		31	31		31		31		31
IFB0	40		40	40			40	40	
IFB1		41			41	41			41
AUB0	42			42	42		42	42	
AUB1		43	43			43			43
API0									off
API1								off	
UPD File	62	62	62	62	62	62	62	62	62
DDI	16,17	16,17	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00	16,17, 06,00
HARD A*	01	01	01	01	01	01	01	01	01

* Hard A (Poke 01) must be entered last.

Recovery Action 2

- If the 1B has not recovered, perform system reinitialization (SR) using 3B Computer tape units as follows:

1. Mount 1600 BPI 1B generic tape on 3B tape unit 0
2. On the 3B MCRT, enter:

VER:UPDATE:TAPE,MT 0!

3. Obtain the generic identification number from the output message.
4. On the 3B MCRT, enter:

LOAD:UPDATE:GEN *a*,MT 0!

a = Generic identification number in the format
4E<20>.05

5. Wait for tape to finish loading
6. Mount 1600 BPI 1B ODA backup tapes on 3B tape unit 0
7. On the 3B MCRT, enter:

VER:UPDATE:TAPE,MT 0!

8. Obtain the base and control data from the output message
9. On the 3B MCRT, enter:

LOAD:UPDATE:CONT "*aaaabb*",MT 0!

aaaabb = Base and control data enclosed in quotes
(") in the format "CHGO99"

Recovery Action 2 (Contd)

- Wait for tape to finish loading
- On the 3B MCRT, enter:

INIT:APDRV:FPI!

- At MCC terminal EAI page, select the following keys:
 - **MODIFY RECV** (Poke 84)
 - **DIRECT DATA INSERT KEYS 17,16,06,00**
(Poke 401,17)(Poke 401,16)(Poke 401,06)(Poke 401,00)
 - **CC 0** (Poke 10)
 - **PS 0** (Poke 20)
 - **PSB 0** (Poke 22)
 - **CSB 0** (Poke 30)
 - **IFB 0** (Poke 40)
 - **AUB 0** (Poke 42)
 - **DIS AUTO PC** (Poke 70)
 - **UPD FILE** (Poke 62)
 - **PHASE 4** (Poke 54)
 - **HARD A** (Poke 01)

Recovery Action 3 (Prior to 4E21 Generic)

- If the 1B did not recover from the SR using 3B Computer tape units, perform the following procedures:
 1. Mount 800 BPI generic tape on 1B TUC
 2. Depress **SR** key on 1B TUC
 3. At MCC terminal EAI page, select the following keys:
 - **MODIFY RECV** (Poke 84)
 - **DIRECT DATA INSERT KEYS 23,17,16,06** (Poke 401,23)
(Poke 401,17)(Poke 401,16)(Poke 401,06)
 - **DIS AUTO PC** (Poke 70)
 - **CC 1** (Poke 11)
 - **PS 1** (Poke 21)
 - **PSB 1** (Poke 23)
 - **CSB 1** (Poke 31)
 - **IFB 1** (Poke 41)
 - **AUB 1** (Poke 43)
 - **NORMAL SR** (Poke 63)
 - **HARD A** (Poke 01)
- After addresses have been printing on MTCE, perform the following procedures:
 1. Mount 800 BPI ODA tape on another 1B TUC
 2. Depress **SR** key on ODA tape's TUC
 3. Wait for generic tape to finish loading
 4. At MCC terminal EAI page, select the following keys:
 - MODIFY RECV** (Poke 84)
 - SOFT A** (Poke 02)
 5. Wait for ODA tape to finish loading; 1B starts to recover.

Recovery Action 4

- If the SR fails or the 1B does not come up, attempt to regain the processor in the emergency configuration so that hardware can be diagnosed and repaired.
- Select MCC keys for first configuration listed in the following Emergency Mode Manual Configuration Table. Enter the pokes from left to right. The word "off" means that this unit should be powered down for this configuration attempt.
- Allow sufficient time (_____seconds) for system to recover.
- If system does not recover, select next manual configuration listed in the Emergency Mode Manual Configuration Table until all possible configurations have been exhausted.

Recovery Action 4 (Contd)

Emergency Mode Manual Configuration Table										
Unit	Processor Configuration States									
	23	24	25	26	27	28	29	30	31	32
Emerg CFG*	48	48	48	48	48	49	49	49	49	49
CC0	10				10	10	10	10	10	Off
CC1		11	11	11				Off	Off	11
PS0	20		20			20		20		
PS1		21		21	21		21		21	21
PSB0	22			22		22		22		
PSB1		23	23		23		23		23	23
CSB0	30			30		30		30		
CSB1		31	31		31		31		31	31
IFB0	40		40	40			40	40		
IFB1		41			41	41			41	41
AUB0	42			42	42		42	42		
AUB1		43	43			43			43	43
API0									Off	Off
API1								Off		
Norm File	61	61	61	61	61	61	61	61	61	61
DDI	16,17	16,17	16,17	16,17	16,17	16,17	16,17	16,17	16,17	16,17
HARD A†	01	01	01	01	01	01	01	01	01	01

* Emergency Configuration is 48 (full) and 49 (minimum).

† **HARD A** (Poke 01) must be entered last.

Attached Processor System Manual Recovery Procedures

Read the following before performing 4ESS Switch Attached Processor System Manual Recovery.

- A typical Processor Recovery Message (PRM) identifies the following:

Example: **PRM_A BCDE FF GG GGGG GGGG**

A = Active CU
B = PRM Type
C = Boot Step
D = Operating System
E = Initialization Level
F = Reason
G = PRM Data

- Automatic system recovery is not progressing if:
 1. The EAI page active CU indicator keeps switching between CU0 and CU1.
 2. Failing PRMs are received continuously.
 3. PRMs are received continuously where the "BOOT Step" keeps counting up and starting over.

Perform **Recovery Actions** in the order listed:

Recovery Action 1

At 3B Computer MCRT, clear EAI page (Poke 14).

Recovery Action 2

- Select MCC keys from left to right for first manual configuration listed in the following Manual Configuration Table.
- Allow sufficient time (_____ seconds) for system to recover.

If failing PRMs or evidence the system did not recover is received, select next manual configuration listed in the Manual Configuration Table until all possible configurations have been exhausted.

- If system does not recover after all possible configurations have been exhausted, continue with **Recovery Action 3**.

Manual Configuration Table

Manual Config	Root	BROOT	Full	MIN	Primary Disk	Secondary Disk	CU0	CU1	Boot
1		30	33		20		10		53
2		30	33		20			11	53
3	31		33			22	10		53
4	31		33			22		11	53
5	31		33		20		10		54
6	31		33		20			11	54
7		30	33			22	10		54
8		30	33			22		11	54

Recovery Action 3

- If the BOOT progressed through boot step “D” before failing, power down both APIs (0 and 1) and repeat from **Recovery Action 2** (Manual Configurations 5 through 8).
- If the BOOT did not progress through boot step “D” before failing, power down CU 0 and continue with **Recovery Action 4**.

Recovery Action 4

- Select MCC keys from left to right for first manual configuration listed in the Manual Configuration Table below.
- Allow sufficient time (_____ seconds) for system to recover.
- If failing PRMs or evidence the system did not recover is received, select next manual configuration listed in the Manual Configuration Table until all possible configurations have been exhausted.
- If system does not recover after all possible configurations have been exhausted, continue with **Recovery Action 5**.

Manual Configuration Table

Manual Config	Root	BROOT	Full	MIN	Primary DISK	Secondary Disk	CU0	CU1	Boot
1	31		33		20		OFF	11	54
2	31		33			22	OFF	11	54
3		30	33			22	OFF	11	54
4		30	33		20		OFF	11	54

Recovery Action 5

Power down both CU0 and CU1, power up CU0, and continue with **Recovery Action 6**.

Recovery Action 6

- Select MCC keys from left to right for first manual configuration listed in the Manual Configuration Table below.
- Allow sufficient time (_____ seconds) for system to recover.
- If failing PRMs or evidence that the system did not recover is received, select next manual configuration listed in the Manual Configuration Table until all possible configurations have been exhausted.
- If system does not recover after all possible configurations have been exhausted, continue with **Recovery Action 7**.

Manual Configuration Table

Manual Config	Root	BROOT	Full	MIN	Primary Disk	Secondary Disk	CU 0	CU 1	Boot
1	31		33		20		10	OFF	54
2	31		33			22	10	OFF	54
3		30	33			22	10	OFF	54
4		30	33		20		10	OFF	54

Recovery Action 7

Power up both CUs (0 and 1) and continue with **Recovery Action 8**.

Recovery Action 8

- Select MCC keys from left to right for first manual configuration listed in the following Manual Configuration Table.

⇒ NOTE:

If the system recovers, the system is in the emergency mode, and call processing does not exist.

- Allow sufficient time (_____ seconds) for system to recover.
- If failing PRMs or evidence the system did not recover is received, select next manual configuration listed in the Manual Configuration Table until all possible configurations have been exhausted.
- If system recovers in minimum configuration (MIN CONFIG), perform Attached Processor System Emergency Recovery Procedures to recover from minimum configuration.
- If system does not recover after all possible configurations have been exhausted, continue with **Recovery Action 9**.

Manual Configuration Table

Manual Config	Root	BROOT	Full	MIN	Primary Disk	Secondary Disk	CU0	CU1	Boot
1	31			32	20		10		54
2	31			32		22	10		54
3	31			32		22		11	54
4	31			32	20			11	54
5		30		32	20		10		54
6		30		32		22	10		54
7		30		32		22		11	54
8		30		32	20			11	54

Recovery Action 9

- Obtain 3B Computer backup tapes written immediately after last 3B Computer retrofit and perform Database-SR to recover ECD files as follows:
 1. Mount TOP tape on tape unit 0
 2. Mount database (DB) tape on tape unit 1
 3. Force CU 0 on-line (Poke 10)
 4. Force Primary Disk on-line (Poke 20)
 5. Select ROOT (Poke 31)
 6. Clear flags (Poke 14)
 7. Read TOP tape (Poke 55)
 8. Wait until TOP tape is loaded
 9. Select Application Parameter (Poke 42)
 10. Clear flags (Poke D)
 11. Read DB tape (Poke 56)
 12. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that system is not recovering is received, continue with **Recovery Action 10**.

Recovery Action 10

- On 3B Computer EAI page:
 1. Force BROOT (Poke 30)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that the system is not recovering is received, continue with **Recovery Action 11**.

Recovery Action 11

- Obtain 3B Computer backup tapes that were written immediately after last retrofit, and perform Mini-SR to recover boot processes as follows:
 1. Mount TOP tape on tape unit 0.
 2. Mount RT0-1 tape on tape unit 1.
 3. Force CU0 on-line (Poke 10).
 4. Force Primary Disk on-line (Poke 20).
 5. Select ROOT (Poke 31).
 6. Select FULL CONFIG (Poke 33).
 7. Read TOP tape (Poke 55).
 8. Wait until TOP tape is loaded.
 9. Read RT0-1 tape (Poke 56).
 10. Wait 15 seconds.
 11. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that the system is not recovering is received, continue with **Recovery Action 12**.

Recovery Action 12

- On 3B Computer EAI page:
 1. Force BROOT (Poke 30)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that system is not recovering is received, continue with **Recovery Action 13**.

Recovery Action 13

Perform Generic-only LDFT by repeating **Recovery Actions 11** and **12** while allowing all RT0 tapes (RT0-1, RT0-2, RT0-3, etc.) to be read completely.

Attached Processor System Emergency Recovery Procedures

⇒ NOTE:

This procedure is for recovering the 4ESS Switch Attached Processor System (APS) from minimum configuration (MIN CONFIG) or emergency mode (EMER MODE) and assumes previous actions have been attempted to recover the APS on full configuration (FULL CONFIG) but failed.

Check for obvious problems and abnormal conditions before attempting emergency recovery:

- Power problems
- Work being performed on frames (CNS, Repairs, Growth, etc.)
- Current recent change activity
- MCC **PROCESSOR CONFIG COMPLETED** lamp does not light
- Current overwrite installation
[Software change package (SCP), BWM, ODA, or Big GULP]
- Sudden environmental changes
(Air conditioning problems, electrical storm, etc.)
- Activity preceding incident
- 3B Computer MCRT **SYS EMER INDICATOR** remains lighted.

**NOTE:**

Contact your support organization within 5 minutes if the 4ESS Switch attached processor system cannot be recovered

Phone Number _____.

Perform **Recovery Actions** in the order listed below:

Recovery Action 1

- At MCRT, type and enter the following to switch FULL CONFIG bootimage with one saved after last retrofit:

**EXC:ENVIR:UPROC, FN “/ tools / bootaud”, ARGS (“sa”,
“xxx”) !**

xxx = SID parameter supplied by support organization.

- Wait for SUCCESS message in response and continue with **Recovery Action 2**.

Recovery Action 2

- On 3B Computer EAI page:
 1. Select FULL CONFIG (Poke 33)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that the system is not recovering is received, continue with **Recovery Action 3**.

Recovery Action 3

- On 3B Computer EAI page:
 1. Select MIN CONFIG (Poke 32)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that system is not recovering is received, continue with **Recovery Action 4**.

Recovery Action 4

- At MCRT, type and enter the following to switch FULL CONFIG ECD with one saved most recently:

EXC:ENVIR:UPROC, FN “/ tools / bootaud”, ARGS (“se2”, “xxx”) !
xxx = SID parameter supplied by support organization.
- Wait for the SUCCESS message in response, and continue with **Recovery Action 5**.

Recovery Action 5

- On 3B Computer EAI page:
 1. Select FULL CONFIG (Poke 33)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that the system is not recovering is received, continue with **Recovery Action 6**.

Recovery Action 6

- On 3B Computer EAI page:
 1. Select MIN CONFIG (Poke 32)
 2. Request 54 Boot (Poke 54).
- If failing PRMs or evidence that system is not recovering is received, continue with **Recovery Action 7**.

Recovery Action 7

Repeat from **Recovery Action 4** (as necessary) using different bootaud parameter (Se0 or Se1)

“Se1” - Selects ECD saved several months ago

“Se0” - Selects ECD saved after the last retrofit.

Notes

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User Notes-7

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Abbreviations

A

ABC

Auxiliary Buffer Control

ACR

Auxiliary Call Register

ACT

Auxiliary Activity

ACTMB

Active Maintenance Bus

ADT

Automatic Digital Testing

ADT

Automatic Digital Testing

ALEV

A-Level

ALK

A-Link

ANI

Automatic Number Identification

AO

Activate Override

APDMI

API

Attached Processor Interface

Abbreviations

API

Attached Processor Interface

APUB

Autonomous Peripheral Unit Base

APUF

Autonomous Peripheral Unit Failure

APUT

Autonomous Peripheral Unit Trouble

ASG

Assigned

ASW

All Seems Well

ASWEPU

ATM

Automatic Trunk Measuring

ATMS

Automatic Transmission Measurement System

ATP

All Test Passed

ATSG

Adjunct Trunk Sub-Group Head Cell

ATSG

Adjunct Trunk Subgroup

AUB

Auxiliary Unit Bus

AUI

Auxiliary Unit Interface

Abbreviations

AUTO

Autonomous

AUX

Auxiliary

B

B/I

Busy/Idle

BC

Buffer Controller

BF

Buffer Fabric

BIMM

BLEV

B-Level

BLK

B-Link

BLM

Base Level Maintenance

BMB

BMB

Buffer Memory B

BMC

Abbreviations

BMC

Buffer Memory C

BSRF

BTFN

BTR

Bus Terminating Resistor

BWM

Broadcast Warning Message

C

CAMA

Central Automatic Message Accounting

CAMA

Centralized Automatic Message Accounting

CB

Control Bus

CC

Central Control

CC

Control console

CC

Control Console

CC

Control console

Abbreviations

CC

Central Control

CCFR

Central Control Fault Recognition

CCIS

Common Channel Interoffice Signaling

CCIS

Common Channeling Interoffice Signaling

CCITT

International Telegraph and Telephone Consultative Committee

CCWS

CAMA Call Waiting/Suspension

CFG

Configuration

CI

CIN

Circuit Identification Number

CINVPAR

Invert ROM Control Parity

CIP

Call in Progress

CKEY

Centralized Automatic Message Accounting Keying

CLIDS

Controller or Client D Source

CLKACT

Clock Activity

Abbreviations

CLN

Code Line Test Circuit

CLRCKER

Clear Clock Error

CMD

Command

CMS

Circuit Maintenance System

CNI

Common Network Interface

CNTL

CNTL

Control

CONFIG

Configuration

CPA

Common Platform Adjunct

CPBS

Control Parity B Source

CPD

CPS

Control Point Switch

CR

Call Register

CS

Call Store

Abbreviations

CSACT

Call Store Activity

CSB

Call Store Bus

CSPGM

Call Store Program

CSR

Channel Status Register

CTLK

CAMA Talking

D

DB

Database

DBT

Diagnostic Buffer Table

DCON

Diagnostic Control

DDI

Direct Data Insert

DFA

Digital Facility Access

DFR

Deferred Fault Recovery

DGN

Diagnostic

Abbreviations

DIF

Digital Interface Frame

DIF-E1

Digital Interface Frame-Export 1

DIOP

Disk Independent Operation

DIU

Digital Interface Unit

DKAD

Disk Administration

DMA

DMA

Direct Memory Access

DMA

Direct Memory Access

DPF

Data Parity Failure

DSS

Diagnostic Sequence State

DT

Digroup Terminal

DT

Digital Trunk

DT

Digroup Terminal

DTCR

Dedicated TSI Connection Register

Abbreviations

DTMF

Dual Tone Multifrequency

DTU

DUB

Data Unit Bus

DUS

Data Unit Selector

E

EAI

Emergency Action Interface

EBL

Extended Bus and LAN

ECD

Equipment Configuration Data

ECOS

End to End Class of Service

ECOS

End-to-End Class of Service

EPIC

Enhanced Peripheral Interface Controller

ERSP

Error Stop

ESR

Error Summary

Abbreviations

EST

Echo Suppressor Terminal

ESU

Echo Suppressor Unit

ESU

Echo Supressor Unit

F

FBI

Favric Bus Interface

FLEV

F-Level

FR

Fault Recovery

FUNC

Function

G

GCP

General Control Pulse

GETS

Government Emergency Telecommunication Service

GI

Group Interrogate

Abbreviations

GULP

Generic Utility Program

I

I/O

Input/Output

ID

Identification

IDTS

Immediate Dial Tone Start

IFACT

Interface Bus Activity

IFB

Interface Bus

IFBSY

Interface Busy

INIT

Initialization

INT

Intermediate

INUP

International Integrated Services

IOCH

Input/Output Clock High

IOCL

Input/Output Clock Low

Abbreviations

IOUC

I/O Unit Controller

IOUS

I/O Unit Selector

IOUS

Input/Output Unit Selector

IPD

Interprocessor Data

IPI

Initial Pulsing Interval

IPUB

Interface to Peripheral Unit Bus at Frame

IRN

Integrated Ring Node

ISS

Interrupt Sequence State

ISUP

Integrated Services Digital Network User Part

ITUP

International Telephone User Part

L

LACID

Link Access Identification

LCS

Lower Call Store

Abbreviations

LLS

LSTR

Link Security Terminal Register

LVS

M

MA

Maintenance

MAC

Maintenance Control

MACP

Maintenance Administration Control Program

MB

Maintenance Busy

MC

Major Category

MCC

Master Control Console

MCD

MCC Direct Data Insert Register

MCD

Modify Recovery Actions

MEMN

Member Number

Abbreviations

MF

Multifrequency

MF

Multifrequency

MFR

Multifrequency

MFRT

Multifrequency Receiver Test Circuit

MFXT

Multifrequency Transmitter

MFXT

Multifrequency Transmitter Test Circuit

MI

Maintenance Interject

MI

Member Interrogate

MI

Maintenance Interject

MI

Member Interrogate

MIN

Minimum

MIRA

Manual Input Request Administration

MIS

Miscellaneous

MMIO

Memory Mapped Input/Output

Abbreviations

MRA

Modified Recovery Action

MRA

Modify Recovery Actions

MRA

Modified Recovery Action

MS

Microstore

MSG

Message

MSG

Message

MSL

Master Select Level

MSN

Miscellaneous Scanner Number

MSP

Multifaceted Signal Processor

MUP

Maintenance and Utility Processor

MUP

Master Control Complex Utility Processor

MUP

Master Control Complex Utility Processor

Abbreviations

N

NAIA

Node Attempted Illegal Access

NC

Network Clock

NCAT

Non-Call Associated Trunks

NCAT

Noncall-Associated Trunk

NCLK

Network Clock

NCSU

Network Clock Sync Unit

NESAC

National Electronic System Assistance Center

NLK

Not Linked

NM

Network Management

NORM

Normal

NSN

Network Switching Number

NWM

Network Management

Abbreviations

O

OBS0

Service Observing Circuit 0

ODA

Office Data Assembler

OMR

Output Message Record

OOS

Out of Service

OOS

Out-Of-Service

OOS

Out-of-Service

OSC

Oscillator

P

PC

Processor Configuration

PC

Peripheral Controller

PC

Processor Configuration

PCP

Positive Call Process

Abbreviations

PCR

Processor Configuration Recovery

PDF

Power Distribution Frame

PE

Prevent Error Source Transmission

PE

Prevent Error Source Transmissions

PH

Phases

PH

Phases

PLSRPLY

Pulse Reply

PM

Peripheral Maintenance Operating System

PM

Peripheral Maintenance Operating System Messages

PP

Peripheral Pulse Error

PR

Processor Recovery Message

P

Program Store

P

Program Store

PS

Program Store Bus

Abbreviations

PSB

Program Store Bus

PSBX

Protected, Backed Executed Text

PSW

PU

Program Unit

PU

Peripheral Unit

PU

Program Unit

PUB

Peripheral Unit Bus

PUB

Peripheral Unit Bus

PUBA

PUBB

Peripheral Unit Bus Branching

PUBR

PUBT

PUC

Peripheral Unit Control

PUCB

Peripheral Unit Control Bus

Abbreviations

PUEA

Peripheral Unit Enable Address

PURB

Peripheral Unit Reply Bus

PUWB

Peripheral Unit Write Bus

PW

Pulse Width

PWRMON

Power Monitor

R

RA

Recorded Announcement

RA

Recorded Announcement

RAM

Random Access Memory

RCDM

Recent Change Data

RCV

Receive

REG

Register

RINGMON

Ring Monitor Kernel Process

Abbreviations

RMS-D2

Remote Measurement System-Digital 2

RO

Receive On

ROP

Read-Only Printer

ROS

Request Out-of-Service

ROTL

Remote Office Test Line

RPI

Routing Pattern Index

RS

Receive Synchronizer

RST

Restore

RSW

Receiver Seems Well

RTNR

Real Time Network Routing

RTP

Ring and Tone Plant

RTP

Ring and Tone Plant

RTSI

Receive Time-Slot Interchange

Abbreviations

S

SAST

System Audit of Stores Using Tape

SC

Subcategory

SCAR

Stable Call Accumulation Register

SCLK

System Clock

SCP

Software Change Package

SCS

Service Circuit System

SD

Signal Distributor

SD

Signal Distributor

SIMR

System Integrity Monitor Register

SIMR

System Integrity Monitor Register

SM

SP

Signal Processor

SP

Signal Processor

Abbreviations

SP

Signal Processor

SP

Signal Processor

SPC

Switching and Permuting Circuit

SPUIE

Signal Processor Unit Interface Error

SR

Software Reinitialization

SR

System Recovery

SR

System Reinitialization

SR

System Reinitialization

SRAM

Static Random Access Memory

SSD

Scan and Signal Distributor

SSD

Second Start Dial

SSD

Second Start Dial

ST

Sequence Table

STBY

Standby

Abbreviations

SU-STAT

Subunit Status

T

TAN

Trunk Appearance Number

TAR

Transition Address Register

TAS

Tone and Announcement Circuits

TAT

Test Access Trunk

TBMN

Trunk Block and Member Number

TBMN

Trunk Block and Memory Number

TBN

Trunk Block Number

TC

Transport Capabilities

TC

Trace and Control

TC

Transport Capabilities

TDN

Time Division Number

Abbreviations

TDN

Trunk Distributor Number

TERM

Terminal

TF

Tape Frame

TGR

Terminal Grouping Frame

TLP

Trouble Locating Procedure

TMR

Trunk Maintenance Register

TMS

Time Multiplex Switch

TMSP

Time Multiplex Switch Port

TMTC

Trunk Maintenance

TN

Trunk Number

TND

Tone Detector Test

TOSL

Trunk OOS List

TOSL

Trunk Out-of-Service List

TPM

Traffic Plant Measurement

Abbreviations

TR

Trunk Register

TRA

Terminal Resource Allocator

TRAM

Table RAM

TRC

Twisted Ring Cable

TRPF

Transit Parity Failure

TS

Time Slot

TSF

Total Signaling Failure

TSG

Trunk Subgroup

TSGHC

Trunk Subgroup Head Cell

TSI

Time Slot Interchange

TSN

Trunk Scanner Number

TSTRSL

Test Result

TSW

Transmitter Seems Well

TTSI

Transmit Time Slot Interchange

Abbreviations

TUC

Tape Unit Controller

U

UCS

Upper Call Store

UHARD-STAT

Unit Hardware Status

UID

Unit Identification

UPD

Update

USOFT-STAT

Unit Software Status

UTE

Unitized Terminal Equipment

V

VBB

Vector Base Bit

VIF

Voiceband Interface Frame

VIU

Voiceband Interface Unit

Abbreviations

VP

Voice Processor

VPIC

Voice Processor Interface Controller

W

WOPS

Without Protection Switch

X

XCVR

Transceiver

XCVT

Transceiver Test Circuit

XPWR

Miscellaneous Power

XTSI

Expanded Time-Slot Interchange

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4ESS™ Switch
1B Processor
4E23 Generic
Maintenance Reference Handbook
Volume 2

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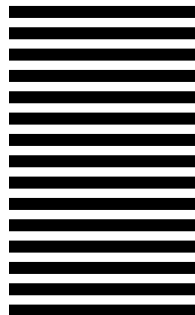
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Register Layouts and Word Breakdown

8

Interrupt Level Printouts

A-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASA(H)	AC1ASA(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	AC1SAT	AC1PCR
AC1MCO	AC1MCP	AC1MCD(H)	AC1MCD(L)	AC1TAR	

**NOTE:**

See "Interrupt Data Register Layouts" for register descriptions.

B-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASB(H)	AC1ASB(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	AC1SAT	AC1PCR
AC1MCO	AC1MCP	AC1MCD(H)	AC1MCD(L)	AC1ITR	AC1ACT
AC1PSQ	AC1TAR	AC1BNCTL	-----	ST1ASB(H)	ST1ASB(L)



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

C-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASC(H)	AC1ASC(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	ST1ASC(H)	ST1ASC(L)
ST1SCA	ST1SDA	ST1BR(H)	ST1BR(L)	AC1ME0(H)	AC1ME0(L)
ST1LIT	ST1LPI	AC1MSR	AC1MMR	ST1MI0(H)	ST1MI0(L)
AC1MI0(H)	AC1MI0(L)	AC1ME1(H)	AC1ME1(L)	AC1MI1(H)	AC1MI1(L)
ST1ME0(H)	ST1ME0(L)	ST1MI1(H)	ST1MI1(L)	AC1ME1(H)	AC1ME1(L)
AC1SAT	AC1TAR	AC1BNCTL	-----	-----	-----



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

D-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASD(H)	AC1ASD(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	ST1CES	ST1ILA
AC1AP	AC1ABC	AC1IBR	ST1IBR	AC1TAR	AC1BNCTL



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

E-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASE(H)	AC1ASE(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	ST1CES	ST1ILA
AC1AP	AC1ABC	AC1IBR	ST1IBR	AC1TAR	AC1BNTCL



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Call Store and Program Store Identification Data

FAILING	FAILING				
H_ADDR	ADDR	RCES	ST1BRS_H	ST1BRS_L	AC1SAL
AC1SAR	ST1SAL	ST1SAR	SCES	FAILING MEMN	VBOOT
BFAILRT	SYSSTAT	IBUSSTAT	SAMEMN	MNSUSP	BUSBUFFGCPS*
GCPACT_L	GCPACT_H	CR01ACT	CR10ACT	XXXXXX	FLAGS1
GCPSTBY_L	GCPSTBY_H	CR01STBY	CR10STBY	XXXXXX	FAFTRACK
CINS	C_ACT_EVEN	C_ACT_ODD	C_STBY_EVEN	C_STBY_ODD	REP_STORE
BUSSTATER	C_H_ACT_EVEN	C_H_ACT_ODD	C_H_STBY_EVEN	C_H_STBY_ODD	ST1ABC
FAILING	XXXXXX				
MCODE					

* The BUSBUFFGCPS field is for CS only and is 00000000 for program store.

Identification Register Descriptions

FAILING H_ADDR— Bits 24-29 of the 30-bit failing address

FAILING ADDR— Bits 0-23 of the 30-bit failing address

RCES—CC Error Summary Used by the Fault Recovery Program to Recover Interrupt

ST1BRS_H—High 8 Bits of the Standby CC Shadow B-Register

ST1BRS_L—Low 24 Bits of the Standby CC Shadow B-Register

AC1SAL—Save Even Address Reply on Program Fetches

AC1SAR—Save Odd Address Reply on Program Fetches

ST1SAL—Save Even Address Reply on Standby CC Program Fetches

ST1SAR—Save Odd Address Reply on Standby CC Program Fetches

SCES—Standby CES Used to Recovery Standby Store When Stores Were Duplexed

FAILING MEMN—Failing Member and Software Decisions

- Bit 0-5 = Suspected failing member. MEMN removed if bit 23 = 1
- 21 = Bootstrap failed on first attempt (first bus)
- 22 = Bootstrap has been entered
- 23 = When set, the member indicated (bits 0-5) has been removed

VBOOT—Variable Bootstrap Status, After Recovery

- Bit 0-3 = Count of bootstrap entries
- 4 = The member number (MEMN) in VBOOT was forced out by VBOOT
- 9-14 = MEMN forced out in current VBOOT state
- 15-17 = Variable boot state counter
- 18 = Two-word pump performed as part of recovery

BFAILRT—The Return Address in the Recovery Program for a Bootstrap Failure

SYSSTAT—System Status at Time of Interrupt

- Bit 0 = PBO of standby CC at entry to interrupt
- 1 = PBA OF standby CC at entry to interrupt
- 2 = PBT of standby CC at entry to interrupt
- 3 = CBO of standby CC at entry to interrupt
- 4 = CBA of standby CC at entry to interrupt
- 5 = CBT of standby CC at entry to interrupt
- 6 = Indicates base MCODE (3=E-level/0=D-level)
for community has been pumped when set
- 7 = State of CC1CCS (CC software duplex status) at time interrupt
- 15 = Status of AC1DIV bit (CC divorce) in CSC prior to interrupt

IBUSSTAT—BUSSTAT at Interrupt Entry (Call Store)

Bit 0 = Non-D-level entry flag

1 = Used to indicate to CALCONFIG that the call store community is to be set up in an off-line configuration

2 = When set, call store memory was pumped from disk as part of recovery

3 = When set, active CC sends over both buses

4 = Defines the bus used by the active CC. Bus 1 is active when set

5 = Both CCs will receive from the active bus when set

6 = CS bus 0 is in trouble if set

7 = CS bus 1 is in trouble if set

8 = When set, indicates there has been a change in the bus configuration

9 = Set if one or more stores are in the frozen state

11 = Set at start of phase by application program. Reset at end of phase by application program. Used to alter interrupt recovery strategy

12 = If status audit fails in CALCONFIG, this item is set before going to the hardware status update. When set, audit failure in CALCONFIG will not go to hard status

13 = Set when a call store bus routine exercise has been requested

14 = Set when a call store bus or call store routine exercise has been requested

15 = A non-backed up store has failed without a duplicate

16 = If set the standby bus is to be kept out-of-service until manual restoral request (TTY)

17 = If set, stop REX before testing next store

18 = Set when block zero has been pumped

19 = If set, the DGN is performing critical tests in case an interrupt occurs, establish configuration found in status table

21 = CS bootstrap assembled a working configuration

22 = CS bootstrap failed to assemble a working configuration using in service stores and the selected bus

23 = Used to save state of CBA/PBA (bit 4/1) prior to a bus store routine or REX

IBUSSTAT—BUSSTAT at Interrupt Entry (Program Store)

- Bit 0 = When set, active CC sends over both program store buses.
- 1 = Defines the program store bus used by the active CC
- 2 = Both CCs receive from the active bus when set
- 3 = Non-E-level entry flag
- 4 = Used to indicate to CALCONFIG that the PS community is to be set up in an off-line configuration
- 5 = When set, PS memory was pumped from disk as part of recovery
- 6 = PS bus 0 is in trouble if set
- 7 = PS bus 1 is in trouble if set
- 8 = When set, indicates there has been a change in the bus configuration
- 9 = Set if one or more stores are in the frozen state
- 11 = Set at start of phase by application program. Reset at end of phase by application program. Used to alter interrupt recovery strategy
- 12 = If status audit fails in CALCONFIG, this item is set before going to the hardware status update. When set, audit failure in CALCONFIG will not go to hard status
- 13 = Set when a program store bus routine exercise has been requested
- 14 = Set when a program store routine exercise has been requested
- 16 = If set the standby bus is to be kept out-of-service until manual restoral request (TTY)
- 17 = If set, stop the store routine. (1/2 hour has expired since exerciser was started.) See bit 14
- 18 = Set when block zero has been pumped
- 19 = If set, the DGN is performing critical tests in case an interrupt occurs, establish configuration found in status table
- 21 = PS bootstrap assembled a working configuration
- 22 = PS bootstrap failed to assemble a working configuration using in service stores and the selected bus
- 23 = Used to save state of PBA prior to a REX routine

SAMEMN—Standby and Active Member Numbers for Failing MCODE

(Valid for non-bus related faults only)

- Bit 0-5 = Active member number supplying MCODE interrupting
- 6-9 = Error count for active unit at entry to interrupt
- 10 = Flag for active member number (set if in service)
- 11 = Unused
- 12-17 = Standby member number supplying MCODE interrupting
- 18-21 = Error count for standby unit at entry to interrupt
- 22 = Flag for standby member number (set if in service)
- 23 = Copy was in progress on standby store when interrupt occurred

MNSUSP—Suspect MEMN List

- Bit 0-5 = Last MEMN having ATP DGN after interrupt
- 6 = When set, bits 0-5 are valid
- 7-12 = Next to last MEMN having ATP DGN
- 13 = When set, bits 7-12 are valid

BUSBUFFGCPs—Call Store Bus Buffer GCP Status Information

(Call Store only)

- Bit 0 = GCP reply for call store bus 0—frame 0 (active if set)
- 1 = GCP reply for call store bus 0—frame 1 (active if set)
- 2 = GCP reply for call store bus 1—frame 0 (active if set)
- 3 = GCP reply for call store bus 1—frame 1 (active if set)

GCPACT_L—Low 24 Bits of Active Store GCP Response

GCPSTBY_L—Low 24 Bits of Standby Store GCP Response

- Bit 0 = Send on bus 0 flip-flop
- 1 = Send on bus 1 flip-flop
- 2 = Receive on bus flip-flop
- 3 = Receive on bit complement
- 4-12 = MCODE name bits
- 13 = Store update bit
- 14 = Trap mode error
- 15 = MCC address match detected when set
- 16 = Trap write protect violation when set
- 17 = Trap all-seems-well fail when set
- 18 = Trap data parity failure when set
- 19 = Trap address parity failure when set
- 20 = Address match detected when set
- 21 = Communications reply inhibit when 0
- 22 = Store in MTCE when 1
- 23 = Store maintenance complement bit

GCPACT_H—High 8 Bits of Active Store GCP Response

GCPSTBY_H—High 8 Bits of Standby Store GCP Response

- Bit 2 = When set, store was not listening to bus

CR01ACT—Control Read 01 Response—Active Store
CR01STBY—Control Read 01 Response—Standby Store

- Bit 0 = Send on bus 0 flip-flop
- 1 = Send on bus 1 flip-flop
- 2 = Receive on bus flip-flop
- 3 = Receive on bus flip-flop complement
- 4-12 = Store MCODE name
- 13 = Update bit—software controlled
- 14 = Trap mode error bit
- 15 = MCC address match detected
- 16 = Trap write protect violation
- 17 = Trap all-seems-well failure
- 18 = Trap data parity fail
- 19 = Trap address parity fail
- 20 = Address match detected
- 21 = Communications reply inhibit complement
- 22 = Maintenance bit
- 23 = Maintenance bit complement

CR10ACT—Control Read 10 Response
CR10STBY—Control Read 10 Response

- Bit 3 = Write protect inhibit
- 4 = Write protect
- 13 = Data parity failure byte 0
- 14 = Data parity failure byte 1
- 15 = Data parity failure byte 2
- 16 = Data parity failure byte 3
- 17 = Address parity failure byte 0
- 18 = Address parity failure byte 1
- 19 = Address parity failure byte 2
- 20 = Address parity failure byte 3
- 21-23 = Store hardware (1 = megaword)

FLAGS1—Flags and Data Relevant to Interrupt

- Bit 0 = Unduplicated and suspect store interrupt
- 2 = Indicates the write protect program entered at MUFRWPHS
[memory not protected by WPAD (Write Protect Administration
Program)]
- 3 = MAC failed to accept the copy job
- 4 = Indicates a write protect violation has occurred on this interrupt and
no other errors were indicated
- 5 = MCODEs duplexed for the failing address
- 6 = Standby store chosen as faulty by recovery
- 7 = Active store chosen as faulty by recovery
- 8 = Indicates parity failure only

FAFTRACK—Full Access Failure Tracking Word

- Bit 0-2 = Indicates the number of times that the full access test failed
- 3-5 = Indicates which times through the full access failure that the standby store was removed
- 6-8 = Indicates which times through the full access failure that the bus was removed to recover
- 9-11 = Indicates which times through the full access failure that the bus was switched to recover
- 12 = Indicates that the standby bus was removed
- 13 = Indicates that the buses were switched
- 14 = Indicates that the pipeline was suspected of error propagation. All store tapes were cleaned and the full access tests were re-executed
- 15 = Indicates that full access was entered
- 16 = Set if bus 0 removed by fault recovery
- 17 = Set if bus 1 removed by fault recovery
- 18 = Disk pumping routine FINFILL was entered as part of recovery
- 19 = Two word pump inconsistency—failing address and MCODE don't match
- 20 = CCs failed access tests when put in step

CINS—Active Interrupt Error Source (AC1INS) Register OR'ed with Standby (ST1INS)

C_ACT_EVEN—Contents of the Active Store at the Falling Address Aligned on an Even Word Boundary (For example, 310 = 310 and 311 = 311)

C_ACT_ODD—Contents of the Active Store at the Falling Address Aligned on an Odd Word Boundary (For example, 310 = 310 and 311 = 311)

C_STBY_EVEN—Same as C_ACT_EVEN Except for the Standby Store When Duplexed

C_STBY_ODD—Same as C_ACT_E_ODD Except for the Standby Store When Duplexed

REP_STORE—Replacement Stores Status

- Bit 0-5 = Replacement member used when bit 23 = 1
- 6-14 = MCODE store was at when taken as a replacement
- 22 = Attempt to find a substitute was made
- 23 = Replacement found when bit = 1

BUSSTAT—At End of Recovery. See IBUSSTAT**C_H_ACT_EVEN—Bit Register Contents for the Active Store on an Even Word Boundry****C_H_ACT_ODD—Bit Register Contents for the Active Store on an Odd Word Boundry**

- Bit 0-7 = Contents of bits 24-31 in memory for the active store at the failing address aligned on an even word boundry (for example; 311 = 310, 310 = 310)
- 12-15 = Stored parity bits for the B register
- 18-21 = Computed parity bits for associated 32 bit word

C_H_STBY_EVEN—Same as C_H_ACT_EVEN Except for the Standby Store When Duplexed**C_H_STBY-ODD—Same as C_H_ACT_ODD Except for the Standby Store When Duplexed****ST1ABC—Standby Auxiliary Buffer Control Containing the All-Seem-Well and Parity Bits for the Reply Words of an Instruction Fetch**

FAILING MCODE—Failing MCODE and Software Decisions

- 0-9 = MCODE associated with bits 20-23
- 11 = All seems well error
- 12 = All seems well failure response from MCODE in bits 0-9
- 13 = Parity error right for E-LEVEL, CS parity error for D-LEVEL
- 14 = Parity error left for E-LEVEL, not available for D-LEVEL
- 19 = Set if the pre-qualify test failed
- 20 = Set if the single MCODE access test failed
- 21 = Set if the full access test failed the first time
- 22 = Set if the full access test failed the second time
- 23 = Bus test failed

Call Store or Program Store Test Results

BOOTAG	VBOTSTA	BR	FR	GR	JR
KR	LR	XR	YR	ZR	MEMN

Two lines of data are printed out for each store that has failed a bootstrap test.

BOOTAG—Program Address of Routine which Identifies Reason for Bootstrap Entry (CS1RBFALRT)

VBOTSTA—Variable Bootstrap Status Word (CS1RVBOOT)

JR—CC J-Register—Contains Address of Failing Test

MEMN—Failing Store Member Number

BR, FR, GR, KR, LR, XR, YR, ZR—CC Register Values at Time Failure Detected

D-Level Software Failure

IB1E_H_ADDR IB1D-ADDR IB1D-LHIN IB1D-RHIN IN1UPA IN1LPA



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

E-Level Software Failure

IB1E_H_ADDR IB1E-ADDR IB1E-LHIN IB1E-RHIN



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

F-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASF(H)	AC1ASF(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	ST1LR	-----
AC1PSQ	AC1ULR	AC1PES	ST1PES	ST1ER	ST1PRM
ST1PRL	ST1PSC	AC1RP0	AC1RP1	ST1RP0	ST1RP1
ST1CSC	ST1INH	PU1RFLCO0	PU1RFLCO1	PU1RFLCO2	PU1RFLCO3
PU1RFLCO4	PU1RFLCO5	PU1RFLCO6	PU1RFLCO7	-----	-----

⇒ NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

For IO F-Levels:

PU1RFLCO0	PLSRPLY (MA Pulse reply)
PU1RFLCO1	USOFT-STAT (Unit Software status)
PU1RFLCO2	UHARD-STAT (Unit hardware status)
PU1RFLCO3	SU-STAT (Subunit status)
PU1RFLCO4	ESR (Error summary)
PU1RFLCO5	ACTION (Recovery action)
PU1RFLCO6	CSR (Channel status register)
PU1RFLCO7	TSTRSL7 (Test result flags)

F-Level (Contd)

For BBFR F-Levels:

PU1RFLCO0	E-Register
PU1RFLCO1	PRM P-Register Most
PU1RFLCO2	PRL P-Register Least
PU1RFLCO3	Failing Address
PU1RFLCO4	L-Register
PU1RFLCO5	Not Used
PU1RFLCO6	Not Used
PU1RFLCO7	Not Used

For other frames and PBFR F-Levels:

PU1RFLCO0	MA Pulse Reply—C0
PU1RFLCO1	MA Pulse Reply—C1
PU1RFLCO2	Hardware Status Register—C0
PU1RFLCO3	Hardware Status Register—C1
PU1RFLCO4	Error Source Register—C0
PU1RFLCO5	Error Source Register—C1
PU1RFLCO6	FAILTEST1 (See Peripheral Fault Recognition Results)
PU1RFLCO7	FAILDATA1 (See Peripheral Fault Recognition Results)

K-Level

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASK(H)	AC1ASK(L)
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	AC1SAT	---

⇒ NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Error Stop (ERSP)

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	-----	-----
AC1SCA	AC1SDA	AC1CSC	AC1CES	AC1FST	AC1FES
AC1ILA	AC1INS	AC1INH	AC1INJ	AC1SC	AC1SR
AC1SCTR	ST1INS	ELIT	AC1LPI	AC1ER	AC1PRM
AC1PRL	AC1PSC	AC1BRS(H)	AC1BRS(L)	-----	-----

⇒ NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Interject

INJ --- --- --- --- ---



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Current Address and Data Address Stacks

AC1SCA(0)	AC1SDA(0)	AC1SCA(1)	AC1SDA(1)	AC1SCA(2)	AC1SDA(2)
AC1SCA(3)	AC1SDA(3)	AC1SCA(4)	AC1SDA(4)	AC1SCA(5)	AC1SDA(5)
AC1SCA(6)	AC1SDA(6)	AC1SCA(7)	AC1SDA(7)	AC1SCA(8)	AC1SDA(8)
AC1SCA(9)	AC1SDA(9)	AC1SCA(10)	AC1SDA(10)	AC1SCA(11)	AC1SDA(11)
AC1SCA(12)	AC1SDA(12)	AC1SCA(13)	AC1SDA(13)	AC1SCA(14)	AC1SDA(14)
AC1SCA(15)	AC1SDA(15)	---	---	---	---

Error During Diagnostic Audit Analysis

When an **Error During Diagnostic** audit occurs, the AUX specifies the address of the diagnostic program that detected an error. The general registers displayed show register contents at the AUX address. In addition, four status sections of the corresponding diagnostic scratch area are displayed.

AUDIT AT dcontoll.adr AUX=dgnprog.adr CLIENT=MTC

ERROR DURING DIAGNOSTIC

CC REGS

L=octal.data	F=octal.data	G=octal.data	J=octal.data
K=octal.data	X=octal.data	Y=octal.data	Z=octal.data

SHADOW REGS

L=octal.data	F=octal.data	G=octal.data	J=octal.data
K=octal.data	X=octal.data	Y=octal.data	Z=octal.data

DIAGNOSTIC CONTROL STATUS

STATUS*

REQID	OPSTAT	PARMS	CUROP	SPFLGS	TMPFLGS	OUTCATNO	SAVY
SAVLIT	CONFIG	ABORT	CATP2	CATPS2	INSGAD	SEGSUBS	ENSGAD
CATP	CATPS						

STATUS*

RAWCNT	RAWTEST	PAGELNK	PAGELNK	PAGERTN	PAGEJSV	RAWTOT	RTNADRS2
LOOPCT	REQTAB	REQTAB	DELAYCTS	CNTLCL	CNTLCL	REGSVF	REGSVG
REGSVJ	REGSVK	REGSVL	REGSVX	REGSVY	REGSVZ	REGSVFS	REGSVGS
REGSVJS	REGSVKS	REGSVLS	REGSVXS	REGSVYS	REGSVZS	DL1SEG	RAWPTSV
SICNT	SIDATA	SIDATA	SIDATA	SIDATA	SIDATA	SIDATA	SIDATA
SIDATA	USERFLGS	PAGEAD	RAWCALL	PSCSAVE1			

STATUS*

DBT	DBT+1	DBT+2	DBT+3	DBT+4	DBT+5	DBT+6	DBT+7
DBT+8	DBT+9	DBT+10	DBT+11	DBT+12	DBT+13	DBT+14	DBT+15
DBT+16	DBT+17	DBT+18	DBT+19	DBT+20	DBT+21	DBT+22	DBT+23
DBT+24	DBT+25	DBT+26	DBT+27	DBT+28	DBT+29	DBT+30	DBT+31

STATUS†

DATA	DATA+1	DATA+2	DATA+3	DATA+4	DATA+5	DATA+6	DATA+7
DATA+8	DATA+9	DATA+10	DATA+11	DATA+12	DATA+13	DATA+14	DATA+15
DATA+16	DATA+17	DATA+18	DATA+19	DATA+20	DATA+21	DATA+22	DATA+23
DATA+24	DATA+25	DATA+26	DATA+27	DATA+28	DATA+29	DATA+30	DATA+31

* Prefix the follow status section with DG1.

† Prefix the follow status section with DG1RAW.

Diagnostic Control Status Descriptions

DG1REQID—Request Identification

- Bit 10-16 = Member ID
- 17-21 = Unit ID of unit under diagnostic
- 22 = Controller half being tested

DG1OPSTAT—Operation Status

- Bit 0 = Diagnostic being aborted
- 1 = Internal error detected
- 2 = Diagnostic abort in progress
- 3 = Do not store diagnostic results
- 4 = Application unit type
- 5 = DGN early terminated
- 6 = CPSECT address known
- 7-10 = Output priority
- 11 = Already printed illegal phase
- 12 = Do not pass EA the DBT
- 15 = First failure exit
- 17 = Inhibit printing raw data
- 18 = DL1 coded diagnostic being executed
- 19 = Wait state for APS=1MAAPSOP
- 20 = Do not go to paging area on abort
- 22 = TLP allowed
- 23 = Page in RDS

DG1PARMS—Control Parmaters Word

- Bit 0-2 = Count of nested CALLSUBS
- 3-5 = Count of nested DOENDS
- 6 = Do DL1 segment end subroutine
- 7-13 = Each increment is .167, terminal ends automatic segment
- 14 = Do DL1 segment INIT subroutine
- 15 = Set indicates currently executing automatic segment SUB
- 16 = Segmenting flag:
 - 0 = Automatic
 - 1 = Self
- 17-23 = Current phase number

DG1CUROP—Conversational Commands Currently Being Executed

- Bit 0 = Advancing
- 1 = Stepping
- 2 = Finding conditions at start of loop--first pass
- 3 = Finding conditions at end of loop--first pass
- 6 = Looking for sync
- 7 = Looking for pause
- 8 = Looping
- 21 = Set indicates defered jump occurring

DG1SPFLGS—DCONS Jobs at Start of a Segment

- Bit 0 = Return from intra-phase paging
- 1 = Return from inter-phase paging
- 2 = Return from special paging
- 3 = Restart diagnostic
- 7 = Set indicates early terminating diagnostic
- 8 = Raw data buffer overflow
- 9 = First test failure as requested
- 10 = Return to a task routine-3
- 11 = Return to a task routine-2
- 12 = Return to a task routine-1
- 13 = Return to a task routine-0
- 14 = Output messages
- 15 = Return to task routine-4-at segend
- 18 = Early terminate DGN
- 19 = Ending current phase
- 20 = Phase initialization in progress
- 21 = Request a new phase
- 22 = New phase needed for CONV diagnostic
- 23 = Terminated diagnostic

DG1TMPFLGS—Temporary Flags

- Bit 0-3 = Message number in DG1OUTCATNO to be outputed
- 11 = Looping back to top of loop
- 12-23 = User temporary flags

DG1OUTCATNO—Messages to be Outputted

Bit 0-5 = CATNO 1

- 1 - Successful jump
- 2 - Successful step
- 3 - Successful advance
- 4 - Are looping
- 5 - Error in loop boundary-start
- 6 - Error in loop boundary-end
- 7 - Error in loop boundary-DOLOOP
- 8 - Error in loop boundary-subroutines
- 10 - Error in advance
- 11 - Paused
- 12 - Error after pause
- 16 - Looping complete

6-11 = CATNO 2 (Same as CATNO 1)

12-17 = CATNO 3 (Same as CATNO 1)

18-23 = CATNO 4 (Same as CATNO 1)

DG1SAVY—Save Area for Data Table Pointer

DG1SAVLIT—Save Area, Initial Read of Long Interval Timer at Start of Segment

DG1CONFIG—Save Area for DGN and System Configuration

Bit = Save of diagnostic PUBO
1 = Save of diagnostic PUBA
2 = Save of diagnostic PUBT
3 = Save of diagnostic PUBR
7 = Save of diagnostic IAPUT
8 = State of IN1IAPUT
9 = Save of PUBO
10 = Save of PUBA
11 = Save of PUBT
12 = Save of PUBR
13 = KCODE match 1 save bits-parity
14 = KCODE match 1 save bits-ASW
15 = KCODE match 0 save bits-parity
16 = KCODE match 0 save bits-ASW
17 = Diagnostic active bit

DG1ABORT—Index of abort SUB if dial or address of abort SUB if DL1**DG1CATP2—CATP Word 2****DG1CATPS2—CATP Summary Word 2****DG1INSGAD—Address of DL1 Segment INIT Subroutine****DG1SEGSUBS—Indexes of the Current Dial Segment Subroutines**

Bit 0-7 = Ending segment subroutine index
8-15 = Beginning segment subroutine index

DG1ENSGAD—Address of DL1 Segment End Subroutine**DG1CATP—CATP Word**

Refer to Section 3, **Conditional All Test Pass (CATP) Layouts** for layouts.

DG1CATPS—Summary CATP

Refer to Section 3, **Conditional All Test Pass (CATP) Layouts** for layouts.

DG1RAWCNT—Failing Result Counter**DG1RAWTEST—Test Counter****DG1PAGELNK—NPGSECT Linkage to Currently Executed PGSECT**

Bit 0-7 = DGN program page offset
17-23 = DGN program page number

DG1PAGERTN—Save Area for Paging Controller**DG1PAGEJSV—Save Area for Paging Controller****DG1RAWTOT—Total Error Count****DG1RTNADRS2—General Save Area for Return Addresses-used by Special Operations Controller****DG1LOOPCT—Contains Count of Times Through Requested Loop on Data Table****DG1REQTAB—Request Table Contains Information Given With Request****DG1DELAYCTS—DG1PAGELNK at Start of Loop****DG1CNTLCL—Contains the Linkage to a SUB to be Run-Called by the Control Program****DG1REGSVF—Number of RD Words Passed to TLF****DG1REGSVG-DG1REGSVZ—Save of G, J, K, L, X, Y, and Z Registers****DG1REGSVFS-DG1REGSVZS—Save of F, G, J, K, L, X, Y, and Z Shadow Registers**

DG1DL1SEG—DL1 ENDSEG/BEGSEG PARMS

Bit 1 = IFOPTS bit 0
2 = IFOPTS bit 1
3 = Inhibit INT
20 = Cross-over buffer bus inhibit

DG1RAWPTSV—Save of Raw Data Pointer at Buffer Overflow**DG1SICNT—Count of Supplementary Words (Maximum=7)**

Bit 0-3 = Count of supplementary data words
4-11 = Supplementary data lit flags
12 = DOLOOPS on/off
13 = Subroutines on/off

DG1SIDATA—Supplementary Data**DG1USERFLGS—User Flags**

Bit 1 = Test has failed
2 = No real early termination
3-4 = Save of DG1TSTRSLT
16 = OK to take pause
17-23 = Number of failing phases

DG1PAGEAD—Address of Start of Current PGSECT**DG1RAWCALL—Actual Test Counter****DG1PSCSAVE1—Diagnostics PSC Save****DG1RAWCALLS—Total Tests Executed**

DG1DBT—Diagnostic Buffer Table

Bit 0-3 = Request code for diagnostic

- 0 - DGN requested by a program without GBT
- 1 - DGN requested by a program via GBT
- 2 - Manual request detected by alarm scan
- 3 - DGN requested by error analysis
- 4 - DGN requested by DGN: TTY message
- 5 - DGN requested by RST: TTY message
- 6 - DGN requested by an audit
- 7 - DGN requested by demand exercise
- 8 - DGN requested as part of a routine exercise-midnight etc
- 9 - Deferred fault recovery (DFR) requested by TTY
- 10 - DGN requested by fault recognition
- 11 - DGN requested by bootstrap programs
- 12 - DGN requested after off-line configuration
- 14 - Unconditional restoral

4-6 = Termination code for diagnostic

- 0 - Diagnostic aborted
- 1 - Initial status error detected-diagnostic not run
- 2 - Internal software error detected-diagnostic halted
- 3 - Craftsperson manually terminated DGN
- 7 - Normal termination

7-8 = Result of the diagnostic

- 0 - Conditional all tests pass
- 1 - Some test failed
- 2 - All tests passed
- 3 - No tests run

9 = Sub-unit specified in DG1SUNITRQ and DG1SMEMNRQ

10-16 = Member number under diagnosis (DG1SMEMNRQ)

17-23 = Unit type under diagnosis (DG1SUNITRQ)

DG1DBT +1 and DG1DBT +17 contain flags set by the manual input request administration (MIRA) program. DG1DBT+1 contains those flags used mainly by DCON. DG1DBT +17 contains those flags used mainly by other programs such as error analysis, the diagnostics themselves, etc. DG1DBT +1 and DG1DBT +17 are functionally divided into two halves. The left half is used for flags that have associated data arguments. The right half is used for flags that have no associated data arguments.

⇒ NOTE:

If the GBT is not set up via a manual request, these flags and data arguments may be set by any program.

DG1DBT +1

- Bit 0 = Raw data requested
- 1 = Inhibit termination on failure
- 2 = Growth specified
- 4 = Conversational diagnostic
- 19 = New conversational commands typed
- 20 = Partial request - run specified phases
- 21 = Repeat diagnostic DG1RPTCNT times
- 22 = Output channel specified
- 23 = TLP specified on input

DG1DBT +2

- Bit 0-7 = Number of times a DGN test is to be repeated (DG1RPTCNT)
- 8-15 = TTY channel on which message received
- 16-23 = Channel, if specified, for outputting

DG1DBT +3

- Bit 0-23 = Reserved for return addresses

DG1DBT +4

Bit 0-9 = Phases 9 through 0 request bits
10-19 = Phases 9 through 0 fail bits
21-23 = MT-MV save

DG1DBT +5

Bit 0-9 = Phases 19 through 10 request bits
10-19 = Phases 19 through 10 fail bits

DG1DBT +6

Bit 0-9 = Phases 29 through 20 request bits
10-19 = Phases 29 through fail bits

DG1DBT +7

Bit 0-9 = Phases 39 through 30 request bits
10-19 = Phases 39 through 30 fail bits

DG1DBT +8

Bit 0-9 = Phases 49 through 40 request bits
10-19 = Phases 49 through 40 fail bits

DG1DBT +9

Bit 0-9 = Phases 59 through 50 request bits
10-19 = Phases 59 through 50 fail bits

DG1DBT +10

Bit 0-9 = Phases 69 through 60 request bits
10-19 = Phases 69 through 60 fail bits

DG1DBT +11

Bit 0-9 = Phases 79 through 70 request bits
10-19 = Phases 79 through 70 fail bits

DG1DBT +12

Bit 0-9 = Phases 89 through 80 request bits
10-19 = Phases 89 through 80 fail bits

DG1DBT +13

Bit 0-9 = Phases 99 through 90 request bit
10-19 = Phases 99 through 90 fail bit

DG1DBT +14

Bit 0-3 = Task number
 0 - Basic unit diagnostic
 4-6 = Frame scan point index
 7-13 = Sub-member number requested
 14-23 = Sub-unit type requested

DG1DBT +15

Bit 0 = Power alarm involved in request
 1 = Request is RMV requestd by TTY
 2 = Skip diagnostic request and dummy ATP
 3 = Flag to show MCFWPEMO was initial entry from
 Maintenance Administration Control Program (MACP)
 4-7 = Number of failing phases to include in TLP
 9 = Sub-unit specified in DG1SUNITHP and DG1SMENHP
10-16 = Helper member number
17-23 = Helper unit type

DG1DBT +16

Bit 7-13 = Helper member number
14-23 = Helper sub-unit

DG1DBT +17

Bit 0-11 = General Flag 0 through 11
12-19 = Set indicates data in DG1DATA0 through DG1DATA7

DG1DBT +18 through DG1DBT +25

Bit 0-23 = DG1DATA0 through DG1DBTA7

DG1DBT +26

Bit 0-23 = Point of maximum definition per FR analysis

DG1DBT +27

Bit 0-23 = Interrupt number associated with this request

DG1DBT +28

Bit 0-23 = Job ID of the diagnostic request

DG1DBT +29

Bit 0-23 = Error analysis processor

DG1DBT +30—Error Analysis Application

Bit 0-7 = Number of ERAT requested DGN cycles remaining to be run

8 = Text phrase present in WRD 29

9 = Indicates a DT frame diagnostic

10-11 = Count of aborts during ERATPUFH

12 = PUFH client flag for MCFWPEM0

13 = Growth unit restoral request

14 = Transfer to SYRE requested by PUFH

15 = Final handling directed by ERAT

16-22 = Error analysis decision code

23 = Final handling completed by SEQ TLB

DG1DBT +31

Bit 0-2 = Code for first abort

3-5 = Code for second abort

6 = Diagnostic aborted once

7 = Diagnostic aborted twice

DG1RAWDATA—Raw Data Area**RAWDATA +1 Through RAWDATA +61—Layout for Raw Data Storage of Failing Result**

Bit 0-11 = Raw data sub catalog

12-23 = Size of raw data sub catalog

Error During Trouble Locating Procedure (TLP) Audit Analysis

When an **Error During Diagnostic** TLP audit occurs, the AUX specifies the address of the TLP program that detected an error. The general registers displayed show most register contents at the AUX address. In addition, the stack and three status sections of TLP control memory are displayed.

AUDIT AT dcontoll.adr AUX=drpp_prog.adr CLIENT=MTC
ERROR DURING DIAGNOSTIC

CC REGS

L=octal.data F=scratch.ptr G=prog.data J=drpp_prog.adr
K=octal.data X=octal.data Y=octal.data Z=octal.data

SHADOW REGS

L=octal.data F=octal.data G=octal.data J=octal.data
K=octal.data X=octal.data Y=octal.data Z=octal.data

STACK STKCNTN=n

stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr
stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr	stackadr

TLP CONTROL STATUS

STATUS *

NWDC0	SCDATA	USDAT1	SCPD	SCPD+1	SCPD+2	SCPD+3	SCPD+4
SCPD+5	SCPD+6	SCPD+7	SCPD+8	SCPD+9	SCPD+10	SCPD+11	SCPD+12
SCPD+13	SCPD+14	SCPD+15	SCPD+16	SCPD+17	SCPD+18	SCPD+19	SCPD+20
SCPD+21	SCPD+22	SCPD+23	SCPD+24	SCPD+25	SCPD+26	SCPD+27	SCPD+28
SCPD+29	SCPD+30	SCPD+31	SCPD+32	SCPD+33	SCPD+34	SCPD+35	SCPD+36
SCPD+37	SCPD+38	SCPD+39	SCPD+40	SCPD+41	SCPD+42	SCPD+43	SCPD+44
TPCRL0	TPCRL1	TPCRL2	TPBKAD	TPERRW			

STATUS †

LOCTID	LOCTRL	LOCFN	TAFILE	ALWUTY	TRYNO	ELAP	OV LAP
TAPERR	TSKADL	TSKADH					

STATUS *

STLPB	STLPB+1	STLPB+2	STLPB+3	STLPB+4	STLPB+5	STLPB+6	STLPB+7
STLPB+8	STLPB+9	STLPB+10	STLPB+11	STLPB+12	STLPB+13	STLPB+14	STLPB+15
STLPB+16	STLPB+17	STLPB+18	STLPB+19	STLPB+20	STLPB+21	STLPB+22	STLPB+23
STLPB+24	STLPB+25	STLPB+26	STLPB+27	STLPB+28	STLPB+29	STLPB+30	STLPB+31
STLPB+32	STLPB+33	STLPB+34	STLPB+35	STLPB+36	STLPB+37	STLPB+38	STLPB+39
STLPB+40	STLPB+41	STLPB+42	STLPB+43	STLPB+44	STLPB+45	STLPB+46	STLPB+47
STLPB+48	STLPB+49	STLPB+50	STLPB+51	STLPB+52	STLPB+53	STLPB+54	STLPB+55
STLPB+56	STLPB+57	STLPB+58	STLPB+59	STLPB+60	STLPB+61	STLPB+62	STLPB+63

* Prefix the following status section with DG1T_.

† Prefix the following status section with DG1A_.

Trouble Locating Procedure Status Descriptions

STACKADR 0 through STACKADR +55

DG1T_NWDC0—Number of Word Counter 0

- Bit 0-12 = Number of disk raw data words
- 13 = Page scratch flag
- 14 = First pass flag
- 15 = End of DGN flag
- 16-20 = Summary TLP flag

DG1T_SCDATA—Stack Data

- Bit 0-5 = Save stack counter
- 6-9 = Number in stack save area
- 10-11 = DKJ re-try counter
- 12 = DKJ read protected flag
- 13 = MACP over-written flag
- 14 = MACP on disk flag
- 15 = Queue access denied flag
- 16 = Queue full flag
- 17 = File found flag
- 18 = I opened queue flag
- 19 = TLP queue verification in progress flag
- 20 = No lamp flag
- 21 = No physical flag
- 22 = Verify restart flag
- 23 = Inhibit 25th bit processing

DG1T_USDAT1—User Data Block 1

- Bit 0-7 = MEQL index
- 8-14 = First failing phase
- 15-17 = Input type data
- 18 = PA SMP TLP flag
- 19 = Force DRPP call at end of phase

DG1T_SCPD—DRPP Scatch Pad**DG1T_SCPD +1 - DG1T_SCPD +44****DG1T_TPCRL0—Tape Control 0**

- Bit 0-11 = Requested tape block
- 12 = File sequencing check
- 13 = Block sequence check flag
- 14 = Tape check pass flag
- 15-18 = Next disk block to be used

DG1T_TPCRL1—Tape Control 1

- Bit 0-11 = Last block read
- 12-23 = Current tape block

DG1T_TPCRL2—Tape Control 2

- Bit 0-11 = Lower bound tape block
- 12-23 = Upper bound tape block

DG1T_TPERRW—Tape Error Words

- Bit 0 = End of file flag
- 1-2 = Comparative dummy block size
- 3-19 = Number of words read
- 20 = Beginning of tape flag

DG1A_LOCTID—Tape ID word

DG1A_LOCTRL—Locator Control Word

DG1A_LOCFN—Queue File Number

DG1A_TAFILE—Tape File Numbers

Bit 0-11 = Desired tape file number
12-23 = Current tape file sequences number

DG1A_ALWUTY—Queue Access Bits for Each Unit

DG1A_TRYNO—Locator or SP Attempt Number

Bit 0-1 = Input state item
2-4 = Locator attempts
5-7 = SP attempts
8-11 = Task number
12-19 = Save input channel ID

DG1A_ELAP—Time Elapsed During Tape Operation

Bit 0-11 = Maximum elapsed time
12-23 = Elapsed time

DG1A_OVLAP—Overall Elapsed Time

Bit 0-11 = Overall maximum elapsed time
12-23 = Overall elapsed time

DG1A_TAPERR—Tape Operation Error Word

- Bit 0 = FSN does not agree with expected
- 1-3 = Output error code
- 4-7 = Reject error code
 - 8 = TLP tape is empty
 - 9 = Contents of LOCTID not in directory
- 10 = Tape OP error has occurred, retry
- 11 = SP encountered tape failure, retry
- 12 = Off-normal output code
- 13 = Off-normal success code
- 14 = Off-normal EOT code
- 15 = Immediate rejection has occurred
- 16 = Invalid directory block
- 17 = Time out has occurred, retry
- 18 = Overall time out has occurred, suspend
- 19 = Data block size error
- 20 = Block word count error
- 21 = Off-normal EOF encountered
- 22 = Off-normal BOT encountered

DG1A_TSKADL—Start Address of New Task (Low PRI)**DG1A_TSKADH—Start Address of New Task (High PRI)****DG1T_STLPB—Special TLP Block****DG1T_STLPB +1 through DG1T_STLPB +63**

Processor Recovery Printouts

Processor Configuration Recovery [PCRv (ALEV, BLEV Reports)]

PCRv: A-LEVEL ENTRY (Full Version)

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASA(H)	AC1ASA(L)
AC1SCA	AC1SDA	AC1CSC	AC1ILA	AC1PCR	AC1SR
AC1MCO	AC1MCP	AC1MCD(H)	AC1MCD(L)	PS1RVBOOT	CS1RVBOOT

PCRv: B-LEVEL ENTRY (Full Version)

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(H)	AC1BR(L)	AC1ASB(H)	AC1ASB(L)
AC1SCA	AC1SDA	AC1CSC	AC1ILA	AC1PCR	AC1SR
AC1MCO	AC1MCP	AC1MCD(H)	AC1MCD(L)	AC1INH	AC1INS

PCRv: FAILED (Full Version)

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR(L)	AC1FRS	AC1GRS	AC1JRS
AC1KRS	AC1LRS	AC1XRS	AC1YRS	AC1ZRS	AC1SR
AC1SC	PC1HISTORY	PC1OVER- RIDE(H)	PC1OVER- RIDE(L)	PC1FILL_ ADDR	AC1PCR

PCRv: A-LEVEL ENTRY (Short Version)

AC1JR	AC1KR	AC1SCA	AC1CSC	AC1PCR	AC1SR
AC1MCO	AC1MCP	AC1MCD(H)	AC1MCD(L)		

PCRv: B-LEVEL ENTRY (Short Version)

AC1JR	AC1KR	AC1SCA	AC1CSC	AC1PCR	AC1SR

PCRv: FAILED (Short Version)

AC1JR	AC1KR	AC1SR	PC1HISSTORY	PC1OVER RIDE(H)	PC1OVER RIDE(L)

⇒ NOTE:

1. Printout is an analysis aid message.
2. Data descriptions can be found in datapool-defined locations or in CC interrupt data.
3. Printout for “B-Level Entry” and “failed” is full or short version according to PC states:

	Actual PC State (Decimal)	Message Format
1 - 17	Non-Pump States & NO-OP	None
18 - 19	18 is First Pump from disk	Full
20 - 23	Pump States	Short
24 - 25	NO-OP States	None
26 - 31	Pump States	Short
32	NO-OP State	None
33 - 39	Pump States	Short
40 - 41	NO-OP States	None
42 - 47	Pump States	Short
48	NO-OP State	None
49 - 51	50 is Pumping Repeated PC	Full
52 - 55	REPC Pump States	Short
56 - 57	NO-OP States	None
58 - 63	REPC Pump States	Short

4. Printout for “A-Level Entry” is short for all PC states.
5. Operate MCC key “Restore Maintenance IO” to obtain the full version printouts.
6. Operate MCC key “Clear Utility Function” to inhibit printouts (This overrides MCC key “Restore Maintenance IO”).
7. See I/O Manual for additional information.

Processor Configuration Recovery (PCRV) is a processor recovery concept that automatically tries every possible combination of the duplex units available to regain a sane simplex configuration. The different configurations are listed in Table 8-A—Processor Configuration State Table. Processor Configuration Recovery steps the processors, memories, and buses through the states until a working configuration is selected.

The Processor Configuration Recovery process may be started by any of the following:

- Called by the Software Integrity Phases
- Invoked by other fault recovery programs
- By timeout of the Processor Configuration Sanity timer (B level interrupt)
- Manual intervention from the MCC.

In the following example, Processor Configuration Recovery is started by the timing out of the Processor Configuration Sanity timer:

- A low level fault occurs.
(C through K level interrupt)
- The appropriate fault recovery program is selected to isolate and correct the fault.
- At the point of interrupt, the Processor Configuration sanity timer is started.
- If the fault recovery program clears the trouble before the processor configuration sanity timer times out, Processor Configuration Recovery is not invoked; the Processor Configuration Sanity timer is reset.
- If the processor configuration sanity timer times out, a B level interrupt occurs; PCRV is started at state 1.
- After each time out, the processor configuration sanity timer is reset and restarted.
- If CC sanity tests pass, a sane configuration has been found, and the processor configuration sanity timer is reset.

- If CC sanity tests fail, the processor configuration sanity timer times out. The processor configuration state is incremented, and another configuration is selected. This condition repeats until a sane configuration is found.

Processor Configuration Recovery (PCRv) starts with minimal changes (switch CCs, then no change), then specifies the program store and the program store bus. After the first 7 attempts at processor configuration, pumping of the memory from the disk is done for each new configuration. Only the CC is forced via hardware; PSs, PSBs, CSs, CSBs, IFBs, and AUBs are forced via Boot ROM firmware. After State O'(77), repeated PCs occur as the state cycles back to O'(40), and repeated cycles on the upper states from O'(40) to O'(77). Repeated PCs continue until a working processor configuration is found, and software resets the processor configuration state counter to zero. Central control switching is done by the hardware at States 1, 4, 10, 20, 40, and 60 (during repeated PCs, the only CC switch is at State 60).

If Processor Configuration Recovery does not pull together, a working 1B Processor, manual intervention may be used to bring the system up via the MCC (with Hard and Soft A-level requests).

Table 8-A. 1B Processor Configuration State Table

State (Octal)	PS	PSB	CSB	IFB	AUB	Repeat PC	Switch CC	Comments
1	-	-	-	-	-	0	No	
2	-	-	-	-	-	0	Yes	If CC trouble bit not set
3	Toggle	-	-	-	-	0	No	Switch Base PS
4	0	0	-	-	-	0	No	PS0/PSB0
5	1	1	-	-	-	0	No	PS1/PSB1
6	0	1	-	-	-	0	No	PS0/PSB1
7	1	0	-	-	-	0	No	PS1/PSB0
10	0	0	0	1	0	0	No	Hash/Pump States
11	1	1	1	0	1	0	Yes	
12	0	1	0	1	0	0	No	
13	1	0	1	0	1	0	No	
14	0	0	1	1	0	0	No	
15	1	1	0	0	1	0	No	
16	0	1	1	1	0	0	No	
17	1	0	0	0	1	0	No	

See footnotes on last page of table.

Table 8-A. 1B Processor Configuration State Table (Contd)

State (Octal)	PS	PSB	CSB	IFB	AUB	Repeat PC	Switch CC	Comments
20	0	0	0	0	1	0	Yes	
21	1	1	1	1	0	0	No	
22	0	1	0	0	1	0	No	
23	1	0	1	1	0	0	No	
24	0	0	1	0	1	0	No	
25	1	1	0	1	0	0	No	
26	0	1	1	0	1	0	No	
27	1	0	0	1	0	0	No	
30	0	0	0	1	1	0	No	
31	1	1	1	0	0	0	No	
32	0	1	0	1	1	0	No	
33	1	0	1	0	0	0	No	
34	0	0	1	1	1	0	No	
35	1	1	0	0	0	0	No	
36	0	1	1	1	1	0	No	
37	1	0	0	0	0	0	No	

See footnotes on last page of table.

Table 8-A. 1B Processor Configuration State Table (Contd)

State (Octal)	PS	PSB	CSB	IFB	AUB	Repeat PC	Switch CC	Comments
20	0	0	0	0	1	0	Yes	
21	1	1	1	1	0	0	No	
22	0	1	0	0	1	0	No	
23	1	0	1	1	0	0	No	
24	0	0	1	0	1	0	No	
25	1	1	0	1	0	0	No	
26	0	1	1	0	1	0	No	
27	1	0	0	1	0	0	No	
30	0	0	0	1	1	0	No	
31	1	1	1	0	0	0	No	
32	0	1	0	1	1	0	No	
33	1	0	1	0	0	0	No	
34	0	0	1	1	1	0	No	
35	1	1	0	0	0	0	No	
36	0	1	1	1	1	0	No	
37	1	0	0	0	0	0	No	

See footnotes on last page of table.

Table 8-A. 1B Processor Configuration State Table (Contd)

State (Octal)	PS	PSB	CSB	IFB	AUB	Repeat PC	Switch CC	Comments
60	0	0	0	0	1	1	Yes	Repeated PC
61	1	1	1	1	0	1	No	
62	0	1	0	0	1	1	No	
63	1	0	1	1	0	1	No	
64	0	0	1	0	1	1	No	
65	1	1	0	1	0	1	No	
66	0	1	1	0	1	1	No	
67	1	0	0	1	0	1	No	
70	0	0	0	1	1	1	No	Repeated PC
71	1	1	1	0	0	1	No	
72	0	1	0	1	1	1	No	
73	1	0	1	0	0	1	No	
74	0	0	1	1	1	1	No	
75	1	1	0	0	0	1	No	
76	0	1	1	1	1	1	No	
77	1	0	0	0	0	1	No	Loop to O'(40) for repeated PC

* Switch CCs if not Repeated PC

† Repeated PC starts with O'(40) when cycle returns from state O'(77).

Processor Configuration Recovery Test Run and HASHSUM Results

PC1HISTORY	PC1OVERRIDE(H)	PC1OVERRIDE(L)	M_ADDR	M_DATA	M_ADDR
M_DATA	M_ADDR	M_DATA	M_ADDR	M_DATA	M_ADDR
M_DATA	M_ADDR	M_DATA	M_ADDR	M_DATA	M_ADDR

(Data block may contain up to 128 words)

PC1HISTORY—Tests Executed During Last PC State or Activate Override

Bit 0 = PU bus was switched by PC peripheral tests

1 = Unused

2 = Some transient CS was zeroed by PC

3 = PC was executed as part of a system reinitialization

4 = Call store bootstrap was requested

5 = Program store bootstrap was requested

6 = AU bootstrap was requested

7 = Hash sums were pumped due to a failure in the hash over hash check

8 = AU bus 0/1 (reset/set) was forced active by PC or activate override

9 = AU tests found a bad CS. CS bootstrap was re-executed

10 = AU tests found a bad PS. PS bootstrap was re-executed

12 = Transient data in CS 0 was zeroed by the PC

13 = Transient data in PS 0 was zeroed by the PC

(always true for PC pump state or activate override)

14 = Core pump actions have been executed (entry was activate override, PC pump state, or phase of memory reinitialization)

15 = Phase entry to PC. PC circuit not inhibited

16 = Phase entry to PC. PC circuit was inhibited

17 = Phase entry to hash and correct memory. returns to phase program

PC1OVERRIDES(H)—Tests Bypassed or Overrides Requested in Last PC State or Activate Override

- Bit 0 = Inhibit MUP restart on A-level and B-level
1 = Supervisory mode in utility system reinitialization
2 = Skip interface bus (IFB) access tests
3 = Inhibit diagnostic tests

PC1OVERRIDES(L)—Tests Bypassed or Overrides Requested in Last PC State or Activate Override

- Bit 15 = System reinitialization completed using generic tape and a separate office data tape
16 = All nonbacked-up memory was zeroed
17 = Hash sum check of core data was bypassed
18 = CC sanity tests were bypassed
19 = Tape error correction inhibited during system reinitialization
20 = Map audits inhibited during system reinitialization
21 = Store maintenance tests were bypassed
22 = File stores were unconditionally restored with internal PESTs set
23 = Duplex file store failure specified during system reinitialization

M_ADDR—Address of Mutilated Fixed Core Data (Bit 0-23)

M_DATA—Invalid Contents of Address Mutilation (Bit 0-23)

Interrupt Data Register Layouts

The Interrupt Data Register Layouts are arranged in an alphabetical order without the AC1 (active) or ST1 (standby) prefix. The number following the register mnemonic is the buffer bus register number. Refer to Section 4, *Reading the Buffer Bus Registers* for instructions.

ABC—Auxiliary Buffer Control (317)

(Froze on Interrupt)

- Bit 0-3 = Parity bits received for the corresponding bytes in auxiliary buffer word, right (ABR) [DFRRP(0-3)1]
- 4-7 = Parity bits received for the corresponding bytes in auxiliary buffer work, left (ABL) [DFRLP(0-3)1]
- 8 = Fetch ASW response (DFASW1)
- 9 = Fetch ASW failure response (DFASWF1)

ACT—Auxiliary Activity Register (355)

- Bit 0 = Processor configuration activity branch B (PCBACT)
- 1 = Program store activity branch (PSACT)
- 2 = Call store activity branch (CSACT)
- 3 = PU activity branch (PUACT)
- 4 = Millisecond clock activity branch (MCLACT)
- 5 = Processor configuration activity branch A (PACT)
- 6 = Matcher activity branch (MAACT)
- 7 = Cycle clock and start/stop activity branch (CLKACT)
- 8 = CC read/write activity branch (RWACT)
- 9 = GCP source activity branch (PUSACT)
- 10 = IFB activity branch (IFACT)
- 11 = Cross-over buffer bus inhibit (XBBINH)
- 12 = CC identity: 0=CC0, 1=CC1 (R/O)(CC1ID)
- 13 = Peripheral unit control bus selection: 0=both busses, 1=same bus (PUCB)
- 14 = Invert ROM control parity (CINVPAR)
- 15 = Peripheral unit control bus polling select: 0=Bus0, 1=Bus1 (POCB)

AP—Address Parity Register (257)

- Bit 0-3 = Parity over the corresponding byte of data address (DAP)
- 4-7 = Parity over the corresponding byte of fetch address (FAP)
- 8 = Parity over the fetch address control signals (FACP)

ASA—Interrupt Return Store A (230)

- Bit 0-29 = Current program address for interrupt routines
- 30 = Homogeneity bit
- 31 = Condition code sign

ASB—Interrupt Return Store B (231)

- Bit 0-31 = See ASA for bits layout

ASC—Interrupt Return Store C (232)

- Bit 0-31 = See ASA for bits layout

ASD—Interrupt Return Store D (233)

- Bit 0-31 = See ASA for bits layout

ASE—Interrupt Return Store E (234)

- Bit 0-31 = See ASA for bits layout

ASF—Interrupt Return Store F (235)

- Bit 0-31 = See ASA for bits layout

ASG—Interrupt Return Store G (236)

Bit 0-31 = See ASA for bits layout

ASH—Interrupt Return Store H (237)

Bit 0-31 = See ASA for bits layout

ASJ—Interrupt Return Store J (240)

Bit 0-31 = See ASA for bits layout

ASK—Interrupt Return Store K (241)

Bit 0-31 = See ASA for bits layout

BNCTL—Bus Node Control Register (000)

- Bit 0 = ARM collection of BN stacks
- 1 = Memory addressing bus node special
- 2 = Invoke the DG snap function

BR—Buffer Register (377)

Bit 0-31 = Provides read/write access to the B-Register

BRS—Buffer Register Shadow (376)

(Froze on Interrupt)

Bit 0-31 = Traps the contents of the B-Register at the time an error occurs

CCS(H)—Bus Control Status (H) (215)

- Bit 24 = CC is active
- 25 = CC1, if not set CC0
- 26 = Routine matching is active in this CC
- 27 = CC stopped by active CC or MUP has halted CC

CCS(L)—Bus Control Status (L) (215)

- Bit 0 = Send on program store bus 0
- 1 = Send on program store bus 1
- 2 = Receive on program store bus 0
- 3 = Send on call store bus 0
- 4 = Send on call store bus 1
- 5 = Receive on call store bus 1
- 6 = CC trouble flip-flop
- 7 = CC divorced flip-flop
- 8 = Send on peripheral unit write bus 0
- 9 = Send on peripheral unit write bus 1
- 10 = Receive on peripheral unit reply bus 0
- 11 = Receive on peripheral unit reply bus 1
- 12 = Attached processor interface 0 trouble
- 13 = Attached processor interface 1 trouble
- 14 = Send on interface 0 trouble
- 15 = Send on interface 1 trouble
- 16 = Receive on interface 0 trouble
- 17 = Receive on interface 1 trouble
- 18 = Auxiliary unit 0 activity flip-flop is set
- 19 = Auxiliary unit interface 0, trouble bus 0
- 20 = Auxiliary unit interface 1, trouble bus 1
- 21 = Auxiliary unit activity 1, flip-flop is set
- 22 = Auxiliary unit interface 1, trouble bus 0
- 23 = Auxiliary unit interface 1, trouble bus 1

CES—CC Error Summary Register (340)

(Froze on Interrupt)

- Bit 0 = Stack counter read operation (SCROP)
- 1 = Stack counter write operation (SCWOP)
- 2 = Data parity write error from CS (DPWECS)
- 3 = Data parity write error from PS (DPWEPS)
- 4-7 = Save B register generated parity bits
 - 4 = B Register parity bit (0) on the ALU (SBRP0)
 - 5 = B Register parity bit (1) on the ALU (SBRP1)
 - 6 = B Register parity bit (2) on the ALU (SBRP2)
 - 7 = B Register parity bit (3) on the ALU (SBRP3)
- 8 = ASW error on MMIO access (IFASWE)
- 9 = Parity error on MMIO response (IFPE)
- 10 = ASW Failure on MMIO access (IFASWF)
- 11 = PS ASW error (PSASWE)
- 12 = PS ASW failure (PSASWF)
- 13 = PS parity error right half (PSPER)
- 14 = PS parity error left half (PSPEL)
- 15 = CS ASW error (CSASWE)
- 16 = CS ASW failure (CSASWF)
- 17 = CS parity error (CSPE)
- 18 = ASW error on PROM access (RASWE)
- 19 = ASW failure on PROM access (RASWF)
- 20 = Parity error on right word read from PROM (RPER)
- 21 = Parity error on left word read from PROM (RPEL)
- 22 = CS maintenance control F/F (MTCCS)
- 23 = PS maintenance control F/F (MTCPS)

CLE—Clock Error Detect and Status (203)

- Bit 0 = Unlatch clock error summary for clock the clock generator (CLKERR1)
- 1 = Active generator clock error bit (CKGAERR1)
 - 2 = CC distribution clock error (CKDIERR1)
 - 3 = Interface bus 0T4 distribution clock error (CKI0ERR)
 - 4 = Interface bus 2T6 distribution clock error (CKI2ERR)
 - 5 = Standby CC twisted ring cable (TRC) or cable fail error latched (CKGSERR)
 - 6 = Standby CC TRC or cable fail error set (CKSGERR)
 - 7 = Clear clock errors bits (CLRCKER)
 - 8 = Test to set 0T4 motion detector to 0 (TMOT40)
 - 9 = Test to set 0T4 motion detector to 1 (TMOT41)
 - 10 = Test to set 1T5 motion detector to 1 and 2 to 0 (TMOT50)
 - 11 = Test to set 1T5 motion detector to 1 and 2 to 0 (TMOT51)
 - 12 = Test to set 2T6 motion detector to 1 and 2 to 0 (TM2T60)
 - 13 = Test to set 2T6 motion detector to 1 and 2 to 1 (TM2T61)
 - 14 = Test to set 3T7 motion detector to 1 and 2 to 0 (TM3T70)
 - 15 = Test to set 3T7 motion detector to 1 and 2 to 1 (TM3T71)
 - 16 = Test to set 0T4 motion detector 3 to 0 (TMOT40A)
 - 17 = Test to set 0T4 motion detector 3 to 1 (TMOT41A)
 - 18 = Test to set 1T5 motion detector 3 to 0 (TMOT50A)
 - 19 = Test to set 1T5 motion detector 3 to 1 (TMOT51A)
 - 20 = Test to set 2T6 motion detector 3 to 0 (TM2T60A)
 - 21 = Test to set 2T6 motion detector 3 to 1 (TM2T61A)
 - 22 = Test to set 3T7 motion detector 3 to 0 (TM3T70A)
 - 23 = Test to set 3T7 motion detector 3 to 1 (TM3T71A)

CSC—CC Status Flip-Flops (351)

- Bit 0 = PS bus control—Active send on both (R/O)(PBO)
- 1 = PS bus control—Active bus (R/O)(PBA)
- 2 = PS bus control—Standby bus trouble (R/O)(PBT)
- 3 = CS bus control—Active send on both (R/O)(CBO)
- 4 = CS bus control—Active bus (R/O)(CBA)
- 5 = CS bus control—Standby bus trouble (R/O)(CBT)
- 6 = CC activity flip-flop (R/O)(CCACT)
- 7 = CC trouble standby flip-flop (R/O)(TCC)
- 8 = CC divorce mode (R/O)(DIV)
- 9* = PUBO—Coded enable PU bus control—Active send on both (R/O)(PUBO)
- 10* = PUBA—Coded enable PU bus control—Active bus (R/O)(PUBA)
- 11* = PUBT—Coded enable PU bus control—Standby bus trouble (R/O)(PUBT)
- 12* = PUBR—Coded enable PU bus control—Active Received on both (R/O)(PUBR)
- 13 = Processor activity status for PBO (PBOS)
- 14 = Processor activity status for CBO (PCOS)
- 15 = Processor activity status for DIV (DIVS)
- 21 = Call store program flip-flop (CSPGM)
- 22 = Freeze stop or clear stop indicator (FSTPTP)
 - 1 = Maintenance matcher freeze-stop standby
 - 0 = Standby CC will receive a clear-stop

* See CC to PUB Routing Table

CC to PUB Routing via CSC Bits (PUBR, PUBT, PUBA, PUBO)

Bit 12 PUBR	Bit 11 PUBT	Bit 10 PUBA	Bit 9 PUBO	Active CC		Standby CC	
				Send Bus	RCV Bus	Send Bus	RCV Bus
0	0	0	0	0	0	1	1
0	0	0	1	0 & 1	0	None	1
0	0	1	0	1	1	0	0
0	0	1	1	0 & 1	1	None	0
0	1	0	0	0	0	None	0
0	1	0	1	0 & 1	0	None	0
0	1	1	0	1	1	None	1
0	1	1	1	0 & 1	1	None	1
1	Don't Care	Don't Care	Don't Care	0 & 1	0 & 1	None	0 & 1

⇒ NOTE:

Both active and standby CCs should have the same values for PUBR, PUBT, PUBA, and PUBO but are interpreted differently as shown in the preceding table.

CUI—CC Utility Interface Register (211)

- Bit 0-8 = CC utility interface address bits (CUIA)
- 9-16 = CC utility interface data bits (CUID)
- 17 = CC utility interface read/write bit (CUIR1WO)
- 18 = CC utility interface busy (CUIBSY)

DLR—Delay-Limited-Run Register (356)

- Bit 0-7 = Delay following trigger before standby CC begins running (DELAY)
- 8-15 = Number of instruction cycles which the standby CC runs (LIMIT)
- 16 = CC freeze-stop after mismatch (standby CC only)(MFSTPFF)
- 17 = CC clear-stop after mismatch (overrides freeze-stop)(MCSTPFF)
- 18 = CC was freeze-stopped (R/O)
- 19 = Freeze-stop standby CC only (W/O)(FSTP)
- 20 = CC was clear-stopped (R/O)
- 21 = Clear-stop standby CC only (W/O)(CLSTP)
- 23 = Start standby CC (W/O)(START)

ELIT—End of Interrupt Long Interval Timer

- Bit 0-23 = Elapsed interrupt time

EPS—Execution Pipeline State (334)

- Bit 0 = DAR read request (CDARRQ)
- 1 = DAR write request (CDARWQ)
- 2 = DAR maintenance request (CDARMQ)
- 3 = DAR control request (CDARCQ)
- 4 = DAR control signal parity (CDARPQ)
- 5 = DAR GCP request (CDARGQ)
- 6 = DAR store secure (CDARSS)
- 7 = Data port is stack request (CDPSTK)
- 8 = DIR 0 active (CDIR0A)
- 9 = DIR 0 "Read" GOT bus (CDIR0GB)
- 10 = DIR 1 Active (CDIR1A)
- 11 = DIR 1 "Read" GOT bus (CDIR1GB)
- 12 = Operational interrupt hold (CINHJ)
- 13 = Data port protected area check flag (DPPACH)

ER—E-Register—Peripheral Unit Enable Register (200)

- Bit 10-16 = Peripheral unit member (Member)
- 17-21 = Peripheral unit type (Bits 10-21 from the enable address)(PUTYPE)

FCE—IFBC Client Enable Register (361)

- Bit 0-15 = Enable client 00 through 15 request
- 19 = Enable FLD/FLT shadow register access
- 20-23 = FLD/FLT shadow register address

FCT—IFBC Control Register (360)

- Bit 0 = Poll operational interjects
- 1 = Poll maintenance interjects
- 2 = Poll maintenance interrupts
- 3 = Enable IFB operational interjects
- 4 = Enable IFB maintenance interrupts
- 5 = Spare
- 6 = Request near client 0 block
- 7 = Request near client E client-to-client
- 8 = Request near client C word
- 9 = Request far client 2 block
- 10 = Request far client 6 client-to-client
- 11 = Request far client 8 word
- 12 = DMA suspended by interrupt (read only)
- 14 = Test request enable
- 15 = IFB0 to IFBC enable
- 16 = IFB1 to IFBC enable
- 18 = IFBC to IFB0 enable (pulse)
- 19 = IFBC to IFB1 enable (pulse)
- 21 = Clear IFBC errors (pulse)
- 22 = IFBC errors interlock
- 23 = IFBC master reset (pulse)

FEE—IFBC Error Enable Register (363)

- Bit 0 = IFB0 control error
- 1 = IFB0 address parity error
- 3 = IFB1 control error
- 4 = IFB1 address parity error
- 6 = MMIO control error
- 7 = MMIO address parity error
- 9 = IFBC arbiters mismatch
- 10 = IFB grant timeout
- 11 = Arbiter state invalid
- 12 = Store write parity error during DMA
- 13 = Multiple client requests
- 15 = Invalid client master reply code
- 16 = Invalid client slave reply code
- 18 = ASW/ASF error during DMA
- 19 = Enable FLA shadow register access
- 20-23 = FLD/FLT shadow register address

FER—IFBC Error Request Register (364)

- Bit 0 = IFB0 control error
- 1 = Memory control bit
- 3 = IFB1 control error
- 4 = Memory maintenance bit
- 6 = MMIO control parity error
- 7 = Spare
- 9 = IFBC arbiters mismatch (override CDIV1)
- 10 = IFB grant timeout
- 11 = Arbiter state invalid
- 12 = Spare
- 13 = Multiple client requests
- 15 = Invalid client master reply code
- 16 = Invalid client slave reply code
- 18-21 = Generate address parity error, byte 0 through 3
- 22 = Examine near non-responding bus

FES—IFBC Error Source Register (362)

- Bit 0 = IFB0 control error
- 1 = IFB0 address parity error
- 3 = IFB1 control error
- 4 = IFB1 address parity error
- 6 = MMIO control error
- 7 = MMIO address parity error
- 9 = IFBC arbiters mismatch
- 10 = IFB grant timeout
- 11 = Arbiter state invalid
- 12 = Store write parity error during DMA
- 13 = Multiple client requests
- 15 = Invalid client master reply
- 16 = Invalid client slave reply
- 18 = ASW/ASF error during DMA
- 19-20 = Spare
- 22 = Client maintenance interrupt active
- 23 = IFBC error detected

FIP—IFBC Interrupt/Interject Poll Register (366)

- Bit 0-23 = Client interrupt/interject active (client 00 through 23)
- 29 = Copy of FCT.OU_POL (matcher/monitor store only)
- 30 = Copy of FCT.MU_POL (matcher/monitor store only)
- 31 = Copy of FCT.MIN_POL (matcher/monitor store only)

FIS—Fetch-Index State Register (332)

- Bit 0 = CCFF homogeneity bit (CCCFFH)
- 1 = CCFF sign bit (CCCFFS)
- 2 = Test complete indicator (CTCOMP)
- 3 = Set index register select and index adder to pass "T" (CTPASS)
- 4 = First fetch of transfer issued (CTFFI)
- 5 = Last cycle memory transaction was "read" (CLCMTR)
- 6 = Relative addition of double index done (CRELDON)
- 7 = Buffer order word, left (BOL) register contents valid instruction word (CBOLV)
- 8 = Buffer order word, right (BOR) register contents valid instruction word (CBORV)
- 9 = Last instruction was "execute" (CLIWE)
- 10 = Pipeline mode switch [If 0 indicates processor running in linear mode (CURLIN0)]
- 11 = GCP instruction delay (CGCPDLY)
- 12 = Lock initiated (potential couplet)(FISLOCK)
- 13 = Locked "Write" in execution pipeline (EPSLOCK)

FLA—IFBC Last Transfer Address Register (367)

- Bit 0-29 = IFB last transfer address bits 00 through 29 (shadowed)

FLD—IFBC Last Transfer Data Register (370)

Bit 0-31 = IFB last transfer data bits 00 through 31 (shadowed)

FLT—IFBC Last Transfer Type Register (371)

- Bit 0-3 = Near IFBC last client granted
 - 4 = Near IFBC granted block DMA
 - 5 = Near IFBC granted word DMA
 - 6 = Near IFBC granted client to client
 - 7 = Near IFBC granted MMIO
- 8-11 = Far IFBC last client granted
 - 12 = Far IFBC granted block DMA
 - 13 = Far IFBC granted word DMA
 - 14 = Far IFBC granted client to client
 - 15 = Far IFBC granted MMIO
- 16-19 = Next client to be granted
 - 20 = Next client requesting block DMA
 - 21 = Next client requesting word DMA
 - 22 = Next client requesting client to client
 - 23 = Last cycle was read (shadowed)
 - 24 = Last cycle was write (shadowed)
 - 25 = Current cycle active on IFB0 (shadowed)
 - 26 = Current cycle active on IFB1 (shadowed)
- 27-30 = IFB data parity bit 0 through 3 (shadowed)
- 31 = IFBC is active

FR—F-Register (260)

Bit 0-31 = F-Register

FRL—IFBC Relocation Lower Register (373)

Bit 0-23 = MMIO relocation address (bits 00 through 23)
29-31 = MMIO relocation address parity (bit 0 through 2)

FRS—F-Register Shadow Register

Bit 0-31 = F-Register Shadow Register

FRU—IFBC Relocation Upper Register (372)

Bit 18-23 = MMIO relocation address (bits 24 through 29)
31 = MMIO relocation address parity (bit 3)

FST—IFBC Status Register (365)

Bit 0 = IFB0-IFBC output enabled
1 = IFB1-IFBC output enabled
2-5 = IFB address parity (shadowed)
6 = IFB0 operation interject active
7 = IFB0 maintenance interject active
8 = IFB0 maintenance interrupt active
9 = IFB1 operation interject active
10 = IFB1 maintenance interject active
11 = IFB1 maintenance interrupt active
12 = IFB0 no client slave reply
13 = IFB1 no client slave reply
14 = IFB0 valid client slave reply
15 = IFB1 valid client slave reply
16-21 = Client slave reply code (bits 0 through 5)
22 = IFB0 no client master reply
23 = IFB1 no client master reply
24 = IFB0 valid client master reply
25 = IFB1 valid client master reply
26-31 = Client master reply code (bits 0 through 5)

GR—G-Register (261)

Bit 0-31 = G-Register

GRS—G-Register Shadow Register

Bit 0-31 = G-Register Shadow Register

IBR—Inhibit Buffer Bus Read Flip-Flops (345)

- Bit 1 = Inhibit buffer bus read of control board 1 (CB1)(IBRBA)
- 2 = Inhibit buffer bus read of maintenance matcher (MM)(IBRBB)
- 3 = Inhibit buffer bus read of fetch index (FI)(IBRBC)
- 4 = Inhibit buffer bus read of fetch address (FA)(IBRBD)
- 5 = Inhibit buffer bus read of control board 2 (CB2)(IBRBE)
- 6 = Inhibit buffer bus read of interface bus control (IFBC)(IBRBF)
- 7 = Inhibit buffer bus read of MCC/utility interface (MUI)(IBRBG)
- 8 = Inhibit buffer bus read of general registers
(GNRG & ALU)(IBRBH)
- 9 = Inhibit buffer bus read of execution decode (XDEC)(IBRBJ)
- 10 = Inhibit buffer bus read of clock and utilities (CKUT)(IBRBK)
- 11 = Data port access of MMIO (IFDP)
- 12 = Inhibit buffer bus read of bus node address (BNAD)(IBRBL)
- 14 = Inhibit grant of call store bus (INCS)
- 15 = Inhibit grant of program store bus (INPS)
- 16 = Data port access of call store (CSDP)
- 17 = Fetch port access of call store (CSFP)
- 18 = Call store was accessed (CSACC)
- 19 = Data port access of program store (PSDP)
- 20 = Fetch port access of program store (PSFP)
- 21 = Program store was accessed (PSACC)
- 22 = Data port access of PROM (PRDP)
- 23 = Fetch port access of PROM (PRFP)

IFR—Instruction Fetch State Register (273)

- Bit 0-2 = Pipeline state. (State 7 is illegal) [PS(0-2)]
- 3 = Indirect transfer has fetched destination address word (INDIR1F1)
- 4 = Indirect transfer has fetched destination instruction word (INDIR2F1)

ILA—Interrupt Level Activity Flip-Flops (341)

- Bit 0-9 = Interrupt level activity F/FS A-K levels ILA(A-K)
- 10 = A- on B-level interrupt (AOB)
- 11 = Interrupt level activity hard "A" source (MCHAO)
- 12 = Interrupt level activity soft "A" source (MCPAO)
- 13 = Interrupt level activity utility "A" source (UTASO)

ILR—Interrupt Level Request Register (342)

- Bit 0-9 = Interrupt level request register A-K ILR(A-K)
- 10 = Modify interrupt address F/F (MOIA)
- 11 = Deferred interrupts F to K inhibited (INI)
- 12-15 = Diagnostic wait state sequencer (NMRD)(NMWE) (UTLR)(UTSY)

INH—Interrupt Inhibit Register (343)

- Bit 0 = J-Level source inhibit (IJS)
- 1 = H-Level source inhibit (IHS)
- 2 = G-Level source interval timer inhibit (IIVTGS)
- 3 = G-Level source—Utility or directed match inhibit (IMGS)
- 4 = APUFS F-Level source autonomous PU failure inhibit (IAPUFS)
- 5 = PUFS F-Level source—Peripheral unit failure inhibit (IPUFS)
- 6 = E-Level source program store inhibit (IES)
- 7 = D-Level source stack overflow inhibit (ISCDS)
- 8 = D-Level source—Protected area failure inhibit (IPADS)
- 9 = D-Level source—IFB D-level inhibit (IIFDS)
- 10 = D-Level source—Call store failure inhibit (ICSDS)
- 11 = B-Level pulse source inhibit (IPSBS)
- 12 = Utility A-Level interrupt inhibit (IUTAS)
- 13 = Inhibit out-of-range D-Level source (IORDS)
- 14 = B-Level internal error inhibit (IINBS)
- 17 = K-Level source 0 inhibit excessive time (IKLOS)
- 19 = Immediate interrupt (R/O)(INTIMM)
- 20 = Interrupt initializing state bit (R/O)(INT)
- 21 = Freeze flip-flop (R/O)(FREZ)
- 22 = Inhibit setting of ASWEPU flip-flop (IASWEPU)
- 23 = Inhibit setting of APEPU flip-flop (IAPEPU)

INJ —Interject Request Register (344)

- Bit 9 = Software interject source set (SINJ)
- 10 = Software interject source reset (W/O)(CLRSINJ)
- 11 = Interface bus maintenance interject source set (IFMINJ)
- 12 = Interface bus maintenance interject source reset (W/O)(CLIFMINJ)
- 13 = APU interject source set (APINJ)
- 14 = APU interject source reset (W/O)(CLRAPINJ)
- 15 = Interval timer interject source set (IVINJ)
- 16 = Interval timer interject source reset (W/O)(CLRIVINJ)
- 17 = Operational interject source set (IFOIJ)
- 18 = Operational interject source reset (W/O)(CLRIFOIJ)
- 19 = Interject activity (INJA)
- 20 = Inhibit interval timer interject source (IIVINJ)
- 21 = Inhibit software interject source (ISINJ)
(Always set for 4ESS switch)
- 22 = Inhibit APUT interject source (IAPUT)

INS—Interrupt Source Register (346)

- Bit 0 = J-Level source (JLS)
- 1 = H-Level source (HLS)
- 2 = G-Level source—Interval timer (IVTGS)
- 3 = G-Level source—Utility or directed match (MGS)
- 4 = F-Level source—Autonomous unit failure (APUFS)
- 5 = F-Level source—Peripheral unit failure (PUFS)
- 6 = E-Level source—Program store failure (ELS)
- 7 = D-Level source—Stack overflow (SCDS)
- 8 = D-Level source—Protected area failure (PADS)
- 9 = D-Level source—IFB D Source failure (IFDS)
- 10 = D-Level source—Call store failure (CSDS)
- 11 = C-Level source—Match error (CLIS)
- 12 = Utility A-Level source (UTAS)
- 13 = D-Level source—Out of range (ORDS)
- 14 = B-Level source—Internal error (INBS)
- 15 = B-Level source—Pulse source error BUF (PSBSO)
- 16 = MCC Program soft A-Level (MCPAS)
- 17 = MCC hard A-Level source (MCHA)
- 18 = B-Level source—Pulse source failure (PSBS)
- 19 = B-Level processor configuration failure (PCBS)
- 20 = K-Level source 0—Excessive time (KL0S)
- 21 = Switch CC B-Level (SWBO)
- 22 = PROM parity or ASW B-Level (RBSO)
- 23 = Control parity B-Level (CPBSO)

ITR—Interval Timer Register (347)

- Bit 0-8 = Read/write access to interval timer counter (IVT)
- 9 = Read (0)/write (1) interval timer control bit (DIRECT)
- 10 = Interval timer "go" flip-flop set (ITGO)
- 11 = Clear interval timer "go" flip-flop (CLRITGO)
- 12-21 = Lower address bits from last buffer bus read or write operation (R/O) (SCC)
- 22 = Saved CC address was a "read" (bit=0) operation or "write" (bit = 1) operation (R/O) (SCCR/W)
- 23 = Saved CC address via utility system (UEXEC)

JR—J-Register (266)

Bit 0-31 = J-Register

JRS—J-Register Shadow Register

Bit 0-31 = J-Register Shadow Register

KR—K-Register (262)

Bit 0-31 = K-Register

KRS—K-Register Shadow Register

Bit 0-31 = K-Register Shadow Register

LHIN—Left-Half Failure Instruction

Bit 0-23 = Left-Half Failure Instruction

LIT—Long Interval Timer (357)

Bit 0-17 = Long interval timer (LIT)
18-23 = IOCH clock counter (IOCH)

LPA—Lower Protected Area Bound (255)

Bit 12-29 = Call Store protected area lower range

LPI—Address of Last Peripheral Instruction (272)

Bit 0-29 = Address of last peripheral instruction

LR—L-Register (374)

Bit 0-31 = L-Register

LRS—L-Register Shadow Register

Bit 0-31 = L-Register Shadow Register

MCD—MCC Direct Data Insert Register (214)

Bit 0-31 = See layout for Direct Data Insert Keys Identification

MCLK—Millisecond Clock (350)

Bit 0-15 = Millisecond clock (MCL)
16-23 = IOCL clock counter (IOCL)

MCO—MCC Processor Override Register (213)

- Bit 0 = Force CC 0 active (MCCC0)
- 1 = Force CC 1 active (MCCC1)
- 2 = Load program store 0 (MCPS0)
- 3 = Load program store 1 (MCPS1)
- 4 = Load call store 0 and 2 (MCCS0)
- 5 = Load call store 1 and 3 (MCCS1)
- 6 = Configure the active CC to use PS bus 0 (MCPSB0)
- 7 = Configure the active CC to use PS bus 1 (MCPSB1)
- 8 = Configure the active CC to use CS bus 0 (MCCSB0)
- 9 = Configure the active CC to use CS bus 1 (MCCSB1)
- 10 = Configure the active CC to boot using IFB 0 (MCIFB0)
- 11 = Configure the active CC to boot using IFB 1 (MCIFB1)
- 12 = Configure the active CC to use file server 0 (MCFS0)
- 13 = Configure the active CC to use file server 1 (MCFS1)
- 14 = Load the system from tape—Utility mode (MCLFTU)
- 15 = Load the system from tape—Normal mode (MCLFTN)
- 16 = Load the system from disk (MCLFD)
- 17-20 = Unused
- 21 = SR ready from the TUC (R/O) (READY)
- 22 = Disable auto PC state flop-flop (MCDISAPC)
- 23 = MCC data is valid when bit is set (MCCVALID)

ME0—External Match Register 0 (321)

- Bit 0-29 = Data is updated from the AFAN bus (active CC) or ADAN bus (standby CC)
- 30-31 = Updated with 0 in normal operation, but buffer-bus writable to any value

ME1—External Match Register 1 (323)

- Bit 0-31 = Data is updated from DADB bus (active CC) or the DBR bus (standby CC)

MI0—Internal Match Register 0 (320)

- Bit 0-29 = Data is updated from the AFAN bus (active CC) or ADAN bus (standby CC)
- 30-31 = Updated with 0 in normal operation, but buffer-bus writable to any value

MI1—Internal Match Register 1 (322)

- Bit 0-31 = Data is updated from DBR bus (active CC) or the DADB bus (standby CC)

MCP(L)—MCC A-Level Program Request Register (212)

- Bit 0-5 = MCC program request phases 1-6
- 6 = MCC inhibit interrupt sources
- 7 = MCC clear utility match condition
- 8-12 = MCC auxiliary program
 - 8 = MCC emergency mode minimum request
 - 9 = MCC emergency mode minimum request
 - 10 = MCC modified recovery action
 - 11 = MCC restore maintenance I/O request
 - 12 = Unused
- 13 = Restore system from normal program file
- 14 = Restore system from update program file
- 15 = Utility inhibit switch
- 16 = Force both MCC/utility processor active
- 17 = MUP in active-active status
- 18 = MUI address parity error
- 19 = MUI data parity error
- 20 = MUI detected invalid address
- 21 = Force enable flip-flop
- 22 = MC3 relay in NMDCF—Read only
- 23 = Near MUP active

MMR—Match Mode Control Register (324)

- Bit 0 = Enables routine matching on active CC
- 1 = Enables routine matching on standby CC
- 2 = Stop standby signal is generated whenever the internal error flag is set to 1
- 3 = Inhibit the update of the error latches in MSR
- 4 = Inhibit the update of the match registers (MI0, MI1, ME0 and ME1)
- 12 = Enables the generation of a C-level interrupt request when a match error occurs
- 18 = Inhibits the setting of the external matcher 0 error (M0E1) latch
- 19 = Inhibits the setting of the external matcher 1 error (M1E1) latch

MSR—Match Summary Register (325)

- Bit 0 = Indicates that matching is active, if set to 1 (MACT1)
- 1 = Internal error flag (MLIERR1)
- 2 = External error flag (MLEERR1)
- 10 = Internal matcher 0 mismatch latch (M0E1)
- 11 = External matcher 0 mismatch latch (M0E1)
- 12 = Internal matcher 1 mismatch latch (M1I1)
- 13 = External matcher 1 mismatch latch (M1E1)
- 16 = Internal matcher 0 direct (unlatched) output (MA0I1)
- 17 = External matcher 0 direct (unlatched) output (MIN01)
- 18 = Internal matcher 1 direct (unlatched) output (MA1I1)
- 19 = External matcher 1 direct (unlatched) output (MIN11)

PCR—Processor Configuration Register (354)

- Bit 0-5 = Processor control state counter (PCC)
- 6 = Enable PC sanity timer (EPCS)
- 7 = Inhibit normal refresh of analog timer (CANTI)
- 8 = Program sanity timer error trigger (PSTET)
- 9 = PC sanity time-out trigger (PCSTO)
- 10 = Deliberate trigger (DLIB)
- 11 = Analog time-out trigger (ATO)
- 12 = Active-active or standby-standby trigger occurred (ACTM)
- 13 = Clock error trigger (CKE)
- 14 = MCC trigger occurred (MCCTO)
- 15 = Repeated PC state occurred (REPC)

PES—Peripheral Unit Error Summary (302)

- Bit 0 = All seems well from PU reply bus 0 (ASW0PU)
- 1 = All seems well from PU reply bus 1 (ASW1PU)
- 2 = Answer parity from PU reply bus 0 (PUF) (AP0PU)
- 3 = Answer Parity from PU reply bus 1 (PUF) (AP1PU)
- 6 = PU ASW error summary (PUF) (ASWEPU)
- 7 = PU answer parity error summary (PUF) (APEPU)
- 8 = Autonomous PU base level report (APUB)
- 9 = Autonomous peripheral unit trouble (APUT)
- 10 = CPD/Coded enable instruction just executed
(1=CODED)(CPDKC)
- 11 = Parity over write bus odd bits (R/O)(PWP1)
- 12 = Parity over write bus even bits (R/O)(PWP2)
- 13 = Inhibit all seems well (PU matchers) (R/O)(INHASW)
- 14 = Inhibit answer parity (PU matchers) (R/O)(INHAP)
- 16 = Reply mismatch error-PU GCP instruction (PUF) (RMEGCP)
- 17 = Reply mismatch error-PU instruction (PUF) (RMEPU)

PM0—Peripheral Unit K-Code Matcher 0 (300)

Bit 0-6 = Member number mask:

1=same bit in MK field will not match (MNK)

10-16 = Member number field (MK)

17-21 = Unit type number

(bits 10-21 match bits 10-21 in

E-register)(UTYN)

22 = Inhibit ASW failure when match occurs (IASWE)

23 = Inhibit answer parity errors when match occurs (IAPE)

PM1—Peripheral Unit K-code Matcher 1 (301)

Bit 0-6 = Member Number Mask:

1=same bit in MK field will not match (MNK)

10-16 = Member number field (MK)

17-21 = Unit type number

(bits 10-21 match bits 10-21 in

E-register)(UTYN)

22 = Inhibit ASW failure when match occurs (IASWE)

23 = Inhibit answer parity errors when match occurs (IAPE)

PRL—P-Register—Least Significant Bits (202)

Bit 0-23 = P-Register bits 0-23

PRM—P-Register—Most Significant Bits (201)

- Bit 0 = P-Register bit 24
- 1 = P-Register bit 25
- 2 = P-Register bit 26
- 3 = P-Register bit 27
- 4 = P-Register bit 28
- 5 = P-Register bit 29
- 6 = P-Register bit 30
- 7 = P-Register bit 31
- 8 = P-Register bit 32
- 9 = P-Register bit 33
- 10 = P-Register bit 34
- 11 = P-Register bit 35

PSC—Peripheral Sequencer Control (303)

- Bit 1 = Scanner response (input order)(SCR)
- 2 = Answer parity enable (APEN)
- 3 = Inhibit PU reply window (IW)
- 4 = Invert PU write parity P2 (IP2)
- 5 = Invert PU write parity P1 (IP1)
- 6 = Inhibit enable address sync (IS)
- 7 = L-Register usage determines window closure
(instead of ASW)(LUDWC)
- 8 = MBIT/MTCPU, Maintenance PU (MTCPU)
- 9 = PU instruction inhibit (PINH)
- 10 = L-Register inhibit (LINH)
- 11 = Start coded enable sequencer (SCEQ)
- 12-16 = Coded enable sequencer state (CEQF)
- 17 = Coded enable PU order completed (PUOC)
- 18 = Peripheral pulse source (PPS)

PSQ—PU Sequencer Auxiliary Counter (306)

Bit 0-2 = CEQ state timer (TCTMR)
3-10 = Re-encoded GCP signal (R/O)(AMTCH)

RHIN—Right-Half Failure Instruction

Bit 0-23 = Right-Half Failure Instruction

RP0—PU Reply Bus 0 One(s) Catcher (304)

Bit 0-23 = Peripheral unit reply bus 0 one(s) catcher (R/O)

RP1—PU Reply Bus 1 One(s) Catcher (305)

Bit 0-23 = Peripheral unit reply bus 1 one(s) catcher (R/O)

SAL—Save Auxiliary—Left (330)

(Froze on Interrrupt)

Bit 0-31 = Same data as ABL

SAR—Save Auxiliary—Right (331)

(Froze on Interrrupt)

Bit 0-31 = Same data as ABR

SAT—Sanity Timers (352)

Bit 0-5 = Program sanity timer (PST)
6 = Reset program sanity timer enable (PSTE)
7-11 = Processor configuration sanity timer (PCST)
15 = CC Activity state (R/O) (CACTS)

SC—Stack counter (254)

Bit 0-5 = Stack counter

SCA—Saved Current Address (252)

(Froze on Interrupt)

Bit 0-29 = Contains the values of CAR corresponding to the last 16 instructions that has gone through the indexing state

30 = Instruction was sent to DIR0 for execution

31 = Instruction was sent to DIR1 for execution

SCTR—Contents of Stack Counter + 1**SDA—Saved Data Address (271)**

(Froze on Interrupt)

Bit 0-29 = Contains the history of the addresses in DAR during the last 16 events in the execution pipeline

30-31 = Type of operation:

0 0 = GCP

0 1 = READ

1 0 = WRITE

1 1 = Non-memory operation

SR—Stack register (267)

Bit 0-31 = Stack register bits 0-31

TAR—Transition Address Register (333)

Bit 23-29 = Provides the 1B24 with access to the high-order address bus

ULR—Unsuccessful L-Register Response from PU Instruction

Bit 0-23 = Unsuccessful L-Register Response

UPA—Upper Protected Area Bound (256)

Bit 12-29 = Call store protected area upper range

XR—X-Register (263)

Bit 0-31 = X-Register

XRS—X-Register Shadow Register

Bit 0-31 = X-Register Shadow Register

YR—Y-Register (264)

Bit 0-31 = Y-Register

YRS—Y-Register Shadow Register

Bit 0-31 = Y-Register Shadow Register

ZR—Z-Register (265)

Bit 0-31 = Z-Register

ZRS—Z-Register Shadow Register

Bit 0-31 = Z-Register Shadow Register

CC/AU—Central Control/Auxiliary Unit

Central Control Bus Node Data —Active

BNA_WD0(000) BNA_WD1(000) BNA_WD2(000) BNA_WD0(001) BNA_WD1(001) BNA_WD2(001)

.
.
.

BNA_WD0(040) BNA_WD1(040) BNA_WD2(040) BNA_WD0(041) BNA_WD1(041) BNA_WD2(041)

⇒ NOTE:

Each part contains a variable list report from entry 000 to 041 where entry 000 is the oldest in time and entry 041 is the most recent in time

BNA_WD0—Bus Node Arbiter Word 0

Bit 0-5 = Upper bits of the port address

6 = Read control signal

7 = Control parity signal

8-9 = Port identification information Number Port Identification

0 - Data Node Access (DNA)

1 - Index Node Access (XNA)

2 - Fetch Node Access (FNA)

3 - Interface Buffer Access (IBA)

10-17 = Control bits for **CC based** on active port identification information

0 - Write control signal from the data node

1 - Maintenance control signal from the data node

2 - Control signal from the data node

3 - GCP control signal from the data node

4 - Control signal from the index node

5 - Write request signal from the data node

6 - Interface Bus grant to data node

10-17 = Control bits for **IFB based** on active port identification information

0 - Write control signal from the Interface Bus Controller

1 - Maintenance control signal from the Interface Bus Controller

2 - Control signal from the Interface Bus Controller

3 - Word DMA request from the Interface Bus Controller

BNA_WD0—Bus Node Arbiter Word 0 (Contd)

Bit 18-20 = Access identification information

- 0 - NA
- 1 - CS
- 2 - PS
- 3 - PROM
- 4 - MMIO
- 5 - Buffer Bus

23 = Entry valid bit used by software

- 0 - Invalid
- 1 - Valid

BNA_WD1—Bus Node Arbiter Word 1

Bit 0-23 = Address on the port

BNA_WD2—Bus Node Arbiter Word 2

Bit 0-5 = Bus Node operation results

- 0 - All Seems Well (ASW)
- 1 - Data Parity Failure (DPF)
- 2 - All Seems Well Failure (ASWF)
- 3 - Node Attempted Illegal Access (NAIA)
- 4 - Control Parity B Source (CPBS)
- 5 - Controller or Client D Source (CLIDS)

6-13 = Number of the entry in the raw data bin. This number can be used to identify what ports were active at the same time

14-23 = Internal fault recovery results

Central Control Execution Pipeline History— Active

SCA(00)	SDA_H(00)	SDA(00)	EPH_RESULT(00)
.	.	.	.
.	.	.	.
.	.	.	.
SCA(15)	SDA_H(15)	SDA(15)	EPH_RESULT(15)

**NOTE:**

Entry 00 is the oldest in time and entry 15 is the most recent in time

SCA—Saved Current Address

Bit 0-23 = The address of an instruction that left indexing

SDA_H—Saved Data Address (High order bits)

Bit 0-6 = The high order bits of the 30 bit SDA. The complete data address is determined by concatenating SDA_H with SDA

SDA—Saved Data Address (Low order bits)

Bit 0-23 = The low order bits of the 30 bit SDA. The complete data address is determined by concatenating SDA_H with SDA

**NOTE:**

The data address (from concatenation for SDA_H and SDA) applies only when the SDA/EPH valid bit is set in the **EPH_RESULT** field. A valid SDA entry must be confirmed with the source listing to verify that the SDA applies to the SCA

EPH_RESULT— Execution Pipeline History Result. Applies only when the SDA/EPH valid bit is set in the **EPH_RESULT** field. This word represents the different pipeline states and completion of an instruction located at SCA.

Bit 0 = Instruction completion bit. If set, instruction was determined to have completed. If not set, instruction completion could not be determined.

3-7 = Final pipeline state of the instruction. A list of execution pipeline states (octal) are as follows:

- 000 - Nothing happened during this clock cycle. The pipeline may be empty or an instruction is stalled in decoded instruction Register 0. The instruction in indexing could be blocked waiting for another condition to clear, or we could be waiting for an instruction fetch to provide an instruction to indexing.
- 002 - The instruction in indexing was loaded into decoded instruction Register 1 since decoded instruction Register 0 is not available.
- 004 - The instruction in decoded instruction Register 0 has completed, but there is no instruction in either decoded instruction Register 1 or an index only instruction to execute. Therefore, the empty word is clocked into decoded instruction Register 0.
- 005 - The instruction in indexing was loaded into decoded Register 0.
- 007 - The instruction in indexing requires two decoded instruction registers and is loaded into both decoded Registers 0 and 1
- 010 - There is an instruction in both decoded instruction Registers 0 and 1, but the instruction in decoded instruction Register 0 has not completed.

-
- 014 - The instruction in decoded instruction Register 0 is complete; so, the instruction in decoded instruction Register 1 moves to decoded instruction register 0, and the empty word is loaded into decoded instruction Register 1.
- 016 - The instruction in decoded instruction Register 0 is complete; so, the instruction in decoded instruction Register 1 moves to decoded instruction register 0, and the instruction in indexing is loaded into decoded instruction Register 1.

9-13 = Initial pipeline state of the instruction:

[See Bit 3-7 for a execution pipeline states (octal)]

15-17 = Operation type of the instruction:

- 0 - The instruction that left indexing was an INDEX only operation and does not require a decoded instruction register to execute.
- 1 - The instruction that left indexing was a READ operation and requires at least 1 decoded instruction register to execute.
- 2 - The instruction that left indexing was a WRITE operation and requires at least 1 decoded instruction register to execute.
- 3 - The instruction that left indexing was a READ/WRITE operation and requires at least 1 decoded instruction register to execute.
- 4 - The instruction that left indexing was a GCP operation and does not require a decoded instruction register to execute.
- 5 - The instruction that left indexing was a STACK operation and requires at least 1 decoded instruction register to execute

23 = SDA/EPH data is valid if set

Central Control Interrupt Data—Active

AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1SR	AC1SC	AC1CES	AC1IBR
AC1INS	AC1INJ	AC1ILA	AC1ILR	AC1ITR	AC1INH
AC1CSC	AC1SAT	AC1PCR	AC1MCLK	AC1LIT	AC1DLR
AC1LPA	AC1UPA	AC1ACT	AC1ER	AC1PRM	AC1PRL
AC1LPI	AC1PES	AC1PSC	AC1PSQ	AC1RP0	AC1RP1
AC1PM0	AC1PM1	AC1ABC	AC1SAL	AC1SAR	AC1FIS
AC1EPS	AC1IFR	AC1MMR	AC1MSR	AC1MCO(H)	AC1MCO(L)
AC1MCD(H)	AC1MCD(L)	AC1MCP	AC1CCS(H)	AC1CCS(L)	AC1CUI
AC1FCT	AC1FCE	AC1FES	AC1FEE	AC1FER	AC1FST
AC1FLA(H)	AC1FLA(L)	AC1FLD(H)	AC1FLD(L)	AC1FLT(H)	AC1FLT(L)
AC1FRU(H)	AC1FRU(L)	AC1FRL(H)	AC1FRL(L)	AC1FIP	AC1CLE

Legend:

AC1 = Active
ST1 = Standby



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Central Control Fault Recognition (CCFR) Interrupt Data

CC1BLSTAT	CC1STATUS	CC1EADAT	CC1CLDAT	CC1EXDAT	CC1DGNCC
CC1BLDGN	CC1PSRDAT	CC1CPBDAT	CC1BRBDAT	CC1BLINV	CC1SWDAT
XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX
XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX
XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX
dddddddd	dddddddd	dddddddd	dddddddd	dddddddd	dddddddd
AC1INS	AC1INH	AC1CES	ST1INS	ST1INH	ST1CES

CC1BLSTAT—CCFR B-Level Status Word. Failing Member and Software Decisions

- Bit 0 = Active CC pulse source failure occurred
- 1 = Active CC boot ROM parity failure occurred
- 2 = Active CC control parity failure occurred
- 3 = Standby CC pulse source failure occurred
- 4 = Standby CC boot ROM parity failure occurred
- 5 = Standby CC control parity failure occurred
- 9 = CC switch occurred
- 10 = CCFR CC switch escalation
- 11 = Manual CC switch requested
- 12 = CCFR attempted CC switch

CC1STATUS—CC Status Word

- Bit 0 = Run deferred CCFR on active CC only
1 = Print results when deferred tests ATP
2 = Switch CCs and retest if deferred tests ATP
3 = Restore standby CC to service
4 = Loop on deferred CCFR
5 = Deferred CCFR in progress
6 = Software active CC member number
7 = CCs are running in step
8 = CCs are in a normal configuration (duplex)
9 = Standby CC under test
10 = Routine CC exercise in progress
11 = Standby CC diagnosed due to high error rate
12 = Active CC diagnosed due to high error rate
13 = High error rate when CCs run in step
14 = External fault recovery requested access tests
15 = Request CC diagnostics
16 = CCFR error analysis diagnostic request
17 = Deferred tests run as part of diagnostics
18 = Results of deferred CC tests during diagnostics
19 = The standby CC was removed via TTY
20 = Update CC out-of-service lamps
21 = B-Level occurred on standby CC
22 = CC stopped by CC access test

CC1EADAT—CCFR Long Term Error Counter

- Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1CLDAT—CCFR Short Term C-Level Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1EXDAT—CCFR Short Term External Entry Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1DGNCC—CCFR Short Term C-/D-/E-/F-Level DGN Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1BLDGN—CCFR Short Term B-Level DGN Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1PSRDAT—CCFR Short Term Pulse Source Failure Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1CPBDAT—CCFR Short Term Control Parity B-Level Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1BRBDAT—CCFR Short Term Boot ROM B-Level Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1BLINV—CCFR Short Term Invalid B-Level Entry Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

CC1SWDAT—CCFR Short Term Switch CC B-Level Error Counter

Bit 0-13 = Error timer
14 = Counter enable flag (if set, counter active)
15-23 = Error counter

ddddddddd—Active CC Pulse Source B-Levels Only

Where any number from 0 to 6 "ddddddddd" lines of data can occur, depending on how many GCP addresses are found in the bus node data. Each GCP address found contains the GCP address in bits 0 through 21 and a code two-bit code in bits 22 and 23 as follows:

00 = Null entry
01 = Retry of GCP address passed
10 = Retry of GCP address failed (hardware error)
11 = Invalid GCP address (software error)

⇒ NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

AC1INS—Active CC Interrupt Register (CCFR B-Levels Only)

AC1INH—Active CC Inhibit Register (CCFR B-Levels Only)

AC1CES—Active CC Error Source Register (CCFR B-Levels Only)

ST1INS—Standby CC Interrupt Register (CCFR B-Levels Only)

ST1INH—Standby CC Inhibit Register (CCFR B-Levels Only)

ST1CES—Standby CC Error Source Register (CCFR B-Levels Only)

Central Control Fault Recognition Tests Output Message Formats

If CC is Active:

REPT:CC a INT FAIL DATA

AC1FR(H)	AC1FR(L)	AC1GR(H)	AC1GR(L)	AC1JR(H)	AC1JR(L)
AC1KR(H)	AC1KR(L)	AC1LR(H)	AC1LR(L)	AC1XR(H)	AC1XR(L)
AC1YR(H)	AC1YR(L)	AC1ZR(H)	AC1ZR(L)	AC1BR(H)	AC1BR(L)
AC1ER	AC1CSC	AC1CCS(H)	AC1CCS(L)	AC1ILA	CC1TESTFAIL
CC1ACW	CC1BCW	CC1STATUS			

If CC is Standby:

REPT:CC a INT FAIL DATA

ST1FR(H)	ST1FR(L)	ST1GR(H)	ST1GR(L)	ST1JR(H)	ST1JR(L)
ST1KR(H)	ST1KR(L)	ST1LR(H)	ST1LR(L)	ST1XR(H)	ST1XR(L)
ST1YR(H)	ST1YR(L)	ST1ZR(H)	ST1ZR(L)	ST1MMR	CC1TESTFAIL
AC1MSR	ST1MSR	ST1BR(H)	ST1BR(L)	AC1ME0(H)	AC1ME0(L)
ST1CAR(H)	ST1CAR(L)	ST1DAR(H)	ST1DAR(L)	ST1MI0(H)	ST1MI0(L)
AC1MI0(H)	AC1MI0(L)	AC1ME1(H)	AC1ME1(L)	AC1MI1(H)	AC1MI1(L)
ST1ME0(H)	ST1ME0(L)	ST1MI1(H)	ST1MI1(L)	ST1ME1(H)	ST1ME1(L)



NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Variable field definitions:

a = Member number of the CC that failed. Description of selected variable names:

ACW—CCFR Control Word

BCW—Backup Control Word

STATUS—CC Status Word

TESTFAIL—Indication of Which Test Failed

CC1TESTFAIL—Failing Test Layout

- Bit 0 = Buffer register tests
 - 1 = Register and homogeneity tests
 - 2 = Index adder tests
 - 3 = Add-one logic tests
 - 4 = Parity generator and checker tests
 - 5 = Protected area tests
 - 6 = Stack tests
 - 7 = Boot ROM tests
 - 8 = Matcher tests
 - 9 = Decoder tests
- 10 = Buffer bus access tests
- 11 = Interrupt sequencer tests
- 12 = Fetch/execution sequencer tests
- 13 = Peripheral bus tests
- 14 = Interface bus tests
- 15-17 = Unused
 - 18 = Subsystem access tests
 - 19 = Logic tests
 - 20 = Active matcher tests
- 21-23 = Unused

CC1ACW-CC1BCW—Control Word Test Selection

- Bit 0 = Buffer register tests
 - 1 = Register and homogeneity tests
 - 2 = Index adder tests
 - 3 = Add-one logic tests
 - 4 = Parity tests
 - 5 = Protected area tests
 - 6 = Stack tests
 - 7 = Boot ROM tests
 - 8 = Matcher tests
 - 9 = Decoder tests
- 10 = Buffer bus access tests
- 11 = Interrupt sequencer tests
- 12 = Fetch/execution sequencer tests
- 13 = Peripheral bus tests
- 14 = Interface bus tests
- 15 = Pulse source failure retry
- 16 = Internal B-Level error recovery
- 17 = Subsystem access tests
- 18 = Peripheral controller (PC) B-level all-tests-passed (ATP) termination routine
- 19 = Switch CC ATP routine
- 20 = C-level ATP routine
- 21 = External entry ATP routine
- 22 = Deferred CCFR ATP termination routine
- 23 = Interrupt termination routine

CC1STATUS—CC Status Word

- Bit 0 = Run deferred CCFR on active CC only
- 1 = Print results when deferred tests ATP
- 2 = Switch CCs and retest if deferred tests ATP
- 3 = Restore standby CC to service
- 4 = Loop on deferred CCFR
- 5 = Deferred CCFR in progress
- 6 = Active CC indicator (which CC is active, 0 or 1)
- 7 = CCs are running in-step
- 8 = CCs were running in-step
- 9 = Standby CC under test
- 10 = Routine exercise in progress
- 11 = Standby CC diagnosed because of high error rate
- 12 = Active CC diagnosed because of high error rate
- 13 = High error rate when CCs run in-step
- 14 = External fault recovery requested CCFR tests
- 15 = Request CC diagnostics
- 16 = CCFR error analysis diagnostic flag
- 17 = Deferred tests run as part of diagnostics
- 18 = Results of deferred tests during diagnosis
- 19 = The standby CC was removed via TTY
- 20 = Update CC out-of-service lamps
- 21 = B-level occurred on standby CC
- 22 = CC halted by access test
- 23 = Unused

Central Control Fault Recognition Deferred Test Output Message Formats

TEST:CC *a* DFR *b*

If CC is Active:

TEST:CC *a* DFR FAIL DATA

AC1FR(H)	AC1FR(L)	AC1GR(H)	AC1GR(L)	AC1JR(H)	AC1JR(L)
AC1KR(H)	AC1KR(L)	AC1LR(H)	AC1LR(L)	AC1XR(H)	AC1XR(L)
AC1YR(H)	AC1YR(L)	AC1ZR(H)	AC1ZR(L)	AC1BR(H)	AC1BR(L)
AC1ER	AC1CSC	AC1CCS(H)	AC1CCS(L)	AC1ILA	CC1TESTFAIL
CC1ACW	CC1BCW	CC1STATUS			

If CC is Standby:

TEST:CC *a* DFR FAIL DATA

ST1FR(H)	ST1FR(L)	ST1GR(H)	ST1GR(L)	ST1JR(H)	ST1JR(L)
ST1KR(H)	ST1KR(L)	ST1LR(H)	ST1LR(L)	ST1XR(H)	ST1XR(L)
ST1YR(H)	ST1YR(L)	ST1ZR(H)	ST1ZR(L)	ST1MMR	CC1TESTFAIL
AC1MSR	ST1MSR	ST1BR(H)	ST1BR(L)	AC1ME0(H)	AC1ME0(L)
ST1CAR(H)	ST1CAR(L)	ST1DAR(H)	ST1DAR(L)	ST1MI0(H)	ST1MI0(L)
AC1MI0(H)	AC1MI0(L)	AC1ME1(H)	AC1ME1(L)	AC1MI1(H)	AC1MI1(L)
ST1ME0(H)	ST1ME0(L)	ST1MI1(H)	ST1MI1(L)	ST1ME1(H)	ST1ME1(L)

⇒ NOTE:

See "Interrupt Data Register Layouts" for register descriptions.

Variable field definitions:

a = Member number of the CC being tested

b = Result of non-failing test

ABORTED = Deferred CC fault recognition has been aborted because
of a maintenance interrupt

ATP = All tests passed

STOPPED = The deferred CC fault recognition has been terminated by
the *STOP:MACLI* input message

CCFR Deferred Test Output Message Formats (Contd)

ACW—CCFR Control Word

BCW—Backup Control Word

STATUS—CC Status Word

TESTFAIL—Indication of which Test Failed

Auxiliary Unit Status Registers

The AU client registers are defined as:

ASR—AU Status Register (Octal 12)

- Bit 0-3 = Parity on data byte 0 through 3 (PARD0-PARD3)
- 4 = Last cycle was read (READ)
- 5 = Last cycle was write (WRITE)
- 7 = Last cycle was word DMA (always 1) (WDMA)
- 9 = Operational interject active (OIJACT)
- 10 = Maintenance interject active (MIJACT)
- 11 = Maintenance interrupt active (MINACT)
- 13 = Word DMA request (WREQ)
- 15 = Reserved
- 16 = Interface busy (IFBSY)
- 17 = All-seems-well response from MMIO (AUASW)
- 18 = AU GCP or MMIO response present (AURESP)
- 19 = AUI in maintenance mode (MTCE)
- 20 = AU activity (AUA)

AUC—AU Control Register (Octal 13)

- Bit 0 = Enable IFB drivers
- 1 = Enable parity checking
- 2 = Enable address limit checking
- 3 = Enable operational interjects
- 4 = Enable maintenance interjects
- 5 = Enable maintenance interrupts
- 6 = Clear operational interjects
- 7 = Clear maintenance interjects
- 8 = Clear maintenance interrupts
- 9 = In-service
- 10 = Update in-progress
- 11 = AUI reset
- 12 = Trouble AU bus 0
- 13 = Trouble AU bus 1
- 14 = Enable AU verify match
- 15 = Enable AU all-seems-well failure checks
- 16 = Enable AU request from API 0
- 17 = Enable AU request from API 1
- 18 = Enable AU request from DUS 0
- 19 = Enable AU request from DUS 1
- 20 = Maintenance mode
- 21 = AU sequencer step
- 22 = AU sequencer INIT
- 23 = AU activity flip-flop

AUE—AU Error Register (Octal 14)

- Bit 0 = DMA lower address limit exceeded
- 1 = DMA upper address limit exceeded
- 2 = Detected absense of ASW on IFB
- 3 = Detected ASWF on IFB
- 4 = Master detected data parity error
- 5 = Slave detected data parity error
- 6 = Slave detected common error
- 7 = Slave detected invalid address error
- 8 = Slave detected address parity error
- 9 = Sent ASWF
- 10 = AU bus detected error
- 11 = Interface bus detected error
- 12-15 = Reserved
- 16 = Command override error
- 17 = AU enable verify mismatch error
- 18 = AU SAP verify mismatch error
- 19 = AU store address bus parity error
- 20 = AU reply bus parity error

LLA—AU Lower Limit Address Register (Octal 15)

Bit 8-23 = AU lower limit (bits 14 through 29)

ULA—AU Upper Limit Address Register (Octal 16)

Bit 8-23 = AU lower limit (bits 14 through 29)

DR—AU Data Register (Octal 17)

Bit 0-31 = AU data register (bits 00 through 31)

UAR—AU Upper Address Register (Octal 40)

Bit 22-29 = AU upper address (bits 22 through 29)

ACM—AU Communication Register (Octal 41)

- Bit 0-3 = AU enable verify expected (bits 00, 01, 12, and 13)
- 4-7 = Store access permitted verify (bits 00, 01, 12, and 13)
- 8-11 = AU request (bits 00, 01, 12, and 13)
- 12-15 = AU enable verify (bits 00, 01, 12, and 13)

AAS—AU Store Address Register (Octal 42)

- Bit 0-21 = AU store address (bits 00 through 21)
- 22 = AU store address parity bit
 - AU upper address bit 22
- 23 = AU store address write bit
 - AU upper address bit 23
- 24 = AU store address read bit
 - AU upper address bit 24
- 25-29 = AU store address (bits 25 through 29)

AAR—AU Reply Register (Octal 43)

- Bit 0-23 = AU reply register (bits 00 through 23)
- 24 = AU reply register all-seems-well
- 25 = AU reply register parity bit 1
- 26 = AU reply register parity bit 2

AUA—AU Address Register (Octal 44)

- Bit 0-15 = AU address register (bits 00 through 15)
- 16 = AU address register read
- 17 = AU address register write
- 18 = AU address register control
- 19 = AU address register parity

AUB—AU Bus Register (Octal 45)

- Bit 0 = AU Store address parity bit
- 1 = AU Store address write bit
- 2 = AU Store address read bit
- 3 = AU reply parity bit 1
- 4 = AU reply parity bit 2
- 5 = AU reply all-seems-well
- 6 = AU bus 0 operational interject
- 7 = AU bus 1 operational interject
- 8 = AU bus 0 maintenance interject
- 9 = AU bus 1 maintenance interject
- 10 = AU MMIO write register parity bit 1
- 11 = AU MMIO write register parity bit 2
- 12 = AU DMA write register parity bit 1
- 13 = AU DMA write register parity bit 2
- 14 = Invert data parity on DMA transactions
- 15 = Enable AU bus drivers

ADW—AU DMA Register (Octal 46)

Bit 0-23 = AU DMA write register (bits 00 through 23)

Miscellaneous Power Internal Data

XSTAT_X	XSTAT_X+1	IMAGE_X	IMAGE_X+1	IMAGE_X+2	IMAGE_X+3
STABINX_X	STABINX_X+1	BSTAT_X	0.....0	0.....0	0.....0
XSTAT	XSTAT+1	IMAGE	IMAGE+1	IMAGE+2	IMAGE+3
STABINX	STABINX+1	BSTAT	LRTW	LRCW	0.....0

**NOTE:**

Prefix all words with XP1R.

XSTAT_X—XPWR 0 Unit Software Word Before XPWR Base Level MTCE
XSTAT—XPWR 1 Unit Software Word After XPWR Base Level MTCE

- Bit 0 = 5 V converter for CS bus 0 found faulty
- 1 = 5 V converter for CS bus 1 found faulty
- 2 = 5 V converter for PS bus 0 found faulty
- 3 = 5 V converter for PS bus 1 found faulty
- 4 = 5 V converter for IF bus 0 found faulty
- 5 = 5 V converter for IF bus 1 found faulty
- 6 = Terminating voltage of CS bus 0 found out-of-range
- 7 = Terminating voltage of CS bus 1 found out-of-range
- 8 = Terminating voltage of PS bus 0 found out-of-range
- 9 = Terminating voltage of PS bus 1 found out-of-range
- 10 = Terminating voltage of IF bus 0 found out-of-range
- 11 = Terminating voltage of IF bus 1 found out-of-range
- 12 = 24 V converter found faulty
- 13-14 = Current XPWR state
 - DGR = Degraded state
 - OOS = Out-of-service
 - ACT = Active state
 - UNA = Unassigned
- 15 = Unused
- 16 = SSD 0 unit is just restored
- 17-18 = Current SD value of XPWR 0
- 19 = XPWR 0 unit is just restored
- 20 = Need to verify XPWR scan image
- 21 = OOS state forced by XPWR software
- 22 = XPWR 0 can be restored only by TTY message
- 23 = Stop XPWR 0 scanning

**XSTAT_X+1—XPWR 1 Unit Software Word Before XPWR Base Level
MTCE****XSTAT+1—XPWR 1 Unit Software Word Before XPWR Base Level MTCE**

- Bit 0 = 5 V converter for CS bus 0 found faulty
- 1 = 5 V converter for CS bus 1 found faulty
- 2 = 5 V converter for PS bus 0 found faulty
- 3 = 5 V converter for PS bus 1 found faulty
- 4 = 5 V converter for IF bus 0 found faulty
- 5 = 5 V converter for IF bus 1 found faulty
- 6 = Terminating voltage of CS bus 0 found out-of-range
- 7 = Terminating voltage of CS bus 1 found out-of-range
- 8 = Terminating voltage of PS bus 0 found out-of-range
- 9 = Terminating voltage of PS bus 1 found out-of-range
- 10 = Terminating voltage of IF bus 0 found out-of-range
- 11 = Terminating voltage of IF bus 1 found out-of-range
- 12 = 24 V converter found faulty
- 13-14 = Current XPWR state
 - DGR = Degraded state
 - OOS = Out-of-service
 - ACT = Active state
 - UNA = Unassigned
- 15 = Unused
- 16 = SSD 1 unit is just restored
- 17-18 = Current SD value of XPWR 1
- 19 = XPWR 1 unit is just restored
- 20 = Need to verify XPWR scan image
- 21 = OOS state forced by XPWR software
- 22 = XPWR 1 can be restored only by TTY message
- 23 = Stop XPWR 1 scanning

IMAGE_X—XPWR 0 Scan Image Word 0 Before XPWR Base Level MTCE
IMAGE_XPWR 0 Scan Image Word 0 After XPWR Base Level MTCE

- Bit 0 = 24 V converter status
- 1-5 = Unused
- 6 = Major alarm indicator
- 7 = CS bus 0 terminating voltage status
- 8 = CS bus 1 terminating voltage status
- 9 = Status of 5 V converter for CS bus 0
- 10 = Unused
- 11 = Status of 5 V converter for CS bus 1
- 12-13 = Unused
- 14 = PS bus 0 terminating voltage status
- 15 = PS bus 1 terminating voltage status
- 16 = Status of 5 V converter for PS bus 0
- 17 = Unused
- 18 = Status of 5 V converter for PS bus 1
- 19-23 = Unused

IMAGE_X+1—XPWR 0 Scan Image Word 1 Before XPWR Base Level MTCE

IMAGE_+1—XPWR 0 scan Image Word 1 After XPWR Base Level MTCE

- Bit 0 = IF bus 0 terminating voltage status
- 1 = IF bus 1 terminating voltage status
- 2 = Status of 5 V converter for IF bus 0
- 3 = Unused
- 4 = Status of 5 V converter for IF bus 1
- 5-6 = Unused
- 7-13 = Buffer used for verifying scan image
- 14-23 = Unused

IMAGE_X+2—XPWR 1 Scan Image Word 0 Before XPWR base level MTCE
IMAGE_+2—XPWR 1 Scan Image Word 0 After XPWR Base Level MTCE

- Bit 0 = 24 V converter status
- 1-5 = Unused
- 6 = Major alarm indicator
- 7 = CS bus 0 terminating voltage status
- 8 = CS bus 1 terminating voltage status
- 9 = Status of 5 V converter for CS bus 1
- 10 = Unused
- 11 = Status of 5 V converter for CS bus 0
- 12-13 = Unused
- 14 = PS bus 0 terminating voltage status
- 15 = PS bus 1 terminating voltage status
- 16 = Status of 5 V converter for PS bus 1
- 17 = Unused
- 18 = Status of 5 V converter for PS bus 0
- 19-23 = Unused

IMAGE_X+3—XPWR 1 Scan Image Word 1 Before XPWR Base Level MTCE

IMAGE_+3—XPWR 1 Scan Image Word 1 After XPWR Base Level MTCE

- Bit 0 = IF bus 0 terminating voltage status
- 1 = IF bus 1 terminating voltage status
- 2 = Status of 5 V converter for IF bus 0
- 3 = Unused
- 4 = Status of 5 V converter for IF bus 1
- 5-6 = Unused
- 7-13 = Buffer used for verifying scan image
- 14-23 = Unused

STABINX_X—XPWR 0 Status Table Index Before XPWR Base Level MTCE
STABINX—XPWR 0 Status Table Index After XPWR Base Level MTCE

Bit 0-23 = Index value

Value = No fault on XPWR 0

Value = SSD 0 is OOS

Value = XPWR 0 is powered down

Value = Fault on converter for ACT bus or 24 V converter

Value = Fault on converter for OOS bus

STABINX_X+1—XPWR 1 Status Table Index Before XPWR Base Level MTCE

STABINX+1—XPWR 1 Status Table Index After XPWR Base Level MTCE

Bit 0-23 = Index value

Value = No fault on XPWR 1

Value = SSD 1 is OOS

Value = XPWR 1 is powered down

Value = Fault on converter for ACT bus or 24 V converter

Value = Fault on converter for OOS bus

BSTAT_X—Bus (CS, PS, IF Bus) Status Word Before XPWR Base Level MTCE

BSTAT—Bus (CS, PS, IF Bus) Status Word After XPWR Base Level MTCE

Bit 0 = CS bus 0 is OOS if set

1 = CS bus 1 is OOS if set

2 = PS bus 1 is OOS if set

3 = PS bus 0 is OOS if set

4 = PS bus 0 is OOS if set

5 = PS bus 1 is OOS if set

6-23 = Unused

LRTW—XPWR Long Range Timer

Bit 0-17 = XPWR long ranger timer
 18-19 = Unused
 20 = Long range timer enable bit
 21-23 = Unused

LRCW—XPWR Long Range Counter Word

Bit 0-11 = Long ranger counter for XPWR 0
 12-23 = Long ranger counter for XPWR 1

XA Window Information

AC1SDA(H)	AC1SDA(L)	AC1XACTL	AC1XAWT	AC1XAWP0	AC1XAWP1
AC1XAWP2	AC1XAWP3	AC1XAWP4	AC1XAWP5	AC1XAWP6	AC1XAWP7
ST1SDA(H)	ST1SDA(L)	ST1XACTL	ST1XAWT	ST1XAWP0	ST1XAWP1
ST1XAWP2	ST1XAWP3	ST1XAWP4	ST1XAWP5	ST1XAWP6	ST1XAWP7

SDA(H)—Saved Data Address (High order bits)

Bit 0-6 = The high order bits (24-29) of the 30 bit SDA. The complete data address is determined by concatenating SDA(H) with SDA(L)

SDA(L)—Saved Data Address (Low order bits)

Bit 0-23 = The low order bits (0-23) of the 30 bit SDA. The complete data address is determined by concatenating SDA(H) with SDA(L)

XACTL—Extended Access Control Register

- Bit 0 = XAWEN0, extended access window 0 enable
- 1 = XAWEN1, extended access window 1 enable
- 2 = XAWEN2, extended access window 2 enable
- 3 = XAWEN3, extended access window 3 enable
- 4 = XAWEN4, extended access window 4 enable
- 5 = XAWEN5, extended access window 5 enable
- 6 = XAWEN6, extended access window 6 enable
- 7 = XAWEN7, extended access window 7 enable

XAWT—Extended Access Window Type Register

- Bit 0 = XAWT0, extended access window 0 enable
- 1 = XAWT1, extended access window 1 enable
- 2 = XAWT2, extended access window 2 enable
- 3 = XAWT3, extended access window 3 enable
- 4 = XAWT4, extended access window 4 enable
- 5 = XAWT5, extended access window 5 enable
- 6 = XAWT6, extended access window 6 enable
- 7 = XAWT7, extended access window 7 enable

XAWPn—Extended Access Window Pointer

- Bit 0-14 = Extended access window pointer

Common Printouts

Common Level Control Data (MI1CONT)

MI1CONT

- Bit 0 = MARP return to reference point
 - 1 = MARP return by rolling back to intermediate level
 - 2 = MARP return by rolling ahead to intermediate level
 - 3 = Audit in progress flag
 - 4 = In restart flag
 - 5 = CC's have been switched
 - 6 = A pump of CS(s) has been performed
 - 7 = A pump of PS(s) has been performed
 - 8 = No backup area has been zeroed
 - 9 = A phase (indicated in MI1PHASEPT) has been requested
- 10 = A pulse source B-level has occurred
- 11 = An out-of-range pulse source B-level
- 12 = An out-of-range call store D-level
- 13 = An out-of-range program store E-level
- 14 = An out-of-range peripheral F-level
- 15 = Request hash sum of area indicated in MI1HASHADRS
- 16 = A maintenance phase record is to be formed by ERAP
- 17 = A software error has occurred
- 18 = MARP invalid interrupt entry
- 19 = SAWS routine has pumped 1 bink (block of 1024 words) on intermediate level
- 20 = CS duplex failure occurred
- 21 = Application work flag 2
- 22 = Application work flag 1
- 23 = Application work flag 0

MI1CONT Control Flags

Bit 1-2 = Roll ahead or back

6-7 = Pump of CS or PS has occurred

11-14 = An out-of-range B-, D-, E- or F-level has occurred

Common Auxiliary Unit Data

SEIW0	SEIW1	SEIW2	SEIW3	FADR	FDAT
RIW0	RIW1	RIW2	RIW3	AUIBA	FBAD
SCID	SMID	SSTA	SCTL	SESR	SLLA
SULA	SDAT_U	SDAT_L	SACM	SAAS_U	SAAS_L
SARR	SAUAR	SAUB	SADW	SAMW	T_PROGADDR
T_TESTADDR	T_TESTOPTS	SAVF	SAVG	SAVJ	SAVK
SAVL	SAVX	SAVY	SAVZ	FESR	FGCP
SSTATE	SERAT	SERAC	SEMRG	SEAST	DTADR
SLTTAT	SLTTAC_AUI0	SLTTAC_AUI1	SLTTAC_AUB0	SLTTAC_AUB1	---
---	SAPI0_BR	SAPI1_BR	SDUS0_BR	SDUS1_BR	SBSTAT_BR
---	SAPI0_AR	SAPI1_AR	SDUS0_AR	SDUS1_AR	BSTAT_AR

⇒ NOTE:

Prefix all words with AU1R.

SEIW0-SEIW3—Save Error Information Words

Bit 0-3 = Error type

6 = Indicates API 0 involved in the error

7 = Indicates API 1 involved in the error

8 = Indicates DUS 0 involved in the error

9 = Indicates DUS 1 involved in the error

12-13 = Operation in progress at the time of the error

15-16 = Read or write indicator

17 = Control node indicator

18-20 = In-service status of AUI 0

21-23 = In-service status of AUI 1

FADR—Failing Address

FDAT—Failing Data

SRIW0-SRIW3—Save Recovery Information Word

- Bit 0-2 = Current recovery state
- 3 = Indicates a status update was attempted
- 4 = Indicates AUI tests were run
- 5 = Indicates an attempt was made to remove an AUI
- 6 = Indicates control was passed to unique AU recovery
- 7 = Indicates an attempt was made to remove an AU
- 8 = Indicates an attempt was made to remove an AU bus
- 9 = Indicates an AUFR bootstrap was attempted
- 10 = Indicates an IFFR bootstrap was requested
- 12 = Indicates the attempt to update status failed
- 13 = Indicates the AUI tests failed
- 14 = Indicate the attempt to remove an AUI failed
- 16 = Indicate the attempt to remove an AU failed
- 17 = Indicate the attempt to remove an AU bus failed
- 21-23 = Recovery state necessary for the next interrupt/interject

AUIBA—Base Address of AUI Requesting/Reporting the Error

FBAD—Base Address of Failing AU

SCID—AUI Client Identification Register of Suspect AUI

- Bit 0-9 = Circuit pack name

SMID—AUI Microcode Identification Register

- Bit 0-9 = Microcode name

SSTA—Status Register of Suspect AUI

- Bit 0-3 = RCVD Data parity bits
- 4 = Last cycle was read
- 5 = Last cycle was write
- 7 = Last cycle was word DMA
- 9 = Operational interject active
- 10 = Maintenance interject active
- 11 = Maintenance interrupt active
- 13 = Word DMA request
- 16 = Interface busy
- 17 = ALI seems well from MMIO
- 18 = AU GCP or MMIO RESP present
- 19 = AUI maintenance mode status
- 20 = AU activity status

SCTL—Control Register of Suspect AUI

- Bit 0 = Client IFB enable
- 1 = Parity checking enable
- 2 = Address limit checking enable
- 3 = Operational interject enable
- 4 = Maintenance interject enable
- 5 = Maintenance interrupt enable
- 6 = Operational interject clear
- 7 = MTCE interject clear
- 8 = MTCE interrupt clear
- 9 = AUI is in-service—toggle flip-flop
- 10 = Update is in-progress—toggle flip-flop
- 11 = AUI reset
- 12 = Trouble AU bus 0
- 13 = Trouble AU bus 1
- 14 = Enable verify AU match
- 15 = Enable all-seems-well fail checks
- 16 = Enable AU request from API 0
- 17 = Enable AU request from API 1
- 18 = Enable AU request from DUS 0
- 19 = Enable AU request from DUS 1
- 20 = Maintenance mode
- 21 = AU sequencer step
- 22 = AU sequencer initialization
- 23 = AU activity flip-flop

SESR—Error Source Register of Suspect AUI

- Bit 0 = DMA lower limit exceeded
- 1 = DMA upper limit exceeded
- 2 = Detected no all-seems-well
- 3 = Detected all-seems-well failure
- 4 = Master detected data parity error
- 5 = Slave detected data parity error
- 6 = Slave detected common error
- 7 = Slave detected invalid address error
- 8 = Slave detected address parity error
- 9 = Sent all-seems-well failure
- 10 = AU bus detected error
- 11 = IFB error maintenance interrupt
- 16 = Command overwrite error
- 17 = AU verify mismatch error
- 18 = AU SAP verify mismatch error
- 19 = AU store address bus parity error
- 20 = AU reply bus parity error

SLLA—Lower DMA Limit Register of Suspect AUI

Bit 8-23 = Lowest DMA address — Bits 14-29

SULA—Upper DMA Limit Register of Suspect AUI

Bit 8-23 = High DMA address limit

SDAT_U—Data Register (Upper Byte) of Suspect AUI**SDAT_L—Data Register (Lower Byte) of Suspect AUI**

SACM—Communication Register of Suspect AUI

- Bit 0 = AU enable verify expected bit 00
- 1 = AU enable verify expected bit 01
- 2 = AU enable verify expected bit 12
- 3 = AU enable verify expected bit 13
- 4 = Store access permitted expected bit 00
- 5 = Store access permitted expected bit 01
- 6 = Store access permitted expected bit 12
- 7 = Store access permitted expected bit 13
- 8 = AU request bit 00
- 9 = AU request bit 01
- 10 = AU request bit 12
- 11 = AU request bit 13
- 12 = AU enable verify bit 00
- 13 = AU enable verify bit 01
- 14 = AU enable verify bit 12
- 15 = AU enable verify bit 13

SAAS_U—Store Address Register (Upper Byte) of Suspect AUI

- Bit 0-5 = Upper address bits 24-29
- 0 = AU store address register read bit

SAAS_L—Store Address Register (Lower Byte) of Suspect AUI

- Bit 0-23 = AU store address
- 22 = AU store address parity bit
- 23 = AU store address write bit

SAUR—AU Reply Register of Suspect AUI

- Bit 0-23 = AU reply register bits 0-23
- 0 = AU reply register all-seems-well
- 1 = AU reply register parity bit 1
- 2 = AU reply register parity bit 2

SAUAR—AU Address Register of Suspect AUI

- Bit 0-15 = AU address register
- 16 = AU address register read bit
- 17 = AU address register write bit
- 18 = AU address register control bit
- 19 = AU address register parity bit

SAUB—AUB Register of Suspect AUI

- Bit 0 = AU store address parity bit
- 1 = AU store address write bit
- 2 = AU store address read bit
- 3 = AU reply parity bit 1
- 4 = AU reply parity bit 2
- 5 = AU reply all-seems-well
- 6 = AU bus 0 operational interject
- 7 = AU bus 1 operational interject
- 8 = AU bus 0 maintenance interject
- 9 = AU bus 1 maintenance interject
- 10 = P1 parity on the AMW register
- 11 = P2 parity on the AMW register
- 12 = P1 parity on the ADW register
- 13 = P2 parity on the ADW register
- 14 = Invert data parity on DMA transaction
- 15 = Enable AU bus drivers

SADW—DMA Write Register of Suspect AUI

SAMW—MMIO Write Register of Suspect AUI

T_PROGADDR—Program Address at Failure Returned From Failing Tests or Bootstrap

T_TESTADDR—Test Address at Failure Returned From Failing Tests or Bootstrap

T_PROGROPTS—Test Options and Flags Returned From Failing Tests or Bootstrap

TSAVF—TSAVZ—F-, G-, J-, K-, L-, X-, Y-, and Z-Registers Returned From Failing Tests or Bootstrap

FESR—Error Source Register of Failing AU

FGCP—GCP Response of Failing AU

- Bit 0 = Maintenance request
 - 1 = Maintenance flip-flop set side
 - 2 = Maintenance flip-flop reset side
- 3-5 = Trapping flip-flop
 - 3 = Clock activity error
 - 4 = Normal CC clock error
 - 5 = Maintenance CC clock error
- 6 = Input address parity error
- 7 = Data parity error (CC to DFC)
- 8 = Write protect error
- 9 = Out of range address error
- 10 = Mode error
- 11 = K-code bit 11
- 12 = Code bit 12
- 13 = K-code bit 13
- 14 = K-code bit 14
- 15 = K-code bit 15
- 16 = CC interface sequencer error
- 17-23 = Trapping flip-flop
 - 17 = K-code match detected
 - 18 = Control read mode detected
 - 19 = Control write mode detected
 - 20 = All ones address detected
 - 21 = All zeros address detected
 - 22 = All ones data detected
 - 23 = All zeros data detected

SSTATE—AUFR State Timing Word

- Bit 0-8 = State timer
- 12-20 = Value of state timer before recovery
- 23 = State timing enable

SERAT—AUFR Error Analysis Timing Word

- Bit 0-6 = Error analysis timer
- 12-18 = Value of error analysis timer before recovery
- 23 = Error analysis timing enable

SERAC—AUFR Error Analysis Counters

SEMRG—AUFR Emergency Action Timing Word

- Bit 0-10 = Emergency action state timer
- 12-22 = Value of emergency action timer before recovery
- 23 = Emergency action timing enable

SEAST—Save Emergency Action State Counter

- Bit 0-4 = AUFR emergency action state counter

DTADR—Program Address Where Bootstrap was Called

SLTTAT—Long-Term Trouble Analysis Timing Word

- Bit 0-11 = Long term term trouble analysis timer
- 23 = Long term term trouble analysis timer enable

SLTTAC_AUI0—Long-Term Trouble Analysis Counter for AUI 0

SLTTAC_AUI1—Long-Term Trouble Analysis Counter for AUI 1

SLTTAC_AUB0—Long-Term Trouble Analysis Counter for AUB 0

SLTTAC_AUB1—Long-Term Trouble Analysis Counter for AUB 1

SSAPIO0_BR—API 0 Status Word Before Recovery

SAPIO1_BR—API 1 Status Word Before Recovery

- Bit 0 = AU marked in trouble
- 1 = AU in offline configuration
- 2 = AU stopped and in maintenance mode
- 4 = Diagnosis to be requested for AU
- 5 = AU KCODE trouble
- 6 = AU is active unit, for API
- 7 = AU is standby unit, for API
- 8 = API is being restored
- 18 = Do not restore AU

SDUS0_BR—DUS 0 Status Word Before Recovery

SDUS1_BR—DUS 1 Status Word Before Recovery

- Bit 0 = AU marked in trouble
- 1 = AU in offline configuration
- 2 = AU stopped and in maintenance mode
- 4 = Diagnosis to be requested for AU
- 5 = AU KCODE trouble
- 6 = AU is active unit, for API
- 18 = Do not restore AU

BSTAT_BR—AUB Status Word Before Recovery

- Bit 0 = AU bus 0 trouble flip-flop in active AUI
- 1 = AU bus 1 trouble flip-flop in active AUI
- 2 = AU bus 0 trouble flip-flop in standby AUI
- 3 = AU bus 1 trouble flip-flop in standby AUI
- 4 = AU bus 0 system in offline configuration
- 5 = AU bus 1 system in offline configuration
- 6 = AU bus stopped and in maintenance mode
- 7 = Do not restore Au bus

SAPI0_AR—API 0 Status Word After Recovery**SAPI1_AR—API 1 Status Word After Recovery**

- Bit 0 = AU marked in trouble
- 1 = AU in offline configuration
- 2 = AU stopped and in maintenance mode
- 4 = Diagnosis to be requested for AU
- 5 = AU KCODE trouble
- 6 = AU is active unit, for API
- 7 = AU is standby unit, for API
- 8 = API is being restored
- 18 = Do not restore AU

SDUS0_AR—DUS 0 Status Word After Recovery**SDUS1_AR—DUS 1 Status Word After Recovery**

- Bit 0 = AU marked in trouble
- 1 = AU in offline configuration
- 2 = AU stopped and in maintenance mode
- 4 = Diagnosis to be requested for AU
- 5 = AU KCODE trouble
- 6 = AU is active unit, for API
- 18 = Do not restore AU

BSTAT_AR—AUB Status Word After Recovery

- Bit 0 = AU bus 0 trouble flip-flop in active AUI
- 1 = AU bus 1 trouble flip-flop in active AUI
- 2 = AU bus 0 trouble flip-flop in standby AUI
- 3 = AU bus 1 trouble flip-flop in standby AUI
- 4 = AU bus 0 system in offline configuration
- 5 = AU bus 1 system in offline configuration
- 6 = AU bus stopped and in maintenance mode
- 7 = Do not restore AU bus

Common Interface Bus Recovery Data

See Interface Bus Printouts.

IFB—Interface Bus Printouts

Common Interface Bus (IFB)

Recovery Data

STAT_BR0	STAT_BR1	STAT_BR2	STAT_BR3	STAT_BR4	STAT_BR5
STAT_BR6	STAT_BR7	STAT_BR8	STAT_BR9	STAT_BR10	STAT_BR11
STAT_BR12	STAT_BR13	STAT_BR14	STAT_BR15	STAT_BR16	STAT_BR17
STAT_BR18	STAT_BR19	STAT_BR20	STAT_BR21	STAT_BR22	STAT_BR23
BSTAT_BR	SRW	SSW	ECW	LTW	RAW
AFCT	AFCE	AFES	AFEE	AFER	AFIP
SFCT	SFCE	SFES	SFEE	SFER	SFIP
AFRU_U	AFRU_L	AFRL_U	AFRL_L	ACSC	CR01
SFRU_U	SFRU_L	SFRL_U	SFRL_L	RQESR	CLSTA
FADR_U	FADR_L	FDAT_U	FDAT_L	MCADR	SCADR
RCADR	DCADR	RCERA	DCERA	BSERA	ERATW
LTPASAV	LTTASAV	LTTOSAV	LTFSAV	LTGSAV	LTJSAV
LTKSAV	LTLSAV	LTXSAV	LTYSAV	LTZSAV	RESERVED
ICRAA	BSRAA	RAATW	DTW	DTADR	SEMRG
B0ANALX	B1ANALX	BANAL	BLW	BLADR	RESERVED
STAT_AR0	STAT_AR1	STAT_AR2	STAT_AR3	STAT_AR4	STAT_AR5
STAT_AR6	STAT_AR7	STAT_AR8	STAT_AR9	STAT_AR10	STAT_AR11
STAT_AR12	STAT_AR13	STAT_AR14	STAT_AR15	STAT_AR16	STAT_AR17
STAT_AR18	STAT_AR19	STAT_AR20	STAT_AR21	STAT_AR22	STAT_AR23
BSTAT_AR					

Note: Prefix all words with IF1R.

IF1RSTAT_BR0-IF1RSTAT_BR23—IFB Client Status Prior to Recovery

- Bit 0 = IFB client is OOS
- 1 = IFB client is stopped
- 3 = IFB client is active
- 4 = IFB client is standby
- 5 = IFB client is forced
- 6 = Request DGN for IFB client
- 8 = IFB client is being restored
- 9 = Do not restore IFB client

IF1RBSTAT_BR—IFB Status Prior to Recovery

- Bit 0 = IFBC activity in active CC
- 1 = IFB 0 trouble set in active CC
- 2 = IFB 1 trouble set in active CC
- 3 = IFBC activity in standby CC
- 4 = IFB 0 trouble set in standby CC
- 5 = IFB 1 trouble set in standby CC
- 8 = IFB subsystem is stopped
- 9 = Do not restore IFB

IF1RSRW—IFB Subsystem Recovery Word

- Bit 0 = Current entry resulted from a D-level interrupt
- 1 = Current entry resulted from an interject
- 2 = Current entry resulted from a BLM
- 3 = Standby CC is available for use during testing
- 4 = Standby CC was in service at entry
- 5 = Multiple client maintenance requests present
- 6 = Requesting client bins loaded
- 7 = Driving client bins loaded
- 8 = Common bins loaded
- 9 = Plant measurement counts must be updated
- 10 = Active IFBC stack bins loaded
- 11 = Standby IFBC stack bins loaded

IF1RSSW—IFB Shadow Stack Word

- Bit 0-1 = Indicates the stack utilized during recovery (octal)
 - 1 - Bus node stack
 - 2 - IFBC stack
- 3-7 = Stack depth utilized during recovery
- 9 = Indicates the standby CCs stacks were utilized

IF1RECW—IFB Error Classification Word

Bit 0-2 = Error class (octal)

- 1 - Indiscernible error
- 2 - Discernible error
- 3 - Memory unit error
- 4 - Client-specific error
- 5 - Software error

3-5 = Error sub-class (octal)

- 1 - Address parity error
- 2 - Data parity error
- 3 - Control parity error
- 4 - Invalid slave reply error
- 5 - Invalid master reply error
- 6 - All-seems-well error

6-9 = Requesting unit (octal)

- 1 - Active CC
- 2 - Standby CC
- 3 - Active CC's IFBC
- 4 - Standby CC's IFBC
- 5 - Memory unit
- 6 - Master client
- 7 - Slave client
- 10 - Uninvolved client

12-14 = In-progress operation (octal)

- 1 - MMIO
- 2 - Word DMA
- 3 - Block DMA
- 4 - Client to client

15-17 = Read/Write Indicator (octal)

- 1 - Read operation
- 2 - Write operation

IF1RECW—IFB Error Classification Word (Contd)

Bit 18-21 = Driving unit (octal)

- 1 - Active CC
- 2 - Standby CC
- 3 - Active CC's IFBC
- 4 - Standby CC's IFBC
- 5 - Memory unit
- 6 - Master client
- 7 - Slave client
- 10 - Uninvolved client

IF1RLTW—IFB Logical Test Word

Bit 0-3 = Type of logical test requested (octal)

- 1 - IFBC test
- 2 - Client MMIO test
- 3 - Client DMA test
- 5 - False responder test
- 6 - All tests with respect to all clients on IFB 0
- 7 - All tests with respect to all clients on IFB 1
- 10 - All tests with respect to a given client
- 11 - All tests with respect to all clients

9-11 = Indicates which client was tested (octal)

- 1 - Requesting client tested
- 2 - Driving client tested

21-23 = Logical test disposition (octal)

- 1 - Logical tests failed
- 2 - Logical tests passed

IF1RRAW—IFB Recovery Action Word

Bit 0-5 = Recovery action (octal)

- 1 - Active CC implicated
- 2 - Standby CC implicated
- 3 - Active CCs IFBC implicated
- 4 - Standby CCs IFBC implicated
- 5 - Memory unit implicated by first look
- 6 - Master client implicated by first look
- 7 - Slave client implicated by first look
- 10 - Uninvolved client implicated by first look
- 26 - Memory unit implicated by logical tests
- 27 - Client implicated by logical tests
- 30 - IFB 0 implicated
- 31 - IFB 1 implicated
- 32 - Client-specific problem implicated
- 33 - Software implicated
- 34 - IFB subsystem status implicated
- 35 - IFB subsystem configuration implicated
- 36 - Transient error implicated
- 37 - Inconclusive error implicated

21-23 = Recovery action disposition (octal)

- 1 - Recovery action failed or was denied
- 2 - Recovery action completed

IF1RAFCT—Active CC IFBC Control Register (AC1FCT)

IF1RAFCE—Active CC IFBC Client Enable Register (AC1FCE)

IF1RAFES—Active CC IFBC Error Source Register (AC1FES)

IF1RAFEE—Active CC IFBC Error Enable Register (AC1FEE)

IF1RAFER—Active CC IFBC Error Request Register (AC1FER)

IF1RAFIP—Active CC IFBC Poll Register (AC1FIP)

IF1RSFCT—Standby CC IFBC Control Register (ST1FCT)

IF1RSFCE—Standby CC IFBC Client Enable Register (ST1FCE)

IF1RSFES—Standby CC IFBC Error Source Register (ST1FES)

IF1RSFEE—Standby CC IFBC Error Enable Register (ST1FEE)

IF1RSFER—Standby CC IFBC Error Request Register (ST1FER)

IF1RSFIP—Standby CC IFBC Poll Register (ST1FIP)

IF1RAFRU_U—Upper Byte of Active CC IFBC Upper Relocation Register (AC1FRU)

IF1RAFRU_L—Lower Bytes of Active CC IFBC Upper Relocation Register (AC1FRU)

IF1RAFRL_U—Upper Byte of Active CC IFBC Lower Relocation Register (AC1FRL)

IF1RAFRL_L—Lower Bytes of Active CC IFBC Lower Relocation Register (AC1FRL)

IF1RACSC— Active CC Status Register (AC1CSC)

IF1RCR01—Memory Unit CR01 Register

IF1RSFRU_U—Upper Byte of Standby CC IFBC Upper Relocation Register (ST1FRU)

IF1RSFRU_L—Lower Bytes of Standby CC IFBC Upper Relocation Register (ST1FRU)

IF1RSFRL_U—Upper Byte of Standby CC IFBC Lower Relocation Register (ST1FRL)

IF1RSFRL_L—Lower Bytes of Standby CC IFBC Lower Relocation Register (ST1FRL)

IF1RRQESR—Requesting Client's Error Summary Register

- Bit 0 = Lower DMA limit exceeded
- 1 = Upper DMA limit exceeded
- 2 = Master detected no all seems well
- 3 = Master detected all-seems-well failure
- 4 = Master detected data parity error
- 5 = Slave detected data parity error
- 6 = Slave detected control error
- 7 = Slave detected unused address error
- 8 = Slave detected address parity error
- 9 = Slave sent ASWF (summary bit for slave errors)
- 10 = Client error (summary bit for maintenance interject)
- 11 = IFB error (summary bit for master errors)
- 12-15 = Reserved
- 16-23 = Client options

IF1RCLSTA—Client's Status Register

Bit 0-3 = Data parity received by client
4 = Last cycle was a read
5 = Last cycle was a write
6 = Last cycle was block DMA
7 = Last cycle was word DMA
8 = Last cycle was client to client
9 = Operational interject active
10 = Maintenance interject active
11 = Maintenance interrupt active
12 = Block DMA request
13 = Word DMA request
14 = Client to client request
15 = Reserved
16-23 = Client options

IF1RFADR_U—Upper Byte of Failing Address

IF1RFADR_L—Lower Bytes of Failing Address

IF1RFDAT_U—Upper Byte of Failing Data

IF1RFDAT_L—Lower Bytes of Failing Data

IF1RMCADR—Base Address of Master Client

IF1RSCADR—Base Address of Slave Client

IF1RRCADR—Base Address of Requesting Client

IF1RDCADR—Base Address of Driving Client

IF1RRCERA—Requesting Client's Error Analysis Counters

Bit 0-2 = CC access error count
3-5 = Store access error count
6-8 = Client access error count
9-11 = IFBC error count
12-14 = Total error count

IF1RDCERA—Driving Client's Error Analysis Counters

Bit 0-2 = CC access error count
3-5 = Store access error count
6-8 = Client access error count
9-11 = IFBC error count
12-14 = Total error count

IF1RBSERA—Bus and Subsystem Error Analysis Counters

Bit 0-5 = IFB 0 error count
6-11 = IFB 1 error count
12-17 = IFB subsystem error count

IF1RERATW—IFB Error Analysis Timing Word

Bit 0-11 = Error analysis timer
23 = Error analysis timing enable

IF1RLTPASAV—Program Address at Logical Test Failure**IF1RLTTASAV—Test Address at Logical Test Failure****IF1RLTTOSAV—Test Options and Flags****IF1RLTFSAV—F Register at Point of Logical Test Failure****IF1RLTGSAV—G Register at Point of Logical Test Failure**

IF1RLTJSAV—J Register at Point of Logical Test Failure

IF1RLTKSAV—K Register at Point of Logical Test Failure

IF1RLTLSAV—L Register at Point of Logical Test Failure

IF1RLTXSAV—X Register at Point of Logical Test Failure

IF1RLTYSAV—Y Register at Point of Logical Test Failure

IF1RLTZSAV—Z Register at Point of Logical Test Failure

IF1RICRAA—Implicated Client's Recovery Action Analysis Counters

- Bit 15-17 = Client removal denied counter
- 18-20 = Client program no action counter
- 21-23 = Client tests run counter

IF1RBSRAA—Bus and Subsystem Recovery Action Analysis Counters

- Bit 0-2 = IFB removal denied counter
- 3-5 = IFB 0 test run counter
- 6-8 = IFB 1 test run counter
- 9-11 = CC removal denied counter
- 12-14 = Successful status update counter
- 15-17 = Subsystem tests run counter
- 18-20 = Memory unit recovery failure counter

IF1RRAATW—Recovery Action Analysis Timing Word

- Bit 0-5 = Recovery action analysis timer
- 23 = Recovery action analysis timing enable

IF1RDTW—IFB Double Trouble Word

Bit 0-5 = Reason for double trouble (octal)

- 1 - Client program requested a bootstrap
- 2 - Status update was attempted and failed
- 3 - Invalid configuration detected
- 4 - Client program no action threshold exceeded
- 5 - Client remove denied threshold exceeded
- 6 - Client tests run threshold exceeded
- 7 - IFB 0 tests run threshold exceeded
- 10 - IFB 1 tests run threshold exceeded
- 11 - IFB remove denied threshold exceeded
- 12 - CC remove denied threshold exceeded
- 13 - Status update threshold exceeded
- 14 - Subsystem tests run threshold exceeded
- 15 - Pre-termination access test failed
- 16 - Memory unit recovery failure threshold exceeded

23 = Indicates a bootstrap is necessary

IF1RDTADR—Program Address Where Double Trouble Condition was Detected**IF1RSEMERG—IFB Emergency Action Word**

Bit 0-3 = Emergency action state

6-17 = Emergency action timer

23 = Emergency action timing enable

IF1RB0ANALX—IFB 0 Long Term Trouble Analysis Counter**IF1RB1ANALX—IFB 1 Long Term Trouble Analysis Counter****IF1RBANAL—IFB Long Term Trouble Analysis Timing Word**

Bit 0-11 = Long term trouble analysis timer

23 = Long term trouble analysis timing enable

IF1RBLW—IFB Base Level Maintenance Word

- Bit 0-6 = Member number of suspect unit
- 7-13 = Unit type number of suspect unit
- 18-20 = BLM client ID
- 21-23 = BLM client error code

IF1RBLADR—Program Address Where BLM was Called**IF1RSTAT_AR0-IF1RSTAT_AR23—IFB Client Status Following Recovery**

- Bit 0 = IFB client is OOS
- 1 = IFB client is stopped
- 3 = IFB client is active
- 4 = IFB client is standby
- 5 = IFB client is forced
- 6 = Request DGN for IFB client
- 8 = IFB client is being restored
- 9 = Do not restore IFB client

IF1RSTAT_AR—IFB Status Following Recovery

- Bit 0 = IFBC activity in active CC
- 1 = IFB 0 trouble set in active CC
- 2 = IFB 1 trouble set in active CC
- 3 = IFBC activity in standby CC
- 4 = IFB 0 trouble set in standby CC
- 5 = IFB 1 trouble set in standby CC
- 8 = IFB subsystem is stopped
- 9 = Do not restore IFB

Interface Bus Bootstrap Failure Data

FAIL_NUM	PROGADDR	TESTADDR	TESTOPTS	SAVF	SAVG
SAVJ	SAVK	SAVL	SAVX	SAVY	SAVZ
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.

FAIL_NUM—Number of Access Test Failures

PROGADDR—Program Address at Failure or:

- Base address of client if client is implicated
- Address of memory if store failure
- 0 for CC0 or 1 for CC1
- 0 for IFB0 or 1 for IFB1

TESTOPTS—Test Options and Flags at Failure. Also Indicates Failing Options:

- Bit 0 = Active CC failed
- 1 = Standby CC failed
- 2 = Store failed
- 3 = IFB failed
- 4 = IFB client failed

SAVF-SAVZ—Save of Register Content When the Failure was Reported

⇒ NOTE:

The failure block consists of one or more instances of failure information with the size of decimal 12. The failure information was filled to the last one.

Interface Bus Client Registers

The hardware registers for the clients are defined as follows:

IF1CID—IFB Client Circuit Identification Register

Bit 0-9 = Circuit pack name

IFBCMID—IFB Microcode Circuit Identification Register

Bit 0-9 = Microcode name

IFBCSTA—IFB Client Status Register

Bit 0-3 = Received Data Parity

4 = Last cycle was read

5 = Last cycle was write

6 = Last cycle was block DMA

7 = Last cycle was word DMA

8 = Last cycle was client to client

9 = Operational interject active

10 = Maintenance interject active

11 = Maintenance interrupt active

12 = Block DMA request

13 = Word DMA request

14 = Client to client request

15 = Reserved

16-31 = Client option

IFBCCTL—IFB Client Control Register

- Bit 0 = Client IFB enable
- 1-2 = Reserved
- 3 = Operational interject enable
- 4 = Maintenance interject enable
- 5 = Maintenance interrupt enable
- 6 = Operational interject clear
- 7 = Maintenance interject clear (client error)
- 8 = Maintenance interrupt clear (IFB error)
- 9 = In-service
- 10 = Update in-progress
- 11 = Reset client
- 12-31 = Client option

IFBCESR—IFB Client Error Source Register

- Bit 0 = DMA lower limit exceeded
- 1 = DMA upper limit exceeded
- 2 = Detected no all-seems-well
- 3 = Detected all-seems-well failure
- 4 = Master detected data parity error
- 5 = Slave detected data parity error
- 6 = Slave detected control error
- 7 = Slave detected unused address error
- 8 = Slave detected address parity error
- 9 = Sent all-seems-well failure
- 10 = Client error (Maintenance interject)
- 11 = IFB error (Maintenance interrupt)
- 12-15 = Reserved
- 16-31 = Client option

IFBCLLA—IFB Client Lower Limit Address Register

Bit 8-23 = Lowest DMA address

IFBCULA—IFB Client Upper Limit Address Register

Bit 8-23 = High DMA address limit

IFBCDAT—IFB Client Data Register

Bit 0-31 = Client option

Interface Bus Client Stack—Active

AC1FST_HI AC1FST_LOW AC1FLT_HI AC1FLT_LOW AC1FLA_HI AC1FLA_LOW
 AC1FLD_HI AC1FLD_LOW AC1FST_HI AC1FST_LOW AC1FLT_HI AC1FLT_LOW
 AC1FLA_HI AC1FLA_LOW AC1FLD_HI AC1FLD_LOW AC1FST_HI AC1FST_LOW
 AC1FLT_HI AC1FLT_LOW AC1FLA_HI AC1FLA_LOW AC1FLD_HI AC1FLD_LOW
 AC1FST_HI AC1FST_LOW AC1FLT_HI AC1FLT_LOW AC1FLA_HI AC1FLA_LOW
 AC1FLD_HI AC1FLD_LOW AC1FST_HI AC1FST_LOW AC1FLT_HI AC1FLT_LOW
 AC1FLA_HI AC1FLA_LOW AC1FLD_HI AC1FLD_LOW AC1FST_HI AC1FST_LOW
 AC1FLT_HI AC1FLT_LOW AC1FLA_HI AC1FLA_LOW AC1FLD_HI AC1FLD_LOW



NOTE:

Change AC1 to ST1 for standby IFBC Stack

AC1FST_HI— Upper Byte of Active IFBC Status Stack

AC1FST_LOW— Lower Bytes of Active IFBC Status Stack

AC1FLT_HI— Upper Byte of Active IFBC Last Transaction Stack

AC1FLT_LOW— Lower Bytes of Active IFBC Last Transaction Stack

AC1FLA_HI— Upper Byte of Active IFBC Last Transfer Address Stack

AC1FLA_LOW— Lower Bytes of Active IFBC Last Transfer Address Stack

AC1FLD_HI— Upper Byte of Active IFBC Last Transfer Data Stack

AC1FLD_LOW— Lower Bytes of Active IFBC Last Transfer Data Stack

MUP—Master Control Complex and Utility Processor Printouts

Unique MUP Data (Long Format)

MC1RCID0	MC1RMID0	MC1RSTA0U	MC1RSTA0	XXXXXXX	MC1RCTL0
MC1RESR0U	MC1RESR0	MC1RDAT0U	MC1RDAT0	MC1RINST0U	MC1RINST0
MC1RRPLY0U	MC1RRPLY0	XXXXXXX	XXXXXXX	MC1RSTAT0	MC1RSTAT0A
XXXXXXX	XXXXXXX	MC1RSDAT0UB	MC1RSDAT0B	MC1RSINST0UB	MC1RSINST0B
MC1RCID1	MC1RMID1	MC1RSTA1U	MC1RSTA1	XXXXXXX	MC1RCTL1
MC1RESR1U	MC1RESR1	MC1RDAT1U	MC1RDAT1	MC1RINST1U	MC1RINST1
MC1RRPLY1U	MC1RRPLY1	XXXXXXX	XXXXXXX	MC1RSTAT1	MC1RSTAT1A
XXXXXXX	XXXXXXX	MC1RSDAT1UB	MC1RSDAT1B	MC1RSINST1UB	MC1RSINST1B
MC1RFIB	MC1RFIB+1	MC1RFIB+2	MC1RSRTB	MC1RCTSWTB	MC1RLRTB
MC1RSIB	MC1RSIB+1	MC1RSIB+2	MC1RSRCB	XXXXXXX	MC1RLRCB
MC1RSFIB	MC1RSFIB+1	MC1RSFIB+2	MC1RDTBLAB	MC1RBLMRAB	MC1RBLMFIB
MC1RST0FAB	MC1RST1FAB	MC1RCTSWFAB	MC1RST0FIB	MC1RST1FIB	XXXXXXX
MC1RPGMAD	MC1RTSTAD	MC1RTSTOP	MC1RILFSAV	MC1RILGSAV	MC1RILJSAV
MC1RILKSAV	MC1RILLSAV	MC1RILXSAV	MC1RILYSAV	MC1RILZSAV	XXXXXXX

MC1RCID0—MUP 0 Client ID Register

MC1RCID1—MUP 1 Client ID Register

Bit 0-9 = Circuit pack name

MC1RMID0—MUP 0 Microcode ID Register

MC1RMID1—MUP 1 Microcode ID Register

Bit 0-9 = Micro code name

MC1STA0U—MUP 0 Status Register

MC1STA1U—MUP 1 Status Register

Bit 24 = Command register is busy

MC1RSTAO—MUP 0 Status Register**MC1RSTA1—MUP 1 Status Register**

- Bit 0 = Received data parity bit 0
- 1 = Received data parity bit 1
- 2 = Received data parity bit 2
- 3 = Received data parity bit 3
- 4 = Last cycle was read
- 5 = Last cycle was write
- 6 = Last cycle was block DMA
- 7 = Last cycle was word DMA
- 8 = Last cycle was client to client
- 9 = Operational interject active
- 10 = Maintenance interject active
- 11 = Maintenance interrupt active
- 12 = Block DMA request
- 13 = Word DMA request
- 14 = Client to client request
- 16 = MMIO trouble
- 17 = MUP trouble
- 18 = MUP not forced
- 19 = MUP not active
- 20 = Reply complete
- 21 = Reply in-progress
- 22 = Reply failure
- 23 = User option reply

MC1RCTL0—MUP 0 Control Register

MC1RCTL1—MUP 1 Control Register

- Bit 0 = Client IFB enable
- 3 = Operational interject enable
- 4 = Maintenance interject enable
- 5 = Maintenance interrupt enable
- 6 = Operational interject clear
- 7 = Maintenance interject clear
- 8 = Maintenance interrupt clear
- 9 = Indicates MUP is in-service
- 10 = Indicates MUP is being updated
- 11 = Reset client
- 12 = MUP activity control
- 13 = MUP trouble control

MC1RESROU—MUP 0 Error Summary Register

MC1RESR1U—MUP 1 Error Summary Register

- Bit 24 = User defined operation register

MC1RESR0—MUP 0 Error Summary Register
MC1RESR1—MUP 1 Error Summary Register

- Bit 2 = Detected no all seems well
- 3 = Detected all-seems-well failure
- 4 = Master detected data parity error
- 5 = MUP detected data parity error
- 6 = MUP detected control error
- 7 = MUP detected unused address error
- 8 = MUP detected address parity error
- 9 = Sent all-seems-well failure
- 10 = Client error—Maintenance interject
- 11 = IFB error—Maintenance interrupt
- 16 = Sanity timeout
- 17 = 68010 bus error
- 18 = DRAM error
- 19 = Memory access error
- 20 = Both MUPs active
- 21 = Software detected error
- 22 = MUP forced in hardware
- 23 = User defined operational interject

MC1RDAT0U—MUP 0 Data Register
MC1RDAT1U—MUP 1 Data Register

Bit 24-31 = Upper byte of data

MC1RDAT0—MUP 0 Data Register
MC1RDAT1—MUP 1 Data Register

Bit 0-23 = Lower 3 bytes of data

MC1RINST0U—MUP 0 Instruction Register
MC1RINST1U—MUP 1 Instruction Register

Bit 24-31 = Upper byte of instruction

MC1RDAT0—MUP 0 Instruction Register
MC1RDAT1—MUP 1 Instruction Register

Bit 0-23 = Lower 3 bytes of instruction

MC1RRPLY0U—MUP 0 Reply Register
MC1RRPLY1U—MUP 1 Reply Register

Bit 24-31 = Upper byte of reply register

MC1RRPLY0—MUP 0 Reply Register
MC1RRPLY1—MUP 1 Reply Register

Bit 0-23 = Lower 3 bytes of reply register

MC1RSTAT0—MUP 0 Software Status Before Fault Processing
MC1RSTAT1—MUP 1 Software Status Before Fault Processing

- Bit 0 = MUP is troubled
- 1 = MUP is stopped
- 3 = MUP is active
- 4 = MUP is standby
- 5 = MUP is forced in hardware
- 8 = MUP is being restored
- 9 = Do not restore MUP

MC1RSTAT0A—MUP 0 Software Status After Fault Processing
MC1RSTAT1A—MUP 1 Software Status After Fault Processing

Bit 0 = MUP is troubled
1 = MUP is stopped
3 = MUP is active
4 = MUP is standby
5 = MUP is forced in hardware
8 = MUP is being restored
9 = Do not restore MUP

MC1RSDAT0UB—MUP 0 Data Register Before the Last Stop/Start Instruction (Same as MC1RDAT0U)
MC1RSDAT1UB—MUP 1 Data Register Before the Last Stop/Start Instruction (Same as MC1RDAT0U)

MC1RSDAT0B—MUP 0 Data Register Before the Last Stop/Start Instruction (Same as MC1RDAT0)
MC1RSDAT1B—MUP 1 Data Register Before the Last Stop/Start Instruction (Same as MC1RDAT0)

MC1RSINST0UB—MUP 0 Instruction Register Before the Last Stop/Start Instruction (Same as MC1RINST0U)
MC1RSSINST1UB—MUP 1 Instruction Register Before the Last Stop/Start Instruction (Same as MC1RINST0U)

MC1RSINSTOB—MUP 0 Instruction Register Before the Last Stop/Start Instruction (Same as MC1RINST0)

MC1RSSINST1B—MUP 1 Instruction Register Before the Last Stop/Start Instruction (Same as MC1RINST0)

MC1RFIB—MUP Fault Information

Bit 0 = MUP member number

3-4 = MUPs software status on the the IFB

1 - Active

2 - Standby

3 - OOS

6-7 = Method of entry into fault recovery

1 - Interject

2 - Interrupt

3 - BLM

9-12 = Fault type

1 - No fault found—interject

2 - Both MUPs active—interject

3 - Memory access error—interject

4 - DRAM error—interject

5 - 68000 bus error—interject

6 - Sanity time-out—interject

7 - Software generated error—interject

8 - Forced active—interject

9 - Time-out—BLM

10 - DMA failed—BLM

11 - Hardware-software mismatch—BLM

15 = Multiply fault indicator

18-19 = Starting state

21-22 = Ending state

MC1RFIB+1—Fault Information From Fault Previous to MC1RFIB
MC1RFIB+2—Fault Information From Fault Previous to MC1RFIB+1

MC1RSRTB—MUP Long Range Timer

Bit 0-17 = Short range timer
21 = Short range timer enable

MC1RCTSWTB—MUP Context Switch Timer

Bit 0-9 = Context switch timer
21 = Context switch timer enable
22 = Indicate a restore command has been sent
23 = Context switch abort indicator

MC1RLRTB—MUP Long Range Timer

Bit 0-17 = Long range timer
21 = Long range timer enable

MC1RSIB—Steps Taken During Fault Processing

Bit 0 = Determine interrupt/interject type
1 = Both MUPs have same hardware activity state
3 = Both MUPs are active software state
4 = Hardware—Software match
6 = Recover both MUPs
7 = Remove standby MUP
9 = Restart MUP
10 = Get MUP information
12 = Reset MUP
13 = Switch MUPs
15 = Switch context
16 = DTBL called

MC1RSIB+1—Steps Taken During Processing for Fault Previous to MC1RSIB

MC1RSIB+2—Steps Taken During Processing for Fault Previous to MC1RSIB+1

MC1RSRCB—MUP Short Range Counter

Bit 0-4 = Number of force related entries

MC1RLRCB—MUP Long Range Counter

Bit 0-8 = MUP 0 long range counter

12-20 = MUP 1 long range counter

MC1RSFIB—Indicates Which Steps Failed During Fault Processing

Bit 0 = Determine interrupt/interject type

1 = Both MUPs have same hardware activity state

3 = Both MUPs are active software state

4 = Hardware—Software match

6 = Recover both MUPs

7 = Remove standby MUP

9 = Restart MUP

10 = Get MUP information

12 = Reset MUP

13 = Switch MUPs

15 = Switch context

16 = DTBL called

MC1RSFIB+1—Indicates Which Steps Failed During Fault Processing for Fault Previous to MC1RSFIB

MC1RSFIB+2—Indicates Which Steps Failed During Fault Processing for Fault Previous to MC1RSFIB+1

MC1RDTBLAB—DTBL Determination Address

MC1RBLMRAB—Return Address of the Caller of a BLM

MC1RBLMFIB—Fault Information from Caller of a BLM

MC1RST0FAB—State 0 Failing Address

MC1RST1FAB—State 1 Failing Address

MC1RCTSWFAB—Context Switch Failing Address

MC1RST0FIB—State 0 Failing Information

Bit 0-17 = Lower bits of MUP reply register

18-23 = Instruction status of restart instruction

MC1RST1FIB—State 1 Failing Information

Bit 0-23 = Lower bits of MUP reply register

MC1RPGMAD—Program Address at Failure

MC1RTSTAD—Test Address at Failure

MC1RTSTOP—Test Option

- Bit 0 = Active CC failed
- 1 = Standby CC failed
- 2 = Store failed
- 3 = IFB failed
- 4 = IFB client failed
- 5 = False response test failed
- 6-12 = Client unique failure information
 - 6 - MUP audit(s) failed
 - 7 - MUP audit(s) failed no DMA data
 - 8 - Active CC failed
 - 9 - Standby CC failed
- 13 = Client delay segment break request flag
- 14 = Test standby configuration
- 15 = On standby configuration
- 16 = Run test on base level
- 17 = No PS test
- 18 = No CS test
- 19 = No CC test
- 20 = Test IFB controller
- 21 = Test IFB client
- 22 = Test store access
- 23 = False response test

MC1RILFSAV—F-Register at Time of MUP Access Test Failure

MC1RILGSAV—G-Register at Time of MUP Access Test Failure

MC1RILJSAV—J-Register at Time of MUP Access Test Failure

MC1RILKSAV—K-Register at Time of MUP Access Test Failure

MC1RILLSAV—L-Register at Time of MUP Access Test Failure

MC1RILXSAV—X-Register at Time of MUP Access Test Failure

MC1RILYSAV—Y-Register at Time of MUP Access Test Failure

MC1RILZSAV—Z-Register at Time of MUP Access Test Failure

Unique MUP Data (Short Format)

FREG GREG TREG XREG

FREG—Fault Encountered by Calling Program

GREG—Originator of BLM Request

TREG—Return Address of Caller

XREG—Invalid MUP Base Address

Unique SSD Data

SS1RCID	SS1RMID	SS1RSTA	SS1RESR	SS1RDAT	SS1RLRTW
SS1RLRCW	SS10ROW40	SS10ROW41	SS10ROW42	SS10ROW43	SS10ROW44
SS10ROW45	SS10ROW46	SS10ROW50	SS10ROW51	SS10ROW52	SS10ROW53
SS10ROW54	SS10ROW55	SS10ROW56			

SS1RCID—SSD 0/1 CID Register

SS1RMID—SSD 0/1 MID Register

SS1RSTA—SSD 0/1 STA Register

SS1RESR—SSD 0/1 ESR Register

SS1RDAT—SSD 0/1 DAT Register

SS1RLRTW—SSD Long Range Timer Word

SS1RLRCW—SSD Long Range Counter Word

SS10ROW40-SS10ROW56—SSD 0/1 Matrix

API/FS—Attached Processor Interface/File Store Printouts

Unique API Data (D-Level, INJ, and BLM Reports)

a...a	b...b	c...c	7...0	7...0	7...0
d...d	e...e	f...f	7...0	7...0	7...0
g...g	h...h	i...i	7...0	7...0	7...0
j...j	k...k	l...l	m...m	n...n	7...0
o...o	p...p	q...q	r...r	s...s	t...t
u...u	v...v	w...w	x...x	y...y	z...z
A...A	B...B	C...C	D...D	E...E	F...F
A...A	B...B	C...C	D...D	E...E	F...F

Defined as:

a = Error information word for state 0.
 b = Error information word for state 1.
 c = Error information word for state 2.
 d = Recovery information word for state 0.
 e = Recovery information word for state 1.
 f = Recovery information word for state 2.
 g = Test link results word for state 0.
 h = Test link results word for state 1.
 i = Test link results word for state 2.
 j = Command system response mode status word.
 k = Command system response mode error word.
 l = Command system response mode sequence violation word.
 m = Command system response mode time-out word.
 n = Command system response mode—3B command and data.
 o = PIC status word.
 p = PIC error word.
 q = PIC state word.
 r = Link test output (latest result).

s = Timing word.

t = Switch fail output. If the API switch fails, this gives the reason for the failure using APFR error codes.

u = Configure fail output. If the configuration of the API fails, this gives the reason for the failure using APFR error codes.

v = Recovery miscellaneous word.

w = Base level maintenance error word.

x = CNI base level error word. (CNIBLM)

y = CNI interject error word. (TBERSTAT)

z = CNI error information word. (CNIEWD)

NOTE:

Variables A through F print two consecutive times. The first set of variables indicate the configuration failure due to command system failure. The second set of variables indicate the switch failure due to command system failures.

A = Command system initiate mode that contains command and data to be sent to the 3B computer.

B = Command system initiate mode status word.

C = Command system initiate mode error word.

D = Command system initiate mode sequence violation word.

E = Command system initiate mode 3B error word.

F = Command system initiate mode time-out word.

EIW—Error Information Word (State 0, 1, 2)

Bit 0-5 = PIC error type or base level client

PIC Error Types:

- 1 - CIR BUF ADR and size do not agree with PIC
- 2 - Pointer check failure
- 3 - Illegal CIR_BUF command
- 4 - 1B CMD register inhibited
- 5 - AU bus sequencer inhibited
- 6 - AU ADR range error
- 7 - AP bus parity failure
- 10 - PIC bus parity failure
- 11 - CMD check error
- 12 - MTC BUF address not loaded
- 13 - Illegal PIC RAM ADR specified
- 14 - PIC error
- 15 - Illegal instruction
- 20 - TB Load/End pointer fault
- 21 - TB unload pointer fault
- 22 - TB self-pointer fault
- 23 - TB address calculation error
- 24 - TB invalid header pointer

Base Level Client:

- 10 - Link integrity monitor (LIM)
- 20 - SAWS audit (SADK)
- 30 - APS message handler (APMH)
- 40 - Functional subroutines (FNCTSUBS)
- 50 - Common network interface (APMHCNI)

6-7 = API command parity failure

- 1 - Failed on write operation
- 2 - Failed on read operation

8 = Interrupt from on-board DGN

EIW—Error Information Word (State 0, 1, 2) (Contd)

Bit 9-11 = 3B Computer Error Type

- 1 - 3B computer buffers initialized
- 2 - 3B computer has marked an API OOS
- 3 - 3B computer system has initialized
- 4 - API sent 3B computer a PIC interrupt
- 7 - CMD system response mode failure

12 = 3B computer interrupt

13 = Dump RAM from active API

14 = Interrupt from active API

15 = Interrupt from standby API

16 = Multiple PIC errors

17 = PIC error detected

18 = No active API for this APS

19 = Unknown CMD received from 3B computer

20 = Error threshold exceeded

21 = Buffer initialization required

22 = No error found

23 = Base level recovery information

RIW—Recovery Information Word (State 0, 1, 2)

- Bit 0-2 = Next recovery state
- 0 - Reconfigure active API
 - 1 - Switch APIs
 - 2 - Initialize COM buffers
 - 3 = APS link test OK
 - 4 = 3B computer buffers were initialized
 - 5 = APS link test failed
 - 6 = Standby APS was removed
 - 7 = Buffer initialization failed
 - 8 = Buffer initialization OK—Threshold exceeded
 - 9 = API configuration failed
 - 10 = API switch failed
 - 11 = No configuration was found
 - 12 = API configuration successful
 - 13 = API switch successful
 - 14 = Buffer initialization successful
 - 15 = APDRV was initialized
 - 16 = 3B has been booted
 - 17 = CNI Stream initialization successful
 - 23 = Pre-duplex fail analysis begun

TL Results—Test Link Results (State 0, 1, 2)

- Bit 0 = API cannot be accessed
- 1 = 3B computer cannot be accessed
 - 2 = 3B computer initialized COM_BUF
 - 3 = 1B to 3B computer link OK

RM Status—Response Mode Status

- Bit 0-2 = Response mode states
 - 0 - Idle state
 - 1 - Sync ACK sent state
 - 2 - CMD received state
- 3 = CMD to API error
- 4 = CMD sequence violation
- 5 = CMD response time-out
- 6-14 = CMD response state code (see APFR error codes)

RM Error—Response Mode Error

- Bit 0-5 = Failing command (see API commands)
- 9-20 = Command error code (see APFR error codes)

RM SEQ VIOL—Response Mode Sequence Violation

- Bit 0-23 = (See Command Register Layout, following)

RM Timeout—Response Mode Time-Out

- Bit 0-23 = (See Command Register Layout, following)

RM CMD Register—Response Mode Command Register

- Bit 0-7 = Interprocessor command
- 8-15 = 3B computer error type
 - 1 - 3B computer buffers initialized
 - 2 - 3B computer has marked an API OOS
 - 3 - 3B computer system has initialized
 - 4 - APS sent 3B computer a PIC interrupt
 - 7 - CMD system response mode failure

PIC Status—PIC Status Word

Bit 0 = PC emulation mode

1 = Interrupt generated by 1B alert

2 = Interrupt generated by 3B computer alert

3 = Interrupt generated by 3B computer system interrupt

4 = 1B alert function disabled

5 = 3B computer alert function disabled

6 = 1B error checking disabled

7 = 3B computer error checking disabled

8 = 1B side in loop-around mode

9 = 3B computer side in loop-around mode

10 = DMA suspended by 1B

11 = DMA suspended by 3B computer

12 = Interrupt generated by PIC error

13 = Interrupt generated by PC

14 = Interrupt generated by 1B system interrupt

15 = Interrupt generated by DGN

PIC Error—PIC Error Word

- Bit 0 = BIC time-out
- 1 = Actual read in offset or size error
- 2 = 1B CMD register inhibited
- 3 = AU bus sequencer inhibited
- 4 = AU ADR range error
- 5 = Parity failure on AP bus
- 6 = Parity failure on PIC bus
- 7 = Pointer check failure
- 8 = Command check error
- 9 = Maintenance buffer address not loaded
- 10 = Illegal PIC RAM address specified
- 11 = PIC error
- 12 = BIC error
- 13 = DMA word count error
- 14 = Illegal circular buffer command
- 15 = Illegal instruction

PIC State—PIC State Word

- Bit 0-2 = PIC state code
 - 0 - No status
 - 1 - Active
 - 2 - Standby
 - 3 - OOS

TL Output—Test Link Output

- Bit 0 = AP1 cannot be accessed
- 1 = 3B computer cannot be accessed
- 2 = 3B computer initialized COM_BUF
- 3 = 1B to 3B computer link OK

Timing Word

- Bit 0-11 = Counter for half-hour timing
- 12-21 = Counter for state sequence timing
- 22 = Half-hour timing enable
- 23 = State sequence timing enable

Switch Failure—API Switch Failure Code

- Bit 0-11 = (See APFR Error Codes)

CONFIG Failure—API Configuration Failure Code

- Bit 0-11 = (See APFR Error Codes)

MISC Recovery—Recovery Miscellaneous Word

- Bit 0-5 = Not Used
- 6-8 = APS Number
- 9-14 = Count of successful buffer initializations
- 15-17 = State upon entry into fault recovery
- 18 = APDRV initialization
- 19 = 3B boot
- 20 = Pre-duplex fail analysis in-progress
- 21-23 = Level of phase requested on 3B

BLM Error—Base Level Maintenance Error Word

- Client = APS Message Handler
 - Octal 3 = No active API for this APS
- Client = Disk system audit
 - Octal 2 = No disk request completions
 - Octal 5 = Circular buffer invalid
 - Octal 30 = Bad currency pointers
 - Octal 34 = No completions FMI non-1B file jobs
 - Octal 35 = No completions non-FMI jobs
- Client = Link integrity monitor (LIM)
 - Bit 0 = LIM command to API error
 - 1 = LIM no access to CMD register
 - 2 = LIM command time-out
 - 3 = API is active
 - 4 = API is standby
 - 5 = 3B computer configuration request detected
 - 6 = 3B computer DMA is suspended
 - 7 = 3B computer is not responding
 - 8 = Error during API status word read
 - 9-12 = Specific API Kcode
 - 13 = Bad status—No active API
 - 14 = Bad status—Active/active API's
 - 15-21 = LIM time count
 - 22 = LIM time-out
 - 23 = LIM timing in progress

IM CMD/Data—Initiate Mode CMD and Data

- Bit 0-7 = Interprocessor command
- 8-15 = Data to be sent to 3B computer
(except for configuration API command)
- 8-11 = MEMN to be configured (CONF_API CMD only)
- 12-15 = Configuration state for MEMN (CONF_API CMD only)
 - 0 - Unit not operational
 - 1 - API is active and in-service
 - 2 - API is standby and in-service
 - 3 - API is OOS
 - 4 - API is in the initialization state

IM Status—Initiate Mode Status Word

- Bit 0-2 = Present command system state
 - 0 - Idle
 - 1 - Sync command sent
 - 2 - Sync acknowledge received
 - 3 - Command sent
 - 4 - Command acknowledge received
 - 5 - Null command sent
- 6 = Command to API error
- 7 = Sequence violation—Sync from 3B computer
- 8 = Time-out error
- 9 = 3B computer had error while processing CMD
- 12-14 = Command to API error count
- 15-16 = Command acknowledge time-out
- 17-21 = Sync acknowledge time-out
- 22 = Final time-out

IM Error—Initiate Mode Error Word

- Bit 0-5 = Failing command (See API Commands, following)
- 9-20 = Command error code (See APFR Error Codes, following)
- 21-23 = Command system state
 - 0 - Idle
 - 1 - Sync command sent
 - 2 - Sync acknowledge received
 - 3 - Command sent
 - 4 - Command acknowledge received
 - 5 - Null command sent

IM SEQ VIOL—Initiate Mode Sequence Violation Word

- Bit 0-23 = (See Command Register Layout, following)

Command Register Layout

- Bit 0-5 = Command OPCODE (See API Commands, following)
- 6-7 = Command disposition code
 - 0 - Completed
 - 1 - Failed
 - 2 - In progress
 - 3 - CMD loaded in CMD register
- 8-23 = Data field

IM 3B Error—Initiate Mode 3B Computer Error Word

- Bit 0-23 = (See Command Register Layout, following)

IM Timeout—Initiate Mode Time-Out Word

- Bit 0-23 = (See the preceding Command Register Layout)

API Commands (Octal)

- 0 = Invalid command
- 1 = MTC_BUF size (send and receive)
- 2 = Lower 16 bits of 1B send MTC_BUF
- 3 = Upper 6 bits of 1B send MTC_BUF
- 4 = Lower 16 bits of 1B receive MTC_BUF
- 5 = Upper 6 bits of 1B receive MTC_BUF
- 6 = Load RAM at 16-bit ADR from my sent MTC_BUF
- 7 = Dump RAM at 16-bit ADR to my receive MTC_BUF
- 10 = Copy my sent MTC_BUF to other receive MTC_BUF
- 11 = Copy my receive MTC_BUF unload PTR to other send
MTC_BUF unload PTR
- 12 = Send interrupt to other side
- 13 = Disable on-board DGN
- 14 = Suspend DMA except for MTC_BUF commands
- 15 = Resume DMA from point of suspension
- 16 = Read 8-bit DMA job number
- 17 = Abort DMA job in progress (if any)
- 20 = Disable PIC loop-around mode
- 21 = Enable PIC loop-around mode
- 22 = Disable all error checks
- 23 = Enable all error checks
- 24 = Read 16-bit API status word
- 25 = Clear through mask 16-bit API status word
- 26 = Read 16-bit API error word
- 27 = Clear through mask 16-bit API error word
- 30 = Read 16-bit API state word
- 31 = Write 16-bit API state word
- 32 = Initiate AU DGN helper
- 33 = Enable on-board DGN
- 34 = Disable alert function

API Commands (Octal) (Contd)

- 35 = Enable Alert Function
- 36 = Send 16-bit data to other processor
- 37 = Receive 16-bit data from other processor
- 40 = Disable PC emulation
- 41 = Enable PC emulation
- 42 = Send interprocessor data to other side (IPD)
- 43 = Read status/error word (TBERSTAT)
- 44 = Update status/error word (TBERSTAT)

APFR Error Codes (Octal)

100 = Failed to get buffer information from message handler
101 = API command failure
102 = Failed to restore common hardware
103 = Failed, forced by ROS key
104 = Failed, unit active main
105 = Failed, bus OOS
106 = Failed, unit not in operational state
107 = UTP to K-code conversion failed
110 = Immediate fail return from message handler on sending message
111 = MCC forced API 00S
112 = Time-out, no message ACK on COM_BUF RST MSG to 3B computer
113 = API command time-out
114 = API command never started processing
115 = Loop-around message not in REC BUF
116 = Mate status fail, MEMN does not exist
117 = Cannot access CMD register in the API
120 = Incorrect final status detected
121 = The test message has failed
122 = The CMD system has failed
123 = An attempt was made to restore active-active
124 = Message handler failed to initialize COM_BUF
125 = No active API found for this APS
126 = Active MEMN for this APS is not operational
127 = Message handler failed to send message
130 = Time-out waiting for message ACK
131 = ACK message from 3B computer was no good
132 = No active in-service API

APFR Error Codes (Octal) (Contd)

133 = Status shows active-active state
134 = Message handler failed to initialize XCOM_BUF
135 = Initial CMD response failed
136 = CMD not sync, sequence violation occurred
137 = SACK CMD to IP_WORD failed
140 = 3B computer CMD was not found
141 = CMD response time-out in wait routine
142 = CACK CMD to IP_WORD failed
143 = Received protocol CMD, expected CMD command
201 = APS MEMN out of range
202 = Fail to restore OOS mate API before switching
203 = MEMN to base address conversion failed
204 = Switch API failed due to the OOS mate API
205 = API is powered down
206 = API is already OOS

Attached Processor Interface Dump RAM Data (API Firmware code MC5A014)

76543210	76543210	76543210	76543210	h-----h	i-----i
j-----j	k-----k	l-----l	m-----m	n-----n	o-----o
p-----p	q-----q	r-----r	s-----s	t-----t	u-----u
v-----v	w-----w	x-----x	y-----y	z-----z	A-----A
B-----B	C-----C	D-----D	E-----E	F-----F	G-----G
H-----H	I-----I	J-----J	K-----K	L-----L	M-----M
N-----N	O-----O	P-----P	Q-----Q	R-----R	S-----S
T-----T	U-----U	V-----V	W-----W	X-----X	Y-----Y
Z-----Z	a1----a1	b1----b1	c1----c1	d1----d1	e1----e1
f1----f1	g1----g1	h1----h1	i1----i1	j1----j1	k1----k1
l1----l1	m1----m1	n1----n1	o1----o1	p1----p1	q1----q1
r1----r1	s1----s1	t1----t1	u1----u1	v1----v1	w1----w1
x1----x1	y1----y1	z1----z1	A1----A1	B1----B1	C1----C1
D1----D1	E1----E1	F1----F1	G1----G1	H1----H1	I1----I1
J1----J1	K1----K1	L1----L1	M1----M1	N1----N1	O1----O1
P1----P1	Q1----Q1	R1----R1	S1----S1	T1----T1	U1----U1
V1----V1	W1----W1	X1----X1	Y1----Y1	Z1----Z1	a2----a2
b2----b2	c2----c2	d2----d2	e2----e2	f2----f2	g2----g2
h2----h2	i2----i2	j2----j2	k2----k2	l2----l2	m2----m2
n2----n2	o2----o2	p2----p2	q2----q2	r2----r2	s2----s2
t2----t2	u2----u2	v2----v2	w2----w2	x2----x2	y2----y2
z2----z2	z2----z2	z2----z2	z2----z2	z2----z2	z2----z2



NOTE:

Fields h through z2 are explained in DUMP RAM field definitions that follow.

DUMP RAM Field Definitions

The following is the dump of the PIC RAM from the API that detected the error:

h = Send COM/XCOM address offset
i = Send COM/XCOM size
j = Send COM/XCOM load pointer
k = Send COM/XCOM unload pointer
l = Receive COM/XCOM virtual offset
m = Receive COM/XCOM size
n = Receive COM/XCOM load pointer
o = Receive COM/XCOM unload pointer
p = Send job buffer state vector and number of words
q = Send job buffer DMA address
r = Send job buffer client information
s = Send job buffer from, time and number
t = Send auditing timing information
u = Spare
v = Spare
w = Send job buffer checksum
x = Receive job buffer state vector and number of words
y = Receive job buffer DMA address
z = Receive job buffer client information
A = Receive job buffer from time and number
B = Receive auditing timing information
C = Spare
D = Spare
E = Receive job buffer checksum
F = PIC status register
G = Error Status register
H = Send MTCE Buffer virtual address for 3B
I = Receive MTCE Buffer virtual address for 3B
J = Send MTCE Buffer address for 1B
K = Receive MTCE Buffer address for 1B
L = Send COM/XCOM Buffer virtual address for 3B

DUMP RAM Field Definitions (Contd)

M = Receive COM/XCOM Buffer virtual address for 3B
N = Send COM/XCOM Buffer address for 1B
O = Receive COM/XCOM Buffer address for 1B
P = Size of MTCE Buffer in 3B
Q = Size of MTCE Buffer in 1B
R = Size of COM/XCOM Buffer in 3B
S = Size of COM/XCOM Buffer in 1B
T = MTCE job buffer offset in 3B
U = MTCE job buffer address in 1B
V = COM/XCOM job buffer offset in 3B
W = COM/XCOM job buffer offset in 1B
X = Size of MTCE job buffer in 3B
Y = Size of COM/XCOM job buffer in 3B
Z = Size of MTCE job buffer in 1B
a1 = Size of COM/XCOM job buffer in 1B
b1 = Number of MTCE job buffers in 3B
c1 = Number of COM/XCOM job buffers in 3B
d1 = Number of MTCE job buffers in 1B
e1 = Number of COM/XCOM job buffers in 1B
f1 = Interprocessor word sent by 3B
g1 = Interprocessor word sent by 1B
h1 = PIC detailed error information
i1 = API State word
j1 = Expanded DMA job number for send MTCE buffer
k1 = DMA requested during CNI
l1 = DMA In
m1 = DMA Out
n1 = Direction of interrupted DMA job
o1 = Common/CNI buffer polling rate
p1 = Firmware version date
q1 = Current 1B DMA job number

DUMP RAM Field Definitions (Contd)

r1 = Current 3B DMA job number
s1 = Memory integrity check word
t1 = Send TB headers address in 1B
u1 = Send TB buffer address in 1B
v1 = Send TB buffer end address in 1B
w1 = Send TB load pointer
x1 = Send TB unload pointer
y1 = Receive TB headers address in 1B
z1 = Receive TB buffer address in 1B
A1 = Receive TB buffer end address in 1B
B1 = Receive TB load pointer
C1 = Receive TB unload pointer
D1 = Pointer state during TB pointer update
E1 = Spare
F1 = Spare
G1 = Spare
H1 = Spare
I1 = Spare
J1 = API scanning status in 3B
K1 = DLN scanning status in 3B
L1 = Incoming TB start virtual address in 3B
M1 = Incoming TB end virtual address in 3B
N1 = Outgoing TB start virtual address in 3B
O1 = Outgoing TB end virtual address in 3B
P1 = Outgoing TB load pointer in 3B
Q1 = Outgoing TB end pointer in 3B
R1 = Incoming TB unload pointer in 3B
S1 = Incoming TB load pointer in 3B
T1 = Incoming TB end pointer in 3B
U1 = Outgoing TB unload pointer in 3B
V1 = Spare

DUMP RAM Field Definitions (Contd)

W1 = Spare
 X1 = Spare
 Y1 = Spare
 Z1 = Send TB virtual address in 1B
 a2 = Receive TB virtual address in 1B
 b2 = Spare
 c2 = Send and receive TB virtual address in 3B
 d2 = TB error threshold and TB DMA transfer size for 1B
 e2 = TB DMA transfer size for 3B
 f2 = TB send load and receive unload error count
 g2 = TB incoming load and outgoing unload error count
 h2 = Interprocessor data word going to 3B from 1B
 i2 = Interprocessor data word going to 1B from 3B
 j2 = TB error and status word
 k2 = TB DMA segment index
 l2 = Spare
 m2 = Spare
 n2 = Spare
 o2 = Spare

The following words are the contents of the last message processed by the API:

p2 = First word of APS message (From, Size, To)
 q2 = Message AP type and sequence number
 r2 = Message client identification
 s2 = Spare
 t2 = Message Checksum
 u2 = Message options field
 v2 = Message time and number of words
 w2 = Message address
 x2 = Message ETIME field
 y2 = Spare
 z2 = Message data

Attached Processor Interface General Control Pulse (GCP) Reply

- Bit 0 = Maintenance interject request
 - 1 = Maintenance flip-flop set side
 - 2 = Maintenance flip-flop reset side
 - 3 = Clock activity error
- 4-5 = Not used
 - 6 = CC input address parity error
 - 7 = CC input data parity error
 - 8 = Not used
 - 9 = CC out-of-range address error
- 10 = CC mode error
- 11 = K-code bit 11
- 12 = K-code bit 12
- 13 = K-code bit 13
- 14 = K-code bit 14
- 15 = K-code bit 15
- 16 = CC interface sequencer error
- 17 = K-code match detected
- 18 = Control read more detected
- 19 = Control write mode detected
- 20 = All ones address and PKA detected
- 21 = All zeros address and PKA detected
- 22 = All ones data and P1, P2 detected
- 23 = All zeros data and P1, P2 detected

Interprocessor Commands (Octal)

- 0 = NULL command
- 1 = Unassigned
- 2 = Synchronization Command
- 3 = Synchronization acknowledgement command
- 4 = IP_CMD command acknowledgement
- 5 = Reinitialize all COM_BUF resources
(including in-service APIs)
- 6 = Initialize in-service APIs to COM_BUF
- 7 = Reinitialize all XCOM_BUF resources
(including in-service APIs)
- 10 = Configure API as specified
- 11 = APS error detected (3B computer only)
- 12 = PS 0 Pump Request
 - Option 1 - Pump the first quarter of PS 0
 - Option 2 - Pump the first quarter of PS 0
 - Option 3 - Pump the first quarter of PS 0
 - Option 4 - Pump the first quarter of PS 0
- 13 = Select logical 1B-File for normal request as specified
 - Option 1 - Logical normal file
 - Option 2 - Logical update file
- 14 = Load PCRVUMP into 3B Computer main memory
 - Option 1 - PCRVUMP copy at DADR 200
- 15 = Request 3B computer to check for buffer initialization
- 16 = Request initialization of APDRV
- 17 = Request to boot the 3B system

CNI Base Level Error Word

Bit 0-2 = Type of error (See CNI Error Types, following)

3 = Side that was in error:

Set = 1B side

Reset = 3B side

4-5 = Message direction at time of error

(See Message Direction, following)

6 = CNI buffer initialization requested

Message Direction

Bit 0 = Direction was incoming to the 1B

1 = Direction was outgoing from the 1B

CNI Error Types (Octal)

1 = Self-pointer error

2 = Unload pointer error

3 = Buffer overflow error

4 = Load/end pointer error

5 = Client requested BLM error

6 = Bad messages error

CNI Error Information Word

Bit 0-2 = CNI Fault type (See CNI Error Types)

3 = Processor side that is in error:

Set = 1B

4-5 = Message direction at time of error. (See message direction)

6 = CNI buffer initialization request

7 = Request that stream be stopped

CNI Interject Error Word

- Bit 0 = Self-pointer fault (TB)
- 1 = Unload pointer fault (TB)
- 2 = Load/end pointer fault (TB)
- 3 = Side of fault;
 - Set = 1B side
 - Reset = 3B side
- 4 = Stream direction; Set = from 1B, Reset = to 1B
- 5 = Current buffer in use;
 - Set = TB
 - Reset = CB
- 6 = Invalid CNI buffer header pointer
- 7 = Invalid pointer address
- 8-11 = Buffer forced out of service (diagnostics only)
- 12-15 = TB Scanning activated (See TB status)

TB Status

- Bit 0 = Send TB for 1B active—outgoing stream
- 1 = Receive TB for 1B active—incoming stream
- 2 = Receive TB for APS active—outgoing stream
- 3 = Send TB for APS active—incoming stream

File Store Disk Identification Tag Definitions

MNEMONIC	Bit	
MAINT*	0	Used by FS fault recognition and diagnostics
GEN*	1	For all loader-generated data
LIB*	2	For nongeneric special programs
ODA*	3	For all ODA translations and parameters
FREE	4	For all sectors not assigned to any other ID
HIST	5	For error analysis trouble histories
TRANS	6	For all COMPOOL defined and engineered transient data
NWM*	7	For all display page information
TKMTC	8	For trunk status information
MERGE	10	For core-disk and hash tables
RCRB*	11	For recent change rollback information
TPM*	12	For traffic and plant schedules
OSDATA	13	OSOR long-term extended storage IDTAG

* Indicates memory areas which are hashed normally by SAWS.

File Store Error Correction Data (FSECD)

WORDS DISKADD ID FLAGS

WORDS—Number of Words Corrected by Status Failure Control

DISKADD—Start Disk Address of Correction

ID—ID Tag Associated with Record

FLAGS—Correction Control Flags

- Bit 1 = Disk write is for copy
- 2 = Disk job being dispensed as cancel request
- 3 = Reread failed
- 4 = ID is provided by client
- 5 = Client requests all writes be verified
- 6 = Buffer Choice:
 - 0 - Priv buffer
 - 1 - MAC paged area
- 7 = Data transfer in-progress
- 8 = Data transfer is waiting for completion of disk write
- 9 = Data transfer is delayed by no DRRs
- 10 = Request pending completion by FSC
- 11 = Give client an immediate return
- 13 = DF is in update mode
- 14 = Task dispenser loaded DRR for data transfer
- 18 = About copy operation at first opportunity
- 19-20 = Priority of copy client
- 21 = Rewrite same file
- 22-23 = Error correction code:
 - 0 - Copy mode
 - 1 - IDMM
 - 2 - UTRAMM
 - 3 - Exerciser error

MAC—Maintenance Control Printouts

Maintenance Control Memory Layout

CNTL+0	CNTL+1	CNTL+2	CNTL+3	CNTL+4	CNTL+5
CNTL+6	CNTL+7	CNTL+8	CNTL+9	CNTL+10	CNTL+11
CNTL+12	CNTL+13	CNTL+14	CNTL+15	CNTL+16	CNTL+17
CNTL+18	CNTL+19	CNTL+20	CNTL+21	CNTL+22	CNTL+23
CNTL+24	INFO +0	INFO +1	INFO +2	INFO +3	INFO +4

⇒ NOTE:

Prefix all words with MA1.

This dump can appear up to four times. Once for each of the three possible active maintenance control (MAC) clients (MAC1, MAC2, MAC3) and once for a generic utility client.

CNTL +0

Bit 0-18 = Job type—program—task

19-21 = Class wait states

State 0 = Normal state

State 1 = Disk operations occurring

State 2 = TTY message being processed

State 3 = Timing taking place

State 4 = Page loading in progress

State 5 = Tape operations in progress

State(s) 6 and 7 are unassigned

22 = CPSECT loaded

23 = Scratch pad activity flag (that is, SCR pad is assigned)

CNTL +0

Bit 0-14 = Program task

CNTL +0

Bit 0-6 = Task number

7-14 = Program number (MA1PGM)

15-18 = Job type (MA1JTYPE)

CNTL +1

- Bit 0 = Mask AUIIJ interject source
- 1 = Mask invalid interrupts
- 2 = Mask APINJ interject source
- 3 = Mask out-of-range interrupts
- 4 = Mask APUFS interject source
- 5 = Mask PUFS interrupt source
- 6 = Mask ELS interrupt source
- 7 = Mask SCDS interrupt source
- 8 = Mask pads interrupt source
- 9 = Mask AUDS interrupt source
- 10 = Mask CSDS interrupt source
- 11 = Mask CLIS interrupt source
- 12 = Mask SCUFS interrupt source
- 13 = Mask ORDS interrupt source
- 14 = Mask all interrupts
- 15 = Mask PSBSO interrupt source
- 16 = Mask error stop
- 17 = Mask AU base level maintenance
- 18 = Mask IO base level maintenance
- 19 = Mask PU base level maintenance
- 20 = Mask KLOS interrupt source
- 21 = Mask KL1S interrupt source
- 22 = Mask KL2S interrupt source
- 23 = Mask KL3S interrupt source

CNTL +2

- Bit 0-21 = Client's next segment address
- 23 = Inhibit call interrupt

CNTL +3

Bit 0-21 = Client's abort address
22 = Client's abort leg in progress

CNTL +4

Bit 0-13 = Unit-type member number

CNTL +4

Bit 0-6 = Member number
7-13 = Unit-type number
14 = Unit-type blockage flag has been set
15 = Page loading completed flag
16 = Client has been aborted by interrupt
17-19 = Abort states
 State 0 = Normal state
 State 1 = Disk operations failed
 State 2 = Maintenance interrupt has occurred
 State 3 = Holding time exceeded
 State 4 = Paging supervisor abort
 State 5 = Open GBT failed
 State 6 = Maintenance interrupt, client in progress
 State 7 = By request
20-22 = Count of interrupts during client execution
 State(s) 0 to 3 are unassigned
 State 4 = MAX number of interrupts allowed
 State(s) 5 to 7 are unassigned
23 = Unit-type blockage check was OK

CNTL +5

Bit 0-10 = Segment counter

11-13 = Job INIT State

State(s) 0 is unassigned

State 1 = Check UTYN blockage

State 2 = Check member blockage

State 3 = Check member blockage

State 4 = Check PS36 CONFIG

State 5 = Job INIT complete

State(s) 6 and 7 are unassigned

14-22 = GBT number

23 = Client in progress flag

CNTL +6

Bit 0-13 = LKPGSECT relative address

16-23 = LKPGSECT page number

CNTL +6

Bit 0-23 = LKPGSECT absolute address

CNTL +7

- Bit 0-7 = LKPGSECT program number
- 8-15 = RETNSECT program number
- 16 = Inhibit G, H, and J-level interrupts
- 17 = Stop AU audits
- 18 = Inhibit AU communications option
- 19 = Inhibit interrupts option
- 20 = Save registers option
- 21 = Break option
- 22 = Bypass CPSECT option
- 23 = Return address saved in controller

CNTL +8

- Bit 0-13 = RETNSECT relative address
- 16-23 = RETNSECT page number

CNTL +8

- Bit 0-23 = RETNSECT absolute address

CNTL +9

- Bit 0-23 = Save L shadow register

CNTL +10

- Bit 0-23 = Save F shadow register

CNTL +11

- Bit 0-23 = Save G shadow register

CNTL +12

Bit 0-23 = Save K shadow register

CNTL +13

Bit 0-23 = Save X shadow register

CNTL +14

Bit 0-23 = Save Y shadow register

CNTL +15

Bit 0-23 = Save Z shadow register

CNTL +16

Bit 0-23 = Save J shadow register

CNTL +17

Bit 0-13 = Relative address following last paging subroutine

14-17 = Disk ID for client

18-19 = Outstanding disk requests

20-23 = Page loading state

CNTL +18

Bit 0-9 = Relative address next subroutine in table
10-15 = Number of partial disk blocks left to read
16-23 = Count of remaining subroutines

CNTL+18

Bit 0-23 = Disk address of page directory table for page

CNTL+18

Bit 0-23 = Beginning INTSUB address

CNTL +19

Bit 0-23 = Link to next control table on load list

CNTL +20

Bit 0-23 = Client delay return address (APMH)

CNTL +21

Bit 0-23 = Save MCP-APS clients scratch pointer

CNTL +22, +23, +24 (Not used)

INFO +0

Bit 0-11 = Subclass of active client
12-22 = Class of active client
23 = Output blocks not saved

INFO +1, +2, +3, +4, (Not used)

Maintenance Control Paged Locations

Program	Address	Scratch	Address
PG1PAGECDGN	14441700	MA1MSCSCP	102000
PG1PAGEMTCE	14457700	MA1MSCP	74000
PG4PAGEMTCC	14475700	MA4MSCP3	352400
PG1PAGEADMN	14440700	MA1ADMNSCP	140317
PG1PAGEGUTL	14422700	MA1GSCP	61051
PG1PAGECLT*	14513700 14515700	LI4SCRATCH0	351442
		LI4SCRATCH1	351502
		LI4SCRATCH2	351542
		LI4SCRATCH3	351602
		LI4SCRATCH4	351642
		LI4SCRATCH5	351702
		LI4SCRATCH6	351742
		LI4SCRATCH7	351802
PG1PAGELIBU	17400000	—	—

*Maximum of 8 libraries (of which two can be paging libraries) can be operating at any time.

MLDGN Layout

DBT+0	DBT+1	DBT+2	DBT+3	DBT+4	DBT+5
DBT+6	DBT+7	DBT+8	DBT+9	DBT+10	DBT+11
DBT+12	DBT+13	DBT+14	DBT+15	DBT+16	DBT+17
DBT+18	DBT+19	DBT+20	DBT+21	DBT+22	DBT+23
DBT+24	DBT+25	DBT+26	DBT+27	DBT+28	DBT+29
DBT+30	DBT+31				



NOTE:

Prefix all words with DG1.

DG1DBT+0—Diagnostic Buffer Table

Bit 0-3 = Request code for diagnostic

- State 0 = DGN requested by a program without GBT
- State 1 = DGN requested by a program via GBT
- State 2 = Manual request detected by alarm scan
- State 3 = DGN requested by error analysis
- State 4 = DGN requested by DGN: TTY message
- State 5 = DGN requested by restore: TTY message
- State 6 = DGN requested by an audit
- State 7 = DGN requested by demand exercise
- State 8 = DGN requested as part of a routine exercise-
midnight, etc.
- State 9 = Deferred FR requested by TTY
- State 10 = DGN requested by fault recognition
- State 11 = DGN requested by bootstrap programs
- State 12 = DGN requested after off-line configuration
- State 13 = Is unassigned
- State 14 = Unconditional restoral
- State 15 = Is unassigned

4-6 = Termination code for diagnostic

- State 0 = Diagnostic aborted
- State 1 = Initial status error detected diagnostic not run
- State 2 = Internal software error detected—diagnostic halted
- State 3 = Manually terminated DGN
- State(s) 4 to 6 are unassigned
- State 7 = Normal termination

7-8 = Results of diagnostic

- State 0 = Conditional—all tests pass
- State 1 = Some tests failed
- State 2 = All tests passed
- State 3 = No tests run

9 = Subunit specified in bits 7-23 of DG1DBT+14

10-16 = Member number under diagnosis

17-23 = Unit type under diagnosis

DG1DBT+1

- Bit 0 = Conversational diagnostic
- 1 = Raw data requested
- 2 = Inhibit termination on failure
- 3 = Growth specified
- 5 = TLP specified on input
- 6 = CATLAS keyword specified
- 20 = New conversational command typed
- 21 = Partial request—run specified phases
- 22 = Repeat diagnostic the number of times specified in bits 0-7 of DG1DBT+2
- 23 = Output channel specified

DG1DBT+2

- Bit 0-7 = The number of times a DGN test is to be repeated
- 8-15 = The TTY channel on which message received
- 16-23 = The channel—if specified—for outputting

DG1DBT+3

- Bit 0-23 = Reserved for return address

DG1DBT+4

- Bit 0-9 = Phases 9 through 0 request bits
- 10-19 = Phases 9 through 0 fail bits
- 21-23 = MT-MV save

DG1DBT+5

- Bit 0-9 = Phases 19 through 10 request bits
- 10-19 = Phases 19 through 10 fail bits

DG1DBT+6

Bit 0-9 = Phases 29 through 20 request bits
10-19 = Phases 29 through 20 fail bits

DG1DBT+7

Bit 0-9 = Phases 39 through 30 request bits
10-19 = Phases 39 through 30 fail bits

DG1DBT+8

Bit 0-9 = Phases 49 through 40 request bits
10-19 = Phases 49 through 40 fail bits

DG1DBT+9

Bit 0-9 = Phases 59 through 50 request bits
10-19 = Phases 59 through 50 fail bits

DG1DBT+10

Bit 0-9 = Phases 69 through 60 request bits
10-19 = Phases 69 through 60 fail bits

DG1DBT+11

Bit 0-9 = Phases 79 through 70 request bits
10-19 = Phases 79 through 70 fail bits

DG1DBT+12

Bit 0-9 = Phases 89 through 80 request bits
10-19 = Phases 89 through 80 fail bits

DG1DBT+13

Bit 0-9 = Phases 99 through 90 request bits
10-19 = Phases 99 through 90 fail bits

DG1DBT+14

Bit 0-3 = Task number
 State 0 = Basic unit diagnostic
 State(s) 1 to 15 are unassigned
4-6 = Frame scan point index
7-13 = Submember number requested
14-23 = Subunit type requested

DG1DBT+15

Bit 0 = Power alarm involved in request
 1 = If set, request is RMV requested by TTY
 2 = Skip diagnostic request and dummy ATP
 3 = Flag to show MCFWPEMO was initial entry from MACP
4-7 = Number of failing phases to include in TLP
 9 = Subunit specified in bits 7-23 of DG1DBT+16
10-16 = Helper member number
17-23 = Helper unit number

DG1DBT+16

Bit 7-13 = Helper member number
14-23 = Helper subunit

DG1DBT+17

- Bit 0 = General Flag 0
- 1 = General Flag 1
- 2 = General Flag 2
- 3 = General Flag 3
- 4 = General Flag 4
- 5 = General Flag 5
- 6 = General Flag 6
- 7 = General Flag 7
- 8 = General Flag 8
- 9 = General Flag 9
- 10 = General Flag 10
- 11 = General Flag 11
- 12 = Set indicates data in DG1DATA0
- 13 = Set indicates data in DG1DATA1
- 14 = Set indicates data in DG1DATA2
- 15 = Set indicates data in DG1DATA3
- 16 = Set indicates data in DG1DATA4
- 17 = Set indicates data in DG1DATA5
- 18 = Set indicates data in DG1DATA6
- 19 = Set indicates data in DG1DATA7

DG1DBT+17

- Bit 0 = PC option for DGNCC input message
- Bit 3 = TUC equipped with ADT in place of tape transport

DG1DBT+18

Bit 0-23 = Data word 0

DG1DBT+19

Bit 0-23 = Data word 1

DG1DBT+20

Bit 0-23 = Data word 2

DG1DBT+21

Bit 0-23 = Data word 3

DG1DBT+22

Bit 0-23 = Data word 4

DG1DBT+23

Bit 0-23 = Data word 5

DG1DBT+24

Bit 0-23 = Data word 6

DG1DBT+25

Bit 0-23 = Data word 7

DG1DBT+26

Bit 0-23 = Point of maximum definition per FR analysis

DG1DBT+27

Bit 0-23 = Interrupt number associated with this request

DG1DBT+28

Bit 0-23 = Job ID of the diagnostic request

DG1DBT+29

Bit 0-23 = Error analysis processor

Bit 0-11 = Text phrase to be passed to DCON

DG1DBT+30

Bit 0-23 = Error analysis application

Bit 0-7 = Number of ERAT requested DGN cycles remaining to be run

8 = If 1, text phrase present in word 29

9 = Indicates a DT frame diagnostic

10-11 = Count of abort during ERATPUFH

12 = PUFH client flag for MCFWPEMO

13 = Growth unit restoral request

14 = Transfer to SYRE requested by PUFH

15 = Final handling directed by ERAT

16-22 = A 7-bit error analysis decision code

23 = Final handling completed by sequence TLB

DG1DBT+31

Bit 0-2 = Code for first abort

3-5 = Code for second abort

6 = Diagnostic aborted once

7 = Diagnostic aborted twice

Supplementary Peripheral Diagnostic Data

TEST	MISMATCH	SUPPLEMENTARY DATA				
NUMBER	VALUE	WORD1	WORD2	WORD3	WORD4	WORD5
		-----	-----	-----	-----	-----
		-----	-----			



NOTE:

Minimum of 5 words of supplementary data.

WORD 1 = Test Output: Raw data from the frame on the PU reply bus/reads of buffer bus register/scan point reads/data from scratch memory

WORD 2 AND 3 = Test Input: High 12 bits of word 2 = address bus/lower 36 bits (words 2 and 3) = write bus

Address bus:

See "K-Codes (E-Register Layouts)"

Write bus:

High 7 bits = OPCODE

Low 29 bits = Data for the specific order

Other possibilities: Pulse point address/buffer bus register address

WORD 4 = Test location: Address in the phase or subroutine where the test failed

WORD 5 = Test information: Most significant digit gives the number of data words that follow; next digit gives the number of DOLOOP words; next digit gives the number of words of subroutine information data that follow; and the low 5 digits give TLP data.

DOLOOP Data: Maximum 7 words

Values printed are the values of the DOLOOP
variables at the time of the test failure.

Innermost DOLOOP is printed first—variable C.B.A.

Subroutine Data: Maximum 7 words

Value(s) printed are the address(es) at the
call substatement(s). The address of the last
executed call SUB is printed first—call SUB C.B.A.

Peripheral Unit (PU) Interrupt Printouts

Common Level Data (MI1CONT)

See Common Printouts.

F-Level

See Interrupt Level Printouts.

Central Control (CC) Interrupt Data

See Central Control/Auxiliary Unit Printouts.

MAC Control Memory Layout

See Maintenance Control Printouts.

Peripheral System Data

WORD 0	WORD 1	WORD 2	WORD 3	WORD 4	WORD 5
WORD 6	WORD 7	WORD 8	WORD 9	WORD 10	WORD 11
WORD 12					

WORD 0—State of PU bus routing Flip Flop's at Time of Interrupt

Bit 9-12 = Active CC coded enable bus select
13-15 = Active CC CPD enable address bus
16-17 = Active CC CPD enable—PU address bus
18-20 = Active CC CPD enable—PU reply bus

WORD 1—PU Bus 0 Software Status

Bit 0 = Image of PUBO flip-flop
1 = Image of PUBA flip-flop
2 = Image of PUBT flip-flop
3 = Image of PUBR flip-flop
4 = Trouble on addressing portion of bus
5 = Trouble on reply portion of bus
6 = Trouble at CC on this bus
7 = Diagnostic has been requested
8 = Peripheral bus removed via TTY
12 = Bus is out of service
16-19 = Number of units unable to receive on this bus at time of interrupt
20-23 = PU maintenance code

WORD 2—PU Bus 1 Software Status (Same as above for bus 0)

WORD 3—PU Bus/Unit Bus Failing Data During Recovery

WORD 4—PU Bus/Unit Bus Failing Test During Recovery

WORD 5—Base SP 0, Controller 0 Software Status After Recovery

WORD 6—Base SP 0, Controller 1 Software Status After Recovery

WORD 7—Base SP 1, Controller 0 Software Status After Recovery

WORD 8—Base SP 1, Controller 1 Software Status After Recovery

WORD 9—Network Clock, Chain 0 Software Status After Recovery

WORD 10—Network Clock, chain 1 Software Status After Recovery

WORD 11—Network Clock, Chain 2 Software Status After Recovery

WORD 12—Network Clock, Chain 3 Software Status After Recovery

Interrupt Source Data

WORD 0 WORD 1 WORD 2 WORD 3 WORD 4

WORD 0—State of P-Register (Bits 24-35) at Time of Interrupt (P-Upper)

Bit 0-5 = MCC row code
6 = MCC matrix selection
7-9 = MCC OPCODE
11 = MCC control mode

For Peripheral Frames

Bit 0-4 = Auxiliary OPCODE
5-11 = OPCODE
(Bit 11 = 1 indicates a maintenance OPCODE)

WORD 1—State of P-Register (Bits 0-23) at Time of Interrupt (P-Lower)

Bit 0-23 = P-Register data bits 0-23

WORD 2—State of E-Register Containing K-Code of the Last Addressed Unit at Time of Interrupt

Bit 10-16 = Member number [See K-Codes (E-Register Layouts)]
17-21 = Unit-ID number [See K-Codes (E-Register Layouts)]

WORD 3—Group Interrogate Response (GI)

Bit 0-23 = Group interrogate states (See MI/GI responses)

WORD 4—Member Interrogate Response (MI)

Bit 0-23 = Member interrogate states (See MI/GI Responses)

Fault Recognition Isolation Data

WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5

WORD 0—Sequence Table or Primary Strategy Table

Bit 0-23 = Table number

WORD 1—Interrupt Sequence State or Primary Strategy Table

Bit 0-23 = State

WORD 2—Point of Maximum Definition

Bit 0-7 = PMD

WORD 3—Resolution Class

Bit 0-1 = Resolution class

State 0 = Resolved

State 1 = Unresolved

State 2 = Changed UTMN

State 3 = Internal error

WORD 4—Fault Class

Bit 0-3 = Fault class (Octal)

State 0 = No action
State 1 = Software
State 2 = Class 1—Transient
State 3 = Class 1—Hard
State 4 = Class 2—Transient
State 5 = Class 2—Hard
State 6 = Class 3—Transient
State 7 = Class 3—Hard
State 10 = Class 4—Transient
State 11 = Class 4—Hard
State 12 = Unequipped
State 13 = Growth
State 14 = TRPF—Transient
State 15 = TRPF—Unresolved

WORD 5—Number of Isolate Attempts in Which Fault Recovery Changed Suspect Unit

Bit 0 = 0 or 1 isolate attempts

Peripheral Fault Recognition Results

PU4RESULT	PU4UTMNO	PU4FRPMD	PU4FRJRG	PBFR0000	TRINDEX
FAILTEST1	FAILDATA1	RELADDR1	FAILTEST2	FAILDATA2	RELADDR2
FAILTEST3	FAILDATA3	RELADDR3	FAILTEST4	FAILDATA4	RELADDR4
FAILTEST5	FAILDATA5	RELADDR5	FAILTEST6	FAILDATA6	RELADDR6
"	"	"	"	"	"
"	"	"	"	"	"
"	"	"	"	"	"

PU4RESULT—Fault Recognition Summary Register

- Bit 0 = CC0 found faulty
- 1 = CC1 found faulty
- 2 = Controller 0 found faulty (or NCLK chain in half 0)
- 3 = Controller 1 found faulty (or NCLK chain in half 1)
- 4 = PU bus 0 found faulty
- 5 = PU bus 1 found faulty
- 6 = PU bus 0 at unit found faulty
- 7 = PU bus 1 at unit found faulty
- 8 = Faulty unit or subunit to be removed and diagnosed
- 9 = Faulty unit or subunit to be removed
- 10 = Fault recognition was unable to find the fault
- 11 = Fault recognition found that a software error caused the F-level
- 12 = Fault recognition found that a transient caused the F-level
- 13 = Signal processor matrix found faulty
- 14 = Controller 0 pulse point is suspect
- 15 = Controller 1 pulse point is suspect

PU4UTMNO—Unit and Member ID Register

- Bit 2-8 = Submember found faulty (if any)
- 9 = Set if submember found faulty
- 10-16 = Member number found faulty (or NCLK bay number)
- 17-23 = Unit type found faulty

PU4FRPMD—Terminal FR Program Register

- Bit 0-7 = Point of maximum definition—terminal FR subroutine INDENT.
- 8-14 = Fault recognition decision code
- 15-21 = Error analysis action code

PU4FRJRG—Save J Register

- Bit 0-23 = FR program address where error was located

PBFR0000—Address of PBFR

TRINDEX—Number of Words Appearing in this Result Printout

FAILTESTn—Failing Test Information

Bit 0-8 = Failing test number
9-11 = 1 failing controller access test
 = 2 failing bus loop test

For Bus Loop Test Only:

Bit 12 = Bus branch circuit half
13-14 = Bus circuit
15 = Bus number
16 = 0 PUBB 0
 = 1 repeater

For Access Test Only:

Bit 17 = 1 Controller 1
 = 0 Controller 0
20 = Controller 0 was access tested
21 = Controller 0 failed access test
22 = Controller 1 was access tested
23 = Controller 1 failed access test

**FAILDATAn—Failing Test Data—Nonzero Bits Represent Failing Bits—
Look in PBFR for more Detail on Failing Tests and Bits**

**RELADDRn—Relative Address in PBFR Where the Bus Loop Test or
Controller Access Test was Called**

Error Analysis Recent History Tables (ERAT)

RCNT+0	RCNT+1	RCNT+2	RCNT+3	RCNT+4	RCNT+5
RCNT+6	RCNT+7	RCNT+8	RCNT+9	RCNT+10	RCNT+11
RCNT+12	RCNT+13	RCNT+14	RCNT+15	RCNT+16	RCNT+17
RCNT+18	RCNT+19	RCNT+20	RCNT+21	RCNT+22	RCNT+23
RCNT+24	RCNT+25	RCNT+26	RCNT+27	RCNT+28	RCNT+29
RCNT+30	RCNT+31	RCNT+32	RCNT+33	RCNT+34	RCNT+35
RCNT+36	RCNT+37	RCNT+38	RCNT+39	RCNT+40	RCNT+41
RCNT+42	RCNT+43	RCNT+44	RCNT+45	RCNT+46	RCNT+47
RCNT+48	RCNT+49	RCNT+50	RCNT+51	RCNT+52	RCNT+53
RCNT+54	RCNT+55	RCNT+56	RCNT+57	RCNT+58	RCNT+59
RCNT+60	RCNT+61	RCNT+62	RCNT+63		



NOTE:

Prefix each word with ER4.

RCNT +0

- Bit 0 = Half of suspect unit
- 1-7 = Member number of suspect unit
- 8-14 = Unit type of suspect unit
- 15 = 1 if a nonautonomous interrupt
- 16-22 = Fault recognition decision code
- 23 = 1 if duplex failure (DDUP)

RCNT +0

- Bit 1-14 = Unit type and member number of suspect
- 16-19 = SA: Type of error analysis entry (FR decision code)
 - State 0 = Decision code of no action
 - State 1 = Remove and request diagnostic
 - State 2 = Remove
 - State 3 = Return to service
 - State 4 = Remove this half and update mate
 - State 5 = Diagnose this half and update mate
 - State 6 = Software error
 - State 7 = Transient error
 - State 8 = EA resolvable
 - State 9 = FR troubled controller guess
 - State 10 = Duplex failure state
 - State 11 = Divorce and run
 - State 12 = Switch activity
 - State 13 = Remove and PEST this growth unit
 - State 14 = Restore and request diagnostic
 - State 15 = Hit time the frame
- 20-21 = SA:Fault recognition application bits
(See RCNT +23 for DAPP assigns)
- 22 = Controller PEST

RCNT +1

- Bit 0-11 = Bits 21-10 of E-Register
- 12-23 = Bits 35-24 of P-Register

RCNT +2

- Bit 0-23 = Bits 0-23 of P-Register

RCNT +3

- Bit 7 = AC1LUDWC
- 8 = AC1MTCPU
- 12-16 = AC1CEQF
- 22 = 1 IF ERATBASE entered
- 23 = Both controller O/S—copy of DUP bit input

RCNT +4

- Bit 0 = AC1ASWOPU
- 1 = AC1ASW1PU
- 2 = AC1POPU
- 3 = AC1P1PU
- 6 = AC1ASWEPU
- 7 = AC1APEPU
- 8 = 1 if interject request, 0 if F-level
- 11 = 1 if BBFR is entering ERAT
- 12 = 1 if PBFR should go to CCPREXFR
- 13 = CC number causing F-level problem
- 14 = 1 if F-level due to active CC problem-DCC must be 1
- 15 = 1 if F-level due to a CC problem
- 16 = ERAT specified bus number
- 17 = ERAT minor bus flag—1 for minor—0 for major
- 18 = 1 if ERAT indicates duplex bus failure
- 19 = Bus number
- 20 = Minor bus flag—1 for minor—0 for major
- 21 = 1 if duplex bus failure
- 22 = 1 if PBFR implicates a bus rather than the specified unit member and half
- 23 = 1 if PBFR is entering ERAT

RCNT +4

Bit 14-15 = F-Level due to CC—Items DCC and DCCACT
16-18 = ERAT specified bus data—ABNO AMNBUS and ADUPB
19-21 = Inputted bus data—DBNO DMNBUS and DDUPB

RCNT +5

Bit 4 = Inhibit AUTNM PU failure summary copy
5 = Inhibit PU failure summary copy
22 = AC1IASWEPU
23 = AC1IAPEPU

RCNT +6

Bit 0-1 = SA: Equipage Status of Interrupting Unit
State 0 = Unequipped
State 1 = Growth
State 2 = Special growth
State 3 = Operational
6 = AC1ACT
7 = AC1TCC
8 = AC1DIV
9 = AC1PUBO
10 = AC1PUBA
11 = AC1PUBT
12 = AC1PUBR

RCNT +7

Bit 0-23 = GI Responses

RCNT +8

Bit 0-23 = MI Responses

RCNT +9

Bit 0-23 = L-Register

RCNT +10

Bit 0-23 = Active bus status

RCNT +11

Bit 0-23 = Standby bus status

RCNT +12

Bit 0-4 = Diagnostic sequence state (DSS)

5-9 = Interrupt sequence state (ISS)

10-14 = Sequence table number (ST)

15-18 = RCNT Link list forward pointer

19 = RCNT almost full flag

20-23 = RCNT Link list backward pointer

RCNT +12

Bit 0-9 = Index to sequence tables

RCNT +13

Bit 0-23 = Analysis table correlated data

RCNT +13

Bit 0-17 = Error analysis temporary storage

18-23 = Analysis table entry qualifier code

RCNT +14

Bit 0-21 = Error analysis timing list register
22 = Timing list audit flag if 1 audit required
23 = EA Timing sign:

0 = Idle (if time = 0)
or timing active
1 = Waiting for diagnostics
(implies time = 0)

RCNT +15

Bit 0-23 = Primary error source register—suspect

RCNT +16

Bit 0-23 = Primary error source register—mate

RCNT +17

Bit 0-23 = Secondary error source register—suspect

RCNT +18

Bit 0-23 = Secondary error source register—mate

RCNT +19

Bit 0-23 = Status register—suspect

RCNT +20

Bit 0-23 = Status register—mate

RCNT +21

Bit 0-23 = Software status—suspect

RCNT +22

Bit 0-23 = Software status—mate

RCNT +23

Bit 0 = Half of suspect unit
1-7 = Member number of suspect unit
8-14 = Unit type of suspect unit
15 = 1 if a nonautonomous interrupt
16-22 = Action code
23 = Re-entry flag

RCNT +23

Bit 1-14 = Unit type and member number from action word
16-19 = SA: Error analysis action code
State 0 = Action code of no action
State 1 = Remove and request diagnostic
State 2 = Remove
State 3 = Return to service
State 4 = Remove this half and update mate
State 5 = Diagnose this half and update mate
State 6 = Software error
State 7 = Transient error
State 8 = EA Resolvable
State 9 = Troubled controller guess
State 10 = Duplex failure state
State 11 = Divorce and run
State 12 = Switch activity
State 13 = Remove and PEST this growth unit
State 14 = Restore and request diagnostic
State 15 = Hit time the frame

Bit 20-21 = SA: ER4DAPP: Fault Recognition Application State

DT

State 0 = Unassigned
State 1 = Suspect is a DTU as supplied in RCNT +32
State 2 = Unassigned
State 3 = Unassigned

EST

State 0 = Unassigned
State 1 = Suspect is the ESU as supplied in RCNT +32
State 2 = Unassigned
State 3 = Unassigned

NCLK

State 0 = Unassigned
State 1 = Suspect is chain as supplied in RCNT +32
State 2 = Unassigned
State 3 = Unassigned

SCLK

State 0 = Unassigned
State 1 = PEST SYS clock A-B counters
State 2 = NCSU
State 3 = Unassigned

SP

State 0 = Unassigned
State 1 = Suspect is matrix of specified SP—also means
PEST matrix
State 2 = Suspect is DT associated with SP2-DT number supplied in
RCNT +32
State 3 = Unassigned

RCNT +24

- Bit 0 = Long-term fault flag
- 1 = DANT roll back request
- 2 = Roll back history flag 1 if RB has occurred
- 3 = Waiting for manual diagnostic request
- 4 = Failure override bit
- 5-9 = Roll back INTRPT sequence ST
- 10-14 = Roll back sequence table number
- 15-18 = RCNT MADRET link
- 19-22 = MAURET link pointer
- 23 = 1 if sequence tables are entered on F-Level

RCNT +25

- Bit 0-17 = Desired audit number
- 18 = Interface program flag
- 19 = Interface program flag
- 20 = Interface program flag
- 21 = Interface program flag
- 22 = Interface program flag
- 23 = Interframe program flag

RCNT +26

- Bit 0-22 = ER4 dump 1

RCNT +27

- Bit 0-22 = ER4 dump 2

RCNT +28

- Bit 0-22 = ER4 dump 3 RCNT +29

RCNT +29

- Bit 0-8 = FR unique PMD number
- 22-23 = SA: Indicates Type of Return from FR
 - State 0 = Unassigned
 - State 1 = FR should unwind
 - State 2 = FR should roll ahead
 - State 3 = FR should return to reference point

RCNT +30

- Bit 0-22 = First associated maintenance file number

RCNT +31

- Bit 0-22 = Last associated maintenance file number

RCNT +32

- Bit 0-22 = Submember word for VIUs and terms

RCNT +33

- Bit 0-23 = Audit and diagnostic results word

RCNT +33

Bit 0-3 = SA: DGN source from DBT

- State 0 = DGN REQ by program without A GBT
- State 1 = DGN REQ by program via a GBT
- State 2 = Manual REQ detected by alarm scan
- State 3 = DGN REQ by error analysis
- State 4 = DGN REQ by DGN: TTY message
- State 5 = DGN REQ by restore: TTY message
- State 6 = DGN REQ by an audit
- State 7 = DGN REQ by demand exercise
- State 8 = DGN REQ as part of routine exercise—midnight,
etc.
- State 9 = Deferred FR requested by TTY
- State 10 = DGN REQ by fault recognition
- State 11 = DGN REQ by bootstrap programs
- State 12 = DGN REQ after off-line CONFIG
- State 13 = Unassigned
- State 14 = Unconditional restoral
- State 15 = Unassigned

4-6 = SA: Termination Code from DBT

- State 0 = Diagnostic aborted
- State 1 = Internal status error detected—DGN not run
- State 2 = Internal software error detected—DGN halted
- State 3 = Manually terminated DGN

State(s) 4 to 6 are unassigned

- State 7 = Normal termination

RCNT +33 (Contd)

7-8 = SA: DGN Test Results from DBT

State 0 = Conditional all tests pass

State 1 = Some tests failed

State 2 = All tests passed

State 3 = No tests run

9 = 1 if diagnostic has completed

17 = Audit error indicator

18-20 = SA: Reasons for Audit Canceled

State 0 = Unassigned

State 1 = Invalid MDN

State 2 = MAX REQ waits exceeded

State 3 = MAX COMP waits exceeded

State 4 = No available MAURET

State(s) 5 to 7 are unassigned

21 = 1 if the requested audit was canceled

22 = 1 if an audit has completed

23 = 1 if an audit has been requested

RCNT +33

Bit 0-8 = Overall DGN results from the DBT

21-23 = Overall audit results

RCNT +34

Bit 0-11 = First supplementary audit number
12-23 = Second supplementary audit number

RCNT +34

Bit 0-23 = First supplementary audit word

RCNT +35

Bit 0-11 = Third supplementary audit number
12-23 = Fourth supplementary audit number

RCNT +35

Bit 0-23 = Second supplementary audit word

RCNT +36

Bit 0-11 = Fifth supplementary audit number
12-23 = Sixth supplementary audit number

RCNT +36

Bit 0-23 = Third supplementary audit word

RCNT +42

Bit 0-4 = SA: Type of Unit Interrupting

State 0 = Unassigned

State 1 = Controller

State 2 = Network clock

State 3 = Terminal

State 4 = VIU

State 5 = DTU

State 6 = DT associated with SP

State 7 = CC problem

State 8 = Major bus

State 9 = Minor bus

State 10 = ESU

State 11 = Babbling bus

State(s) 12 to 31 are unassigned

6 = 1 if this is a duplex failure

9-12 = Count of number of times SECT updated

15-23 = Count of number of interrupt in this RCNT

RCNT +42

Bit 0-23 = First summary word

RCNT +43

Bit 0-4 = Copy of BRCEC

6-10 = Copy of ARCEC

12 = 1 if SSTT search performed

13 = 1 if SSTT match was found

15 = 1 if fmon RCNT analysis performed

16 = 1 if RCNT analysis was significant

17 = 1 if analysis gave unit and unit was in-service

RCNT +43

Bit 0-18 = 1 if analysis gave new SEQT ISS and DSS
20 = Flag indicating last RCNT was input RCNT
23 = Second summary word

RCNT +44

Bit 0-4 = Copy of ER4NEPT
6-9 = Copy of ER4INPT
12-15 = Previous value of RCNT +33 0-3
16-18 = Previous value of RCNT +33 bits 4-6
19-20 = Previous value of RCNT +33 bits 7-8

RCNT +44

Bit 12-20 = Previous value of RCNT +33 bits 0-8

RCNT +44

Bit 0-23 = Third summary word

RCNT +45

Bit 0-12 = Port PEST number—corresponds 1 to 1 with port number

RCNT +45

- Bit 0-6 = DT member number
- 7-13 = DT unit type number
- 14 = 1 if this is the last DT that is not duplex failed
- 15-18 = SA: ER4ATYPE: DT action by ERAT
- 19 = DT controller acted on by EA
- 21 = Suspect DT controller—from FR PROG
- 22 = 1 if mate SPC recorded error
- 23 = 1 if mate DTC is OOS

RCNT +46

- Bit 0-23 = Submember flags for controller 0

RCNT +47

- Bit 0-23 = Submember flags for controller 1

RCNT +48

- Bit 0-23 = Indicates subunits causing multiple interrupts

RCNT +49

- Bit 0 = 1 if multiple interrupt due to current sub-member
- 15 = Indicator to test for special TSI and TMS duplex fail requests
- 18-22 = Count of number of audit tries from duplex fail sequence table
- 23 = Indicates possible hardware implication when DEC code = software

RCNT +50

Bit 0-23 = Value of EX4CLOCK at time of interrupt (10 ms/bit)

RCNT +51

Bit 0-22 = DELTA time since last interrupt—in 10-ms increments
23 = DELTA time overflow indicator

RCNT +52

Bit 0-22 = Leaky bucket counter
23 = EA duplex failed unit and/or requested phase 2

RCNT +53

Bit 0 = State of SP2 CO RCV from 0 FF
1 = State of SP2 CO RCV from 1 FF
3 = State of SP2 CO send to 0 FF
4 = State of SP2 CO sent to 1 FF
6 = DT CO out-of-service bit 1 = OOS
7 = DT C1 out-of-service bit 1 = OOS
9 = SP2 CO out-of-service bit 1 = OOS
12 = State of SP2 C1 RCV from 0 FF
13 = State of SP2 C1 RCV from 1 FF
15 = State of SP2 C1 send to 0 FF
16 = State of SP2 C1 send to 1 FF
17 = 1 if mate DTC clock is available
18 = DT CO out-of-service bit 1 = COS
19 = DT C1 out-of-service bit 1 = COS
20 = 1 if suspect DT can run alone
21 = SP2 C1 out-of-service bit 1 = OOS
22 = 1 if mate DT is restorable
23 = 1 if mate DT can run alone

RCNT +53

Bit 0-1 = SP2 controller 0 RCV RTG
3-4 = SP2 controller 0 send RTG
6-7 = DT CO and C1 OS status
12-13 = SP2 controller 1 RCV RTG
15-16 = SP2 controller 1 send RTG
18-19 = Same as bits 6-7

RCNT +53

Bit 0-23 = Suspect DT/SP2 routing and status-same as SP4PORTSTAT

RCNT +54

Bit 0-3 = NCLK master OSC select bits on first phase error interrupt
6-7 = NCLK, count number of phase error interrupts (PMDs 15 and 22). Third interrupt removes previously recorded master OSC (Bits 0-3).

RCNT +54

Bit 0-23 = Most recent term data (ESR)

RCNT +54

Bit 0-3 = Term
4-23 = Most recent term ESR

RCNT +54

Bit 0-5 = Bits 1-6 of R12 of VIU
6-11 = Bits 1-6 of R13 of VIU
12-17 = Bits 1-6 of R14 of VIU
18-23 = Bits 1-6 of R15 of VIU

RCNT +54

Bit 0-23 = VIU 0 error source register

RCNT +54

Bit 0-23 = DT/SP2 low port routing—suspect soft status

RCNT +55

Bit 0-23 = Most recent term data (MR)

RCNT +55

Bit 0-3 = Bit 0 set. If first term word block busy and so on
4-23 = Most recent term MR

RCNT +55

Bit 0-23 = VIU 1 error source register—same as RCNT +54

RCNT +55

Bit 0-23 = DT/SP2 high port routing—suspect soft status

RCNT +56

Bit 0-23 = Previous term data (ESR)

RCNT +56

Bit 0-3 = Term
4-23 = Previous term ESR

RCNT +56

Bit 0-23 = VIU 2 error source register—same as RCNT +54

RCNT +56

Bit 0-23 = DT/SP2 low port routing—mate soft status

RCNT +57

Bit 0-23 = Previous term data (MR)

RCNT +57

Bit 4-23 = Previous term MR

RCNT +57

Bit 0-23 = VIU 3 error source register—same as RCNT +54

RCNT +57

Bit 0-23 = DT/SP2 high port routing—mate soft status

RCNT +58

Bit 0-23 = Previous term data (ESR)

RCNT +58

Bit 0-3 = Term

4-23 = Previous term ESR

RCNT +58

Bit 0-23 = VIU 4 error source register—same as RCNT +54

RCNT +59

Bit 0-23 = Previous term data (MR)

RCNT +59

Bit 4-23 = Previous term MR

RCNT +59

Bit 0-23 = VIU 5 error source register—same as RCNT +54

RCNT +60

Bit 0-23 = Previous term data (ESR)

RCNT +60

Bit 0-3 = Term

4-23 = Previous term ESR

RCNT +60

Bit 0-23 = VIU 6 error source register—same as RCNT +54

RCNT +61

Bit 0-23 = Previous term data (MR) RCNT +61

RCNT +61

Bit 4-23 = Previous term MR

RCNT +61

Bit 0-23 = RCNT error source register—same as RCNT + 54

RCNT +61

Bit 12-15 = Failing level

RCNT +62

Bit 0-23 = VCFR F-Level access test results

RCNT +62

Bit 0-23 = VCFR INT VIC I/S VIC register 10-11

RCNT +63

Bit 0-23 = First word of Unit-Type Translator

**Error Analysis Strategy Data
(DIF/SCS/XTSI, FLEV, Interject BLM Reports)
(NCSU BLM Reports)(FERA)**

WORD 0	WORD 1	WORD 2	WORD 3	WORD 4	WORD 5
WORD 6	WORD 7	WORD 8	WORD 9	WORD 10	WORD 11
WORD 12	WORD 13	WORD 14	WORD 15	WORD 16	WORD 17
WORD 18	WORD 19	WORD 20	WORD 21	WORD 22	WORD 23
WORD 24	WORD 25	WORD 26	WORD 27	WORD 28	WORD 29
WORD 30	WORD 31				

WORD 0

Bit 0-6 = Member number
7-13 = Unit type
15-16 = Strategy
21-23 = Data file state

WORD 1

Bit 0-6 = Subunit member number
7-16 = Subunit type
21-22 = No history file code
0 = No history
2 = Found history
23 = Subunit previously implicated

WORD 2

Bit 0-3 = Interrupt level
6-13 = Number of interrupts
15-21 = Leaky bucket count

WORD 3

Bit 0-23 = Interrupt time

WORD 4

Bit 0-6 = Interrupting member number

7-13 = Interrupting unit type

15-16 = Next timed strategy

18-19 = Next timed strategy state

WORD 5

Bit 0-4 = Next primary strategy state

6-10 = Next primary strategy

12-16 = Present primary strategy state

18-22 = Present primary strategy

WORD 6

Bit 0-2 = Next secondary strategy state

3-5 = Next secondary strategy

6-8 = Present secondary strategy state

9-11 = Present secondary strategy

12-14 = Timed strategy state

15-17 = Timed strategy

18-20 = Demand analysis state

21-23 = Demand analysis

WORD 7

- Bit 0-2 = Next analysis state
- 3-5 = Next analysis
- 6-8 = Present analysis state
- 9-11 = Present analysis
- 12-14 = Originator class
- 18 = Demand analysis trigger
- 21 = Demand analysis active

WORD 8

- Bit 0-7 = PMD number
- 9-12 = Fault class
- 15-16 = Resolution class
- 18-19 = Retry status
- 21 = Diagnostic strategy active

WORD 9

- Bit 0-6 = Member number under diagnostic analysis
- 7-13 = Unit type under diagnostic analysis
- 15 = Diagnostic strategy override
- 18 = Diagnostic progress
- 21-22 = Timed analysis active flag

WORD 10

- Bit 0-16 = Subunit type and member number under diagnostic analysis

WORD 11

Bit 0-1 = Next diagnostic strategy state
2-3 = Next diagnostic strategy
4-5 = Present diagnostic strategy state
6-7 = Present diagnostic strategy
8-9 = ATP restore interrupt count
10-13 = Diagnostic request
14-16 = Diagnostic count
17-20 = Diagnostic termination code
21-22 = Diagnostic result
23 = Audit request

WORD 12

Bit 0-23 = Timed reentry time

WORDS 13-22

Bit 0-23 = Suspect array (secondary UTMNs and SUTMNs)

WORDS 23-26

Bit 0-23 = Strategy data

WORD 27

Bit 0-23 = Maintenance file number

WORD 28

Bit 0-23 = Delta time

WORDS 29-30

Bit 0-23 = Subunit summary

WORD 31

Bit 0-23 = Data file time-out time

Error Analysis Strategy Data(ERAT) (TNFR FLEV Reports)

WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5 WORD 6

WORD 0—Time of Interrupt

Bit 0-23 = Value of EX4 clock at time of interrupt (10 ms/bit)

WORD 1—Number of Interrupts

Bit 0-8 = Number of interrupts on the suspect unit since error
history is kept for unit

WORD2—Leaky Bucket Count

Bit 0-22 = Leaky bucket count on which zap, zero-start,
duplex-failure actions are based

WORD 3—Sequence Table

Bit 0-4 = Error analysis choice of sequence table number

WORD 4—Interrupt Sequence State

Bit 0-4 = Error analysis choice of interrupt state number

WORD 5—Diagnostic Sequence State

Bit 0-4 = Error analysis choice of diagnostic sequence state number

WORD 6—How to Return Choice

Bit 0-1 = Error analysis choice of unwinding mechanism

State 0 = Unassigned

State 1 = FR should unwind

State 2 = FR should roll ahead

State 3 = FR should return to reference point

Peripheral Unit Frame Printouts

GI/MI—Group Interrogate/Member Interrogate Responses

GI Response:

Reply Bit 0	SP/DIF Members 0-23
1	SP/DIF Members 24-31
2	NC Chains 0-3
3	TMS Members 0-3
4	TSI Members 0-15
5	TSI Members 16-31
6	TSI Members 32-47
7	TSI Members 48-63
8	VIF Members 0-15
9	VIF Members 16-31
10	VIF Members 32-47
11	VIF Members 48-63
12	VIF Members 64-79
13	VIF Members 80-95
14	VIF Members 96-111
15	VIF Members 112-127
16	EST 0-15
17	EST 16-31
18	Unused
19	SCS Members 0-7
20	Unassigned

MI Response:

Bit position is respective to member number in that group.

To execute the MI/GI library program:

EX: LIBSYS:PKG LG gg FLDS, PGM LIB1, TASK 0!

Where gg = Generic number

K-Codes (E-Register Layouts)

(Bits 0-11 on PUEA bus — See Section 5, *Peripheral Enable Address (PUEA) Bus Format* in Volume 1)

PUEA Bus Bits	UNIT Type ID*					6	5	4	3	2	1	0			
	11	10	9	8	7										
SP/DIF	0	0	0	1	0	Member Number					MTX				
SCLK	0	0	0	1	1	Member Number									
TMS	0	0	1	0	0						MEM NO.				
TSI	0	0	1	0	1	Member Number					SPC				
TGR	0	0	1	1	0	Member Number									
IOUS	0	0	1	1	1	MEM NUM			IOUC						
EST	0	1	0	0	1	Member Number									
SCS	0	1	0	1	1	MEM NUM			SCU NUM						

* The unit type ID identified by the upper 5 bits (bits 7-11) of the PUEA bus does not necessarily have the same octal/value as the unit type codes (COMPOOL 4XLU____).

See *Unit Type Codes* in this section.

Peripheral Unit—Maincodes

Bit 20-23 Software Status (Octal)

- 0 = Controller is normal
- 1 = Controller in diagnostic
- 2 = Controller in exercise
- 3 = Controller in fault recovery/error analysis
- 4 = Controller in listen—only mode
(for NCLK, OSC update in—progress)
- 5 = Controller is unequipped
- 6 = Controller seized for diagnostic
- 7 = Controller out of service for growth
- 10 = Controller out of service—normal
- 11 = Connecting TSI is duplex failed
- 12 = Controller being updated
- 13 = PUB in process of being restored
- 14 = Controller left out of service following phase
- 15 = Controller out of service and connecting TSI is duplex
failed
- 16 = Controller failed restore attempt
- 17 = For TMS, controller removed due to A-link problem for
VIF, EST, controller out of service due to TSI outage

Digroup Trunk—Maincodes

See *Digroup Trunk Printouts*.

Subunit—Maincodes

Bit 20-23 Software Status (Octal)

- 0 = Normal
- 1 = Subunit out of service—normal
- 2 = Subunit controller is duplex failed
- 3 = Subunit out of service and subunit controller is duplex failed
- 4 = Subunit connecting TSI is duplex failed
- 5 = Unequipped
- 6 = Subunit out of service and connecting TSI is duplex failed
- 7 = Subunit out of service for growth
- 10 = Subunit controller and subunit connecting TSI are duplex failed
- 11 = Subunit controller, subunit, and subunit connecting TSI are all duplex failed
- 12 = Don't allow protection switch for this subunit (WOPS)
- 13 = Subunit in diagnostic
- 14 = Subunit left out of service following phase

Unit-Type Codes

Octal/Decimal Values	Compool Symbol	Unit
000/0	—	Unassigned
001/1	4XLUOA	Office Dependent Alarms
002/2	4XLUSP	Signal Processor
003/3	4XLUNETCLK	Network Clock
004/4	4XLUTMS	Time-Multiplexed Switch
005/5	4XLUTSIF	Time-Slot Interface Frame
006/6	4XLUTAC	Terminal Access Circuit (CCIS)
007/7	4XLUEST	Echo Suppressor Terminal
010/8	4XLUDIF	Digital Interface Frame
011/9	4XLUPUBB	Peripheral Unit Bus Branching
012/10	—	Unassigned
013/11	4XLUVIF	Voiceband Interface Frame
014/12	4XLUDT	Digroup Terminal Frame
015/13	4XLUSYSCLK	System Clock
016/14	4XLUABC	Area Bus Center
017/15	4XLUBDFB	Battery Distribution Fuseboard
020/16	4XLU620	620 Power Plant
021/17	4XLU625	625 Power Plant
022/18	4XLUMFA	Miscellaneous Frame A
023/19	4XLUTTF0	Toll Terminal Frame 0
024/20	4XLUTTF1	Toll Terminal Frame 1
025/21	4XLUTTF2	Toll Terminal Frame 2
026/22	4XLUTTF3	Toll Terminal Frame 3
027/23	4XLUTTF4	Toll Terminal Frame 4
030/24	4XLUTTF5	Toll Terminal Frame 5
031/25	4XLUTTF6	Toll Terminal Frame 6

Octal/Decimal Values	Compool Symbol	Unit
032/26	4XLUTTF7	Toll Terminal Frame 7
033/27	4XLUMFB	Miscellaneous Frame B
034/28	4XLUNMFR	NETMGT Display Control Frame
035/29	4XLU630	630 Power Plant
036/30	4XLUCCT	Continuity Check Transceiver
037/31	4XLUCCDS	CCIS Data Set Frame (2048A Dataset)
040/32	4XLUTPOS	Test Position
041/33	4XLURECANNM	Recorded Announcement Machine
042/34	4XLURMDC	NETMGT Remote/DIST Circuit
043/35	4XLUGRID	Office Alarm Grid Circuit
044/36	4XLURTPLANT	Ringing and Tone Plant
045/37	4XLUTCONTL	NETMGT DOC Transceiver Unit (Transmitter)
046/38	4XLURCONTL	NETMGT DOC Transceiver Unit (Receiver)
047/39	4XLUMFSF	MF Signaling Frame
050/40	4XLUSCS	Service Circuit System
051/41	———	Unassigned
052/42	4XLUADG	Automatic Distribution Group
055/45	4XLUMFC	Miscellaneous Frame C
056/46	4XLUMFCT	Multifrequency Compelled Frame

Octal/Decimal Values	Compool Symbol	Unit
057/47	4XLUMFCX	Multifrequency Compelled Unit
060/48	4XLUAPS	Pseudo I/O Unit-Type
153/107	1XLUSSD	Scan & Signal Distributor (SSD)
154/108	1XLUMUP	MCC & Utility Processor (MUP)
155/109	1XLUAUI	Auxiliary Unit Interface (AUI)
156/110	1XLUIFB	Interface Bus (IFB)
157/111	1XLUPDF	Power Distribution Frame (PDF)
160/112	1XLUPUB	Peripheral Unit Bus (PUB)
161/113	1XLUDUB	Data Unit Bus (DUB)
162/114	1XLUAUB	Auxiliary Unit Bus (AUB)
163/115	1XLUCSB	Call Store Bus (CSB)
164/116	1XLUPSB	Program Store Bus (PSB)
165/117	1XLUIOUS	I/O Unit Selector (IOUS)
166/118	1XLUXPWR	Miscellaneous Power (XPWR)
167/119	1XLUTUC	Tape Unit Controller (TUC)
170/120	1XLUDUS	Data Unit Selector (DUS)
171/121	1XLUFN	Fans
173/123	1XLUCS	Call Store (CS)
174/124	1XLUPS	Program Store (PS)
175/125	1XLUCC	Central Control (CC)
176/126	1XLUAPI	Attached Processor Interface (API)

Subunit-Type Codes/Keywords

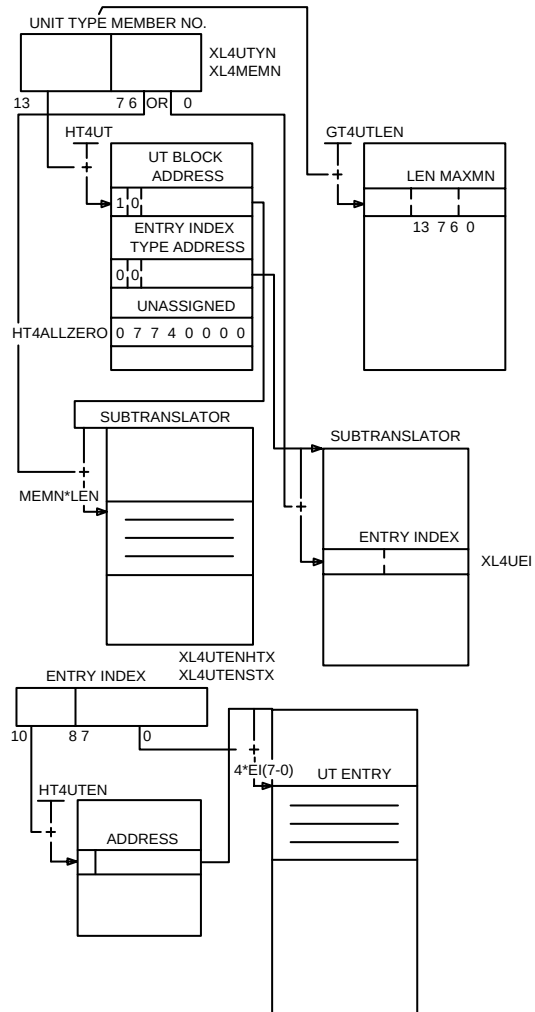
Compool Symbol *

Subunit

1KWIOUC	I/O Unit Controller
1KWCONV	Converter (PCDF)
1KWCONTR	Controller
1KWIPUB	IPUB
1KWDAMON	Distribution and Monitor Unit (PCDF)
1KWPORT	Port
1KWIOMP	I/O Microprocessor (IOP)
4KWVIU	Voiceband Interface Unit (VIF)
4KWTER	Terminal (TGR)
4KWNCPU	Network Clock Sync Unit (SCLK)
4KWCHAIN	CHAIN (NCLK)
4KWC1IPUB	Controller 1 IPUB (TMSP)
4KWC0IPUB	Controller 0 IPUB (TMSP)
4KWPPPL	Pulse Point Matrix Left (SP)
4KWPPR	Pulse Point Matrix Right (SP)
4KWALC	A-Link Controller (TSI)
4KWPUBBR	PUBB Repeater
4KWCONL	Converter Left (SP)
4KWCONR	Converter Right (SP)
4KWDTU	Digroup Terminal Unit (DT)
4KWESU	Echo Suppressor Unit (EST)
4KWOSC	Oscillator (NCLK)
4KWDIU	Digital Interface Unit (DIF)
4KWREF	Reference (NCSU)
4KWSCCLK	System Clock
4KWSCU	Service Circuit Unit (SCS)

* Octal/decimal values for these symbols are generic dependent. See compools IO1CATE and IO4CATE for latest values.

Unit Type Translations



Trunk Registers Printouts

Trunk Register Layout—Word 0

Bit 0-16 = Tag 1 - Function of State Code

17-23 = TR Code - State of Trunk

Decimal Value	Left Adjusted Octal	TR Codes
0	000	Unassigned
1	004	Idle Trunk
2	010	Idle trunk on which glare was detected
3	014	TR on interject engineered timing list
4	020	TR on base level engineered timing list
5	024	Trunk to dedicated TSI, or 1-Way to tone or announcement, or on base level engineered timing list
6	030	ICT in busy in a TR only state
7	034	2WOP Busy to CDO
8	040	OGT in waiting for answer state
9	044	OGT in the talking state
10	050	OGT in the clearback 1 state
11	054	OGT in the re-answer 1 state
12	060	OGT in the clearback 2 state
13	064	OGT in the re-answer 2 state
14	070	OGT in the clearback 3 state
15	074	OGT in the re-answer 3 state

Decimal Value	Left Adjusted Octal	TR Codes
16	100	Trunk used in TAN-to-TAN connection
17	104	Monitor available for use
18	110	Trunk is self-connected
19	114	Nailed-up connection busy to a TR
20	120	CAMA ICT in busy in a try only state
21	124	Trunk used for TAN nail-up
22	130	Q.931 PBX access protocol ICT on queue
23	134	ISUP (ISDN User Part) ICT on queue for a CR
24	140	ICT in clearback 1 state
25	144	ICT in re-answer 1 state
26	150	ICT in clearback 2 state
27	154	ICT in re-answer 2 state
28	160	ICT in clearback 3 state
29	164	ICT in re-answer 3 state
30	170	TR removed from MF queue
31	174	TR on MF ORIG queue
32	200	ICT busy to a CR
33	204	OGT busy to a CR
34	210	Service circuit on ICT busy to CR
35	214	Service circuit on OGT busy to CR

Decimal Value	Left Adjusted Octal	TR Codes
36	220	ICT dial tone start setup state
37	224	DTMF receiver busy to an ICT
38	230	Dial tone start ICT on queue for a DTMF receiver
39	234	IDTMFWK trunk on queue for a DTMF receiver and CR
40	240	Connection for growth testing
41	244	TR on MFC origination queue
42	250	Busy or idle occupied position keying trunk connected to MF-receiver
43	254	MF-receiver connected to position keying trunk
44	260	Service Observing
45	264	Waiting to service observe
46	270	Stall CC/VPA retest 5 sec to allow BLK received
47	274	Service circuit release timing
48	300	DP bylink trunk on 50-ms timing
49	304	DP DD-SD trunk on 150-ms timing
50	310	DP DD-SD trunk on 40-ms timing
51	314	DP bylink trunk with a digit RECON on 50-ms timing
52	320	Q.931 (PBX Access Protocol) Trunk in the clearing state

Decimal Value	Left Adjusted Octal	TR Codes
53	324	ISUP (ISDN User Part) trunk in the clearing state
54	330	MF ICT EA signaling—timing winks before connecting to an announcement
55	334	Unassigned
56	340	Guard timing
57	344	Incoming slave trunk of a broadband call
58	350	Outgoing slave trunk of a broadband call
59	354	Special CLF sent, wait RLG
60	360	Unassigned
61	364	Backward signal sent wait
62	370	Master trunk of a broadband call in the incoming stable state
63	374	Master outgoing trunk of a broadband call waiting for answer
64	400	Master outgoing trunk of a broadband call in the talking or connected state
65	404	DP origination error detected timing
66	410	INUP (CCS7 International ISUP) ICT on queue for a CR

Decimal Value	Left Adjusted Octal	TR Codes
67	414	CAMA operator position talking trunk waiting for an MF receiver to become available
68	420	INUP (CCS7 International ISUP) trunk in the clearing state
69	424	Timing the flashing of the calls waiting trunks during CAMA suspension
70	430	Timing for CAMA OP POS to ACK a DISC
71	434	CLF sent, wait RLG—CCIS or ISUP
72	440	Unassigned
73	444	CLF received, wait IAM
74	450	CLF sent, COT received, wait RLG
75	454	PDT sent, wait response—CCIS or ISUP
76	460	COT received, wait IAM
77	464	ITUP (International Telephone User Part) Trunk-in-the-Clearing State
78	470	ITUP (International Telephone User Part) ICT on queue for a CR
79	474	Unassigned
80	500	DP active state
81	504	DP active state and audit
82	510	Unassigned

Decimal Value	Left Adjusted Octal	TR Codes
83	514	Blue box fraud MFRCVR monitor connection to ICT
84	520	System integrity monitor CCIS trunk in talk state
85	524	Interim busy—CCIS, ISUP, or Q.931
86	530	CCIS trunk on engineered queue for CR
87	534	DP trunk on queue for CR
88	540	Unassigned
89	544	International MF ORIG queue for CR and RCVR
90	550	International busy to a link list
91	554	International ICT busy to a TR with voice path
92	560	International OGT busy to a TR with voice path
93	564	International 2nd TR with fixed TR4CODE
94	570	CCITT6 origination queue for a CR
95	574	Unassigned
96	600	TR is in audit state and on audit list
97	604	TR is in audit state and could not get on audit list
98	610	Test call incoming side
99	614	Test call outgoing side

Decimal Value	Left Adjusted Octal	TR Codes
100	620	System integrity confused incoming trunk
101	624	System integrity confused outgoing trunk
102	630	DPLS ICT waiting before sending answer
103	634	DPLS ICT sending answer
104	640	DPLS ICT has completed sending answer
105	644	DPLS ICT RCVD CLB while sending answer
106	650	DPLS ICT waiting before sending CLB
107	654	DPLS ICT sending CLB
108	660	DPLS ICT RCVD reanswer while sending CLB
109-110	664-670	Unassigned
111	674	international high-and-wet timing
112	700	International high-and-wet list
113	704	Out-of-service ignore
114	710	On trunk maintenance MW list—connected to MW tone
115	714	VIF operational controls being applied to this trunk
116	720	105 test line queue with TPT connection
117	724	High-and-wet timing
118	730	High-and-wet list

Decimal Value	Left Adjusted Octal	TR Codes
119	734	Trunk maintenance TR
120	740	Unassigned
121	744	Busy to trunk maintenance TR
122	750	Roll-back state
123	754	Reserved for recent change purposes
124	760	ICT busy to TMR
125	764	OGT busy to TMR
126	770	Service circuit on ICT busy to TMR
127	774	Service circuit on OGT busy to TMR

Trunk Register Layout—Word 1

- Bit 0-18 = TAG 2—Function of state code
19 = RCP—Reserved for call processing
20-22 = MB—Maintenance busy bits
23 = CCS—Trunk is CCIS6, ISUP, ITUP, CCITT No. 6 or Q931

Decimal Value

(Bits 20-23) Combined CCIS and MB Bits

0	Non-CCIS trunk is not maintenance busy
1	Non-CCIS trunk is locked out due to maintenance or circuit change
2	Non-CCIS trunk is on camp-on list
3	Non-CCIS trunk is in error analysis
4	Non-CCIS trunk is in 1st filter state
5	Non-ccis trunk is in 2nd filter state
6	Non-CCIS trunk is in 3rd filter state
7	Non-CCIS trunk is in 4th filter state
8	CCIS trunk is not maintenance busy
9	CCIS lockout
10	CCIS camp-on
11	CCIS error analysis
12	CCIS blocked from far end
13	CCIS lockout and far end blocked
14	CCIS SCGA camp-on
15	CCIS lockout and timing of far-end blocking

International Second Trunk Register Layout—Word 0

Bit 0-5 = State-state of trunk within model (Program module)
6-9 = Model-processing model controlling trunk signals

Decimal Value

0	Unassigned
1	CCITT5 incoming setup call stage
2	CCITT5 incoming post-setup call stage
3	CCITT5 incoming clearing call stage
4	CCITT5 high-and-wet model
5	CCITT5 outgoing setup call stage
6	CCITT5 Outgoing post-setup call stage
7	CCITT5 outgoing clearing call stage
8	Unassigned
9	CCITT6 incoming setup call stage
10	CCITT6 incoming post-setup call stage
11	CCITT7 incoming clearing call stage
12	CCITT7 high-and-wet model
13	CCITT6 outgoing setup call stage
14	CCITT6 outgoing post-setup call stage
15	CCITT6 outgoing clearing call stage

Bit 10 = Overlap answer required = CCITT5-In and CCITT5-Out
11 = Transit call = INTL-In and INTL-Out
12 = Time while awaiting answer
13-15 = Unassigned
16 = Linked to a call detail recording register
17-23 = TR code-state of trunk (same as TR code in 1st trunk register)

International Second Trunk Register Layout—Word 1

- Bit 0-12 = RRN-(Modified) call detail recording register number
(RRN *8 +Base = RR address)
- 13-18 = Unassigned
- 19-23 = Status-CCIS, maintenance busy, reserved for call processing
information

PUPHDATA—Peripheral Unit Phase Data Printouts

PUPHDATA—Digital Interface Frame (DIF) (Phase 2, 3, or 4)

See *Digital Interface Frame Printouts*.

PUPHDATA—Service Circuit System (SCS) (Phase 2, 3, or 4)

See *Service Circuit System/Service Circuit Unit (SCS/SCU) Printouts*.

PUPHDATA—Peripheral Units Phase 3 or 4



NOTE:

TTY request: **OP:ERAPDATA PUPHDATA:MFNUM a!**

a = MFNUM or range of MFNUM for phase 2, 3, or 4

WORD 0	WORD 1	WORD 2	WORD 3	WORD 4	-----
-----	-----	-----	-----	-----	-----

(Pattern repeats in blocks of five words for each failing unit)

WORD 0

Bit 0-6 = Member number

7-13 = Unit type (right adjusted)

WORD 1

Bit 0-23 = Address where controller 0 failed

WORD 2

Bit 0-23 = Access test data that caused controller 0 to fail

WORD 3

Bit 0-23 = Address where controller 1 failed

WORD 4

Bit 0-23 = Access test data that caused controller 1 to fail

For simplex failures, address is all zeros for controller passing access test.

PUPHDATA—Duplex Failed Units



NOTE:

TTY request: **OP:ERAPDATA PUPHDATA:MFNUM a!**

a = MFNUM or range of MFNUM for phase 2, 3, or 4

WORD 0 -----

WORD 0

Bit 0-6 = Member number

7-13 = Unit type (right adjusted)

14 = Indicates duplex failure

This output message form has the same number of words as the number of duplex failed units in the list printed after a phase.

CCIS—Common Channel Interoffice Signaling (CCIS) Printouts

CCIS Critical Registers

(Controller Data)

SOFTWARE STATUS C0	HARDWARE STATUS C0	ESR C0	CONTLR POLLING MASK	TERMINAL POLLING MASK	LSTR1	LSTR2*	LSTR6*
SOFTWARE STATUS C1	HARDWARE STATUS C1	ESR C1	CONTLR POLLING MASK	TERMINAL POLLING MASK	LSTR3	LSTR7*	LSTR8*

(Terminal Data Accessed via C0)

SOFTWARE STATUS REQ	MODE REQ	ESR REQ	CONTROL REQ	INSTR ADDR REG	LSTR4	LKSTAT1*	LKSTAT2*

(Terminal Data Accessed via C1)

SOFTWARE STATUS REG	MODE REG	ESR REG	CONTROL REQ	INSTR ADDR REG	LSTR5

⇒ NOTE:

Terminal dumped is terminal 0 when not specified in action message.
Otherwise, terminal dumped is specified in action message.

* Data output for manual CREG DUMP Only.

LSTR = Link status registers (Datapool C14LSTR)

LKSTAT = Link status word (COMPOOL C140PLKSTAT)

Controller Software Status

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Divorce controller from mate
 - 6 = Indicates which controller is active
 - 7 = Controller diagnostic requested
 - 8 = Remove via TTY
- 12 = Controller OS
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on PU bus 0
- 17 = Controller cannot send on PU bus 0
- 18 = Controller cannot receive on PU bus 1
- 19 = Controller cannot send on PU bus 1
- 20-23 = PU maintenance code

Controller Hardware Status

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on bus 0
- 3 = Send on bus 1
- 4 = Divorce controller from mate
- 6 = Active unit
- 7 = False trouble indicator
- 8 = False data parity sent to TM
- 9 = False OPCODE parity sent to TM
- 10 = Controller appears active to TM (Quarantine)
- 11 = High and low SP indicators inhibited
- 12 = MA enable
- 13 = Receive on enable
- 14 = S0 enable
- 15 = S1 enable
- 16 = Divorce enable
- 18 = AU enable
- 19 = False TBL indicator enable
- 20 = FDP enable
- 21 = FOP enable
- 22 = Quarantine enable
- 23 = ISP enable

Controller Error Source Register

- Bit 0 = ASW failure
- 2 = Even parity failure on PU bus
- 3 = Odd parity failure on PU bus
- 4 = TM data parity failure
- 5 = ASW not returned from TM
- 6 = ASW returned from an unaccessed TM
- 7 = Quarantine mode
- 8 = OPCODE decoder failure
- 9 = Data transfer failure—TIR to reply register
- 10 = Valid OPCODE indicator
- 12 = ASWF PEST
- 14 = PFE PEST
- 15 = PFO PEST
- 16 = TDPF PEST
- 17 = NTASW PEST
- 18 = EASW PEST
- 19 = QUAR PEST
- 20 = OPDF PEST
- 21 = DTF PEST
- 22 = VOC PEST

Controller Polling Mask

Bit 0-15 = Respective numbered TGR in-service

Terminal Polling Mask

Bit 0-15 = Respective numbered terminal in-service
(within TGR being dumped)

Terminal Software Status

Bit 7 = Terminal diagnostic requested
8 = Restore terminal by TTY
12 = Terminal OOS
15 = Terminal power off
16 = Terminal is actively signaling
17 = INIT or sync request made
18 = Terminal accessible via controller 1
19 = Terminal accessible via controller 0
20-23 = PU (terminal) maintenance code

Terminal Mode Register

- Bit 5 = Maintenance read of data bus
- 6 = Write empty list pointer
- 7 = Snap contents of transfer bus and hold in PRB register
- 8 = Memory sequencer stop
- 9 = Bid overflow check
- 10 = CC-alert PEST
- 11 = Load indirect
- 12 = Modem maintenance control point—FT
- 13 = Modem maintenance control point—LT
- 14 = Modem maintenance control point—AL
- 15 = Modem maintenance control point—DL
- 16 = Modem maintenance control point—LC
- 17 = Single cycle mode
- 18 = Sequence check inhibit
- 19 = Inhibit instruction execution
- 20 = Terminal is stopped
- 21 = Ignore terminal failures
- 22 = Initialize terminal
- 23 = Terminal active = 0, standby = 1

Terminal Error Source Register

- Bit 6 = Data set ready
- 7 = Send data (complemented)
- 8 = RCV data (complemented)
- 9 = Partial error summary B
- 10 = Partial error summary A
- 11 = Error summary
- 12 = Link list address error
- 13 = Link list data failure
- 14 = Modem transmit bid O/F
- 15 = Modem receive bid O/F
- 16 = Data memory C parity failure
- 17 = Data memory AB parity failure
- 18 = Program memory parity failure
- 19 = I/O list number error
- 20 = I/O decoder error
- 21 = Buffer O/F on I/O put
- 22 = I/O data parity failure
- 23 = I/O OPCODE parity failure

Terminal Control Register

Bit 4 = CC alert
5 = Buffer overflow
6 = Buffer full
7 = CC exercise
8 = Modem fine sync
9 = Modem external clock control
10 = Modem external clock input
11 = Modem carrier failure
12 = Data memory page 1 bit
20 = Data memory page 2 bit
21 = Transfer condition code
22 = Modem transmit bid
23 = Modem receive bid

Terminal Instruction Address Register

Bit 11-19 = TM program address at which TM stopped

CCIS Status and Pulse Point Reply

CI4TACSTREG—TGR Software Status

RCNT 21, 22

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on PU bus 0
- 3 = Send on PU bus 1
- 4 = Divorce controller from mate
- 6 = Indicates active controller
- 7 = Controller diagnostic requested
- 8 = Controller to be restored only by TTY
- 12 = Controller out of service
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on bus 0
- 17 = Controller cannot send on bus 0
- 18 = Controller cannot receive on bus 1
- 19 = Controller cannot send on bus 1
- 20-23 = PU maintenance code

CI4TACSTREG—TGR Hardware Status

RCNT 19, 20

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on bus 0
 - 3 = Send on bus 1
 - 4 = Divorce controller from mate
 - 6 = Indicates active controller
 - 7 = False trouble indicator
 - 8 = When set, false data parity is sent to TM
 - 9 = When set, false OPCODE parity is sent to TM
- 10 = When set, controller will appear active to TM
- 11 = Inhibits high-and-low priority SP indications
- 12 = MA enable bit
- 13 = Receive on enable bit
- 14 = SO enable bit
- 15 = S1 enable bit
- 16 = Divorce enable bit
- 18 = AU enable bit
- 19 = Enable for false trouble indicator
- 20 = FDP enable bit
- 21 = FOP enable bit
- 22 = QUAR enable bit
- 23 = ISP enable bit

CI4TACESR—TGR Error Source Register

RCNT 15,16

- Bit 0 = All-seems-well failure
- 2 = Even parity failure on PU bus
- 3 = Odd parity failure on PU bus
- 4 = Parity failure on term data bus
- 5 = All-seems-well not returned from terminal
- 6 = All-seems-well returned from an unaccessed terminal
- 7 = Controller in the quarantine mode
- 8 = TAC OPCODE decoder failure
- 9 = Error in the transfer of data from the terminal information register to reply register
- 10 = Valid OPCODE indicator
- 12 = ASWF PEST
- 14 = PFE PEST
- 15 = PFO PEST
- 16 = TDPF PEST
- 17 = NTASW PEST
- 18 = EASW PEST
- 19 = QUAR PEST set
- 20 = OPDF PEST
- 21 = DTF PEST
- 22 = VOC PEST

CI4ESR—Terminal Error Source Register

RCNT 54

- Bit 6 = Data set ready
- 7 = Send data (complemented)
- 8 = RCV data (complemented)
- 9 = Partial error summary B
- 10 = Partial error summary A
- 11 = Error summary
- 12 = Link list address error
- 13 = Link list data failure
- 14 = Modem transmit bid O/F
- 15 = Modem receive bid O/F
- 16 = Data memory C parity failure
- 17 = Data memory AB parity failure
- 18 = Program memory parity failure
- 19 = I/O list number error
- 20 = I/O decoder error
- 21 = Buffer O/F on I/O put
- 22 = I/O data parity failure
- 23 = I/O OPCODE parity failure

CI4MR—Terminal Mode Register

RCNT 55

- Bit 5 = Maintenance read of data bus
- 6 = Write empty list pointer
- 7 = Snap contents of transfer bus and hold in PRB register
- 8 = Memory sequencer stop
- 9 = Bid overflow check
- 10 = CC-alert PEST
- 11 = Load indirect
- 12 = Modem maintenance control point—FT
- 13 = Modem maintenance control point—LT
- 14 = Modem maintenance control point—AL
- 15 = Modem maintenance control point—DL
- 16 = Modem maintenance control point—LC
- 17 = Single cycle mode
- 18 = Sequence check inhibit
- 19 = Inhibit instruction execution
- 20 = Terminal is stopped
- 21 = Ignore terminal failures
- 22 = Initialize terminal
- 23 = Terminal active = 0, standby = 1

CI4CPR—TGR MA Pulse Point Reply

FLEV 39, 40

- Bit 0 = Maintenance access bit set by pulse
- 1 = Receive on bus flip flop toggled by pulse
- 2 = State of send on bus zero flip flop
- 3 = State of send on bus one flip flop
- 4 = Quarantine state (when reset)
- 6 = Active unit state
- 8 = Peripheral bus even parity failure
- 9 = Peripheral bus odd parity failure
- 10 = Peripheral bus K-code match indication
- 11 = Peripheral bus M-bit indication
- 12 = Receive on bus flip flop
- 13 = Internal address field parity
- 14 = OPCODE decoder indication

DIF—Digital Interface Frame (DIF) Printouts

DIF/DIFE1 Critical Registers (FLEV and Interject Reports)

CSTATUS CESR	HWSTATR PEST	MADATA MPESRH MPESR*	FSTATUS MPESRF MPRETE*	DIUOSO DIUSUMO	DIUOS1 DIUSUM1
CLKESR PSVL	SPESR PSVH	IBIR 0....0 MAPESR*	EXR 0....0 EXCFESR*	PSRL AUDR EXCMASK*	PSRH TRKCNTNTR
BSTATR SPSTATR	HPPTRS LUSPD0 MAPCNTRS* ESCNCNTL†	LPPTRS LUSPD1 MAPREGS*	DBPTRS LUSPP0 MPSTKPTR*	SZPTRS LUSPP1 MPPMCNT*	MBPTRS MPBSTAT
URD1 URD7 CCPST0	URD2 URD8 CCPST1	URD3 URD9 MPIES	URD4 URD10 MPRTIS	URD5 URD11 MPMBSF EXECSMW*	URD6 URD12 0....0
DACPST0 CALOW MEMN	DACPST1 CAHIGH XLATE	DRFPST0 INTJ FIRMWARE	DRFPST1 0....0 5....5	PSSSL 0....0 5....5	PSSSH 0....0 5....5

Upper half = Controller 0

Lower half = Controller 1 (Not shown)

* DIFE1 Registers

† DIFE1 MF/DTMF 4ST registers

CSTATUS—Controller Software Status

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Controller divorced from mate
 - 5 = Autonomous processing stopped (STOP)
 - 6 = Active TSI clock
 - 7 = Controller active
 - 8 = Controller quarantined (EC)
 - 10 = Cross controller update in progress (DIFE1 only)
 - 11 = Controller slaved to mate
 - 12 = Controller out of service
 - 13 = Controller removed via TTY
- 20-23 = PU maintenance code

HWSTATR—Controller Hardware Status

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Controller divorced from mate
 - 5 = Autonomous processing stopped
 - 6 = Active TSI clock
 - 7 = Controller active
 - 8 = Controller quarantined
 - 9 = Set for MP/SP PS memory lock
- 10 = Cross-controller update in progress (DIFE1 only)
- 11 = Controller clock slaved to mate
- 12 = Enable loading MA F/F
- 13 = Enable loading receive on (RO) F/F
- 14 = Enable loading S0 F/F
- 15 = Enable loading S1 F/F
- 16 = Enable loading DNORSE F/F
- 17 = Enable loading stop F/F
- 18 = Enable loading clock activity F/F
- 19 = Enable loading active/standby F/F
- 20 = Enable loading emergency cutoff F/F
- 21 = Enable loading PS memory write lock F/F
- 22 = Enable loading update bit
- 23 = Enable loading slave F/F

MADATA—Maintenance Access Data

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Controller divorced from mate
 - 5 = Autonomous processing stopped
 - 6 = Active TSI clock
 - 7 = Controller active
 - 8 = Receive bus parity failure even
 - 9 = Receive bus parity failure odd
- 10 = K-code match
- 11 = Mode bit
- 12 = Complement of bit 1
- 13 = Controller quarantined
- 14 = AINT (Autonomous Interrupt)
- 15 = ASWF (All-seems-well failure)
- 16 = Unassigned OPCODE received
- 17 = Mode failure
- 18 = EXEC sequencer error
- 19 = Main clock framing error
- 20 = 16-mbit clock error
- 21 = Clock ESR summary (see CLKESR)
- 22 = Maintenance processor halted
- 23 = EXEC program store error

FSTATUS—Frame Software Status

- Bit 0 = PU bus 0 at frame removed via TTY
- 1 = PU bus 1 at frame removed via TTY
- 2 = PU bus 0 out of service at frame
- 3 = PU bus 1 out of service at frame
- 4 = Switch in progress (clock SW, activity SW)
- 5 = Maintenance buffer overflow correction in progress
- 6 = Digit buffer overflow correction in progress
- 7 = Update controller in progress
- 10 = Protection switch in progress (spare DIU 32)
- 11 = Protection switch in progress (spare DIU 33)
- 12-17 = Spare assignment number for DIU 32
- 18-23 = Spare assignment number for DIU 33

DIUOS0—DIU Software OS Status

- Bit 0-23 = DIU 0 through 23 out of service

DIUOS1—DIU Software OS Status

- Bit 0-9 = DIU 24 through 33 out of service

CESR—Controller Primary ESR

- Bit 0 = ASWF (All-seems-well failure—PUF F-level)
- 1 = AINT (Autonomous Interrupt—APUF F-Level)
- 2 = PU bus parity failure even
- 3 = PU bus parity failure odd
- 4 = INAPUT (Internal APUT—Interject)
- 5 = APUB (base level)
- 6 = Unassigned OPCODE received
- 7 = Mode failure
- 8 = Out-of-frame error
- 9 = 16-mbit clock error
- 10 = EXEC ESR summary (See IBIR)
- 11 = Internal bus ESR Summary (See IBIR)
- 12 = Maintenance processor ESR summary (See MPESR)
- 13 = SP ESR summary (See SPESR)
- 14 = Clock ESR summary (See CLKESR)
- 15 = MAP ESR summary (See MAPESR) (DIFE1 only)
- 15 = Frogger error (DIFE1—MF only)
- 16 = T1 line mismatch
- 17 = Internal bus mismatch
- 18 = Reply register mismatch
- 19 = Sequencer mismatch
- 20 = SP m-bit mismatch (DIFE1 only)
- 21 = Not connected (always 0)
- 22 = Low-frequency clock mismatch
- 23 = Not connected (always 0)

PEST—Controller PEST Register

- Bit 0 = Inhibit ASW failure
- 1 = Inhibit autonomous interrupt
- 2 = Inhibit peripheral unit bus even parity failure
- 3 = Inhibit peripheral unit bus odd parity failure
- 4 = Inhibit internal APUT
- 5 = Inhibit APUB
- 6 = Inhibit unassigned OP-CODE
- 7 = Inhibit mode failure
- 8 = Inhibit out of frame
- 9 = Inhibit 16-mbit external clock error
- 10 = Inhibit EXEC local ESR summary
- 11 = Inhibit local ESR summary
- 12 = Inhibit MP local ESR summary
- 13 = Inhibit SP local ESR summary
- 14 = Inhibit clock local ESR summary
- 15 = Inhibit map local ESR summary failure
- 16 = Inhibit T1 line mismatch
- 17 = Inhibit internal bus mismatch
- 18 = Inhibit reply register mismatch
- 19 = Inhibit sequencer mismatch
- 20 = Inhibit SP mismatch
- 21 = Unused bit
- 22 = Inhibit low frequency clock mismatch
- 23 = Unused bit

MPESRH—Maintenance Processor ESR for Hardware Errors (Domestic DIF only)

- Bit 0 = Hard-core parity mismatch
- 1 = CPU trap error
- 2 = DMA request time-out
- 3 = External bus read parity failure
- 4 = IB reply function failure
- 5 = Incoming CC port parity failure
- 6 = Incoming CN port parity failure
- 7 = Program store parity error (TM37)
- 8 = Unit maintenance bus error
- 9 = Unit scanner PEST error
- 10 = Unit maintenance bus shift register alarm
- 11 = Unit scan error 1
- 12 = Unit scan error 2
- 13 = Program store parity error (TM64)

MPESR—MP ESR and Halt PEST Bit (DIFE1 Only)

Bit 0-7 = Firmware error code (octal)

- EC 0 = No errors
- EC 1 = OS8 memory overload
- EC 2 = Invalid macro OPCODE
- EC 3 = EXEC MP service time-out
- EC 4 = Compelled response not available
- EC 5 = Invalid output request
- EC 6 = Sanity time-out
- EC 7 = Maintenance buffer overflow time-out
- EC 10 = Unassigned interrupt error
- EC 11 = Unused
- EC 12 = Unit failure code ESR
- EC 13 = Diagnostic failure code ESR
- EC 14 = UMB failure pattern for EST
- EC 15 = ESR pattern for scanner failure
- EC 16 = MP ESR code for wrong ICOUNT
- EC 17 = Micro DCON firmware failure
- EC 20 = MP program store audit failure
- EC 21 = SP program store audit failure

- 8 = Hard-core parity mismatch
- 9 = CPU trap error
- 10 = DMA request time-out
- 11 = External bus read parity failure
- 12 = Firmware ESR bit failure
- 13 = Incoming CC port parity failure

MPESR—MP ESR and Halt PEST bit (DIFE1 only) (Contd)

- Bit 14 = Incoming CN port parity failure
- 15 = Main program store parity failure (TM37)
- 16 = Unit maintenance bus error
- 17 = Unit scanner PEST error
- 18 = Unit maintenance bus shift register alarm
- 19 = Unit scan error 1
- 20 = Unit scan error 2
- 21 = Always reset (0)
- 22 = MP halt error
- 23 = PEST bit for MP halt error

**MPESRF—Maintenance Processor ESR for Firmware Errors
(Domestic DIF only)**

Bit 0-7 = Firmware error code (octal)

0 = No errors

1 = OS8 memory overload

2 = Invalid macro OP CODE

3 = MP to EXEC service request time-out

4 = Compelled response not available

5 = Invalid output request

6 = Sanity time-out

7 = Maintenance buffer overflow time-out

10 = Unassigned interrupt error

12 = Excessive number of units alarming

14 = Unit maintenance bus error (TM38)

15 = Unit DMA scanner failure (TM43)

16 = MPESR code for bad interrupt count

MPRETE—MP Reset Enable Bit (DIFE1 Only)

Bit 0 = When set, EXEC halt interrupt (See EXCMASK) sends
MPRESET

DIUSUM0—DIU 0-23 ESR Summary

Bit 0-23 = DIU 0 through 23 has an error

DIUSUM1—DIU 24-33 ESR Summary

Bit 0-9 = DIU 24 through 33 has an error

CLKESR—Clock Error Source Register

- Bit 0 = CK16 energy detector for controller-unit link A
- 1 = Frame sync energy detector for controller-unit link A
- 2 = CK16 energy detector for controller-unit link B
- 3 = Frame sync energy detector for controller-unit link B
- 4 = GGC32PY and GGC32SY ESR for link A
- 5 = GGC32PY and GGC32SY ESR for link B
- 6 = GBC parity error
- 7 = Minor framing error
- 8 = Clock chain link A sync pulse error
- 9 = Clock chain link B sync pulse error
- 10 = GGCSY and 10msec clock error
- 11 = Super frame sync error
- 12 = Active/standby link A error
- 13 = Active/standby link B error
- 14 = Super frame pattern and SFSY link A error
- 15 = Super frame pattern and SFSY link B error
- 16 = Clock chain a GGCPY and GWCPY error
- 17 = Clock chain and SFSY ESR
- 18 = 1.5mhz and T1FSY link A error
- 19 = 1.5mhz and T1FSY link B error
- 20-23 = Not sourced from TM24 (CLKESR)

SPESR—Signal Processor Error ESR (Domestic DIF only)

- Bit 0 = XROM output parity error
- 1 = XROM output parity error
- 2 = XROM address parity error
- 3 = XROM address parity error
- 4 = Cross-controller update loop parity error
- 5 = TSS output parity error
- 6 = Error on block M data A distribution
- 7 = Error on block M data B distribution
- 8 = Error on M data A distribution
- 9 = Error on M data B distribution
- 10 = Error on inhibit status A distribution
- 11 = Error on inhibit status B distribution
- 12 = E scanner mismatch
- 13 = E store address parity error
- 14 = M store address parity error
- 15 = Firmware failure to write SP register
- 16 = M store data mismatch
- 17 = IS store data mismatch
- 18 = XC M data loop mismatch
- 19 = XC is data loop mismatch
- 20 = IB receive parity error
- 21 = E data store mismatch
- 22 = Always reset (0)
- 23 = Always reset (0)

SPESR—Signal Processor ESR (DIFE1 only)

- Bit 0 = State translator parity error
- 1 = Current trunk state parity error
- 2 = Looped jump control mismatch
- 3 = Looped RPTFLG control mismatch
- 4 = Block of M bit distribution update mismatch
(DIU 0 through 15 and 32)
- 5 = Block of M bit distribution update mismatch
(DIU 16 through 31 and 33)
- 6 = M bit distribution loop mismatch (DIU 0 through 15 and 32)
- 7 = M bit distribution loop mismatch (DIU 16 through 31 and 33)
- 8 = Looped PCIS distribution mismatch (DIU 0 through 15 and 32)
- 9 = Looped PCIS distribution mismatch (DIU 16 through 31 and 33)
- 10 = Cross-controller trunk state mismatch
- 11 = Always reset (0) (tied to bit 23)
- 12 = E bit scanner mismatch
- 13 = E bit store—address parity error
- 14 = M bit store—address parity error
- 15 = Duplicated E bit store mismatch
- 16 = Duplicated M Bit store mismatch
- 17 = Duplicated PCIS store mismatch
- 18 = Looped cross-controller M bit data mismatch
- 19 = Looped cross-controller PCIS data mismatch
- 20 = Internal bus data error
- 21 = TSS address parity error
- 22 = Current trunk state E bit mismatch
- 23 = Always reset (0) (tied to bit 11)

IBIR—Internal Bus ESR (Domestic DIF only)

⇒ NOTE:

Any bit 0-9 activates IBSUM bit in CESR; any bit 10-15 activates EXEC SUM bit in CESR

- Bit 0 = IB multiplexer A—return mismatch (TM48)
- 1 = IB multiplexer B—return mismatch (TM48)
- 2 = IB multiplexer C—return mismatch (TM48)
- 3 = IB multiplexer D—return mismatch (TM48)
- 4 = IB multiplexer E—return mismatch (TM48)
- 5 = Receive IB parity error
- 6 = Destination ACK error
- 7 = Source/DEST/OPCODE loop mismatch
- 8 = Source ACK error
- 9 = Maintenance buffer underflow
- 10 = ALU mismatch
- 11 = SP data ready error
- 12 = Unassigned MP OPCODE
- 13 = MP data ready error
- 14 = EXEC sequencer mismatch
- 15 = EXEC PROM parity error
- 16 = IB ESR summary (for bits 0-9)
- 17 = EXEC ESR summary (for bits 10-15)
- 18 = PEST for bits 0-17
- 19 = ROM check enable
- 20 = ROM check start
- 21 = Always reset (0) (TM59)
- 22 = Always reset (0) (TM59)
- 23 = Always reset (0) (TM59)

IBIR—Internal Bus ESR (DIFE1 only)**NOTE:**

Any bit 0-9 activates IBSUM bit in CESR; any bit 10-15 and 22 activates EXEC SUM bit in CESR

- Bit 0 = IB multiplexer A—return mismatch (TM365)
- 1 = IB multiplexer B—return mismatch (TM365)
- 2 = IB multiplexer C—return mismatch (TM365)
- 3 = IB multiplexer D—return mismatch (TM365)
- 4 = IB multiplexer E—return mismatch (TM365)
- 5 = Receive IB parity error
- 6 = Destination ACK error
- 7 = Source/DEST/OPCODE loop mismatch
- 8 = Source ACK error
- 9 = Firmware error—maintenance buffer (See EXCFESR bits 11-14)
- 10 = ALU mismatch
- 11 = Firmware error—SP (See EXCFESR bits 0-10, 21, 22)
- 12 = Firmware error—EXEC (See EXCFESR bits 17-20)
- 13 = Firmware error—MP (See EXCFESR bits 15-16)
- 14 = EXEC sequencer mismatch
- 15 = EXEC PROM parity error
- 16 = IB ESR summary (for bits 0-9)
- 17 = EXEC ESR summary (for bits 10-15, 22)
- 18 = PEST for bits 0-17, 22
- 19 = ROM check enable
- 20 = ROM check start
- 21 = Always reset (0)
- 22 = Buffer RAM address parity check error
- 23 = Always reset (0)

EXR—Exercise Register

- Bit 0 = MP time-out exercise
- 1 = General-purpose EX1
- 2 = General-purpose EX2
- 3 = General-purpose EX3
- 4 = General-purpose EX4
- 5 = General-purpose EX5
- 6 = General-purpose EX6
- 7 = Out-of-frame EX1
- 8 = Out-of-frame EX2
- 9 = Controller to subunit interface exercise
- 10 = Master clock A exercise
- 11 = Master clock B exercise
- 12-23 = Not sourced from TM364

PSRL—Protection Switch Request Register—Lower Half

- Bit 0-15 = DIU 0 through 15 protection switch requested
- 17 = Lower group PSW enable

PSRH—Protection Switch Request Register—Higher Half

- Bit 0-15 = DIU 16 through 31 protection switch requested
- 17 = Higher group PSW enable

PSVL—Protection Switch Verify—Lower Half

- Bit 0-15 = PSV DIU 0 through 15
- 16 = PSV DIU 32
- 17 = No PSW active in lower half

PSVH—Protection Switch Verify—Higher Half

- Bit 0-15 = PSV DIU 16 through 31
- 16 = PSV DIU 33
- 17 = No PSW active in higher half

**MAPESR—Message Accounting Processor ESR and Status Register
(DIFE1 only) (Bit 0-9 MAPESR, Bit 21-23 MAP Status Register)
(All zeros for DIFE1-MF)**

- Bit 0 = Parity over receive IB data
- 1 = Parity on PTSS read
- 2 = Parity on PTSRPS read
- 3 = Trunk counters out of step
- 4 = Cross-controller link fault
- 5 = P-Bit link to SP fault
- 6 = PTSS MUX data parity
- 7 = Processor to PTSS parity
- 8 = P-bit store address parity
- 9 = Clock loop fault
- 21 = Reclocked stop for MAP
- 22 = Reclocked update for MAP
- 23 = Local PEST for MAP

EXCFESR—EXEC Firmware ESR (DIFE1 only)

Bit 0-23 = Contents of the buffer RAM error source firmware word
(BRAMERR)

- Bit 0 = HP report on maintenance trunk
- 1 = LP report on maintenance trunk
- 2 = SZ report on maintenance trunk
- 3 = DB report on maintenance trunk
- 4 = HP report to full buffer
- 5 = LP report to full buffer
- 6 = SZ report to full buffer
- 7 = DB report to full buffer
- 8 = SP data ready during SPINIT
- 9 = SP data ready during MP order
- 10 = SP data ready during CC order
- 11 = Maintenance buffer pointer underflow
- 12 = Maintenance buffer word counter mismatch
- 13 = Maintenance buffer pointers equal
- 14 = Maintenance buffer status underflow
- 15 = MP data ready error
- 16 = MP unassigned OPCODE
- 17 = Interrupt jump table—CC
- 18 = Interrupt jump table—MP
- 19 = Unassigned interrupt
- 20 = Front end error
- 21 = MFREPORT from invalid trunk (DIFE1—MF only)
- 22 = SP ready failure during MF report
(DIFE1—MF only)
- 23 = Real-time frogger test failure (DIFE1—MF only)

EXCMASK—EXEC Interrupt Masks (DIFE1 only)**⇒ NOTE:**

LVL 0 has the lowest priority, LVL F the highest
(setting an interrupt mask bit disables the interrupt task)

Bit 0 = Level 0—Maintenance processor
1 = Level 1—Real time
2-9 = Levels 2-9 unused
10 = Level A—Digit buffer report
11 = Level B—Seizure buffer report
12 = Level C—SP low priority buffer report
13 = Level D—SP high priority buffer report
14 = Level E—EXEC Halt
15 = Level F—CC

AUDR—Arithmetic unit data register (domestic DIF only)

Bit 0-23 = Data

TRKCNT—SP Trunk Counters

Bit 0-11 = SP trunk counter 1 (Read)
12-23 = SP trunk counter 0 (Write)

BSTATR—Buffer Status Register

- Bit 0 = High priority (HP) buffer full (0 = full, 1 = not full)
- 1 = High priority (HP) buffer empty (0 = empty, 1 = not empty)
- 2 = Low priority (LP) buffer full (0 = full, 1 = not full)
- 3 = Low priority (LP) buffer empty (0 = empty, 1 = not empty)
- 4 = Digit (DG) buffer full (0 = full, 1 = not full)
- 5 = Digit (DG) buffer empty (0 = empty, 1 = not empty)
- 6 = Seizure (SZ) buffer full (0 = full, 1 = not full)
- 7 = Seizure (SZ) buffer empty (0 = empty, 1 = not empty)
- 8 = Always reset (0)
- 9 = Always set (1)
- 10 = Always reset (0)
- 11 = Always set (1)

ESCNCNTL—E-Scanner Control Register (DIF-E1 DTMF/4-State and DIF-E1 MF/4-State only)

⇒ NOTE:

L = Low (L) half DIU(s) 0-15

H = High (H) half DIU(s) 16-31

Bit 0-1 = Unused

2-5 = DIU 0-7 (Reset = 4 State, Set = Normal)

2 = L (DIU 0-1) Pair

3 = L (DIU 2-3) Pair

4 = L (DIU 4-5) Pair

5 = L (DIU 6-7) Pair

6 = DIU low half spare (32) set if spare is switched
for MF or DTMF DIU

7-10 = DIU 8-15 (Reset = 4 state, Set = Normal)

7 = L (DIU 8, 9) Pair

8 = L (DIU 10, 11) Pair

9 = L (DIU 12, 13) Pair

10 = L (DIU 14, 15) Pair

11 = DIU high half spare (33) set if spare is switched
for MF or DTMF DIU

12-15 = DIU 16-23 (Reset = 4 State, Set = Normal)

12 = H (DIU 16, 17) Pair

13 = H (DIU 18, 19) Pair

14 = H (DIU 20, 21) Pair

15 = H (DIU 22, 23) Pair

16 = DIU low half spare (Replicated bit 6)

17-20 = DIU 24-31 (Reset = 4 State, Set = Normal)

17 = H (DIU 24, 25) Pair

18 = H (DIU 26, 27) Pair

19 = H (DIU 28, 29) Pair

20 = H (DIU 30, 31) Pair

21 = DIU high half spare (Replicated bit 11)

22-23 = Unused

HPPTRS—High Priority Buffer Pointers

Bit 0-7 = Read pointer
8-15 = Write pointer

LPPTRS—Low Priority Buffer Pointers

Bit 0-7 = Read Pointer
8-15 = Write pointer

DBPTRS—Digit Buffer Pointers

Bit 0-7 = Read pointer
8-15 = Write pointer

SZPTRS—Seizure Buffer Pointers

Bit 0-7 = Read pointer
8-15 = Write pointer

MBPTRS—Maintenance Buffer Pointers

Bit 0-7 = Read Pointer
8-15 = Write Pointer

SPSTATR—SP Status Register

- Bit 0 = Cross-controller SP update
- 1 = Inhibit cross-controller SP update
- 2-5 = Spare assignment number DIUs 0-15
- 6 = DIU 32 switch enable
- 7-10 = Spare assignment number DIUs 16-31
- 11 = DIU 33 switch enable
- 12-14 = Idle DIU's block digroup signaling exercise (octal)
 - EX 0 = Block signaling on digroup 1
 - EX 1 = Block signaling on digroup 2
 - EX 2 = Block signaling on digroup 3
 - EX 3 = Block signaling on digroup 4
 - EX 4 = Block signaling on digroup 5
 - EX 5, 6, 7 = Per digroup exercise disabled
- 15 = Idle DIUs block all digroup signaling exercise
- 16 = SP stop/run status (1 = Run)
- 17 = SP stop/run status for unit exercise (1 = Run)
- 18-22 = DIFE1 only
 - 18 = Signal processor (SP) local PEST bit
 - 19 = High priority (HP) buffer not full
 - 20 = Low priority (LP) buffer not full
 - 21 = Digit (DG) buffer not full
 - 22 = Seizure (SZ) buffer not full

MAPCNTRS—MAP Trunk Counters (DIFE1 Only)
(All zeros for DIFE1—MF)

Bit 0-11 = Read trunk counter
12-23 = Write trunk counter

MAPREGS—MAP IPIR and PWR (DIFE1 Only) (All zeros for DIFE1—MF)

Bit 0-5 = Initial Pulsing Interval (IPI) Register
6-11 = Pulse Width (PW) Register

⇒ NOTE:

Each register contains, in octal, the number of 8-ms increments representing the IPI and PW for PPM

MPSTKPTR—MP Stack Pointer (DIFE1 Only)

Bit 0-15 = MP stack pointer (at time of error) (only valid when not all ones)
(0-7 = Low byte, 8-15 = High byte)

MPPMCNT—MP Program Counter (DIFE1 Only)

Bit 0-15 = Maintenance processor program counter (at time of error)
(only valid when not all ones)

**LUSPD0—Look Up Signal Processor Link Error Data (0)
(Domestic DIF Only)**

Bit 0-23 = DIU 0 through 23 LUSP link error or unequipped DIU

**LUSPD1—Look Up Signal Processor Link Error Data (1)
(Domestic DIF Only)**

Bit 0-9 = DIU 24 through 33 LUSP link error or unequipped DIU

LUSPP0—Look Up Signal Processor PEST Data (0) (Domestic DIF Only)

Bit 0-23 = LUSP PEST bits for DIU 0 through 23

LUSPP1—Look Up Signal Processor PEST data (1) (Domestic DIF Only)

Bit 0-9 = LUSP PEST bits for DIU 24 through 33

MPBSTAT—Maintenance Buffer Status

Bit 0-4 = Number of reports in EXEC MTC buffer (0-31)

URD1—12—Unit Raw Data (For Common Alarms) Common Format

BITS		
23 - - - - - 16	15 - - - - - 8	7 - - - - - 0
THIRD DIU	SECOND DIU	FIRST DIU

URD1 = DIU 2, DIU 1, DIU 0
 URD2 = DIU 5, DIU 4, DIU 3
 URD3 = DIU 8, DIU 7, DIU 6
 URD4 = DIU 11, DIU 10, DIU 9
 URD5 = DIU 14, DIU 13, DIU 12
 URD6 = DIU 17, DIU 16, DIU 15
 URD7 = DIU 20, DIU 19, DIU 18
 URD8 = DIU 23, DIU 22, DIU 21
 URD9 = DIU 26, DIU 25, DIU 24
 URD10 = DIU 29, DIU 28, DIU 27
 URD11 = DIU 32, DIU 31, DIU 30
 URD12 = ———, ———, DIU 33

Bit 0-7 = First DIU

8-15 = Second DIU

16-23 = Third DIU

Bit 0, 8, 16 = DS120 transmit alarm

1, 9, 17 = DS120 receive alarm

2, 10, 18 = Clock framing alarm

3, 11, 19 = Signaling parity alarm (EAS)

4, 12, 20 = Signaling parity alarm (MAS)

5, 13, 21 = Active/standby match alarm

6, 14, 22 = Common clear alarm

7, 15, 23 = (DIFE1 only) SP to unit interface error (SPUIE)

CCPST0—Common Alarm PESTs, DIU 0-23

Bit 0-23 = If set, indicates common alarms not PESTed for DIU 0 through 23

CCPST1—Common Alarm PESTs, DIU 24-33

Bit 0-9 = If set, indicates common alarms not PESTed for DIU 2 through 33

MPIES—MP Interrupt Enable Status Bits

0-3 = Task enable status code (octal)

0 = All tasks disabled

1 = All tasks disabled

2 = Task 1 enabled

3 = Task 1-2 enabled

4 = Task 1-3 enabled

5 = Task 1-4 enabled

6 = Task 1-5 enabled

7 = Task 1-6 enabled

10 = All tasks enabled

11 = MP halted

Task 1 = UART (TTY) task

Task 2 = MP bootstrap

Task 3 = MP macro execution

Task 4 = MP internal message execution

Task 5 = MP sanity timer

Task 6 = Unit maintenance (real-time tasks)

Task 7 = Unused

MPRTIS—MP Routine Task Inhibit Status (Domestic DIF Only)

- Bit 0 = When set, routine exercise disabled
- 1 = When set, PSW audit disabled
- 2-15 = Replicated bit 0-1 data

MPRTIS—MP Routine Task Inhibit Status (DIFE1 only)

- Bit 0 = When set, PSW audit disabled
- 1 = When set, MP program store audit disabled
- 2 = When set, SP program store audit disabled
- 3 = When set, MAP charge bit audit disabled
- 4 = When set, MAP rate pointer audit disabled
- 5 = When set, SP M, PCIS, TSW audit disabled
- 6 = When set, MAP routine exercise disabled
- 7 = When set, DIU routine exercise disabled
- 8-15 = Replicated bits 0-7

**MPRTIS—MP Routine Task Inhibit Status
(DIFE1-MF, DIFE1-DTMF only)**

- Bit 0 = When set, PSW audit disabled
- 1 = When set, MP program store audit disabled
- 2 = When set, SP program store audit disabled
- 3 = When set, TDIU, mode, ESCANNER audit disabled
- 4 = Not used
- 5 = When set, SP M, PCIS, TSW audit disabled
- 6 = Not used
- 7 = When set, DIU routine exercise disabled
- 8-15 = Replicated bits 0-7

**EXECSMW—EXEC Saved Mask Word (DIFE1 only) Contains
Image of the EXEC Interrupt Mask Saved
Prior to the Interrupt (See EXCMASK)**

- Bit 0 = Saved MP interrupt mask (level 0)
- 1 = Saved real-time interrupt mask (level 1)
- 2 = Saved SP interrupt mask (level A,B,C,D)
- 7 = Saved halt interrupt mask (level E)

**MPMBSF—MP MTC Maintenance Buffer Seizure Flag
(Domestic DIF Only)**

- Bit 0 = When set, maintenance buffer in use

DACPST0—Digroup Alarm PESTs (0)

- Bit 0-23 = If set, indicates digroup alarms not PESTed for DIU 0 through 23

DACPST1—Digroup Alarm PESTs (1)

- Bit 0-9 = If set, indicates digroup alarms not PESTed for DIU 24 through 33

DRFPST0—Digroup Report Function PESTs (0)

- Bit 0-23 = If set, indicates digroup report function not PESTed for DIU 0 through 23

DRFPST1—Digroup Report Function PESTs (1)

Bit 0-9 = If set, indicates digroup report function not PESTed for
DIU 24 through 33

PSSSL—Protection Switch Firmware Status—Lower Half

Bit 0-15 = PSW status for DIU 0 through 15
17 = Lower group PSW enable

PSSSH—Protection Switch Firmware Status—Higher Half

Bit 0-15 = PSW Status for DIU 16 through 31
17 = Higher group PSW enable

CALOW—Common Alarms—Lower Half

- Bit 0-6 = Suspect DIU (0-15)
 - 7 = Multiple DIU's alarming in lower half
 - 8 = DS120 transmit alarm
 - 9 = DS120 receive alarm
 - 10 = Clock framing alarm
 - 11 = Signaling parity alarm (EAS)
 - 12 = Signaling parity alarm (MAS) (M + PCIS DIST.)
 - 13 = Active/standby match alarm
 - 14 = Common clear alarm
 - 15 = SP to unit interface error (SPUIE) (DIFE1 only)
 - 16 = PSW audit failure—lower half
 - 17 = PSW audit failure—higher half
- 18-21 = PSW audit failure code (octal) (DIFE1-MF only)
 - 0 = Unassigned
 - 1 = Verify MP software image PSW low half
 - 2 = Verify MP software image PSW high half
 - 3 = Verify MP software image PSW low-vs-PROT switch register low
 - 4 = Verify MP software image PSW high-vs-PROT switch register high
 - 5 = Verify MP software image PSW low-vs-low SAN register
 - 6 = Verify MP software image PSW high-vs-high SAN register
 - 7 = Verify MP software image PSW low-vs-PROT switch verify register low
 - 10 = Verify MP software image PSW high-vs-PROT switch verify register high

CAHIGH—Common Alarms—Higher Half

- Bit 0-6 = Suspect DIU (16-33)
 - 7 = Multiple DIUs alarming in higher half
 - 8 = DS120 transmit alarm
 - 9 = DS120 receive alarm
 - 10 = Clock framing alarm
 - 11 = Signaling parity alarm (EAS)
 - 12 = Signaling parity alarm (MAS)
 - 13 = Active/standby match alarm
 - 14 = Common clear alarm
 - 15 = SP to unit interface error (SPUIE) (DIFE1 only)
 - 16 = PSW audit failure—lower half
 - 17 = PSW audit failure—higher half
- 18-21 = PSW audit failure code (octal) (DIFE1-MF only)
 - 0 = Unassigned
 - 1 = Verify MP software image PSW low half
 - 2 = Verify MP software image PSW high half
 - 3 = Verify MP software image PSW low-vs-PROT switch register low
 - 4 = Verify MP software image PSW high-vs-PROT switch register high
 - 5 = Verify MP software image PSW low-vs-Low SAN register
 - 6 = Verify MP software image PSW high-vs-high SAN register
 - 7 = Verify MP software image PSW low-vs-PROT switch verify register low
 - 10 = Verify MP software image PSW high-vs-PROT switch verify register high

INTJ—Interject Register

Bit 0 = Digit buffer overflow interject source
8 = Digit buffer overflow PEST

MEMN—DIF/DIFE1 Member Number

Bit 0-6 = DIF/DIFE1 Member Number (0-31)

XLATE—First Word of DIF/DIFE1 UT Translator

Bit 18-23 = Frame type (octal)
10 = Vintage DIF (J68960A)
21 = DIFE-1 domestic
23 = MF/DIFE-1 domestic
24 = DTMF-4S/DIFE-1 domestic
25 = MF-4S/DIFE-1 domestic

FIRMWARE—Word 48 (Octal 60) of DIF/DIFE1 UT Translator

Bit 0-3 = MP firmware version—controller 0
4-7 = SP Firmware version—controller 0
8-11 = EXEC firmware version—controller 0
12-15 = MP firmware version—controller 1
16-19 = SP firmware version—controller 1
20-23 = EXEC firmware version—controller 1

Auxiliary Data— (DIF/DIFE1 BLM Reports)

BSIZE	KIND	HEADER	DATA0	DATA1	DATA2
DATA3	DATA4	DATA5	DATA6	DATA7	DATA8
DATA9	DATA10	DATA11	DATA12	DATA13	DATA14
DATA15	MBPTRS*	MPBSTAT*	CCPST0*	CCPST1*	DIUOS0*
DIUOS1*					

* Data output only when kind = 1 (Illegitimate)

BSIZE—Auxiliary Data Block Size

Bit 1-6 = Block size

KIND—Kind of Report

Bit 0 = Kind of report

0 = Autonomous

1 = Illegitimate

HEADER—Frame Report Header (MB)

Bit 0-7 = Macro OPCODE

8-11 = Number of words in report

12 = segment report flag

13 = Autonomous flag

16-20 = Macro identification (assigned by Message Dispenser)

Frame Report Data Words 0-15

DATA0—Format 0—(Kind = 1, Illegitimate report)

Bit 0-23 = Data (may be a timed-out macro response,
or any format 1 below)

DATA0—Format 1—(Kind = 0, Autonomous report)

Bit 4-7 = Message ID (MID)

Use MID to distinguish DATA0 - DATA15 below

MID = 0

DATA0—Message ID=0—Digroup Alarm Report

Bit 0-3 = Digroup number

8-13 = DIU number

14 = Always zero

15 = Always zero

16-23 = SM1 digroup alarm data as shown. SM6, 7 or SM9, 10—
See DIU Internal Registers bits 0-7.

16 = XMT data alarm

17 = XMT D9 pattern alarm

18 = RCV-A alarm

19 = XMT signal alarm

20 = RCV D9 pattern alarm

21 = RCV data alarm

22 = RCV-B signal alarm

23 = RCV out-of-frame (OOF) alarm

DATA1—Message ID=0 Digroup Alarm Report

(See DIU Internal Register)

Bit 0-7 = Digroup alarm data

8-15 = Digroup report function data

16-23 = Digroup state

MID = 1

DATA0—Message ID=1—Digroup Report Function Alarm Report

Bit 0-3 = Digroup number

8-13 = DIU number

14 = Always zero

15 = Invalid PCC digroup state (SM10)

16-23 = SM1 digroup report function data as shown. SM6, 7, or
SM9, 10—See DIU Internal Registers bit 0-7.

16 = Illegal inhibit signaling alarm

17 = No forced D2 status alarm

18 = Illegal forced D2 alarm

19 = RCV D2 summary alarm

20 = No inhibit signaling with OOF alarm

21 = No multiframe alignment alarm (SM9)

22 = Positive negative SLIP alarm

23 = Illegal multiframe alignment alarm (SM9)

DATA1—Message ID=1—Digroup Report Function Alarm
Report (See DIU Internal Register)

Bit 0-7 = Digroup alarm data

8-15 = Digroup report function data

16-23 = Digroup state

MID = 2

DATA0—Message ID=2—Facility Status Report

Bit 0-3 = Digroup number

8-13 = DIU number

14 = 10^{-3} error rate alarm (CRC or Fe)

15 = 10^{-6} error rate alarm (CRC or Fe)

16 = Remote alarm (yellow)

17 = Local alarm (red)

18 = Out of frame (OOF)

19 = Negative SLIP

20 = Positive SLIP

For DIF or DIF-E1 (Domestic or MF)

21 = Message request

22 = Digroup alarm PEST

23 = Digroup report function PEST

For DIF-E1 (MF4ST or DTMF)

21 = Datalink down (SM10)

22 = Remote multiframe alignment alarm (SM9, SM10)

23 = Local multiframe alignment alarm (SM9, SM10)

MID = 3

DATA0—Message ID=3—Compelled Facility Status Report

Bit 0-23 = (Same format as MID = 2)

MID = 4

DATA0—Message ID=4—Routine Exercise Report

Bit 0-3 = Digroup number

8-13 = DIU number

21-23 = Failing routing code

1 = False all-unit decoding failure

2 = Overlapping UMB words failure

3 = Report stream MUX (SM2) failure

4 = Digroup MUX failure for a single digroup

5 = Common failures (SM2, SM3, SM4, SM5)

6 = Digroup exercise failure (each SM1)

7 = Service circuit digroup exercise failure (each SM6)

DATA1—Message ID=4—Routine Exercise Report

Bit 0-7 = Raw common alarm data at time of failure (for common failures) raw digroup alarm data at time of failure (for digroup failures)

9-16 = Set to zero for common failures, raw report function data at time of failure for digroup failures

18-23 = Failing test number

MID = 5

DATA0—Message ID=5—M/U Store Virtual Trunk Audit
Report

Bit 0-3 = Code 0 = M store audit, 1 = U (PCIS) store audit

8-19 = Virtual trunk address

20 = Correct expected data from virtual trunk

21 = Incorrect data retrieved from virtual trunk

DATA1—Message ID=5—M/U Store Virtual Trunk Audit
Report

Bit 0-8 = Total errors found

MID = 6

DATA0—Message ID=6—MAP Audit Report
(DIFE1 Domestic only)

Bit 0-3 = Task code

0 = PTSS

1 = RPS

2 = DIF-D PTSS

8-19 = Virtual trunk address

20-23 = Total errors (4 lower bits)

DATA1—Message ID=6—MAP Audit Report
(DIFE1 Domestic only)

For task code = 0 or 2

Bit 7 = Charge bit data

15 = Charge bit data

16-20 = Total errors (5 upper bits)

For task code = 1

Bit 0-6 = Failing rate pointer data

8-14 = Expected rate pointer data

16-20 = Total errors (5 upper bits)

MID = 7

DATA0—Message ID=7—SPTSS Virtual Trunk Audit Report
Bit 0-3 = Task code 0 = SPTSS
8-19 = Virtual trunk address

DATA1—Message ID=7—SPTSS Virtual Trunk Audit Report
Bit 0-15 = Correct expected data from virtual trunk
16-23 = Total errors (8 lower bits)

DATA2—Message ID=7—SPTSS Virtual Trunk Audit Report
Bit 0-15 = Incorrect data retrieved from virtual trunk
16 = Total errors (1 upper bit)

MID = 8

DATA0—Message ID=8—Mode, TDIU, ESCANNER Audit Report

Bit 0-3 = Digroup number

8-13 = DIU number

14 = ESCANNER bit for DIU pair (0 = 4ST, 1 = not 4ST)

15-17 = Mode of digroup (DC if bits 0-3 = 0)

0 = ESCANNER bit and TDIU disagree

1 = One digroup in wrong mode

2 = Two digroups in wrong mode

3 = Three digroups in wrong mode

4 = Four digroups in wrong mode

5 = Unused

6 = MP "Saved Mode Word" for spare DIU incorrect

7 = SM1, SM6, SM7 has illegal bit set in digroup state word

(See DIU Internal Registers)

DATA1—Message ID=8—Mode, TDIU, ESCANNER Audit Report

Bit 0-3 = Number of digroup mode failures

4-7 = Number of digroup offset failures

8-15 = Mode of first failing digroup

16-23 = Offset of first failing digroup

MID = 9

DATA0—Message ID=9—TDIU Audit Report

Bit 0-3 = Digroup number

8-13 = DIU number

18-23 = TDIU (type of DIU)

MID = 10

DATA0—Message ID=10—Frequency Data Link Status Report

Bit 0-3 = Digroup number

8-13 = DIU number

16 = Data link status (0 = FDL up, 1 = FDL down)

MBPTRS—Maintenance Buffer Pointers

Bit 0-7 = Read pointer

8-15 = Write pointer

MPBSTAT—Maintenance Buffer Status

Bit 0-4 = Number of reports in MB (0-31)

CCPST0—Common Alarm PESTs, DIU 0-23

Bit 0-23 = If set, indicates common alarms not PESTed for DIU 0 through 23

CCPST1—Common Alarm PESTs, DIU 24-33

Bit 0-9 = If set, indicates common alarms not PESTed for DIU 24 through 33

DIUOS0—Out-of-Service DIU 0-23

Bit 0-23 = DIU 0 through 23 out of service

DIUOS1—Out-of-Service DIU 24-33

Bit 0-9 = DIU 24 through 33 out of service

DIU Internal Registers (Via TTY Request)

USTATUS	DGALM1	DGRF1	DGST1	DGALM2	DGRF2	DGST2	DGALM3
DGRF3	DGST3	DGALM4	DGRF4	DGST4	DGALM5	DGRF5	DGST5
CALM	XDIU	XDIUTDG	0....0	0....0	0....0	0....0	0....0
DGSTAT1	FD1	LCA1	RMA1	FEHIGH1	FELOW1	0....0	0....0
DGSTAT2	FD2	LCA2	RMA2	FEHIGH2	FELOW2	0....0	0....0
DGSTAT3	FD3	LCA3	RMA3	FEHIGH3	FELOW3	0....0	0....0
DGSTAT4	FD4	LCA4	RMA4	FEHIGH4	FELOW4	0....0	0....0
DGSTAT5	FD5	LCA5	RMA5	FEHIGH5	FELOW5	0....0	0....0

USTATUS—Software Unit Status Register

- Bit 0 = DIU PESTed via TTY message
- 1 = Digroup 1 PESTed via TTY message
- 2 = Digroup 2 PESTed via TTY message
- 3 = Digroup 3 PESTed via TTY message
- 4 = Digroup 4 PESTed via TTY message
- 5 = Digroup 5 PESTed via TTY message
- 6 = Digroup 1 out of service
- 7 = Digroup 2 out of service
- 8 = Digroup 3 out of service
- 9 = Digroup 4 out of service
- 10 = Digroup 5 out of service
- 12 = DIU out of service
- 13 = DIU removed via TTY message
- 20-23 = Peripheral subunit maintenance code

DGALM1—5 SM1—Digroup Alarm data (Digroups 1 through 5)

- Bit 0 = Transmit parity and zero code suppression alarm
- 1 = Transmit superframe parity alarm
- 2 = Receive "A" signaling "E" data parity alarm
- 3 = Transmit signaling parity alarm
- 4 = Receive pattern alarm
- 5 = Receive parity, clock and SLIP alarm
- 6 = Always zero
- 7 = Receive out-of-frame (at this instant)

DGRF1—5 SM1—Digroup Report Function Data (Digroups 1 through 5)

- Bit 0 = Receive D2 forced to zero
- 1 = At least one out-of-frame received this 384-ms scan
- 2 = Receive framing error
- 3 = Receive negative SLIP
- 4 = Receive positive SLIP
- 5 = Receive inhibit signaling and parity alarm
- 6 = Transmit force D2 to zero
- 7 = Received at least one D2 forced to zero this 2-ms superframe

DGST1—5 SM1—Digroup State (always zero)

DGALM1—4 SM6, SM7—Digroup Alarm Data (Digroups 1 through 4)

- Bit 0 = RCV PCM parity error
- 1 = Tone generator mismatch
- 2 = DSP error summary
- 3-7 = Always zero

DGRF1—4 SM6, SM7—Digroup Report Function Data (Digroups 1 through 4) (for DIFE1-MF SM6 and DIFE1-DTMF SM7)

- Bit 0 = DSP 0 error (RCVR 3)
- 1 = DSP 1 error (RCVR 2)
- 2 = DSP 2 error (RCVR 1)
- 3 = DSP 3 error (RCVR 0)
- 4 = DSP 4 error (XMTR 3)
- 5 = DSP 5 error (XMTR 2)
- 6 = DSP 6 error (XMTR 1)
- 7 = DSP 7 error (XMTR 0)

DGST1—4 SM6, SM7—Digroup State (Always Zero)

DGALM1—5 SM9, SM10—Digroup Alarm Data (Digroups 1 through 5)

- Bit 0 = Transmit formatter (TF): superframe sync alarm or internal parity alarm. If bit 3 is also set: input data parity alarm, SYN alarm, or lost communications with maintenance buffer (MB)
- 1 = Framer (FR): hardware alarm(s)
- 2 = Receive synchronizer (RS): signaling processing error. If bits 4 and 5 are also set: lost communication with MB
- 3 = TF: signaling alarm. If bit 0 is also set, see bit 0 explanation
- 4 = RS: pseudo random pattern error. If bits 2 and 5 are also set, see bit 2 explanation
- 5 = RS: RAM data output parity error system channel counter alarm, frame counter alarm, or GGC00 clock alarm. If bits 2 and 4 are also set, see bit 2 explanation
- 6 = SM9—Always zero
SM10—All TDIU modes except 64 CC and ESF—
always zero
—64 CC and ESF modes (TDIU=037 or 060)
this bit=0 if PCC is normal
this bit=1 if PCC is not normal (See DGST 1-5
SM9, SM10—Digroup state 1, bits 4-6)
- 7 = FR: out-of-frame (at this instant)

**DGRF1—5 SM9, SM10—Digroup Report Function Data
(Digroups 1 through 5)**

- Bit 0 = Receiving yellow alarm
1 = At least one out-of-frame in this 384-ms scan
2 = FR: framing errors or CRC-6 errors
3 = RS: negative SLIP
4 = RS: positive SLIP
5 = RS: signaling extraction inhibited
6 = FR: transmit yellow alarm
7 = Received yellow alarm

**DGST1—5 SM9, SM10—Digroup state 1 (Digroups 1 through 5)
(Use if bit 7=0)**

- Bit 0 = Processor PROM CHECKSUM error
1 = Blue alarm
2 = Line error 0
3 = Line error 1
4-6 = SM9, SM10 (if DGALM 1-5 bit 6=0)
4 = FR: transmitting multiframe alignment alarm
5 = local multiframe alignment alarm
6 = remote multiframe alignment alarm
= SM10 (if DGALM 1-5 bit 6=1)
000 = PCC reset
001 = PCC sanity error
010 = PCC data link down
011 = PCC in PSW mode
7 = Word ID—always 0

DGST1—5 SM9, SM10—Digroup State 2 (Digroups 1 through 5)
(Use if bit 6 = 0 and bit 7 = 1)

- Bit 0 = T1 frame format [SF(0) or ESF(1)]
- 1 = Zero code suppression, bits 1 and 2
- 2 = [0-NOZCS, 1-B8ZS, 2-ZCS, 3-B8ZS (64CC)]
- 3 = Signaling translation, bits 3 and 4
- 4 = (0-POTS, 1-CSDC, 2-IADC, 3-4 state)
- 5 = Signaling format [RB(0) or DMI(1)]
- 6 = Word ID—always 0
- 7 = Word ID—always 1

DGST1—5 SM9, SM10—Digroup state 3 (Digroups 1 through 5) (Use if bit 6=1 and bit 7=1)

- Bit 0 = Programmed time of unit 0
 1 = Programmed time of unit 1
 2 = Programmed time of unit 2
 3 = Programmed time of unit 3
 4 = Programmed time of unit 4
 5 = Always 0
 6 = Word ID—always 1
 7 = Word ID—always 1

SM9 and SM10 Notes: After SM9 or SM10 reset (power ON or MP order), the processor goes through diagnostics. If a failure exists, then DGALM, DGRF, DGST have the following values:

DGALM	DGRF	DGST	Explanation
00000377	00000377	00000377	Executing initialization code with no errors
00000377	00000377	00000240	Processor failure
00000377	00000377	00000201	Processor PROM failure
00000377	00000377	00000202	Maintenance buffer failure
00000377	00000377	00000300	PCC hardware failure (SM10 only)
00000000	00000000	00000000	Reset complete

CALM—DIU Common alarm data

- Bit 0 = DS 120 transmit alarm
 1 = DS 120 receive alarm
 2 = Clock framing alarm
 3 = E signaling parity alarm
 4 = M or U signaling parity alarm
 5 = Active/standby match alarm
 6 = Common clear alarm
 7 = SP-DIU interface error (DIFE1 only)

XDIU—DIU Translations Data

- Bit 0-9 = TSI member-SPC-port
 - 0-2 = TSI port connection
 - 3 = (0) TSI SPC 0 (1) TSI SPC 1
 - 4-9 = TSI member where DIU is connected
- 10-14 = Type of digroup state assignment
 - 0 = Not removed when protection switched
 - 1 = Removed when protection switched
- 15-17 = DIU member version states (states 0, 2-7 unassigned)
 - state 1 = initial DIU version
- 18-21 = Type of hardware (THC)
 - 0 = DIU not equipped
 - 1 = SM1B— voice DIU
 - 6 = SM6—MF service circuit DIU
 - 9 = SM9—Hardware pack
 - 10 = SM10 hardware pack
- 22-23 = Unused

XDIUTDG—Digroup Translation Data

- Bit 0-3 = Type of digroup 1
- 4-7 = Type of digroup 2
- 8-11 = Type of digroup 3
- 12-15 = Type of digroup 4
- 16-19 = Type of digroup 5
- 20-23 = Type of hardware (5THW)

**DGSTAT1—Digroup Status Information
(Digroups 1 through 5)**

- Bit 0 = Digroup is in remote alarm state
- 1 = Digroup is in local alarm state
- 2 = Out-of-frame occurrence
- 3 = Last SLIP was a negative SLIP
- 4 = Last SLIP was a positive SLIP
- 5 = Deferred message request bit
- 6 = Remote multiframe alignment alarm
- 7 = Local multiframe alignment alarm

**FD1-5—Digroup Forced Digit Information
(Digroups 1 through 5)**

- Bit 0 = If set, transmit force-D2-to-zero requested
- 1-2 = Requested/actual force-D2-to-zero error hit timer
- 3-7 = Local multiframe alignment alarm timer

LCA1-5—Digroup Local Alarm Data (Digroups 1 through 5)

- Bit 0-5 = Local alarm timer
- 6 = Digroup alarm PEST bit (0 = PEST set)
- 7 = DG report function PEST bit (0 = PEST set)

RMA1-5—Digroup Remote Alarm Data (Digroups 1 through 5)

- Bit 0-1 = Remote alarm timer
- 2 = 16-second timer bit for OOS
- 3-4 = Digroup alarm hit timer
- 5-6 = Steady SLIP hit timer
- 7 = 16-second timer bit for SLIP

**FEHIGH1-5—Digroup Frame Error High Count
(Digroups 1 through 5)**

Bit 0-5 = Number of framing errors for 1-in-1000 error rate calculations
(16-second interval)

6-7 = Illegal inhibit status hit timer

**FELOW1-5—Digroup Frame Error Low Count
(Digroups 1 through 5)**

Bit 0-5 = Number of framing errors for 1-in-1,000,000 error rate
calculations (40-minute interval)

6 = When set, 1-in-1000 error rate was exceeded and reported

7 = When set, 1-in-1,000,000 error rate was exceeded and reported

PUPHDATA—DIF (Phase 2, 3, or 4)



NOTE:

TTY request: **OP:ERAPDATA PUPHDATA:MFNUM a!**

a = MFNUM or range of MFNUM for phase 2, 3, or 4

WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5
WORD 6 WORD 7

WORDS 0-3 = Controller 0

WORDS 4-7 = Controller 1

WORD 0,4

Bit 0-2 = Boot task ACK code

- 0 = A boot task has been spawned
- 1 = A spawned task did not complete
- 2 = Controllers booted duplex
- 3 = One controller removed
- 4 = Both controllers failed
- 5 = Request error
- 6 = No boot task requested
- 7 = PMOS returned fail

3-5 = Request code

- 0 = Do not boot DIF frame
- 1 = Hard controller boot (PH4)
- 2 = Soft1 controller boot (PH2, PH3)
- 3 = Soft2 controller boot (PH3)
- 4 = Remove controller

WORD 0,4 (Contd)

Bit 6-9 = Request data code (octal)

- 0 = DIF frame unequipped
- 1 = DIF frame in growth state
- 2 = Controller in Zap Table
- 3 = Controller in Zero Start Table
- 4 = Controller in Babbling Bus Table
- 5 = Controller is out of service
- 6 = Controller boot level is hardware level 4
- 7 = Controller normal
- 10 = TSI duplex failure
- 11 = PUB duplex failure
- 12 = TSI and PUB duplex failure

10 = Final configuration request

(0 = controller removed, 1 = controller restored)

WORD 0,4 (Contd)

Bit 11-16 = Failing data code (octal)

0 = All tests pass or controller already removed prior to phase

1 = Not used

2 = Message Dispenser—frame rejected parallel INIT macro

3 = PMOS—failed to schedule “parallel polling (INIT macro)”

4 = Not used

5 = Maincomm pulse on bus failure

6 = PU bus loop failure

7 = Internal bus loop failure

10 = Message Dispenser—parallel polling (INIT macro) timeout

12 = IPUB out-of-service failure

13-23 = See INIT macro failure code below

24 = Not Used

25 = Not Used

26 = Not Used

27 = Topic—restore failure

30 = Post restore access test failure

31 = PMOS—failed to schedule “restore”

32 = PMOS—failed to schedule “remove”

34 = See INIT macro failure code below

40 = MAP INIT failure

41 = SP INIT failure

52-77 = See INIT macro failure code

17-22 = Unit type

INIT Macro Failure Code

Octal Code	MP Function	INIT Macro Failure
13		Invalid data failure
14	ERSCH	ESR check failure
15	MU STORE	M store check failure
16	PSW	PSW register check failure
17	PTR INIT	Buffer pointer failure
20	UNCL	Unit MTCE bus failure
21	ZESR	EXR register failure
22	SP INIT	SP INIT failure or SP failed to write TBIT 0 = 1
23		Extended bus cutoff failure (PUC only)
34	SP INIT	Single step trunk counter failure
52	HINITMAP	MAP ESR failure
53	DISUCL	Unit MTCE bus failure
54	MU Store	U store check failure
55	MU Store	SP TSS virtual trunk INIT failure or rate pointer store failure or charge bit initialization failure
56	PSW	PSW register hardware vs software failure
57	MU Store	MAP PTSS check failure
60	PSRAC	PSWH register check failure
61	ZESR	CLCK, IBIR, SPESR, CESR register failure
62	SP INIT	SP failed to write TBIT = 0
63	PSRAC	SP SAN registers failed verify
64	PTR INIT	Buffer status register failure
65	ZESR	PEST register failure
66	ZESR	MAP ESR failed to 0
67	ESRCH	MAP ESR failed to 0
70	DICLEAR	Unit MTCE bus failure

INIT Macro Failure Code (Contd)

Octal Code	MP Function	INIT Macro Failure
71	SP INIT	TBit 0 not set
72	SP Cycle	Start SP order fails
73	SP Cycle	Inhibit update failure
74	SP INIT	Single step IBIR failure
75	SP Cycle	Block (EX0, EX1, EX2) failure
76	SP Cycle	Stop SP order fails
77	SP INIT	TRK CNTR 1 $\neq$ 0 After SP single step

WORDS 1,5**INIT Macro Pass**

Bit 0-16 = INIT Macro DIU 0-16 Status (1 = Pass, 0 = Fail)
17-23 = Member number

INIT Macro Fail

Bit 0-16 = Failing order
17 = Fail data code (octal)
0 = Fail
1 = Success
18-23 = Fail code

WORDS 2,6

INIT Macro Pass

Bit 0-16 = INIT macro DIU 17-33 status (1 = Pass, 0 = Fail)

17 = Establish clock failure

18 = Pump failure

INIT macro fail

Bit 0-16 = Don't care

17 = Establish clock failure

18 = Pump failure

WORDS 3,7

INIT macro pass

Bit 0-23 = Always zero

INIT macro fail

Bit 0-23 = Failing reply data

DT—Digroup Trunk Printouts

DT Fault Detected

**DT4STAT0-DT4STAT1 PMD NUM IMP Entity PMD Add MSGHLF2
MSGHLF1**

Software Status Word O

- Bit 7 = DT Diagnostic request
- 8 = DT restore only via TTY
- 12 = DT duplex out of service
- 15 = Major power ALM
- 20-23 = Maintenance state
 - State 0 = Normal
 - State 1 = DT in diagnostic
 - State 2 = DT in exercise
 - State 3 = DT in FR or EA
 - State 4 = In time-out
 - State 5 = Unequipped
 - State 6 = In restoral update
 - State 7 = In growth
 - State 8 = Under repair
 - State 9 = Waiting for final restoral
 - State 10 = Under restoral
 - State 11 = Spare code
 - State 12 = OS by phase
 - State 13 = Being initialized
 - State 14 = Spare code
 - State 15 = In ignore

Software Status Word 1

Bit 0-7 = Respective numbered DTU OOS
8 = Spare unit out of service
9 = Controller 0 out of service
10 = Controller 1 out of service
12-14 = Protection switch number
15 = Enable protection switch
16 = Protection switch in progress flag
17 = System clock switch in progress flag
18 = DT SYS CLK select
19 = DT line CLK select
20 = DT MSG NTWK select

PMD Number Data

Bit 0-7 = PMD number
9-12 = ERAT decision code
15-18 = ERAT action code

Implicated Entity

Bit 0-10 = Same as 0-10 in software STAT1

PMD Address

Bit 0-23 = PMD address

The data in MSGHLF2 and MSGHLF1 is dependent on the PMD number in bits 0-7 of the PMD NUM word.

For PMD numbers 12, 15, and 23 (octal), MSGHLF2 and MSGHLF1 are zero

For PMD number 1, the formats are:

MSGHLF2 bit 0-11 = K-code of the associated SP2

12-15 = Port associated with the SP2

16-22 = DT member number

MSGHLF1 bit 0-23 = Relative address in DTFRMAIN of the failing order

For PMD number 17, the formats are:

MSGHLF2 Bit 0 = Transmitter in trouble

1 = Invalid DT OPCODE

2 = Mismatch between message sequences

3 = Mismatch between I/O sequences

4 = DT CLK bit error

5 = Frame timing error

6 = DT sanity check

7 = Reclock register serial mismatch

8 = Shift register mismatch

9 = Incoming serial bit stream parity error

10 = Invalid I/O sequence call state

15-18 = The DT port number calculated by the DT and sent to the SP2 during testing

23 = When set indicates that no data and/or no timing was received by the SP2 from the DT during link testing

MSGHLF1 Bit 0-23 = Same as MSGHLF2

PMD Address (Contd)

⇒ NOTE:

In duplex SP2 configurations, MSGHLF2 has the link results through SP controller 1, and MSGHLF1 has the link results through SP controller 0. If the associated SP2 controller 0 is out of service, MSGHLF2 and MSGHLF1 are the same, and the results are read through SP2 controller 1. If controller 1 is out of service, MSGHLF2 is all 7s and MSGHLF1 has valid data.

For all other PMD numbers, the following formats are used for MSGHLF2 and MSGHLF1:

MSGHLF2—Message Half 2

Bit 0-2 = Function number
3-6 = Time of unit number
7-10 = DT number
11-15 = DT to CC internal OPCODE

MSGHLF1—Message Half 1

The format of MSGHLF1 is dependent on MSGHLF2. The decimal equivalent of bits 3-6 (time-of-unit number) and bits 0-2 (function number) together indicate the format to be utilized (See formats listed on next page).

Format 12,6 Digroup status report

- Bit 0-2 = Digroup addressed
- 3-6 = DT unit addressed
- 7 = Remote alarm status
- 8 = Local alarm status
- 9 = Out-of-frame indication
- 10 = SLIP indicator
- 11 = SLIP polarity
- 12 = PEST status
- 13 = (Format 12,7) DF report camp-on status

Format 12,7 Bipolar Test Violations

- Bit 0-2 = Digroup addressed
- 3-6 = DT unit
- 7 = Unit test failed status
- 8 = Bipolar violation report indicator
- 9 = DF report camp-on status (12, 7)
- 10-11 = BV sample high count
- 12-13 = BV sample low count

Format 13,7 Protection Switch Status

- Bit 0-2 = Protection switch number
- 3 = Enable protection switch
- 4-12 = DT units 0 through 8, respectively

Format 14,7 Controller ESR

- Bit 1 = Report functions
- 2 = Clock 0 ABS
- 3 = ABS0
- 4 = Clock 1 ABS
- 5 = ABS1
- 6 = Message STRM mismatch
- 7 = Enable protection switch
- 8 = Mismatch
- 9 = DT system clock select
- 10 = DT line clock select
- 11 = DT message network select 0
- 12 = DT message network select 1
- 13 = Exercise 1
- 14 = Exercise 0
- 15 = Any protection SW relay

Format 15,7 UNIT ESR

- Bit 0-8 = DT units 0 through 8

Digroup Trunk—Maincodes

Bit 20-23 Software Status (Octal)

- 0 = DT is normal
- 1 = DT in diagnostic
- 2 = DT in exercise
- 3 = DT in fault recovery/error analysis
- 4 = DT in time-out
- 5 = DT is unequipped
- 6 = DT in restoral update
- 7 = DT in growth state
- 10 = DT under repair
- 11 = DT waiting for final restore
- 12 = DT under restoral
- 13 = DT spare code
- 14 = DT out of service by phase
- 15 = DT being initialized
- 16 = DT spare code
- 17 = DT in ignore

DUC/DUS—Data Unit Controller/Data Unit Selector Printout

Internal DUS Registers and Test Results Data Block (DUSREG)

DS10BR	DS1IBR	DS10AR	DS1IRA	DS1SELREG	DS1SVRM
DS10IRA	DS1MCR	DS1PCR	DS1ESR	GCPA	GCPR
TFWRD*	TADDR*	TVCTR*	TRSLT*	XFRWD0*	SVR1*
TFWRDB*	TADDRB*	TVCTRB*	TRSLTB*	XFRWD1*	SVR2*
OVSTAT+0*	STAT0+0*	RSTAT0+1*	RSTAT1+0*	RSTAT1+1*	SVR3*
STAT0+0†	STAT0+1†	STAT0+2†	STAT0+3†	STAT0+4	†STAT0+5†
STAT0+6†	STAT0+7†	STAT0+8†	STAT0+9†	STAT0+10	†STAT0+11†
STAT0+12†	STAT0+13†	STAT0+14†	STAT0+15†	AU1RSTAT+12	AU1RSTAT+13
STAT0+0†	STAT0+1†	STAT0+2†	STAT0+3†	STAT0+4†	STAT0+5†
STAT0+6†	STAT0+7†	STAT0+8†	STAT0+9†	STAT0+10†	STAT0+11†
STAT0+12†	STAT0+13†	STAT0+14†	STAT0+15†	AU1RSTAT+12	AU1RSTAT+13
STAT1+0†	STAT1+1†	STAT1+2†	STAT1+3†	STAT1+4†	STAT1+5†
STAT1+6†	STAT1+7†	STAT1+8†	STAT1+9†	STAT1+10†	STAT1+11†
STAT1+12†	STAT1+13†	STAT1+14†	STAT1+15†	XR	XR
TU1AREG	TU1DR	TU1CCREG	TU1DBR	TU1COM	TU1PCREG
TU1MR	TU1CBREG	TU1ECREG‡	TU1RCRCREG‡	TU1MIS	TU1OIS
		TU1WDCREG¶	TU1WCRCREG¶		
TU1TTS	TU1SRR(23-18)	TU1CIBG	TU1HLSB	0.....0	0.....0
	TU1LTCR(17-0)				

* Prefix this word with DS1R_ or DS1R

† Prefix this word with DC1R

‡ Contain bits 12-23

¶ Contain bits 0-11

DS10BR—DUS Output Buffer Register (Contains output data for CC-DUS reads and DUS-core writes; also contains the read/write data after a CC-DUC read/write operation)

Bit 0-23 = Output buffer register

DS1IBR—DUS Input Buffer Register (Buffers input data for CC-DUS/DUC writes and DUS-core reads)

Bit 0-23 = Input buffer register

DS10AR—DUS Output Address Register (Contains core address for DUS-core reads and writes)

Bit 0-15 = CS/PS address

16-20 = CS/PS K-code

21 = CS/PS bit

22 = Read bit

23 = Write bit

DS1IRA—DUS Inhibit Register (Controls which DUC the DUS polls: 0 = do not poll associated DUC, 1 = poll associated DUC)

Bit 0-15 = Inhibit register bits

DS1SELREG—DUS Select Register (Indicates which DUC the DUS is polling at this time as controlled by the DUS inhibit register)

Bit 0-15 = Selector bits

DS1SVRM—DUS Select Verify Register (Contains the select verify response of the DUC just accessed)

Bit 0-15 = SVR Bits

**DS10IRA—DUS Operational Interject Register [Indicates which DUC(s)
are requesting operational interject]**

Bit 0-15 = OIR bits

16 = OI bit from DUCs

**DS1MCR—DUS Maintenance and Control Register (applies
nonoperational conditions to the DUS for maintenance purposes)**

Bit 0 = Inhibit DUC clock sync

1 = Inhibit ASW/ASWF reset

5 = SR complete

10 = Inhibit enable and dummy block reset

12 = Invert DUC address parity

13 = Invert DUC data select

14 = Inhibit DUC select

16 = Inhibit DUC reply reset and gatein

17 = AUS SR mode flip-flop

18 = Mode decoder 1

19 = Mode decoder 2

22 = DUC reply bus ASW

23 = DUC control bus parity

DS1PCR—DUS PEST Control Register (Allows internal DUS errors to be inhibited)

- Bit 0 = Maintenance interject
- 1 = Operational interject
- 5 = CC communications
 - Clock sync error
 - Clock internal error
 - IAR parity failure
 - IBR parity failure
 - CC sequencer error
 - Decoder error
 - Mode error
- 10 = CS/PS communications
 - ASW/ASWF error
 - CS/PS sequencer error
 - IBR parity failure (CS/PS)
- 12 = DUC communications
 - DUC sequencer error
 - DUC reply bus parity failure
 - DUC reply bus ASW failure
 - DUC control bus parity failure
 - DUC select verify failure
 - DUC maintenance interject

DS1ESR—DUS Error Summary Register (Contains summary of DUS error conditions if they exist)

- Bit 0 = DUC sequencer error
- 1 = CS/PS sequencer error
- 6 = Mode error
- 9 = IBR parity failure (CS/PS)
- 10 = CS/PS ASW error
- 12 = DUC reply parity failure
- 13 = DUC reply ASW failure
- 14 = DUC poll parity failure (control bus)
- 18 = DUC select verify failure
- 19 = DUC maintenance interject reply

GCPA—GCP Address of DUS

- Bit 0-23 = GCP address

GCPR—GCP Results of DUS

Bit 0 = Maintenance interject flip-flop
1 = Maintenance ("1" Side)
2 = Maintenance ("0" Side)
3 = Clock sync error
4 = Clock internal error
6 = IAR parity failure
7 = IBR parity failure
9 = Decoder failure (O/N)
10 = Mode error
11 = DUC write bus parity
12 = DUC address bus parity
14 = CC COM sequencer freeze F/F
16 = CC sequencer error
17 = K-code match
18 = Control read
19 = Control write
20 = IAR all "1" detector
21 = IAR all "0" detector
22 = IBR all "1" detector
23 = IBR all "0" detector

If DS1R_XFRWD0 bit 23 = 0, then

DS1R_TFWRD(B)—Test Failure Word (Contains unique identification of the test that the DUS/DUC failed during fault recovery—for the suspected faulty DUS/DUC)

Bit 0-5 = Test group
6-11 = Test subroutine
12-17 = Test number

If DS1R_XFRWD0 bit 23 = 1, then

DS1R_TFWRD—DC1P_WORDU<DUC>

- Bit 0-4 = Function number
 - 5 = Tape is read-only or read write
 - 6 = Tape has an SL volume reader
 - 7 = Diagnostic in progress
- 8-9 = State of this unit
 - 00 = Not linked (NLK)
 - 01 = Active (ACT)
 - 10 = Standby (STBY)
 - 11 = Assigned (ASG)
- 10 = Autonomous operation in progress on this unit
- 11 = DUC is in-service
- 12-14 = Tape position
 - 000 = Unknown
 - 001 = Read at BOT
 - 010 = Not tape mounted
 - 011 = Released at BOT
 - 100 = At valid write point
 - 101 = Not at valid write point
 - 110 = Released (not at BOT)
 - 111 = New tape mounted
- 15 = File state changing
- 16 = File is open
- 17 = BOT passed
- 18-22 = DOC number

**DS1R_TFWRDB—DC1P-WORDA <FUNCTION> Same Layout as
DS1RTFWRD Word Associated with Function Specified in Item
DC1P_FNUMU in Word DS1R_TFWRD**

If DS1R_XFRWD0 bit 23 = 0, then

**DS1R_TADDR(B)—Test Address (Contains the internal DUS/DUC address
where the test failed—for the suspected faulty DUS/DUC)**

If bit 10 = 0, then: Bit 0-5 = TUC address
6-9 = TUC K-code

If bit 10 = 1, then: Bit 0-9 = TUC K-code
11-15 = DUS K-code
16-21 = AU K-code

If DS1R_XFRWD0 bit 23 = 1, then

DS1R_TADDR—DC1U-DWRTN <DUC>

Bit 0-23 = DUAD address where processing will resume

DS1R_TADDRB—DC1U-TORTN <DUC>

Bit 0-23 = Usually contains DUAD address indicating last command from
client

If DS1R_XFRWD0 bit 23 = 0, then

DS1R_TVCTR(B)—Test Vector (Contains the input test data— test vector—applied to the DUS/DUC—for the suspected faulty DUS/DUC)

Bit 0-23 = Test vector

If DS1R_XFRWD0 bit 23 = 1, then

DS1R_TVCTR—DC1U-UCB5 <DUC>

- Bit 0 = DUC job was aborted
- 1 = DUC was switched to other DUS
- 2 = TTY message received
- 3 = Key change has occurred
- 4 = Operation complete was received
- 5 = Autonomous operation in progress
- 6 = Reconfiguration request from DUFR
- 7 = Start a program segment
- 15 = Set if request to demount key in OIS register of TUC has changed state
- 16 = Set if unassigned mode key in OIS register of TUC has changed state
- 17 = Set if AMA mode key in OIS register of TUC has changed state
- 18 = Set if utility mode key in OIS register of TUC has changed state
- 19 = Set if SR mode key in OIS register of TUC has changed state
- 20 = Set if remote mode key in OIS register of TUC has changed state
- 21 = Set if tape over reads key in OIS register of TUC has changed state
- 22 = Set if door opened key in OIS register of TUC has changed state
- 23 = Set if write enable ring key in OIS register of TUC has changed state

DS1R_TVCTRB—DC1U-UCFO <DUC>

- Bit 0 = Data overwrite on last operation
- 1 = Late-data on last operation
- 2 = Time-out on last operation
- 3 = FOF detected on last operation
- 4 = LRC fail on last operation
- 5 = CRC fail on last operation
- 6 = VRC fail on last operation
- 7 = Read-block-completed on last operation
- 8 = CHR-CNT-EQ-O on last operation
- 9 = Invalid command detected on last operation
- 10 = BOT detected on last operation
- 11 = EOT detected on last operation
- 12 = BOT is present before command is sent
- 13 = EOT is present before command is sent
- 14 = Invalid mode detected on last operation
- 15 = State of request to demount key in OIS register of TUC
- 16 = State of unassigned mode key in OIS register of TUC
- 17 = State of AMA mode key in OIS register of TUC
- 18 = State of utility mode key in OIS register of TUC
- 19 = State of SR mode key in OIS register of TUC
- 20 = State of remote mode key in OIS register of TUC
- 21 = State of tape over heads key in OIS register of TUC
- 22 = State of door opened key in OIS register of TUC
- 23 = State of write enable ring key in OIS register of TUC

If DSR1_XFRWDO Bit 23 = 0, then

DS1R_TRSLT(B)—Test Result (Contains the output test results received from the DUS/DUC—for the suspected faulty DUS/DUC)

Bit 0-23 = Test results

If DSR1_XFRWDO bit 23 = 1, then

DS1R_TRSLT—J

Bit 0-23 = Sometimes will contain DUAD address that will explain reason for TUC removal

DS1R_TRSLTB—Test Result Buffer (Contains the output test result received from the DUS/DUC— for the DUS/DUC used in alternate route testing)

DS1R_XFRWDO—Transfer Trace Word 0 (Contains a point-by-point trace of the program flow through the pident DUFRTADM)

Bit 0 = Transfer trace point 0
1 = Transfer trace point 1
2 = Transfer trace point 2
3 = Transfer trace point 3
4 = Transfer trace point 4
5 = Transfer trace point 5
6 = Transfer trace point 6
7 = Transfer trace point 7
8 = Transfer trace point 8
9 = Transfer trace point 9
10 = Transfer trace point 10
11 = Transfer trace point 11
12 = Transfer trace point 12
13 = Transfer trace point 13
14 = Transfer trace point 14

DS1R_XFRWDO—Transfer Trace Word 0 (Contains a point-by-point trace of the program flow through the pident DUFRTADM) (Contd)

15 = Transfer trace point 15
16 = Transfer trace point 16
17 = Transfer trace point 17
18 = Transfer trace point 18
19 = Transfer trace point 19
20 = Transfer trace point 20
21 = Transfer trace point 21
22 = Transfer trace point 22
23 = Transfer trace point 23

DS1R_XFRWD1—Transfer Trace Word 1 (Contains a point-by-point trace of the program flow through the pident DUFRPUCDU)

Layout same as DS1R_XFRWDO

DS1R_TFWRDB—Test Failure Word Buffer (Contains unique identification of the test that the DUS/DUC failed during fault recovery—for the DUS/DUC used in alternate route testing)

(See DS1R_TFWRD)

DS1R_TADDRB—Test Address Buffer (Contains the internal DUS/DUC address where the test failed—for the DUS/DUC used in alternate route testing)

(See DS1R_TFWRD)

DS1R_TVCTRB—Test Vector - Buffer (Contains the input test data - test vector—applied to the DUS/DUC—for the DUS/DUC used in alternate route testing)

(See DS1R_TFWRD)

DS1R_TRSLTB—Test Result Buffer (Contains the output test results received from the DUS/DUC—for the DUS/DUC used in alternate route testing)

(See DS1R_TFWRD)

DS1R_SVR1—Contains the Identity of the DUC in Bits 0-15 (In 1/N format) that is to be used in diagnosing the DUS just removed from service

DS1R_SVR2—Contains the Identity of the DUC in Bits 0-15 (In 1/N format) used for alternate route testing by the fault recovery program

DS1ROVSTAT—Overall Status for ADS Community 0 (Status that applies to the ADS community as a whole)

- Bit 0 = Inhibit fast data job requests
- 1-5 = Fast data job in progress
- 6 = Update DUC status after bootstrap
- 7 = AU complex configuration is frozen
- 8 = Off-line stop bit
- 9 = DUAD hold CTR over DUFR segment breaks
- 10 = Inhibit TUC switches
- 23 = Notify DUAD to update DUC status

DS1RSTAT0—Status Word 0 for DUSs 0 and 1 (ADS Community 0)(Contains control and status flags)

- Bit 0 = Helper unit for DGN tape motion phases
- 2 = RMV DUS from SRV FLG
- 3 = Restore DUS to SRV FLG
- 4 = TTY REQ to RST DUS W/O DGN
- 7 = REQ phase 1 of DUS DGN
- 8 = REQ PH1 and PH2 of DUS DGN

DS1RSTAT1—Status Word 1 for DUSs 0 and 1 (ADS Community 0)(Contains error history information)

- Bit 0-2 = ESR error count
- 3-5 = SVR error count
- 6-8 = Count of DUFR TSTS=STP and DGN TSTS=ATP

DS1R—SVR3—Contains the Identity of the DUC (In 1/N format) with which the DUS was Communicating at the Time of Failure

- Bit 0-15 = DUC identity

**DC1RSTATO—Status Word 0 for DUCs 0 through 15 (ADS Community 0)
at Interject (Contains control and status flags)**

- Bit 0 = DUC temporarily OSS flag
 - 1 = Both DUS OOS indicator
 - 2 = Out-of-service FLG
 - 3 = RMV DUC from SRV FLG
 - 4 = Restore DUC to SRV FLG
 - 5 = Tape motion has failed
 - 7 = DUC REQ CONFIG change
 - 8 = REQ DUC be configured to DUS 0 (1 = Not true)
 - 9 = REQ DUC be configured to DUS 1 (1 = Not true)
 - 10 = DUC presently CONF to DUS 0 (1 = not true)
 - 11 = DUC presently CONF to DUS 1 (1 = not true)
 - 12 = RMVD DUS 0 - suspect DUC TBL
 - 13 = RMVD DUS 1 - suspect DUC TBL
 - 14 = RMVD DUC - suspect DUS 0 TBL
 - 15 = RMVD DUC - suspect DUS 1 TBL
 - 16 = Retry DUC TST via DUS 0
 - 17 = Retry DUC TST via DUS 1
 - 18 = DUC TBL associated with DUS 0
 - 19 = DUC TBL associated with DUS 1
 - 21 = Do not restore DUC
 - 22 = DUC off line FLG
 - 23 = REQ DUC DGN FLG

**DC1RSTATO—Status Word 0 for DUCs 0 through 15 (ADS Community 0)
after Interject (contains control and status flags)**

Layout same as DC1RSTATO

**AU1RSTAT—Common AU Status Word for DUSs 0 and 1
(ADS Community 0) at Interject (Contains control and status flags)**

- Bit 0 = AU marked in trouble
- 1 = AU in off-line configuration
- 2 = AU stopped and in maintenance mode
- 4 = Request diagnosis for AU
- 5 = AU K-code trouble
- 8 = Do not restore AU

**AU1RSTAT—Common AU Status Word for DUSs 0 and 1 (ADS
Community 0) after Interject (Contains control and status flags)**

Layout same as AU1RSTAT

**DC1RSTAT1—Status Word 1 for DUCs 0 through 15 (ADS Community 0)
(Contains control and status flags)**

- Bit 3 = TTY request to restore DUC W/O DGN
- 4 = Nonemergency remove bit
- 5 = INH all job requests for this DUC
- 8 = Normal switch request of DUC to DUS 0
- 9 = Normal switch request of DUC to DUS 1

**DC1RSTAT2—Status Word 2 for DUCs 0 through 15 (ADS Community 0)
(Contains error history information)**

Bit 0-5 = Count of DUFR TST=STF and DGN TST=ATP

XR—Contains the Actual K-Code of the DUS Involved in the Interject

Bit 11-15 = DUS K-code

**TU1AREG—TUC Store Address Register (Contains core address for
TUC-core reads and writes)**

Bit 0-21 = Address register

**TU1DR—TUC Data Register (Contains output/input data for TUC-core
writes/reads)**

Bit 0-23 = TUC data register

**TU1CCREG—TUC Character Count Register (Contains 1s complement of
number of 8-bit characters to be read/written from/to tape)**

Bit 0-17 = Character count register

TU1DBR—TUC Data Buffer Register (Buffers the data that is read/written from/to tape between the data register and the tape for writes onto tape. It divides the 24 bits of data into three [3] 8-bit tape characters—for read from tape. It generates a 24-bit data word from the three [3] 8-bit tape characters read from tape)

Bit 0-23 = TUC data buffer register

TU1COM—TUC Command Register (Contains the TUC tape transport operational command, that is, write, read, backspace, etc.)

- Bit 0 = Stop the TUC softly
- 1 = Fast forward to EOT with erase current
- 2 = Write
- 3 = Fill
- 4 = Write EOF
- 8 = Rewind to BOT
- 9 = Fast forward to EOT
- 10 = Read
- 11 = Advance 1 block
- 12 = Backspace 1 block
- 13 = Forward locate EOF
- 14 = Reverse locate EOF

TU1PCREG—TUC PEST Control Register (Allows internal TUC and/or tape transport errors to be inhibited)

- Bit 1 = Operational interject
- 2 = DUC communications
 - Clock sync
 - Address parity
 - R/W REG select
 - Data parity
- 3 = Autonomous sequence failures
 - Increment parity
 - CLPP self-check
 - Data XFER parity
 - Buffer parity fail on write
 - Internal register select
 - Time-out
 - Late data
 - Data overwrite
- 4 = Tape transfer failures
 - Erase-write current
 - CAPSTAN motion abnormal
 - TT converter output
 - TT converter –48 v input
 - SERVO lamp
 - Temperature abnormal

TU1MR—TUC Maintenance Register (Applies nonoperational conditions to the TUC for maintenance purposes)

- Bit 0 = Trouble F/F
- 1 = Suppress tape motion and erase-write current
- 2 = CLPP maintenance input 1
- 3 = CLPP maintenance input 2
- 4 = Gate ECR to tape read register
- 5 = GOSPLe mode
- 6 = Step 1 clock cycle
- 9 = Force tape parity track to zero

TU1CBREG—TUC Control Bus Register (Contains internal TUC maintenance interject, operational interject, read, write status)

- Bit 0 = MI request
- 1 = OI request
- 2 = Read request
- 3 = Write request

TU1ECREG—TUC Error Correct Register—9 Bits (Contains the bit to be corrected when operating in the error correct read mode)

- Bit 0-8 = Error correct register

TU1WDREG—TUC Write Driver Register—9 Bits (Contains the 8-bit character and parity being written onto tape)

- Bit 0-8 = Write driver register

TU1RCRCREG—TUC Read CRC Register—9 Bits (Generates and accumulates the CRC character from data being written onto tape)

Bit 0-8 = Read CRC register

TU1WCRCREG—TUC Write CRC Register—9 Bits

Bit 0-8 = Write CRC register

TU1MIS—TUC Maintenance Interject Status Register (Contains the source of the TUC maintenance interject request)

- Bit 0 = Clock sync failure
- 1 = Address parity failure
- 2 = R/W Register select failure
- 3 = Data parity failure
- 8 = Increment parity failure
- 9 = CLPP self-check failure
- 10 = Data XFER parity failure
- 11 = Buffer parity failure on write
- 12 = Autonomous register select failure
- 13 = Time-out
- 14 = Late data
- 15 = Data overwrite
- 16 = Erase-write read current failure
- 17 = CAPSTAN motion abnormal
- 18 = TT DC PWR failure
- 19 = TT -48 v failure (R/O)
- 21 = SERVO lamp failure (R/O)
- 22 = Temperature abnormal (R/O)

TU10IS—TUC Operational Interject Status Register (Contains the source of the TUC operational interject request)

- Bit 0 = Operation complete
- 1 = BOT detected
- 2 = EOT detected
- 3 = EOF detected
- 4 = VRC failure
- 5 = CRC failure
- 6 = LRC failure
- 8 = Read dummy-block complete
- 9 = CHAR count equal zero
- 10 = Invalid mode
- 11 = Invalid command
- 12 = AMA mode request
- 13 = Request to demount
- 14 = Unassigned mode
- 15 = AMA mode
- 16 = Utility mode
- 17 = SR mode
- 18 = SR mode buffer (R/O)
- 19 = Tape over heads (R/O)
- 20 = Remote mode (R/O)
- 21 = Door closed (R/O)
- 22 = Write-enable ring in (R/O)
- 23 = Key changed

**TU1TTS—TUC and Tape Transport Status Register (Contains internal
TUC and tape transport hardware status indications)**

- Bit 0 = TT ready (R/O)
- 1 = BOT present (R/O)
- 2 = EOT present (R/O)
- 3 = Forward motion (R/O)
- 4 = Reverse motion (R/O)
- 5 = Stopped motion (R/O)
- 6 = Rewinding (R/O)
- 7 = LRC equal zero (R/O)
- 8 = Busy/idle (1/0)
- 9 = Park/normal (1/0)
- 10 = Low/high speed (1/0)
- 11 = Forward/reverse motion (1/0)
- 12 = Stop/start (1/0)
- 14 = Enable CAPSTAN motion indicator
- 16 = Active
- 17 = Standby
- 18 = Assigned secondary standby
- 19 = Read only/read-write (1/0)
- 20 = File open/closed (1/0)
- 21 = Acknowledge demount request
- 22 = OK to demount

TU1SRR—TUC System Reinitialization Sequencer Register (Contains the state flip-flops of the TUC system reinitialization sequencer)

Bit 18 = SR active
19 = SR state 0
20 = SR state 1
21 = SR state 2
22 = SR after activate

TU1LTCR—TUC Long Timer Counter Register (TUC hardware timer)

Bit 0-17 = Long timer counter

TU1CIBG—TUC Write Clock and IBG Detector Register (TUC interblock gap detector register)

Bit 12-18 = Write clock
19 = Received one data character
20-23 = IBG detector

TU1HLSB—TUC Hot-Line Scan Back Results (TUC front end error indicators received on every TUC hot-line address)

- Bit 0 = Hot-line decoder select
- 1 = Bus select F/F
- 2 = State of TF/F
- 3 = Clock out of sync
- 4 = Inhibit clock out of sync
- 5 = Auto clock set request
- 8 = Slow down request has occurred
- 9 = No correction necessary has occurred
- 10 = Speed up request has occurred
- 11 = Clock initialization has occurred
- 14 = Clock out of sync has occurred
- 15 = FB174 pack missing from LOC 72-33
- 16 = FB174 pack missing from LOC 76-33

EST—Echo Suppressor Terminal Printouts

EST Critical Registers (FLEV Reports)

CSTATUS	STATR	USTATUS	USTAR	CESR1	CESR2
CESR3	CESR4	PEST12	PEST34	USR	UPR
EXR	PSR	PCM	UPA	LLSSR	TSSSR
CSTATUS	STATR	USTATUS	USTAR	CESR1	CESR2
CESR3	CESR4	PEST12	PEST34	USR	UPR
EXR	PSR	PCM	UPA	LLSSR	TSSSR

Upper Half Controller 0

Lower Half Controller 1

**NOTE:**

Prefix all words with ES4.

CSTATUS—Software Status

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Divorce controller from mate
 - 5 = Emergency cutoff
 - 6 = Indicates which TSI clock is being used
 - 7 = Controller diagnostic requested
 - 8 = Remove via TTY
 - 9 = When set, controller is active
- 10 = Controller is slave to mate
- 11 = Controller send-ons are clamped to zero
- 12 = Controller out of service
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Power off controller
- 16 = Controller cannot receive on PU bus 0
- 17 = Controller cannot send on PU bus 0
- 18 = Controller cannot receive on PU bus 1
- 19 = Controller cannot send on pu bus 1
- 20-23 = PU maintenance code

STATR—Hardware Status

- Bit 0 = Read write/MA pulse set-maintenance access bit
- 1 = Read write/MA toggled-PU bus which controller receives from
- 2 = Controller sends to PUB 0
- 3 = Controller sends to PUB 1
- 4 = Divorce controller from mate
- 5 = Emergency cutoff
- 6 = Indicates which TSI clock is being received
- 7 = Indicates which controller is active
- 8 = When set, the ESC clock is the slave of its mate
- 9 = Clamp send on FFS to 0
- 10 = Spare
- 11 = Spare
- 12 = MA enable bit (bit 0)
- 13 = RO enable bit (bit 1)
- 14 = S0 enable bit (bit 2)
- 15 = S1 enable bit (bit 3)
- 16 = DIV enable bit (bit 4)
- 17 = ES4EC enable bit (bit 5)
- 18 = ES4CA enable bit (bit 6)
- 19 = ES4AS enable bit (bit 7)
- 20 = ES4ST enable bit (bit 8)
- 21 = ES4SOC enable bit (bit 9)
- 22 = SP1 enable bit
- 23 = SP2 enable bit

USTATUS—Unit Software Status

- Bit 0 = ESU 0 is not available
- 1 = ESU 1 is not available
- 2 = ESU 2 is not available
- 3 = ESU 3 is not available
- 4 = ESU 4 is not available
- 5 = ESU 5 is not available
- 6 = ESU 6 is not available
- 7 = ESU 7 is not available
- 8 = ESU 8 is not available
- 9 = ESU 9 is not available
- 10 = ESU 10 is not available
- 11 = ESU 11 is not available
- 12 = ESU 12 is not available
- 13 = ESU 13 is not available
- 14 = ESU 14 is not available
- 15-18 = Spare assignment number
 - 14 = spare ESU number
- 19 = Protection switch is in progress
- 20 = Clock settling in progress
- 21 = Keep bit for controller 0 clock
- 22 = Keep bit for controller 1 clock

USTAR—Unit Status

- Bit 0 = Clear all unit ESRS and LLS
 - 0 = Clear
 - 1 = Stop clear
- 1 = Unit exercise bit 1
- 2 = Unit exercise bit 2
- 3 = Stop the vector generator 0 = Stop, 1 = Start
- 4 = Vectors are running—64-MS delay complete

CESR1—Error Source Register 1

- Bit 0 = ASWF (All-seems-well failure — PUF F-level)
- 1 = AINT (Autonomous interrupt — APUF F-level)
- 2 = Parity error over even bits of PU bus
- 3 = Parity error over odd bits of PU bus
- 4 = an error occurred in an ESU
- 5 = Sequencer mismatch-PU read/write sequencer
- 6 = Mode failure
- 7 = Reply bus parity mismatch
- 8 = Internal bus mismatch
- 9 = GGC sync mismatch for GGCA
- 11 = Clock out of frame
- 12 = 17X OP CODE destination error
- 13 = Unassigned OP CODE
- 14 = Destination code error
- 15 = OP CODE decoder error

CESR2—Error Source Register 2

- Bit 0 = Unit summary register error
- 1 = Controller scanner comparison
- 2 = As flip-flop loop comparison
- 3 = TSS RAM output parity error
- 4 = S/F register compare input data vs written data
- 5 = E/D register compare function failure
- 6 = TSS input register parity
- 7 = TSS RAM daisychain loop failure
- 8 = Unit write compare function
- 9 = Vector shift register parity and daisychain ERR
on maintenance bus
- 10 = Vector clock sync failure
- 11 = Vector countdown comparison error

CESR3—Error Source Register 3

- Bit 0 = OR of CESR3 and CESR4
- 2 = TSS acknowledge
- 3 = LLS acknowledge
- 5 = Unused—ACK for new autonomous functions
- 6 = Autonomous function error
(ASWF for AUTO FUNC)
- 11 = LLS to internal bus parity error
- 12 = LLS status register or RAM parity error
- 13 = LLS sequencer error
- 14 = LLS status register load error
- 15 = LLS status register read error

CESR4—Error Source Register 4

- Bit 0 = 16-MB clock error (energy detector)
- 1 = 16-MB clock daisychain (energy detector)
- 2 = GBC clock error (framing check)
- 3 = GBC sync daisychain MM
- 4 = GWC counter error MM
- 5 = GWC sync daisychain MM
- 6 = GGC sync daisychain MM
- 7 = ORed clock daisychain error (bits 1, 3, 5, 6)
- 8 = Vector ROM1 parity error
- 9 = Vector ROM2 parity error
- 10 = Vector ROM3 parity error
- 11 = Vector ROM4 parity error

PEST12—PEST Register 12

- Bit 0 = Inhibit ASWF
- 1 = Inhibit AINT
- 2 = Inhibit input
- 3 = CESR1MM PEST
- 12 = CESR1 non-MM PEST
- 13 = Sequencer MM PEST
- 14 = Mode failure PEST
- 15 = CESR2 PEST

PEST34—PEST Register 34

Bit 0 = PEST CESR34 summary

1 = PEST CESR3 bit-1

2 = PEST CESR3 bit-4

3 = PEST CESR3 bits-7, 8, 9

12 = CESR3 others PEST

13 = PEST CESR3 bit-5

14 = PEST CESR3 bit-6

15 = PEST CESR4

USR—Unit Error Summary

Bit 0 = Read only-error summary from unit 0

1 = Read only-error summary from unit 1

2 = Read only-error summary from unit 2

3 = Read only-error summary from unit 3

4 = Read only-error summary from unit 4

5 = Read only-error summary from unit 5

6 = Read only-error summary from unit 6

7 = Read only-error summary from unit 7

8 = Read only-error summary from unit 8

9 = Read only-error summary from unit 9

10 = Read only-error summary from unit 10

11 = Read only-error summary from unit 11

12 = Read only-error summary from unit 12

13 = Read only-error summary from unit 13

14 = Read only-error summary from unit 14

UPR—Unit PEST

- Bit 0 = Inhibit errors from unit 0
- 1 = Inhibit errors from unit 1
- 2 = Inhibit errors from unit 2
- 3 = Inhibit errors from unit 3
- 4 = Inhibit errors from unit 4
- 5 = Inhibit errors from unit 5
- 6 = Inhibit errors from unit 6
- 7 = Inhibit errors from unit 7
- 8 = Inhibit errors from unit 8
- 9 = Inhibit errors from unit 9
- 10 = Inhibit errors from unit 10
- 11 = Inhibit errors from unit 11
- 12 = Inhibit errors from unit 12
- 13 = Inhibit errors from unit 13
- 14 = Inhibit errors from unit 14

EXR—Exercise

- Bit 0 = Exercise error 1
- 1 = Exercise error 2
- 2 = Exercise error 3
- 3 = Exercise error 4
- 4 = Clock exercise error 5
- 5 = Clock exercise error 6
- 6 = Clock exercise error 7
- 7 = Exercise error 8

PSR—Protection Switch Request

- Bit 0 = Protection switch request for unit 0
- 1 = Protection switch request for unit 1
- 2 = Protection switch request for unit 2
- 3 = Protection switch request for unit 3
- 4 = Protection switch request for unit 4
- 5 = Protection switch request for unit 5
- 6 = Protection switch request for unit 6
- 7 = Protection switch request for unit 7
- 8 = Protection switch request for unit 8
- 9 = Protection switch request for unit 9
- 10 = Protection switch request for unit 10
- 11 = Protection switch request for unit 11
- 12 = Protection switch request for unit 12
- 13 = Protection switch request for unit 13
- 14 = Unused
- 15 = PS enable RO-set via 4ESMIENPSW and 4ESMIDISPSW—
writing B15 of this register does not affect ES4PSEN but sets
b15 of register UPA

PCM—Protection Switch Relay Contact Monitor

- Bit 0 = Protection switch monitor relay for ESU 0 read only
- 1 = Protection switch monitor relay for ESU 1 read only
- 2 = Protection switch monitor relay for ESU 2 read only
- 3 = Protection switch monitor relay for ESU 3 read only
- 4 = Protection switch monitor relay for ESU 4 read only
- 5 = Protection switch monitor relay for ESU 5 read only
- 6 = Protection switch monitor relay for ESU 6 read only
- 7 = Protection switch monitor relay for ESU 7 read only
- 8 = Protection switch monitor relay for ESU 8 read only
- 9 = Protection switch monitor relay for ESU 9 read only
- 10 = Protection switch monitor relay for ESU 10 read only
- 11 = Protection switch monitor relay for ESU 11 read only
- 12 = Protection switch monitor relay for ESU 12 read only
- 13 = Protection switch monitor relay for ESU 13 read only

UPA—Unit Power Alarm

- Bit 0 = Power alarm unit 0
- 1 = Power alarm unit 1
- 2 = Power alarm unit 2
- 3 = Power alarm unit 3
- 4 = Power alarm unit 4
- 5 = Power alarm unit 5
- 6 = Power alarm unit 6
- 7 = Power alarm unit 7
- 8 = Power alarm unit 8
- 9 = Power alarm unit 9
- 10 = Power alarm unit 10
- 11 = Power alarm unit 11
- 12 = Power alarm unit 12
- 13 = Power alarm unit 13
- 14 = Power alarm unit 14
- 15 = Enable UPA read from PSR B15—write via PSR B15—B15 of this register cannot be written

LLSSR—Last Look Store Status

- Bit 0-4 = LLS address bits 1-4 = unit number and bit 0=word number
- 5-10 = Last look store function code

TSSSR—Trunk Status Store Status

- Bit 0-3 = Spare image number
- 4 = S/F data for MASS update
- 5 = E/D data for MASS update
- 7 = MASS update mode = 1

EST LLS Memory (FLEV, Interject Reports)

ESU0	ESU0	ESU1	ESU1	ESU2	ESU2
ESR1	ESR0	ESR1	ESR0	ESR1	ESR0
ESU3	ESU3	ESU4	ESU4	ESU5	ESU5
ESR1	ESR0	ESR1	ESR0	ESR1	ESR0
ESU6	ESU6	ESU7	ESU7	ESU8	ESU8
ESR1	ESR0	ESR1	ESR0	ESR1	ESR0
ESU9	ESU9	ESU10	ESU10	ESU11	ESU11
ESR1	ESR0	ESR1	ESR0	ESR1	ESR0
ESU12	ESU12	ESU13	ESU13	ESU14	ESU14
ESR1	ESR0	ESR1	ESR0	ESR1	ESR0
ESU15	ESU15	CESR1	USR	UPR	UPA
ESR1	ESR0				

Upper half (shown)—Dumped at time of interject (via active controller).

Lower half (not shown)—Same format as above dumped after clearing all errors and hit timing for 10 ms.

ESU0—15—Higher half ESR bits for ESU0 through ESU15

ESR1

- Bit 0 = RCV Envelope > Threshold (suspect pack NH5 RCV)
- 1 = XMT signal peak (suspect pack NH5 XMT)
- 2 = XMT Envelope $\geq$ XMT data (suspect pack NH5 XMT)
- 3 = XMT Envelope > Threshold (suspect pack NH5 XMT)
- 4 = TRK Status store E/D (suspect pack NH8)
- 5 = TRK status store S/F (suspect pack NH8)
- 6 = GGC counter sync (suspect pack NH8)
- 7 = Echo suppressor initialize (suspect pack NH8)
- 8 = Good interval count initialize (suspect pack NH8)
- 9 = GWC counter sync (suspect pack NH7)
- 10 = Controller select (suspect pack NH7)
- 11-15 = Unused ESR bits
- 16-23 = (Not used—zeros)



NOTE:

ESR1 data for an unequipped ESU is octal 00064626 or 00013151, depending on ESU number.

ESU0—15—Lower half ESR bits for ESU0 through ESU15**ESR0**

- Bit 0 = RCV input framing (suspect pack NH2)
- 1 = RCV input framing (suspect pack NH2)
- 2 = RCV output data (suspect pack NH2)
- 3 = RCV output data and framing (suspect pack NH2)
- 4 = XMT input framing (suspect pack NH3)
- 5 = XMT input framing (suspect pack NH3)
- 6 = XMT output data (suspect pack NH3)
- 7 = XMT output data and framing (suspect pack NH3)
- 8 = RCV line driver out (suspect pack NH1)
- 9 = XMT line driver out (suspect pack NH1)
- 10 = Suppress control (suspect pack NH4)
- 11 = Noise control (suspect pack NH4)
- 12 = Compress control (suspect NH4)
- 13 = Tone disable control (suspect pack NH6)
- 14 = RCV signal peak (suspect pack NH5 RCV)
- 15 = RCV Envelope $\geq$ XMT data (suspect pack NH5 RCV)
- 16-23 = (not used—zeros)

**NOTE:**

ESR0 data for an unequipped ESU is octal 00064626 or 00113151, depending on ESU number.

CESR1—Controller Error Source Register 1

Bit 0-15 = (See CESR1 for EST Critical Registers)

USR—Unit Summary Register

Bit 0-14 = (See USR for EST Critical Registers)

UPR—Unit PEST Register

Bit 0-14 = (See UPR for EST Critical Registers)

UPA—Unit Power Alarm

Bit 0-15 = (See UPA for EST Critical Registers)

EST MA Pulse Point Reply

ES4MADATA—MA Pulse Point Reply FLEV 39, 40

- Bit 0 = Maintenance access bit-set by pulse
- 1 = Receive on bus F/F toggled by pulse
- 2 = State of send on bus 0 F/F
- 3 = State of send on bus 1 F/F
- 4 = State of divorce F/F
- 5 = State of emergency cutoff flip-flop
- 6 = State of clock activity F/F
- 7 = State of active/standby F/F
- 8 = PU bus even parity failure indicator
- 9 = PU bus odd parity failure indicator
- 10 = PU bus K code match indicator
- 11 = PU bus M-bit indicator
- 12 = Receive on bus F/F complement
- 13 = Autonomous interrupt indicator
- 14 = All-seems-well interrupt indication
- 15 = Unassigned OPCODE failure, CESR1-UNASOP
- 16 = Slave timing
- 17 = One-out-of-one OPCODE checker error, CESR1-OPDEC
- 18 = When set, send-on is disabled
- 19 = Clock error, CESR4-16-MB
- 20 = Out of frame, cESR1-OOF
- 21 = Destination code error, CESR1-DESE
- 22 = Mode failure, CESR1-MODFL
- 23 = 17X DEST code error, CESR1-17XDSE

I/O—Input/Output Frame Printouts

I/O Status and Internal Data

Poll Failure

IO1RST	IO1RST	IO1RST	IOUS	ERROR
IOUS	IOMP	IOUC	STATUS	SUMMARY
			REG	REG

OR

Maintenance Request

IO1RST	IO1RST	IO1RST	IOUS	IOUC	SUPPLE
IOUS	IOMP	IOUC	STATUS	STATUS	MENTARY
			REG	REG	DATA

IO1RSTIOUS—IIOUS Software Status

- Bit 0 = IOUS maintenance state
- 1 = Receive bus for IOUS
- 2 = Send on bus 0
- 3 = Send on bus 1
- 4 = IOUS removed by fault recovery action
- 5 = Diagnostic requested for IPUB 0 but no GBT
- 6 = Diagnostic requested for IPUB 1 but no GBT
- 7 = Diagnostic requested for IOUS but no GBT
- 8 = IOUS removed by TTY request
- 12 = IOUS out of service
- 13 = IPUB 0 removed by TTY request
- 14 = IPUB 1 removed by TTY request
- 16 = IPUB 0 out of service
- 18 = IPUB 1 out of service
- 20-23 = PU MTCE code

IO1RSTIOMP—IOMP Software Status

- Bit 4 = IOMP removed by fault recovery action
- 7 = Diagnostic requested for IOMP but no GBT
- 8 = IOMP removed by TTY request
- 12 = IOMP out of service
- 20-23 = PU MTCE code

IO1RSTIOUC—IOUC Software Status

- Bit 0-2 = Character parity failure counter
- 3 = F-level PESTed for I/O K-code
- 4 = IOUC removed by fault recovery action
- 5-6 = Input buffer overflow counter
- 7 = Diagnostic requested for IOUC but no GBT
- 8 = IOUC removed by TTY request
- 9-10 = Character overrun counter
- 11 = Maintenance state of IOUC
- 12 = IOUC out of service
- 13-15 = Inter character time-out counter
- 16-17 = Timeout counter
- 19 = Restoral runjob requested
- 20-23 = PU MTCE code

IOUS Status Register (5A021)

- Bit 0 = Maintenance flip-flop
- 1 = Receive on bus flip-flop
- 2 = Send on bus 0
- 3 = Send on bus 1

IOUS Status Register (5A052) (IOP)

- Bit 0 = Maintenance flip-flop
- 1 = Receive on bus flip-flop
- 2 = Send on bus 0
- 3 = Send on bus 1
- 4 = IOMP 0 out of service
- 5 = IOMP 1 out of service
- 6 = Hold acknowledge monitor
- 7 = IOMP select monitor
- 8 = IOMP 1 hold acknowledge failure
- 9 = IOMP 0 hold acknowledge failure
- 10 = IOMP 1 data store request failure
- 11 = IOMP 0 data store request failure
- 12 = Invalid instruction received
- 13 = IOMP 0 invalid access (power problem)
- 14 = IOMP 1 invalid access (power problem)
- 15 = DMAC parity failure
- 17 = IOMP out-of-range memory address
- 18 = ROM parity failure
- 19 = DMAC sanity failure
- 20 = Character counter underflow
- 21 = Channel ID match failure
- 22 = PU bus parity failure over odd bits
- 23 = PU bus parity failure over even bits

IOUC Status Register (5A045) (IOP)

- Bit 8 = Channel is out of service
- 9 = Channel is in idle state
- 10 = Channel is in end-of-message RCVD state
- 11 = Channel is in break received state
- 12 = Channel is in input state
- 13 = Channel is in output state
- 14 = Channel is in full duplex mode
- 15 = Channel buffer is empty
- 16 = Channel buffer should be loaded
- 17 = Channel buffer should be unloaded
- 18 = Channel is in transparent mode
- 21 = Invalid channel command received
- 22 = Software error detected
- 23 = Hardware error detected

Error Summary Register (5A021)

- Bit 0 = All-seems-well failure
- 2 = Parity failure over even PU write bus bits
- 3 = Parity failure over odd PU write bus bits
- 5 = Multiple K-code match detected
- 6 = Invalid instruction detected by IOUS
- 19 = Channel response failure
- 20 = Channel buffer parity failure
- 21 = High-speed (7.7 μ sec) clock monitor
- 22 = Low-speed (71.4 μ sec) clock monitor
- 23 = Clock failure

Error Summary Register (4C049)

- Bit 0 = PC Error Summary
 - 1 = PC sanity failure
 - 2 = PC routine maintenance failure
 - 3 = PC clock failure
 - 4 = PC RAM parity failure
 - 5 = Enable gate through error
 - 6 = Invert parity
- 14 = IOMP1 error summary
- 15 = IOMP0 error summary
- 16 = PC 0 error
- 17 = PC 1 error
- 18 = PC 2 error
- 19 = PC 3 error
- 20 = PC 4 error
- 21 = PC 5 error
- 22 = PC 6 error
- 23 = PC 7 error

Error Summary Register (5A049/5A052) (IOP)

- Bit 0 = DMAC-IOMP gate through bit
 - 1 = IOMP clock failure
 - 2 = IOMP sanity failure
 - 3 = Memory parity failure
 - 4 = Memory—IOMP parity failure
 - 5 = Routine maintenance error
 - 6 = Force power failure
 - 7 = LIU—IOMP parity failure
- 8-13 = DMAC routine maintenance failure code
- 14 = IOMP 1 error summary bit
- 15 = IOMP 0 error summary bit

IOUC Status Register (5A021)

- Bit 8 = Channel buffer is empty
- 9 = Carrier failure alarm
- 10 = Low paper alarm
- 11 = Channel maintenance state
- 12 = Channel is in idle state
- 13 = Channel is in input state
- 14 = Channel is in output state
- 15 = Channel is in break received state
- 16 = Channel buffer should be loaded
- 17 = Channel buffer should be unloaded
- 18 = Start of input message
- 19 = Maintenance request
- 20 = Inhibit maintenance request
- 21 = Output buffer overflow
- 22 = Character parity failure
- 23 = Input buffer overflow

IOUC Status Register (5A049/5A052/4C049) (IOP)

- Bit 0 = Channel is connected (4C049 only)
- 8 = Channel is out of service
- 9 = Channel is in idle state
- 10 = Channel is in end-of-message received state
- 11 = Channel is in break received state
- 12 = Channel is in input state
- 13 = Channel is in output state
- 14 = Channel operation is full duplex
- 15 = Channel buffer is empty
- 16 = Channel buffer should be loaded
- 17 = Channel buffer should be unloaded
- 18 = Channel is in transparent mode
- 21 = Invalid channel command received
- 22 = Software error detected
- 23 = Hardware error detected

Supplementary Data (Channel Status Bit-23 Set) (5A049/5A052)

- Bit 12 = Intercharacter time-out (>45 seconds)
- 14 = Character overrun
- 15 = Input buffer overflow
- 16 = Serial parity failure
- 17 = MP to LU parity failure
- 18 = LU to MP parity failure
- 19 = Low paper
- 20 = No clear to send
- 21 = Carrier failure
- 22 = Automatic call unit failure

Supplementary Data (Channel Status Bit-23 Set) (4C049)

Bit 13 = Protocol halt
20 = Data set transmit error
21 = Data set receive error
22 = ACU error
23 = Protocol error

Supplementary Data (Channel Status Bit-23 Set) (5A049/5A052/4C049)

Bit 8-15 = High byte of failing address
16-23 = Low byte of failing address

I/O MA Pulse Point Reply (5A021)

- Bit 0 = Overall (IOUS) maintenance
 - 1 = Receive on bus 0 or 1
 - 2 = Send on bus 0
 - 3 = Send on bus 1
- 8 = Parity failure over even bits
- 9 = Parity failure over odd bits
- 10 = K-code match (any IOC K-code)
- 11 = Maintenance bit on PU enable address bus
- 12 = Specifies complement of R0 (address bus)
- 13 = Multiple K-code match
- 14 = Invalid instruction detected by IOUS

I/O MA Pulse Point Reply (5A049) (IOP)

- Bit 0 = Maintenance access
 - 1 = Receive on bus 0 or 1
 - 2 = Send on bus 0
 - 3 = Send on bus 1
 - 4 = MP0 out of service
 - 5 = MP1 out of service
 - 6 = MP hold acknowledge
 - 7 = MP select F/F state
 - 8 = MP1 hold ACK error
 - 9 = MP0 hold ACK error
- 10 = MP1 request DS ACK error
- 11 = MP0 request DS ACK error
- 12 = Invalid instruction
- 13 = MP0 invalid access error
- 14 = MP1 invalid access error
- 15 = DMAC parity failure
- 16 = Unassigned
- 17 = MPDS ADR OOR access error
- 18 = Micro INSTR ROM parity error
- 19 = DMAC sanity failure
- 20 = Character count underflow
- 21 = Channel ID match failure
- 22 = PU write bus parity odd
- 23 = PU write bus parity even

I/O Operational Failure Data

5A021 I/O FRAME:

ERROR CODE	CHAN- NEL #	IO1CHAN- STAT0	IO1CHAN- STAT1	ERROR SUM REG	IOUC STATUS REG

OR

5A052/5A089/4C049 I/O PROC FRAME:

ERROR CODE	CHAN- NEL #	IO1CHAN- SAT0	IO1CHAN- STAT1	IOUS STATUS REG	IOUC STATUS REG

Error Code (Octal)

- 1 Buffer empty indicator not set after 24 characters
- 2 Time-out (20 sec) of constant break signal
- 3 No service request after ACK (?T)
- 4 Time-out of channel
- 5 SR received but channel not in any state
- 12 CMS channel removed from service
- 13 Time-out of CMS channel in output state

Channel # Octal/ Decimal	Channel Name COMPOOL * Symbol 4IO—XXX	Channel # Octal/ Decimal	Channel Name COMPOOL * Symbol 4IO—XXX
0/0	MTC	26/22	Unassigned
1/1	SREC1	27/23	Unassigned
2/2	RCMOC	30/24	SREC2
3/3	BELT1	31/25	RCDT2
4/4	BELT2	32/26	RCDT3
5/5	Unassigned	33/27	TRF2
6/6	RCREC	34/28	NMDT3
7/7	RCDT1	35/29	TEC2
10/8	TRF1	36/30	TEC3
11/9	NMPR1	37/31	TEC4
12/10	NMDT1	40/32	TCA5
13/11	NMDT2	45/37	TCA2
14/12	TEC1	46/38	TCA3
15/13	CMS1	47/39	CA4
16/14	CMS2	50/40	TCA5
17/15	CMS3	51/41	TCA6
20/16	CMS4	56/46	RCRRT1
21/17	TCA1	57/47	RCRRT2
22/18	RMT1	60/48	NMPR2
23/19	SVOBS	61/49	NMNOC1
24/20	SCC1	62/50	TTS1
25/21	SCC2	63/51	TTS2

Footnote is listed at the end of table.

Channel # Octal/ Decimal	Channel Name COMPOOL * Symbol 4IO—XXX	Channel # Octal/ Decimal	Channel Name COMPOOL * Symbol 4IO—XXX
64/52	TTS3	106/70	MAC1
65/53	TTS4	107/71	MAC2
66/54	TTS5	110/72	MAC3
67/55	TTS6	111/73	PSIRAS
70/56	Unassigned	112/74	PSSPR
72/58	DUP1	113/75	PSSPR2
71/57	ISCC	114/76	NSA1
73/59	DUP2	115/77	NSA2
74/60	DUP3	116/78	RMS1
75/61	DUP4	117/79	RMS2
76/62	DUP5	120/80	RMS3
77/63	DUP6	121/81	RMS4
100/64	CMSH1	122/82	RMS5
101/65	CMSH2	123/83	RMS6
102/66	EDASH1	124/84	Reserved
103/67	EDASH2	125/85	Reserved
104/68	NSCS	130/90	Reserved
105/69	RC1A3B	131/91	Reserved

* Symbols 4IO—XXX (For example 4IO—MTC) are defined
in COMPOOL IO4CATE

IO1CHANSTAT

Bit 0-4 = Channel state (octal values)

- 0 = Unequipped
- 1 = Idle
- 2 = Input
- 3 = Output
- 6 = Input started
- 7 = Waiting for ACK
- 10 = ACK loaded
- 11 = Last output
- 12 = Waiting for output idle SR
- 13 = Break ACK characters loaded
- 14 = Waiting for link reset
- 15 = Waiting for protocol handler analysis
- 16 = Waiting for input segment
- 17 = Waiting for next segment
- 20 = Tape timing
- 21 = Inquiry character sent
- 22 = Waiting for start of tape
- 30 = Dial-up channel disconnected
- 31 = Input call detected on dial-up channel
- 32 = Call placed on dial-up channel
- 36 = Waiting for ACK to CMS output
- 37 = Out of service
- 5 = Channel in transparent mode
- 6 = Temporary dial-up connection
- 10-11 = Secondary timing counter (paper tape)

IO1CHANSTAT (Contd)

Bit 12-14 = Time-out index (octal values)

- 2 = Input timing
- 3 = Output timing
- 4 = Break timing
- 5 = ACK timing
- 6 = Output timing after time-out characters sent
- 7 = Dial-up timing

15-23 = Time-out time (octal values)

- 0 = None
- 1 = None
- 2 = 2 minutes
- 3 = 15 seconds
- 6 = 2 minutes
- 7 = 5 seconds
- 10 = 5 seconds
- 11 = 15 seconds
- 13 = 20 seconds
- 17 = 15 seconds
- 20 = 20 seconds
- 21 = 5 seconds
- 22 = 5 seconds
- 30 = None
- 31 = 2 minutes
- 32 = 102 seconds
- 36 = 5 seconds
- 37 = None

NCLK—Network Clock Frame Printouts

NCLK Critical Registers (Via TTY Request)

A — A	B — B	C — C	D — D	E — E	F — F	O — O	O — O
G — G	H — H	I — I	J — J	K — K	L — L	O — O	O — O

A = Register 0 CHAIN 0
B = Register 1 CHAIN 0
C = Software Status CHAIN 0

D = Register 0 CHAIN 1
E = Register 1 CHAIN 1
F = Software Status CHAIN 1

G = Register 0 CHAIN 2
H = Register 1 CHAIN 2
I = Software Status CHAIN 2

J = Register 0 CHAIN 3
K = Register 1 CHAIN 3
L = Software Status CHAIN 3

NCLK Data (FLEV Interrupt Reports)

A — A	B — B	C — C	D — D	E — E	F — F	O — O	O — O
G — G	H — H	I — I	J — J	K — K	L — L	O — O	O — O
A' — A'	B' — B'	C' — C'	D' — D'	E' — E'	F' — F'	O — O	O — O
G' — G'	H' — H'	I' — I'	J' — J'	K' — K'	L' — L'	O — O	O — O

Upper Half = Data at time of interrupt

Lower Half(') = Data after recovery actions completed

A (A') = Register 0 CHAIN 0
B (B') = Register 1 CHAIN 0
C (C') = Software Status CHAIN 0

D (D') = Register 0 CHAIN 1
E (E') = Register 1 CHAIN 1
F (F') = Software Status CHAIN 1

G (G') = Register 0 CHAIN 2
H (H') = Register 1 CHAIN 2
I (I') = Software Status CHAIN 2

J (J') = Register 0 CHAIN 3
K (K') = Register 1 CHAIN 3
L (L') = Software Status CHAIN 3

Register 0 (READ0)

- Bit 0 = Frame counter mismatch
- 1 = Counter mismatch
- 2-11 = Fanout level detector
- 12 = Autonomous output disconnect
- 13-22 = Output disconnect fanouts
- 23 = Unused

Register 1 (READ1)

- Bit 0 = Master selected — OSC 0
- 1 = Master selected — OSC 1
- 2 = Master selected — OSC 2
- 3 = Master selected — OSC 3
- 4-7 = OSC error bits
 - 4 = OSC level detector error
 - 5 = OSC phase detector error (phase lock)
 - 6 = Master OSC select level
 - Detector error (MSL)
 - 7 = Phase unlock detector error
- 8 = Master OSC output selected
- 9 = Phase lock release (meter solenoid operated)
- 10 = Error summary indicator
- 11 = Error source inhibit (overall PEST)
- 12 = Phase lock oven monitor
- 13 = Parity mismatch
- 14 = Translator pretest failure
- 15 = Decode all zeros (don't care)
- 16 = Frame pulse detector
- 17-23 = Unused

Software Status (NC4STAT + CHAIN Number)

- Bit 0 = OSC 0 is master
- 1 = OSC 1 is master
- 2 = OSC 2 is master
- 3 = OSC 3 is master
- 4 = OSC in this chain is out of service
- 5 = Matcher(s) in this chain is disabled
- 6 = Unused
- 7 = Diagnostic has been requested
- 8 = CHAIN removed by TTY request
- 9-11 = Unused
- 12 = This chain is out of service
- 13 = Error inhibit for this chain (PEST)
- 14 = Output disconnect
- 15-19 = Access test results:
 - 15 = Power off this chain
 - 16 = Write group 0 is functional
 - 17 = CHAIN is able to send on bus 0
 - 18 = Write group 1 is functional
 - 19 = CHAIN is able to send on bus 1
- 20-23 = PU maintenance code

⇒ NOTE:

1. Register 0 and register 1 refer to READ0 and READ1 responses respectively from the NCLK hardware description.
2. CHAIN 0, 1, 2, and 3 refer to CHAIN 00, 01, 10 and 11 respectively in the NCLK hardware description. (Example: CHAIN 2 = CHAIN 10 = Bay 1, CHAIN 0)

NCLK CC Pulse Point Address Assignments

CC Pulse Point Address	IREG CHAIN	Bus	Clock
401020	READ 0	0	0
401040	READ 0	1	0
402001	READ 1	0	0
402002	READ 1	1	0
402004	READ 0	0	1
402010	READ 0	1	1
402020	READ 1	0	1
402040	READ 1	1	1
404001	READ 0	0	2
404002	READ 0	1	2
404004	READ 1	0	2
404010	READ 1	1	2
404020	READ 0	0	3
404040	READ 0	1	3
01000101	READ 1	0	3
01000102	READ 1	1	3

SCLK—System Clock Frame Printouts

SCLK Critical Registers (FLEV and BLM Reports) (Equipped With NCSU)

For SCLK:	SWSTAT	HSTATR	HESR	PEST	TODCTRA	TODCTRB
	CR0	CR1	CR2	CR3	CR4	CR5
	CR6	CR7	CR8	CR9	CR10	CR11
For NCSU:	CR12	CR13	CR14	CR15	CR16	CR17
	CR18	CR19	CR20	CR21	CR22	CR23
	UTMN*	7——7†	7——7	7——7	7——7	7——7

Upper Half = SCLK Controller 0 lower half (not shown) = SCLK controller 1

* MN only for BLM reports

† First word UT translator (UTTRANS)

SWSTAT—SCLK Software Status Register

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on bus 0
 - 3 = Send on bus 1
 - 4 = Divorced from mate
 - 5 = Stop count
 - 6 = Clamp NCSU from SCLK
 - 7 = Diagnostic requested
 - 8 = Restore by TTY
 - 9 = Counter read select [1 = CTR-A (CLOCK 0)]
- 12 = Controller out of service
- 13 = Bus 0 power off
- 14 = Bus 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on bus 0
- 17 = Controller cannot send on bus 0
- 18 = Controller cannot receive on bus 1
- 19 = Controller cannot send on bus 1
- 20-23 = PU maintenance code

HSTATR—SCLK Hardware Status Register

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on bus 0
- 3 = Send on bus 1
- 4 = Divorced from mate
- 5 = Stop count
- 6 = Clamp NCSU from SCLK
- 7 = Counter read select [1 = CTR-A (CLOCK 0)]
- 12-19 = Write enables for bits 0-7

HESR—SCLK Hardware Error Source Register

- Bit 0 = All-seems-well failure
- 1 = A and B counter mismatch
- 2 = Parity failure even
- 3 = Parity failure odd
- 4 = Invalid OPCODE
- 5 = Mode failure
- 6 = Reply register mismatch
- 7 = NCSU ASW failure

PEST—SCLK PEST Register

- Bit 12 = PEST SCLK ASW failure
- 13 = PEST A and B counter match failure
- 14 = PEST NCSU ASW failure

TODCTRA—SCLK Time of Day Counter—A

Bit 0-3 = 0.1 seconds
4-8 = 1 second
9-14 = 0.5 minutes
15-20 = 0.5 hours
21 = Day toggle bit

TODCTRB—SCLK Time of Day Counter—B

Bit 0-21 = Same as TOD CTR-A

CR0—NCSU Software Status Register

Bit 0 = Maintenance access
1 = Receive from controller 0 or 1
2 = Send to controller 0
3 = Send to controller 1
7 = Reference active (0 = REG, 1 = ALT)
8 = Removed via TTY
9-11 = Operational mode
12 = NCSU out of service
13 = Regular reference out of service
14 = Alternate reference out of service
16 = Active outage
17 = Standby outage
20-23 = PU subunit maintenance code

Operational Mode Values (Bits 9-11)

0 = Normal mode (phase locked)
1 = Free running mode
2 = Fast start mode

CR1—NCSU Hardware Status and ESR Register

- Bit 0 = Maintenance access
 - 1 = Receive from controller 0 or 1
 - 2 = Send to controller 0
 - 3 = Send to controller 1
 - 4 = Clock test when reset
 - 5 = Parity test when reset
 - 6 = Inhibit PROC sanity errors when reset
- 7-11 = Spare status bits
 - 12 = ASW failure
 - 13 = Clock parity error
 - 14 = Clock error
 - 15 = Processor match error
 - 16 = Processor sanity
 - 17 = Invalid OPCODE
 - 18 = Processor trap
 - 19 = Processor detected error (See CR19)
- 20-23 = Unassigned

CR2—NCSU Mode Register/Reference Register/ODA Reference

- Bit 0-1 = Reason for free run
 - 2 = Misframe threshold exceeded
 - 3 = REF outage threshold exceeded
 - 4 = Phase build-out threshold exceeded
 - 5 = Free run threshold exceeded
- 6-7 = Operational mode (See CR0)

Reference Source Register

- Bit 9-10 = Regular reference (BSRF=0, DS1A=1, DS1B=2, None =3)
- 11-12 = Alternate reference (BSRF=0, DS1A=1, DS1B=2, None=3)
- 13 = Active Reference (0 = REG, 1 = ALT)
- 14 = Regular reference out of service
- 15 = Alternate reference out of service

ODA Reference Register

Register value = 0—Unequipped, 1—Regular, 2—Alternate

- 18-19 = BSRF
- 20-21 = DS1A
- 22-23 = DS1B

CR3—NCSU Base ESR 0/Base ESR 0 Last Look

Base ESR 0

- Bit 0 = Oscillator OOR
- 1 = OSC 0-0 OOR
- 2 = OSC 0-1 OOR
- 3 = OSC 1-0 OOR
- 4 = OSC 1-1 OOR
- 5 = BSRF outage
- 6 = DS1A outage
- 7 = DS1B outage

BASE ESR 0 Last Look

- 12-19 = Last look of bits 0-7

CR4—NCSU Secondary ESR/Base ESR 1

Secondary ESR

- Bit 0 = OSC and UPROC mismatch
- 1 = OSC write data mismatch
- 2 = OSC 0 mismatch
- 3 = OSC 1 mismatch
- 4 = OSC 2 mismatch
- 5 = OSC 3 mismatch

Base ESR 1

- Bit 12 = NCLK F-level phase
- 13 = Normal mode
- 15 = Fast start enter
- 16 = Dead slave complete
- 17 = Dead slave failed

CR5—Oscillator Words 0 and 1

- Bit 0-7 = OSC word 0
- 8-15 = OSC word 1

CR6—Integral Register 0 (Bit 0-15)

CR7—Integral Register 1 (Bit 0-15)

CR8—Integral Register 2 (Bit 0-15)

CR9—Integral Register 3 (Bit 0-15)

CR10—Program Counter Before Reset (Bit 0-15)

CR11—Power Up Counter

Bit 0-5 = Power up count

CR12—UPROC Detected Data

Bit 0-15 = Additional UPROC detected error data (See CR19)
Equals OSC number for CR19 = 10, 12, 13, 14, 15, 36
Equals master OSC number for CR19 = 17
Equals reference register for CR19 = 33
Equals I/O port data for CR19 = 34
Equals contents of I/O (0xc10B) for CR19 = 35
Equals OPCODE for CR19 = 40

CR13—Unit Quality

Bit 0-15 = Number of UPROC detected errors in memory tables

CR14—Proportional Registers

Bit 0-7 = Proportional register 0
8-15 = Proportional register 1

CR15—REF Outage and Misframe Counters

Bit 0-7 = Reference outage counter
12-19 = Misframe counter

CR16—Free Run and Phase Build-Out Counters

Bit 0-7 = Free run counter
12-19 = Phase build-out counter

CR17—NCLK Software Status Register — CHAIN 0

- Bit 0 = OSC 0 is master
- 1 = OSC 1 is master
- 2 = OSC 2 is master
- 3 = OSC 3 is master
- 4 = OSC in this CHAIN is out of service
- 5 = Matcher(s) in this CHAIN is disabled
- 6 = Unused
- 7 = Diagnostic has been requested
- 8 = CHAIN removed by TTY request
- 9-11 = Unused
- 12 = This chain is out of service
- 13 = Error inhibit for this CHAIN (PEST)
- 14-19 = Access test results
 - 14 = Output disconnect
 - 15 = Power off this CHAIN
 - 16 = Write group 0 is functional
 - 17 = CHAIN is able to send on bus 0
 - 18 = Write group 1 is functional
 - 19 = CHAIN is able to send on bus 1
- 20-23 = PU maintenance code

CR18—NCSU Miscellaneous Register

- Bit 0 = Macro in progress
- 1 = Test state flip-flop
- 2 = Parity fail not (0 = parity failure)
- 3 = OSC 0-0 cutoff
- 4 = OSC 0-1 cutoff
- 5 = OSC 1-0 cutoff
- 6 = OSC 1-1 cutoff
- 7 = Parity test when reset

CR19—NCSU UPROC Detected Error Code

Bit 0-7 = Error code (octal value)

- 0 = OSC 0-0 readback mismatch
- 1 = OSC 0-1 readback mismatch
- 2 = OSC 1-0 readback mismatch
- 3 = OSC 1-1 readback mismatch
- 4 = OSC 0-0 data register mismatch
- 5 = OSC 0-1 data register mismatch
- 6 = OSC 1-0 data register mismatch
- 7 = OSC 1-1 data register mismatch
- 10 = Window size error
- 11 = Master switch during dead slave
- 12 = OSC word change GT 40 HEX
- 13 = OSC word change GT 100 HEX
- 14 = Illegal phase comparator bits
- 15 = Dead slave OSC cutoff
- 17 = Delta OSC word GT 1000 HEX (FAST), 100 HEX (NORM)
- 20 = Build-out error
- 21 = Integral term LT 800 HEX
- 22 = BSRF quality
- 23 = Integral term GT 3800 HEX
- 24 = Fast start GT 300 decimal
- 25 = Phase hit, delta phase MEAS GT 14 HEX
- 26 = Phase comparator OOR
- 27 = Phase error—slope short
- 30 = Phase error—slope medium
- 31 = Phase error—slope long
- 32 = Phase comparator jitter
- 33 = REF register bad data
- 34 = Master OSC I/O port invalid
- 35 = Master OSC cutoff
- 36 = Major OSC alarm
- 37 = Stuck ready bit (phase COMP)
- 40 = Routine exercise failure
- 41 = Minor OSC alarm
- 42 = OSC power failure

Bit 8-23 = (Not used—zeros)

CR20—NCSU Program Counter

Bit 0-15 = Program Counter

CR21—NCSU Lap Counter

Bit 0-15 = Number of 8-sec counts since last fast start

CR22—NCSU UPROC Program Mode

Bit 0-7 = UPROC Program states

Value 0 = Reset

1 = EXEC

2 = Fast start

3 = Normal

4 = Free run

CR23—SCLK Controller

Bit 0 = Indicates SCLK controller through which NCSU dump was obtained

UTMN—Unit Type and Member Number

Bit 0-6 = Member number

7-13 = Unit type

SCLK MA Pulse Point Reply

Bit 0 = MA F/F
1 = RO F/F
2 = SO F/F
3 = S1 F/F
4 = DIV F/F
5 = Stop F/F
8 = Parity fail, even bits
9 = Parity fail, odd bits
10 = K-code (mismatch)
11 = M-bit
12 = RO F/F COMPL
13 = ASW fail
14 = Invalid OPCODE
15 = Mode fail

UTTRANS—First Word Unit-Type Translator

Bit 0-23 = First word of Unit-Type Translator

SCS/SCU—Service Circuit System/Service Circuit Unit Printouts

Service Circuit System Critical Registers (FLEV and Interject Reports)

CSTATUS	HWSTATR	MADATA	FSTATUS	SCUOS	CESR
PEST	CONTROL	EBLKSTATL	EBLKSTATH	EBLKADR	GRESR
GRCNTRM	GADRM0	GADRM1	EXESR	EXCSTATML	EXCSTATMH
EXFPTR	EXPC	EXSANTIM	EXSTKBL	EXSTKBH	EXSTRPTR
EXINTR	RLPBPTR	WLPBPTR	RDBPTR	WDBPTR	MBPTRS
SDOWMBPTR	MBSTAT	SCU0ESR	SCU1ESR	SCU2ESR	SCU3ESR
SCU4ESR	SCU5ESR	SCU6ESR	SCU7ESR	SCU8ESR	SCU9ESR
SCU10ESR	SCU11ESR	SCU12ESR	SCU13ESR	SCU14ESR	SCU15ESR
FWERRBUF0	FWERRBUF1	FWERRBUF2	FWERRBUF3	FWERRBUF4	FWERRBUF5
FWERRBUF6	FWERRBUF7	FWERRBUF8	FWERRBUF9	EBERRORM	EBLKADRM
EBLKSTATML	EBLKSTATMH	0.....0	0.....0	0.....0	0.....0
MEMN	XLATE	5.....5	5.....5	5.....5	5.....5

Upper Half = Controller 0

Lower Half = Controller 1 (Not shown)

CSTATUS—Controller Software Status

- Bit 0 = Maintenance access (MA)
- 1 = PU bus receive on select (RO)
- 2 = Send on bus 0 (S0)
- 3 = Send on bus 1 (S1)
- 4 = Divorce controller from mate (DIV)
- 5 = Stop autonomous processing (STOP)
- 6 = Divorce I/O synchronization (IODIV)
- 7 = Controller active/standby (AS)
- 8 = Emergency cutoff (EC)
- 12 = Controller out of service (OS)
- 13 = Controller removed via TTY (RMVTTY)
- 20-23 = Maintenance code (MAIN)
(See "Peripheral Unit—Maincodes")

HWSTATR—Controller Hardware Status

- Bit 0 = Maintenance Access (MA)
- 1 = PU bus receive on select (RO)
- 2 = Send on bus 0 (S0)
- 3 = Send on bus 1 (S1)
- 4 = Divorce controller from mate (DIV)
- 5 = Stop autonomous processing (STOP)
- 6 = I/O synchronization divorce (IODIV)
- 7 = Controller active/standby (AS)
- 8 = Emergency cutoff (EC)
- 12 = Enable loading MA F/F (EMA)
- 13 = Enable loading RO F/F (ERO)
- 14 = Enable loading S0 F/F (ES0)
- 15 = Enable loading S1 F/F (ES1)
- 16 = Enable loading DIV F/F (EDIV)
- 17 = Enable loading STOP F/F (ESTOP)
- 18 = Enable loading IODIV F/F (EIODIV)
- 19 = Enable loading as F/F (EAS)
- 20 = Enable loading EC F/F (EEC)

MADATA—Maintenance Access Data

- Bit 0 = Maintenance access (MAMA)
- 1 = Receive on bus 0 or 1 (MARO)
- 2 = Send on bus 0 (MAS0)
- 3 = Send on bus 1 (MAS1)
- 4 = Divorce controller from mate (MADIV)
- 5 = Stop autonomous processing (MASTOP)
- 6 = Cross-controller update bit in control register (MAXCUPD)
- 7 = Active/standby (1 = controller is active) (MAAS)
- 8 = Parity failure even (MAPUBFE)
- 9 = Parity failure odd (MAPUBFO)
- 10 = K-code match (MAKM)
- 11 = Mode bit (MAMBIT)
- 12 = Complement of RO (MAROC)
- 13 = Emergency cutoff (MAEC)
- 14 = Autonomous interrupt (MAAINT)
- 15 = ASW failure (MAASWF)
- 16 = Unassigned OP-CODE failure (MAUNASOP)
- 17 = Mode failure (MAMODFL)
- 18 = PUBI parity error (MAPPE)
- 19 = I/O synchronization divorce (MAIODIV)
- 20 = EXEC local error source summary (MAEXECSUM)
- 21 = Backplane error (MABPSUM)
- 22 = Local clock failure (MALCLKF)

FSTATUS—Frame Software Status

- Bit 0 = PUB0 at frame removed via TTY (TTYIPUB0)
- 1 = PUB1 at frame removed via TTY (TTYIPUB1)
- 2 = PUB0 out of service at frame (OSIPUB0)
- 3 = PUB1 out of service at frame (OSIPUB1)
- 4 = Frame LAN PEST status (FLANPEST)
- 5 = Switch in progress (SIP)
- 6 = Maintenance buffer overflow task in progress (MBOVFL)
- 7 = Digit buffer overflow (DBOVFL)
- 8 = Stops file copy from APS to SCU(s) (STOPCOPY)
- 13 = Controller to RST when DUF to DGN an SCU (UDGNCTRL)

SCUOS—SCU Software OS Status

- Bit 0-15 = SCU0 through 15 out of service

CESR—Controller Primary ESR

- Bit 0 = All seems well failure (ASWF)
- 1 = Autonomous interrupt (AINT)
- 2 = Peripheral unit bus even parity failure (PUPFE)
- 3 = Peripheral unit bus odd parity failure (PUPFO)
- 4 = Internal autonomous peripheral unit trouble - interject (INAPUT)
- 5 = Autonomous peripheral unit base level (APUB)
- 6 = Invalid/unassigned OP-CODE (UNASOP)
- 7 = Firmware error bit (SWERR0)
- 8 = Firmware error bit (SWERR1)
- 9 = Firmware error bit (SWERR2)
- 10 = Firmware error bit (SWERR3)
- 11 = Firmware error bit (SWERR4)
- 12 = Mode failure (MODFL)
- 13 = PUBI parity error (PPE)
- 15 = Local clock failure (LCLKF)
- 18 = Extended bus error summary (EBSUM)
- 19 = Global RAM local error source summary (GRAMSUM)
- 20 = EXEC local error source summary for bits 0-16 in the EXEC
error source register (EXECSUM)
- 21 = Backplane error summary (BPSUM)
- 22 = Clock phase lock error (CPMM)
- 23 = Cross-controller mismatch (CCMM)

PEST—Controller PEST Register

- Bit 0 = Inhibit ASWF (IASWF)
- 1 = Inhibit AINT (IAINT)
- 2 = Inhibit PUPFE (IPUPFE)
- 3 = Inhibit PUPFO (IPUPFO)
- 4 = Inhibit INAPUT (IINAPUT)
- 5 = Inhibit APUB (IAPUB)
- 6 = Inhibit UNASOP (IUNASOP)
- 7 = Inhibit SWERR0 (ISWERR0)
- 8 = Inhibit SWERR1 (ISWERR1)
- 9 = Inhibit SWERR2 (ISWERR2)
- 10 = Inhibit SWERR3 (ISWERR3)
- 11 = Inhibit SWERR4 (ISWERR4)
- 12 = Inhibit MODFL (IMODFL)
- 13 = Inhibit PPE (IPPE)
- 15 = Inhibit LCLKF (ILCLKF)
- 18 = Inhibit EBSUM (IEBSUM)
- 19 = Inhibit GRAMSUM (IGRAMSUM)
- 20 = Inhibit EXECSUM (IEXECSUM)
- 21 = Inhibit BPSUM (IBPSUM)
- 22 = Inhibit CPMM (ICPMM)
- 23 = Inhibit CCMM (ICCMM)

CONTROL—Controller Control Register

- Bit 0 = High priority buffer empty (HPE) (Not used)
- 1 = Low priority buffer empty (LPE)
- 2 = Digit buffer empty (DGE)
- 3 = Seizure buffer empty (SZE) (Not used)
- 4 = Cross-controller update enable (XCUPD)
- 11 = Handshake between PUBI and EXEC during arbitration (EXARB)
- 12 = Disables ability for next write to reply register to initiate reply sequence. Cleared when reply register is written (RPLDIS)
- 13 = Control bit that initiates reply sequence without overwriting reply register (RPLY)
- 14 = Force clock error fast (FCLKERF)
- 15 = Force clock error slow (FCLKERS)
- 16 = Sets INAPUT in CESR (SINAPUT)
- 17 = Sets APUB in CESR (SAPUB)
- 18 = Sets UNASOP in CESR (SUNASOP)
- 19 = Software error bit (SWERR0)
- 20 = Software error bit (SWERR1)
- 21 = Software error bit (SWERR2)
- 22 = Software error bit (SWERR3)
- 23 = Software error bit (SWERR4)

EBLKSTATL—Extended Bus Link Status Register - Low

- Bit 0 = Illegal command received by the SCU (ICRSCS)
- 1 = SCU receive link parity error (RLPARERR)
- 2 = SCU active link violation (ACTLINKV)
- 4 = SCU receive FIFO full (RFF)
- 5 = SCU receive FIFO half full (RFHF)
- 6 = SCU reply FIFO not empty (RFNE)
- 7 = SCU error summary bit (ERRSUM)
- 8 = Transmit sequencer active (TSA)
- 9-14 = Transmit sequencer state (TSEQS)
- 15 = Copies the WSRB bit in the extended bus control register when WSRB is strobed by WSR (STATLSSRB)
- 16 = Receive sequencer active (RSA)
- 17-21 = Receive sequencer state (RSEQS)
- 22 = Near operation complete (NOC)
- 23 = Operation complete sync (EBIOC)

EBLKSTATH—Extended Bus Link Status Register - High

- Bit 0 = Illegal command received by the controller (ICRCNTR)
- 1 = Receive link violation (RLV)
- 2 = Copies the WSRB bit in the extended bus control register when WSRB is strobed by WSR (STATHSSRB)
- 3 = Destination data parity error (DDATPE)
- 4 = Receive parity error (RPE)
- 5 = Source parity error (SPE)
- 6 = Destination parity error (DPE)
- 7 = Transmit parity error (TPE)

EBLKADR—Extended Bus Link Address Register

Bit 0-4 = Link logical address (LLA)

GRESR—Global RAM Error Source Register

- Bit 0-3 = RAM bank A parity error bits (ERAP)
- 4-7 = RAM bank B parity error bits (ERBP)
- 8-11 = Destination bus data parity error bits (EDDP)
- 13 = Source bus A address parity error (ESAAP)
- 14 = Source bus B address parity error (ESBAP)
- 15 = Cross-connect update bus mismatch (EXUMM)
- 16 = Cross-connect SYNDROBUS mismatch (EXSMM)

GRCNTRM—Global RAM Control Register (From Memory)

- Bit 0 = Read count enable (CRCNTE0)
- 1 = Read count enable (CRCNTE1)
- 2 = Count down enable (CCNTDN0)
- 3 = Count down enable (CCNTDN1)
- 4 = Write count enable (CWCNTE0)
- 5 = Write count enable (CWCNTE1)
- 7 = Maintenance Test: Syndrome Bus Transmit Inhibit (MTSTSXI)
- 8 = Maintenance Test: Destination Data Enabled to Backplane (MTSTDEN)
- 9 = Maintenance Test: Destination Address Enabled to Backplane (MTSTAEN)
- 10 = Maintenance Test: Destination Data and Address Enabled to Update Bus (MTSTXEN)
- 11 = Maintenance Test: Destination Data Parity (MTSTP0)
- 12 = Maintenance Test: Destination Data Parity (MTSTP1)
- 13 = Maintenance Test: Destination Data Parity (MTSTP2)
- 14 = Maintenance Test: Destination Data Parity (MTSTP3)
- 15 = Maintenance Test: Destination Address Parity (MTSTP4)
- 16-21 = Maintenance Test: Destination Address Offset (MTSTOF)
- 22 = Maintenance Test: Destination Address Mode (MTSTMD0)
- 23 = Maintenance Test: Destination Address Mode (MTSTMD1)

GADRM0—Global Address Register 0 (From Memory)

Bit 0-19 = The base address with which the lower 6 bits are logically OR'ed with one of the offset fields from the microword (OFFSET0)

GADRM1—Global Address Register 1 (From Memory)

Bit 0-19 = The base address with which the lower 6 bits are logically OR'ed with one of the offset fields from the microword (OFFSET1)

EXESR—EXEC ESR Register

Bit 0 = EXEC stack boundry error (STKBNDERR)
1 = Sanity timer elapsed (SANITYTMR)
2 = ALU mismatch (ALUMM)
3 = Source parity error (SPERR)
5-12 = Micro RAM parity error (MPERR)
15 = Software defined error (SOFTERR)

EXCSTATML—EXEC Status Register - Low (From Memory)

- Bit 0 = ALU carry bit (CARRY)
- 1 = ALU zero flag (ZERO)
- 2 = ALU sign bit (NEGATE)
- 3 = ALU overflow bit (OVERFLOW)
- 4 = ALU link flag (LINK)
- 5 = Test bits (EXCTEST0)
- 6 = Test bits (EXCTEST1)
- 7 = Always true condition bit (True)
- 8 = Force parity error source A byte 0 (FPESRCA0)
- 9 = Force parity error source A byte 1 (FPESRCA1)
- 10 = Force parity error source A byte 2 (FPESRCA2)
- 11 = Force parity error source A byte 3 (FPESRCA3)
- 12 = Force parity error source B byte 0 (FPESRCB0)
- 13 = Force parity error source B byte 1 (FPESRCB1)
- 14 = Force parity error source B byte 2 (FPESRCB2)
- 15 = Force parity error source B byte 3 (FPESRCB3)
- 16 = Force energy detector error (FEDE)
- 17 = Force clock timing mismatch bits (FCTMM0)
- 18 = Force clock timing mismatch bits (FCTMM1)
- 19 = Force ALU mismatch (FALUMM)
- 20 = Vector base bit (VBB)

EXCSTATMH—EXEC Status Register—High (From Memory)

Bit 0-7 = Interrupt vector (IVECT)

EXFPTR—EXEC Frame Pointer

Bit 0-15 = Frame address (FA)

EXPC—EXEC Program Counter

Bit 0-15 = Microword address (MWA)

EXSANTIM—EXEC Sanity Timer

Bit 0-23 = Timer count bits (TIMER)

EXSTKBL—EXEC Stack Boundry Register - Low

Bit 0-15 = Stack bounds low address (SBL)

16-23 = Lower half of the stack bounds high address (LSBH)

EXSTKBH—EXEC Stack Boundry Register - High

Bit 0-7 = Higher half of the stack bounds high address (HSBH)

EXSTKPTR—EXEC Stack Pointer

Bit 0-15 = Stack pointer address (EXSP)

EXINTR—EXEC Interrupt Register

- Bit 0 = Spare external interrupt (SPARE0)
- 1 = PU bus operation interrupt from PUBI (PUBOINT)
- 2 = Spare external interrupt (SPARE2)
- 3 = PU bus error interrupt from PUBI (PUBEINT)
- 4 = Mask bit for SPARE0 (MSPARE0)
- 5 = Mask bit for PUBOINT (MPUBOINT)
- 6 = Mask bit for SPARE2 (MSPARE2)
- 7 = Mask bit for PUBEINT (MPUBEINT)
- 8 = Disable interrupt (DISINT)
- 9 = Active interrupt (ACTINT)

RLBPTR—Low Priority Read Pointer

Bit 0-11 = Read pointer

WLPBPTR—Low Priority Write Pointer

Bit 0-11 = Write pointer

RDBPTR—Digit Buffer Read Pointer

Bit 0-11 = Read pointer

WDBPTR—Digit Buffer Write Pointer

Bit 0-11 = Write Pointer

MBPTRS—Maintenance Buffer Pointers

Bit 0-11 = Read pointer
12-23 = Write pointer

SDOWMBPTR—Shadow Maintenance Buffer Pointer

Bit 0-11 = Active read pointer

MBSTAT—Maintenance Buffer Status Register

Bit 0-8 = Number of reports in the maintenance buffer

SCU0ESR-SCU15ESR—SCU0-15 Primary ESR's

- Bit 0 = EPIC parity error (ERER)
- 1 = Unused bit - Zero will be returned (SPARE1)
- 2 = Unused bit - Zero will be returned (SPARE2)
- 3 = Micro store memory parity error (MSPER)
- 4 = Sanity timeout error (SAN)
- 5 = Clock error (CLOCK)
- 6 = Table RAM read parity error (TRPER)
- 7 = Invalid link state - both extended bus links ACT/ACT or STBY/STBY (INVLS)
- 8 = Misc. error summary (SESRASUM)
- 9 = Disk error summary (SESRBSUM)
- 10 = LAN error (LANER)
- 11 = SCU disk pump failure (DL)
- 12 = DS120 link frame error (DS120)
- 16-22 = SCU error code (ERRCODE). See SCU Error Code List
- 23 = Summary of bits 0-15

FWERRBUF0—Firmware Detected Error Code

Bit 0-23 = Error Code (Octal)

SCC Base Level Error Codes

- 1 = SCC main scheduler loop error (ERSCMAIN)
- 2 = EXEC system call error (EROSEXEC)
- 3 = Signal system call error (EROSIGNAL)
- 4 = Wait system call error (EROSWAIT)
- 5 = Diagnostic already in-progress error (ERDGINPROG)
- 6 = Main MTC buffer overflow (EROSMTCBUFOF)
- 7 = Tried to EXEC an invalid process (EROSINVPROC)
- 10 = Data corruption in EB process (EREBPOLL)
- 11 = SCC pump error (ERPMSCU)
- 12 = SCC pump buffer error (ERPMBUF)
- 13 = SCC pump CHECKSUM error (ERPMCHKSUM)
- 14 = SCC pump data error (ERPMDATA)
- 15 = SCU access test error (ERACCSCU)
- 16 = Verify program HASHSUM error (ERVPGHASH)
- 17 = ECD error (ERECD)
- 20 = PUMP SCU MSP error (ERMSP)
- 21 = SCC INIT. through update error (ERUPD)
- 22 = Low priority buffer overflow (EROSLPBUFOF)
- 23 = Digit buffer overflow (EROSDGBUFOF)
- 24 = SCC retrofit pump error (ERRETROPMIN)
- 25 = Disk file copy error (ERDFCINVLD)
- 26 = Error PU write file (ERINDDWERR)
- 27 = Incomplete information to process command
(ERINCMPLTD)
- 30 = Error in input data to the comand (ERRDERR)

SCC Interrupt Error Codes (Contd)

- 40 = Read RAM error (ERINRDRAM)
- 41 = Read register error (ERINRDREG)
- 42 = Write RAM error (ERINWRTRAM)
- 43 = Write 32 bit register error (ERINWRT32REG)
- 44 = Write 24 bit register error (ERINWRT24REG)
- 45 = MTC buffer overflow error (ERINMTCBUFOF)
- 46 = Macro process buffer overflow (ERINMCBUFOF)
- 47 = Group 1 macro error (ERINGRP1MAC)
- 50 = Group 2 macro error (ERINGRP2MAC)
- 51 = Read MTC buffer pointer error (ERINRMTCPTR)
- 52 = MTC buffer update error (ERINMTCUP)
- 53 = Clear buffer error (ERINCLRBUF)
- 54 = Write buffer write-pointer error (ERINWBUFWP)
- 55 = Write buffer read-pointer error (ERINWBUFRP)
- 56 = Pump macro process error (ERSCCPMIN)
- 57 = Write SCU status error (ERWSTATUS)
- 60 = Initialize SCU error (ERISCUERR)
- 61 = Clear SCU error (ERCLESR)
- 62 = Read SCC micro-RAM error (ERINRDSCCMRAM)
- 63 = In-service SCU macro error (ERINISSCUMAC)
- 64 = Out-of-service SCU macro error (ERINOSSCUMAC)
- 65 = ECD error (ERINECD)
- 66 = MSP error (ERINMSP)
- 67 = ECD macro error (ERINECDMAC)
- 70 = Deferred update announcement error (ERUPDAN)

SCC Interrupt Error Codes (Contd)

71 = SCC INIT. through update error (ERINSCCUPD)
72 = LP buffer underflow (ERINOSLPUF)
73 = Digit buffer underflow (ERINOSDGUF)
74 = Error reading the LP buffer read pointer (ERINRLPPTR)
75 = Error reading the digit buffer read pointer (ERINRDGPTR)
76 = SCC retrofit pump—illegal buffer error (ERRETROPMBUF)
77 = SCC invalid diagnostic test group number
(ERINVDGNTGN)
100 = SCC received a DGN report when not divorced
(ERDGNNOTDIV)
101 = Write SCC micro-RAM error (ERINWRTMRAM)
102 = Invalid breakpoint
110 = No SCU(s) equipped
111 = Unequipped SCU not PESTed
120 = EB polling process not running
121 = Macro process not running
122 = Current process address invalid
04000000 = Hardware error
10000000 = Illegal PUB order
77777777 = SCU interject

**NOTE:**

When an error code is present, FWERRBUF1-9 contains additional data saved at the time of the error.

FWERRBUF1—Origin of Error

If bit 9 equals 0 = Process error interrupt

Bit 8 equals 0 = Error during base level processing
then bits 0-7 = Process id number

Otherwise

Bit 8 equals 1 = Error during interrupt-level processing
then bits 0-7 = Interrupt vector

If bit 9 equals 1 = Hardware error interrupt
Bits 0-7 = Interrupt vector
Bit 12 = Previous error flag
Bit 13 = Non-recoverable error flag
Bit 14 = Process mode (0 = Normal, 1 = Diagnostic)

FWERRBUF2—Additional Data Saved at Time of Error

If FWERRBUF0 = Octal 10000000

Bits 0-23 = PU receive register low (Data 0-23)

Otherwise

Bits 0-23 = Data from PL (0-23)

FWERRBUF3—Additional Data Saved at Time of Error

If FWERRBUF0 = Octal 10000000

Bits 0-23 = PU receive register high

Otherwise

Bits 0-11 = OPAD from PU (24-35)

Bits 12-23 = KCODE from E (10-21)

 **NOTE:**
See K-codes (E-Register Layouts)

FWERRBUF4—Additional Data Saved at Time of Error

Bit 0-15 = EXEC stack pointer (EXSTKPTR)
(Saved register - See EXSTKPTR Register Layout)

FWERRBUF5—Additional Data Saved at Time of Error

Bit 0-15 = Contents of the stack

FWERRBUF6—Additional Data Saved at Time of Error

Bit 0-15 = Frame pointer to local RAM

FWERRBUF7—Additional Data Saved at Time of Error

Bit 0-15 = EXEC program counter (EXPC)
(saved Register - See EXPC Register Layout)

FWERRBUF8—Additional Data Saved at Time of Error

Bit 0-23 = Current process table address

FWERRBUF9—Additional Data Saved at Time of Error

Bit 0-15 = SCU0-15 PEST bits

EBERRORM—Extended Bus Error Code (From Memory) - Interject Only

Bit 0-23 = Error code (octal)

0 = No error

1 = Digit buffer overflow

2 = Invalid message format from SCU

3 = Invalid number of words from SCU

4 = Invalid process ID from SCU

5 = Corrupt TEMP EB MTC buffer

6 = Corrupt process buffer

7 = EB buffer overflow

10 = Error shown in following EBLKSTATML or EBLKSTATMH
Layouts

EBLKADRM—Extended Bus Link Address (From Memory)

Bit 0-23 = See EBLKADR Register Layout

Bit 0-23 = Octal 00177777 if EBERRORM error code equals 0 or 1 (No
data saved)

EBLKSTATML—Extended Bus Link Status - Low (From Memory)

Bit 0-23 = See EBLKSTATL Register Layout

Bit 0-23 = Zero if EBERRORM error code equals 0 or 1 (No data saved)

EBLKSTATMH—Extended Bus Link Status - High (From Memory)

Bit 0-23 = See EBLKSTATH Register Layout

Bit 0-23 = Zero if EBERRORM error code equals 0 or 1 (No data saved)

MEMN—SCS Member Number

Bit 0-6 = SCS Member Number (0-7)

XLATE—First Word of SCS Unit Type Translator

Bit 0-15 = SCU0-7 SCU member equipage (two bits per SCU)

00 = Unequipped (future)

01 = Grow

10 = Special grow

11 = Operational

16-17 = Member equipage

18-20 = Member type hardware generation (MTHG)

21-23 = Member type (1=Standard Type)

Auxiliary Data—(SCS Interject Reports)

SEC1	KEY	COUNT	ESRHIGH	ESRLOW	MISCESR
DISKESR	SCUSTAT	ADR1	ADR2	ADR3	REG0
REG1	REG2	SEC2	REG3	REG4	REG5
REG6	REG7	REG8	REG9	REG10	REG11
REG12	REG13	REG14	REG15	USTATUS	SCUPESTR



NOTE:

This printout only occurs for a single SCU error, not multiple SCUs alarming. The **SCU(n)** number is printed on the action line.

SEC1—Start of Dump Section 1 (14 Words)

Bit 0-23 = 1

KEY—Error Data Key

Bit 0-23 = Error code (octal)

00000000 = No error since last SCU INIT
 00012345 = ESR single error
 00054321 = ESR multi-error (attempted but locked)
 00037777 = ESR multi-error (unlocked)

COUNT—Error Count

Bit 0-23 = Number of failures (octal) when ESR is unlocked
 = 1 if ESR is locked

ESRHIGH—SCU(n) Primary ESR High (esrh)

- Bit 0 = Miscellaneous error summary (sesrasum)
- 1 = Disk error summary (sesrbsum)
- 2 = LAN error (laner)
- 3 = SCU disk pump failure (dl)
- 4 = DS120 link frame error (ds120)
- 5-7 = Unused bits
- 8-14 = SCU error code (errcode)—See SCU Error Code List
- 15 = Summary of bits 0-4 (ESRHIGH) and bits 0-7 (ESRLOW)
- 16-23 = Ignore



NOTE:

Bits 0-15 are the same as bits 8-23 in SCS Critical Register Dump for SCU(n)ESR

ESRLOW—SCU(n) Primary ESR Low (esrl)

- Bit 0 = EPIC parity error (erer)
- 1 = Unused bit (spare 1)
- 2 = Unused bit (spare 2)
- 3 = Micro store memory parity error (msper)
- 4 = Sanity timeout error (san)
- 5 = Clock error (clock)
- 6 = Table RAM read parity error (trper)
- 7 = Invalid link state—both extended bus links ACT/ACT or STBY/STBY (invs)

⇒ NOTE:

Bits 0-7 are the same as bits 0-7 in SCS Critical Register Dump for SCU(n)ESR

MISCESR—Auxiliary ESR-Miscellaneous Errors (ERmisc)

- Bit 0 = Table RAM (TN1983) error (TRAM)
- 1 = Micro store (TN1977) error (MS)
- 2 = Enhanced peripheral interface controller (TN1976) error (EPIC)
- 3 = Trace and control (L567460) error (unofficial LAB only pack) (TC)
- 4 = Buffer fabric (TN1982) error (BF)
- 5 = Buffer controller (TN1981) error (BC)
- 6 = Voice processor interface controller (TN1980) error (VPIC)
- 7 = Voice processor (TN1979) error (VP)
- 8-11 = Multifaceted signal processor (TN1589) pack 0-3 error (MISPO-3)
- 12-13 = Multifaceted interface processor (TN4001) pack 0-1 error (MISPO-1)
- 14 = DS120 interface and time slot interchange (TN1588) error (DXI)
- 15 = Extended bus and LAN interface (KCN4) error (EBL)

DISKESR—Auxiliary ESR-Disk Errors (ERdisk)

Bit 0-2 = BIDO-2—SCSI bus device ID number:

0-3 = Hard disk drive 0-3

6 = Floppy disk drive

7 = Host adapter circuit pack (TN1978)

3-4 = BUS0,1—SCSI Bus 0,1 error

(bits 0-2 indicate which device on the bus had the error).

5-7 = Unused bits

⇒ NOTE:

The following bits are an image of bits 8-15 of register "esrl" which are used to control the LED error indicators on the disk drive circuit packs

8-11 = DSK00-03—Disk errors for SCSI bus 0

12-15 = DSK10-13—Disk errors for SCSI bus 1

SCUSTAT—SCU(n) Hardware Status Register (usr)

- Bit 0 = SCU is in-service (SERV)
- 1 = Hard initialization (INIT)
- 2 = Run via EPROM (RUNEP)
- 3 = PEST for ERRSUM bit in EBLKSTAT (PSTESR)
- 4 = Inhibit transmit status (reply buffer look empty) (INHXSTAT)
- 5 = Inhibit ESR lock (IESRLK)
- 6 = Inhibit SCU access to LAN (ILAN)
- 7 = Inhibit SCU access to EB (IEXBUS)
- 8 = SCU file descriptor select (FILE0)
- 9 = SCU file descriptor select (FILE1)
- 10 = SCU file descriptor type (0 = DGN, 1 = OPER) (FILETY)
- 11 = SCSI bus select (FILESB)
- 12 = Enable writing of SERV (ESERV)
- 13 = Enable writing of INIT (EINIT)
- 14 = Enable writing of RUNEP (ERUNEP)
- 15 = Enable writing of PSTESR (EPSTESR)
- 16 = Enable writing of INHXSTAT (EINHXSTAT)
- 17 = Enable writing of IESRLK (EIESRLK)
- 18 = Enable writing of ILAN (EILAN)
- 19 = Enable writing of IEXBUS (EIEXBUS)
- 20 = Enable writing of FILE0 (EFILE0)
- 21 = Enable writing of FILE1 (EFILE1)
- 22 = Enable writing of FILETY (EFILETY)
- 23 = Enable writing of FILES B (EFILESB)

ADR1—First Program Return ADR

ADR2—Second Program Return ADR

ADR3—Third Program Return ADR

REG0-2—Processor ALU Register 0-2**SEC2—Start of Dump Section 2 (14 WORDS)****REG3-15—Processor ALU Registers 3-15****USTATUS—SCU(n) Software Status**

- Bit 0 = SCU is PESTed via TTY request (SCUP)
- 1 = Disk in use as copy destination (DISKIUCD)
- 2 = Disk in use as copy source (DISKIUCS)
- 3 = Disk in use-format in progress (DISKIUF)
- 4 = Announcement update in progress (ANUPDIP)
- 5 = Skip announcement update (SANNUPD)
- 6 = SCU remove pending (RMVPND)
- 7 = In progress activity monitor (IPAM)
- 9-11 = Announcement update status (ANUPDSTAT)
 - 0 = No announcement update activity
 - 1 = Complete
 - 2 = In-progress
 - 3 = Failed
 - 4 = Stopped
- 12 = SCU is out-of-service (OS)
- 13 = SCU is removed via TTY request (RMVTTY)
- 18 = Pump of SCU for DGN succeed (UDGNPMPPASS)
- 20-23 = SCU MAINCODE (MAIN) (See Subunit-Maincodes)

SCUPESTR—SCU 0-15 PEST Register

Bits 0-15 = Hardware PEST bits for SCU 0-15

⇒ NOTE:

Bits 0-15 are the same as FWERRBUF9 (bits 0-15) in SCS Critical Register Dump.

Auxiliary Data—(SCS BLM Reports)

BSIZE	KIND	HEADER	DATA0	DATA1	DATA2
DATA3	DATA4	DATA5	DATA6	DATA7	DATA8
DATA9	DATA10	DATA11	DATA12	DATA13	DATA14
DATA15	MBPTRS*	SDMBPTR*	MBSTAT*	SOFTPST*	0...0
SCUOS*					

* Data output only when kind = 1 (Illegitimate)

BSIZE—Auxiliary Data Block Size

Bit 1-6 = Block size

KIND—Kind of Report

Bit 0 = Kind of report (0 = Autonomous, 1 = Illegitimate)

HEADER—Frame Report Header [Maintenance Buffer (MB)]

Bit 0-6 = Macro subopcode (See SCS Macro Subopcode List)

7 = Unused

8-11 = Number of words in report

12 = Segment report flag

13 = Autonomous report flag

14 = Error flag

15 = Unused

16-20 = Macro ID number (assigned by Message Dispenser)

21 = Source of report (0=CONTR, 1=SCU)

⇒ NOTE:

1. Invalid SCU order if bit 13=0, bit 14=1, and bit 21=1.
2. Autonomous SCU error if bit 13=1, bit 14=1, and bit 21=1.
3. Unexpected macro response if bit 13=0, bit 14=0, and bit 21=d.c.

DATA0-15—Frame Report Data Words (0-15)

DATA0—Second Header (If header bit 21 = 1)

Bit 0-3 = SCU number

4 = Command type

0 = In-service command

1 = Out-of-service command

5 = Error flag from header (bit 14)

0 = Report fail

1 = Report pass

DATA1—Error code (If header bit 21 = 1)

Bit 0-7 = SCU error subcode (See SCU Error Subcode List)

8-15 = SCU error code type

1 = Order error

2 = Audit error

3 = Hardware error

4 = Action reply (MISC)

5 = AAP error

6 = MIP-CDSU errors

DATA2—SCU First Return Address

DATA3—SCU Second Return Address

DATA4—SCU Third Return Address

DATA5—SCU ALU Register R0

DATA6—SCU ALU Register R1

DATA8—SCU ALU Register R2

DATA8—SCU ALU Register R3

DATA9—SCU ALU Register R4

DATA10—SCU ALU Register R11

DATA11—SCU ALU Register R12

DATA12—SCU ALU Register R13

DATA13—SCU ALU Register R14

DATA14—SCU ALU Register R15

DATA15—Unused

MBPTRS—Maintenance Buffer Pointers

Bit 0-11 = Read pointer

12-23 = Write pointer

SDMPTR—Shadow Maintenance Buffer Pointer

Bit 0-11 = Temporary read pointer

MBSTAT—Maintenance Buffer Status

Bit 0-11 = Number of reports

SOFTPST—SCU PEST Summary

Bit 0-15 = If set, SCU 0-15 errors are inhibited

SCUOS—SCU(s) Out of Service Summary

Bit 0-15 = If set, SCU 0-15 is out of service

SCU Internal Registers (via TTY Request)

USTATUS SCUESR SCUSTAT TRAN1 TRAN2 TRAN3 0.....0 0.....0

USTATUS—SCU Software Status

- Bit 0 = SCU is PESTed via TTY request (SCUP)
- 1 = Disk in use as copy destination (DISKIUCD)
- 2 = Disk in use as copy source (DISKIUCS)
- 3 = Disk in use - format in progress (DISKIUF)
- 4 = Announcement update in progress (ANUPDIP)
- 5 = Skip announcement update (SANNUPD)
- 6 = SCU remove pending (RMVPND)
- 7 = In progress activity monitor (IPAM)
- 9-11 = Announcement update status (ANUPDSTAT)
 - 0 = No announcement update activity
 - 1 = Complete
 - 2 = In-progress
 - 3 = Failed
 - 4 = Stopped
- 12 = SCU is out of service (OS)
- 13 = SCU is removed via TTY request (RMVTTY)
- 18 = Pump of SCU for DGN succeed (UDGNPMPPASS)
- 20-23 = SCU MAINCODE (MAIN) (Subunit—Maincodes)

SCUESR—SCU Error Source Register

- Bit 0 = EPIC parity error (EPER)
- 3 = Micro store memory parity error (MSPER)
- 4 = Sanity timeout error (SAN)
- 5 = Clock error (CLOCK)
- 6 = Table RAM read parity error (TRPER)
- 7 = Invalid link state - both extended bus links ACT/ACT or STBY/STBY (INVLS)
- 8 = MISC. error summary (SESRASUM)
- 9 = Disk error summary (SESRBSUM)
- 10 = LAN error (LANER)
- 11 = SCU disk pump failure (DL)
- 12 = DS120 link frame error (DS120)
- 16-22 = SCU error code (See SCU Error Code List)
- 23 = Summary of bits 0-15

SCUSTAT—SCU Hardware Status Register

- Bit 0 = SCU is in-service (SERV)
- 1 = Hard initialization (INIT)
- 2 = Run via EPROM (RUNEP)
- 3 = PEST for ERRSUM bit in EBLKSTAT (PSTESR)
- 4 = Inhibit transmit status (reply buffer look empty) (INHXSTAT)
- 5 = Inhibit ESR lock (IESRLK)
- 6 = Inhibit SCU access to LAN (ILAN)
- 7 = Inhibit SCU access to EB (IEXBUS)
- 8 = SCU file descriptor select (FILE0)
- 9 = SCU file descriptor select (FILE1)
- 10 = SCU file descriptor type (0=DGN, 1=OPER) (FILETY)
- 11 = SCSI bus select (FILESB)
- 12 = Enable writing of SERV (ESERV)
- 13 = Enable writing of INIT (EINIT)
- 14 = Enable writing of RUNEP (ERUNEP)
- 15 = Enable writing of PSTESR (EPSTESR)
- 16 = Enable writing of INHXSTAT (EINHXSTAT)
- 17 = Enable writing of IESRLK (EIESRLK)
- 18 = Enable writing of ILAN (EILAN)
- 19 = Enable writing of IEXBUS (EIEXBUS)
- 20 = Enable writing of FILE0 (EFILE0)
- 21 = Enable writing of FILE1 (EFILE1)
- 22 = Enable writing of FILETY (EFILETY)
- 23 = Enable writing of FILES B (EFILESB)

TRAN1—SCU Translation Data Word 1

Bit 0-3 = TSI Port number connected to SCU
4 = TSI SPC number connected to SCU
5-9 = TSI MEMN connected to SCU
19-20 = SCU software version
21-23 = Type of service circuit

TRAN2—SCU Translation Data Word 2

Bit 0-11 = DSP0-5 software version (2 bits per DSP)
12-23 = DSP0-5 equipage bits (2 bits per DSP)

TRAN3—SCU Translation Data Word 3

Bit 0-7 = DISK0-3 capacity indicator (2 bits per disk)
8-15 = DISK0-3 equipage bits (2 bits per disk)
16-23 LAN address

SCS Macro Subopcode List (Octal)

See Auxiliary Data—(SCS BLM Reports).
If header bits 0-6 are not zero, an unexpected macro response has occurred.

See the following tables.

SCS Controller Macros (Header bit 21=0):**Macro****Subopcode****Header (Bits 0-6) Macro Description**

001	Dump all SCS controller breakpoints macro
002	Initialize SCU(s) macro
003	Inter-SCU raw disk copy macro (Word 0)
004	Inter-SCU raw disk copy macro (Word 1)
005	Inter-SCU disk file copy macro (Word 0)
006	Inter-SCU disk file copy macro (Word 1)
007	Read SCC ROM version marco
010	Initialize CDSUS macro
011	Pump SCU MIPS macro
012	Update DS120 port tables
013	SCS controller initialization through update bus macro
014	SCU equipment configurations initialization macro
015	Pump SCU MSPS macro
016	Check deferred announcement update macro
017	SCS controller generic update initialization marco
020	Hard SCS controller initialization macro
022	SCS controller disk pump
023	SCS generic retrofit pump
024	EB/LAN FIFO test
025	SCS controller diagnostic
026	SCS macro task abort
027	SCS verify program HASHSUM
030	Clear all SCU primary ESRS
031	Write all SCU status registers
032	Write all SCU status registers enable
033	SCU access test
034	Write controller file to disk
035	Write low controller 16-bit address
036	Write high controller 16-bit address
037	File write bit map

SCU Macros (Header bit 21=1) :**Macro****Subopcode****Header (Bits 0-6) Macro Description**

001	Read RAM (Length)
002	Read RAM (16-Bit address)
003	Read announcement busy/idle status
004	Read DS120 port status
005	SCU loop
006	Start SCU task
007	Stop SCU task macro
010	Set SCU fast breakpoint
011	Set normal breakpoint
012	Set custom breakpoint (Micro-program address)
013	Set Custom breakpoint (Length)
014	Set custom breakpoint (Direct memory address)
015	Set custom breakpoint (Indirect memory address)
016	Set custom breakpoint (Indirect register address)
017	Clear one breakpoint for the SCU
020	Clear all breakpoints for the SCU
021	Dump all breakpoints for the SCU
022	Clear SCU error register (MISCERRREG and DISKERRREG)
030	Read SCU Raw data from disk
031	Read SCU file from disk
032	Read low 16-bit address

SCU Macros (Header Bit 21=1) (Contd) :**Macro****Subopcode****Header (Bits 0-6)****Macro Description**

033	Read high 16-bit address
034	Read SCU micro-program word
035	Read SCU raw error data
036	Read SCU register
037	Read SCU program version
040	Flush SCU queues
042	Copy SCU disk file
044	Write SCU sub-block data
045	Write SCU 16-bit data word
046	Write last SCU 16-bit data word in sub-block
047	PEST SCU error reports
050	UnPEST SCU error reports
051	Read SCU error report PESTs
101	Copy SCU raw disk
103	Format SCU disk
104	SCU diagnostic
106	Write SCU raw data to disk
110	Write SCU register
111	Write SCU memory (Table RAM only)
114	Write SCU 16-bit address
116	Write SCU micro-program word
117	Write SCU micro-program data
124	Convert SCU database
127	Deferred SCU announcement update

SCU Error Code List (Octal/Hex)

See Auxiliary Data—(SCS Interject Reports),
SCS Critical Registers FLEV and Interject Reports—(SCU0ESR-SCU15ESR)
SCU Internal Registers (via TTY Request)—(SCUESR).

Octal/Hex

20/0x10	Host Adapter Circuit Pack Selection Failure, Side Select Error Interrupt
21/0x11	Queue Does Not Have Sufficient Space
22/0x12	Base Cycle (BAse) or Signal Proocessing (SPx) Phase Timeout Error
23/0x13	Disk Format Error
24/0x14	Disk 0 Not Equipped
25/0x15	Announcement Table Merge Error
26/0x16	Disk Link Vector Size Problem
27/0x017	No Free Space on Disk
30/0x018	Segment Out-of-Range
31/0x019	LAN Initialization Failure
32/0x01a	Record Error Recovery Failure, Restore SCU
33/0x01b	LAN Software Driver Problem in Deferred Announcement Update
34/0x01c	Time-Out Error in Deferred Announcement Update
35/0x01d	Event Error in Deferred Announcement update
36/0x01e	Error in Loading Txmt Buffer Descriptor
37/0x01f	Error in setting SCB and CP
40/0x020	"OPEN" Detected on LAN Cable
41/0x021	"SHORT" Detected on LAN Cable
42/0x022	LAN Overrun (rcv-dma)
43/0x023	LAN Transmit/Receive Queue Error
44/0x024	EBL Parity Error when Reading Input FIFO
45/0x025	Poll Time-Out from AAP
46/0x026	Default Error for SCU Program Download (Download did not finish within allocated time)

Octal/Hex

47/0x027	ECD Parameter Mismatch with Value Read from the Disk
50/0x028	Tone File Error
140/0x60	General MIP Errors
141/0x61	MIP Transmit FIFO Error
142/0x62	MIP Receive FIFO Error
143/0x63	MIP Equipage Error
144/0x64	CDSU Equipage Error
145/0x65	General Interject Type Error Message Received From CDSU

**NOTE:**

See *Service Circuit System (SCS)—Maintenance TOP* (234-151-077AC) to Analyze CDSU-Related BLM and Interject Error Codes

146/0x66	MIP Disk Job Error
147/0x67	MIP Miscellaneous Data Error
150/0x68	MIP Load Check Sum Error
151/0x69	MIP or CDSU Reply Fail
152/0x6A	ASR Miscellaneous Errors

thru

157/0x6F	ASR Miscellaneous Errors
160/0x70	ASR LAN MIP0 Error
161/0x71	ASR LAN MIP1 Error
162/0x72	ASR LAN CDSU0 Error
163/0x73	ASR LAN CDSU1 Error
164/0x74	ASR LAN CDSU2 Error
165/0x75	ASR LAN CDSU3 Error
166/0x76	ASR LAN CDSU4 Error
170/0x78	ASR T1 MIP0 Error
171/0x79	ASR T1 MIP1 Error
172/0x7A	ASR T1 CDSU0 Error
173/0x7B	ASR T1 CDSU1 Error
174/0x7C	ASR T1 CDSU2 Error
175/0x7D	ASR T1 CDSU3 Error
176/0x7E	ASR T1 CDSU4 Error

Disk Copy (COPYX) Errors

Octal/Hex

60/0x30	ECD_SETUP
61/0x31	ECD_WRITEFLAG
62/0x32	ECD_ANN
63/0x33	ECD_EXPAND
64/0x34	ECD_CRITICAL
65/0x35	ECD_CHUNK
66/0x36	ECD_CLUSTER
67/0x37	ECD_RDSTART
70/0x38	ECD_RDEND
71/0x39	ECD_WRSTART
72/0x3a	ECD_WREND
73/0x3b	ECD_2SUB
74/0x3c	ECD_RD
75/0x3d	ECD_WR
76/0x3e	ECD_ECD
77/0x3f	ECD_AXDATJOB
100/0x40	ECD_STATEFLAG
101/0x41	ECF_CKSUM
102/0x42	ECF_FILE

SCU Error Subcode List (Octal)

See Auxiliary Data—(SCS BLM Reports)

Order Errors (DATA1 Bits 8-15 = 1)

- 1 Invalid Input Order or Cannot Perform the Request
- 2 Input Order Data Range Check
- 3 Input Order out of Sequence
- 4 Disk File Does not Exist (Size = 0)
- 5 Disk File Access Crosses Block Boundary
- 6 File Section not on Floppy Disk
- 7 Request below Range of the Floppy Disk File Section
- 10 Request above Range of the Floppy Disk File Section
- 11 Disk Copy Source File > Destination File
- 12 ECD Parameter Problem
- 13 Channel Hardware is already Busy
- 14 Playback Concatenation Limit (32) Exceeded
- 15 Too many disk Write-Read Jobs Pending (> 8)

Audit Errors (DATA1 Bits 8-15 = 2)

- 1 SCSI Bus Error Counter—Audit Failure
- 2 Announcement Compare—Audit Failure
- 3 Playback Channel—Audit Failure
- 4 Record Channel—Audit Failure

Hardware Errors (DATA1 Bits 8-15 = 3)

- 1 Disk Data Job Error
- 2 MSP Sanity Failure
- 3 MSP Equipage Failure

Action Reply—Miscellaneous (DATA1 Bits 8-15 = 4)

1	Miscellaneous Data Error
2	Check Sum Error
3	AXsbt Data Job Time-Out
4	"WAIT" Time-Out Occurred
5	Base Level Cycle Error
6	Base Level Cycle (BAsE) Phase Error or Signal Processing (SPx) Phase Error
7	Miscellaneous Data Error in Record Process
10	Data Job Failure in Record Process
11	Signal Processing Error
12	"WAIT" Event Error Occurred

This group represents errors that occur when an AAP order is received/executed.

AAP Order (DATA1 Bits 8-15 = 5)

- 1 Another Order is in Progress
- 2 Process ID Mismatch
- 3 Bad Announcement Status
- 4 Illegal Order Sequence
- 5 Error in Moving Data from LAN RAM to TR
- 6 Error in Returning Frame Structures to RFA
- 7 Error in Loading Txmt Buffer Descriptor
- 10 Error in Setting SCB and CP
- 11 Error in Reading or Writing the Disk
- 12 Disk Offset Table not Initialized
- 13 Illegal Announcement Length (< 4 Blocks)
- 14 Error in Linking through Vector Table
- 15 Transmit (to AAP) Timed Out
- 16 Illegal Order from AAP
- 17 Order Data Range Order
- 20 File not found on Disk (Size = 0)
- 21 No Poll Request Received from AAP
- 22 Math Error, Overflow, Divide by Zero, etc.
- 23 Error in the LAN Co-Processor
- 24 Header Data Mismatch (for example; announcement number)
- 25 Data Check-Sum Error
- 26 Disk State Flag Error
- 27 Invalid Announcement Number
- 30 Miscellaneous Data Error

AAP Order (DATA1 Bits 8-15 = 5) (Contd):

- 31 Error Loading FS Parameters
- 32 Error Loading DLVT Parameters
- 33 Error Loading Version Parameters
- 34 Error Loading Status Parameters
- 35 SCSI ID Out of Range
- 36 Disk not Equipped
- 37 Not Enough Space on the Disk
- 40 Error during ANN Data Transfer to/from Disk
- 41 Poll from AAP has Timed Out
- 42 Error in Addressing List of Free CLUMPS in DLVT
- 43 Clean-up of at and DLVT Failed
- 44 Disk for AM Announcement not Zero
- 45 Not Enough Space in AM RAM for Announcement
- 46 Internal Assignment Mismatch
- 47 External Assignment Mismatch
- 50 LAN XMIT Hardware Error
- 51 LAN COP Ran out of Resources
- 52 CRC Error Threshold Exceeded
- 53 Packet Alignment Threshold Exceeded
- 54 Announcement Compare Mismatch
- 55 LAN RCV Hardware Error
- 56 Announcement Set Error for Assign

MIP-CDSU Errors (DATA1 Bits 8-15 = 6)

- 1 Invalid Message Received from a CDSU
- 2 General BLM Type Error Message Received from a CDSU

**NOTE:**

See *Service Circuit System (SCS)—Maintenance TOP*
(234-151-077AC) to Analyze CDSU-Related BLM and Interject Error Codes

- 3 No Setup Order was Received Before a Speech Recognition Collect Order
- 4 No CDSU or MIP is Equipped to Process the Requested Order
- 5 CDSU Channel Number is not Within Range

Restore SCS Fail Data (Via TTY Message)

FAILDATA is printed to identify the reason an SCS failed to restore. The format is as follows:

RST SCS FAILDATA=[*dde*0000*f* or 04*ggggggg*]

Where: *dd* = Failure Code (Octal)

01 = Program update failed during controller restore

02 = Random access memory (RAM) update failed during controller restore

03 = Verify HASHSUM failed during controller restore

05 = Controller hard INIT failed

22 = SCU INIT failed

23 = SCU equipment configuration data (ECD) failed

24 = SCU multifaceted signal processor (MSP) failed

25 = SCU MIP marco failed

26 = SCU CDSU marco failed

e = Unit/macro failure code (Octal):

0 = Macro failed. (*f* contains marco failure data)

4 = Macro successful but unit reported failure. (*f* always 0)

Continued on next page

Where: f = Message dispenser (macro) failure data:

- 0 = Invalid macro ID passed to message dispenser (program error)
- 1 = Macro not accepted by frame (all 1's response not received from frame)
- 2 = Macro response not received in time allowed [Peripheral Maintenance Operating System (PMOS) task hold timeout]
- 3 = Macro response not received in time allowed (macro response not ready)
- 4 = Message dispenser request was successful but a task hold was not requested (program error)

04 = Errors occurred after RAM update

gggggg = Global RAM error source register, GRESR (Octal):

- Bit 0-3 = RAM Bank A parity error bits (ERAP)
- 4-7 = RAM Bank B parity error bits (ERBP)
- 8-11 = Destination bus data parity error bits (EDDP)
- 13 = Source Bus A address parity error (ESAAP)
- 14 = Source Bus B address parity error (ESBAP)
- 15 = Cross-connect update bus mismatch (EXUMM)
- 16 = Cross-connect SYNDROBUS mismatch (EXSMM)
- 17 = Always 1. Indicates macro success but unit reported failure.

PUPHDATA—SCS (PHASE 2, 3, OR 4)

**NOTE:**

TTY request: **OP:ERAPDATA PUPHDATA:MFNUM a!**

a = MFNUM or range of MFNUM for Phase 2, 3, or 4

WORD 0 WORD 1 WORD 2 WORD 3 WORD 4 WORD 5
WORD 6 WORD 7

WORDS 0-3 = Controller 0

WORDS 4-7 = Controller 1

WORD 0,4

Bit 0-2 = Boot task ACK code

- 0 = A boot task has been spawned
- 1 = A spawned task did not complete
- 2 = Controllers booted duplex
- 3 = One controller removed
- 4 = Both controllers failed
- 5 = Request error
- 6 = No boot task requested
- 7 = PMOS returned fail

Bit 3-5 = Request code

- 0 = Do not boot frame
- 1 = Hard controller boot (HDWRLEV 3 or 4)
- 2 = Soft controller boot (HDWRLEV 1)
- 3 = Soft controller boot (HDWRLEV 2)
- 4 = Remove controller

Bit 6-9 = Request data code (octal)

- 0 = Frame unequipped
- 1 = Frame in growth state
- 2 = Controller in zap table
- 3 = Controller in zero start table
- 4 = Controller in babbling bus table
- 5 = Controller is out of service
- 6 = Controller boot level is HDWRLEV 3 or 4
- 7 = Controller normal

Bit 10 = Final configuration request

(0 = Controller removed, 1 = Controller restored)

Bit 11-16 = Failing data code (octal)

- 0 = All tests pass or controller already removed prior to phase
- 1 = Main COMM pulse on bus failure
- 2 = PU bus loop failure
- 3 = IPUB out-of-service failure
- 4 = Topic - restore failure
- 5 = Post restore access test failure
- 6 = PMOS - failed to schedule "Restore"
- 7 = PMOS - failed to schedule "Remove"
- 10 = Frame rejected macro
- 11 = PMOS - failed to schedule "Parallel Polling"
- 12 = Parallel polling timeout
- 13 = Frame failed macro
- 14 = Error while polling macro
- 15 = Controller had less good SCUs than mate
- 16-77 = Unused

Bit 17-22 = SCS Unit Type (Octal 50)

WORD 1,5

SCU INIT Macro Results

- Bit 0-15 = SCU 0-15 pass/fail bits
 - 0 = Fail (or unequipped)
 - 1 = Pass
- 16 = Unused
- 17-23 = SCS member number

WORDS 2,6

- Bit 0-4 = Failed macro ID code (octal)
 - 0 = Unused
 - 1 = SCU initialize macro
 - 2 = Controller disk pump macro
 - 3 = Controller update macro
 - 4 = Controller verify HASHSUM macro
 - 5 = SCU access test macro (hard boot)
 - 6 = SCU ECD macro
 - 7 = SCU MSP macro
 - 10 = Controller hard initialize macro (soft boot)
 - 11 = SCU access test macro (soft boot)
 - 12 = Controller hard initialize macro (hard boot)
 - 13 = Update DS120 port table macro
 - 14 = SCU MIP pump macro
 - 15 = SCU CDSU initialize marco
- 5 = SCU pump code
 - 0 = This controller was not pumped from SCU disk
(if duplex, this controller was updated from mate)
 - 1 = This controller was pumped from SCU disk (using first
SCU to pass SCU initialize macro - see word 1,5)

WORDS 3,8 Not Used

SP—Signal Processor Frame Printouts

SP Internal Registers (FLEV Report)

ESR2	ESR2	WPEST	WPEST	MAR	MAR
MDR	MDR	CDR	CDR	MXAR	MXAR
MXWR	MXWR	MXHR	MXHR	MFWR	MFWR
DPWR	DPWR	DPWAUX	DPWAUX	TBSR	TBSR
PLSR	PLSR	EDST	EDST	EDSTM	EDSTM
SDST	SDST	AP33	AP33	SDSTM	SDSTM
MMST	MMST	MMSTM	MMSTM	MSEC	MSEC
XMC	XMC	PSTAT	PSTAT	FHPB	FHPB
FSZB	FSZB	FLPB	FLPB	FDGB	FDGB
FDPI	FDPI	FDPO	FDPO	MALLO	MALLO
MALLZ	MALLZ	MZOZ	MZOZ	MOZO	MOZO
MEMZ	MEMZ	MEMO	MEMO	SPECT	SPECT
SVMEMA	SVMEMA	SVMEND	SVMEND	ESR3	ESR3
DTARA	DTARA	DTARB	DTARB	DTDOPA	DTDOPA
DTOPB	DTOPB	DTBST	DTBST	DTCNT	DTCNT
DTSQFF	DTSQFF	DTSANT	DTSANT	DTRCVL	DTRCVL
DTRCVU	DTRCVU				
CONTR 0	CONTR 1	CONTR 0	CONTR 1	CONTR 0	CONTR 1



NOTE:

Prefix all words with SP4.

ESR2—Error Source Register 2

- Bit 0 = The PU sequencer has failed to complete a preceding PU instruction
- 1 = Spare F/F
- 2 = Matrix work register mismatch
- 3 = Spare F/F
- 4 = An ASW failure has been detected in the matrix
- 5 = A homogeneity failure has been detected in the matrix
- 6 = Matrix hold registers mismatch
- 7 = Matrix hold register mismatches with matrix work register

WPEST—Write PEST Register Port D0

- Bit 12 = PEST error source register 1 bits 4, 8 (not applicable to SP2)
- 13 = PEST error source register 1 bits 2, 3, 6, 10-19, 21 (not applicable to SP2) and error source register 3 bits 2, 3 for SP2
- 14 = PEST error source register 2 bits 2, 4-7 (not applicable to SP2)
- 15 = PESTs error source register 1 bit 5
- 16 = PESTs error source register 1 bit 7
- 17 = PESTs SP2 interface error source register 3 bits 1, 2, 4-9
- 18 = PESTs SP2 interface error source register 3 bit 0
- 19-22 = Spare FFs
- 23 = When set, this controller receives and writes into its memory all data written into the mate controller's memory

MAR—Memory Address Register

Bit 0-11 = Contents of memory address register

MDR—Memory Data Register

Bit 0-23 = Contents of memory data register

CDR—Coder Register

Bit 0-11 = Complete contents of coder register

MXAR—Matrix Address Register

Bit 0-8 = Contents of matrix address register

MXWR—Matrix Work Register

Bit 10-15 = MF tone point digit from MFWR

or

Bit 0-3 = Matrix homogeneity bits read from SP with work register

4-7 = Matrix ASW bits read from SP with work register

8-15 = Lower half of MX work register bits 0-7 of SD read

16-23 = Upper half of MX work register bits 8-15 of SD read

MXHR—Matrix Hold Register

- Bit 0 = Matrix row homogeneity row—bits reset when a row is enabled
- 1 = Matrix row homogeneity row—bits set when a row is enabled
- 2 = Matrix row homogeneity row—bits set when a row enabled
- 3 = Matrix row homogeneity row—bits set when a row is enabled
- 4-7 = Matrix ASW for row bits 0-3, 4-7, 8-11, and 12-15. Set when row is enabled
- 8-23 = Contents of matrix hold register scan or SD data from matrix or contents of matrix work register SD write data to matrix

MFWR—MF Work Register Port D1

- Bit 0-4 = MF work list entry timer
- 5-8 = MF work list entry digit four
- 9-12 = MF work list entry digit three
- 13-16 = MF work list entry digit two
- 17-20 = MF work list entry digit one
- 21 = MF transmitter tone points status U = 0 down, U = 1 up
- 22 = MF outputting rate R = 0 = 7 PPS 70 ms, R = 1 = 10 PPS 55 ms
- 23 = Last digit indicator L = 1 = last digit

DPWR—Dial Pulse Work Register

- Bit 0-11 = Trunk distributor tag or trunk distributor address for this entry
- 12-15 = Digit or remaining pulses of digit being outputted
- 16-21 = Pulse and interdigit timer
 - 22 = SD point status U = 0 = on-hook or SD = 0 U = 1 = off-hook or SD set
 - 23 = Last digit indicator L = 1 = last digit

DPWAUX—Dial Pulse Work Register

- Bit 12-15 = Digit or remaining pulses of digit being outputted
- 16-21 = Pulse and interdigit timer
 - 22 = SD PT status 0 = on-hook 1 = off-hook
 - 23 = Last digit indicator 1 = LDI

TBSR—T-Bit Shift Register

- Bit 0-5 = Bit 0 of T1 through T6 shift register
- 6-11 = Bit 1 of T1 through T6 shift register
- 12-17 = Bit 2 of T1 through T6 shift register
- 18-23 = Bit 3 of T1 through T6 shift register

PLSR—Present Look Register

Bit 8-23 = Contents of present look register
or

Bit 8 = MF reception signal present point
10-15 = MF reception tone points

EDST—Executive and DP Output Sequencer

Bit 0 = Executive sequence state 0 flip-flop
1 = Executive sequence state flip-flop
2 = Executive sequence hold flip-flop
3 = Executive sequence call flip-flop
4 = 5-ms flip-flop
5 = 5-mS AUX flip-flop
6 = When set, MF sequence returned-UNIV cycle
7 = When set, MF sequence returned-MISC cycle
8 = When set, scan sequence returned-UNIV cycle
9 = When set, scan sequence returned-MISC cycle
10 = When set, DP out sequence returned
11 = Sanity timer counter 3
12 = Sanity timer counter 2
13 = Sanity timer counter 1
14 = SERR flip-flop
15-18 = DP out sequence state flip-flops
19 = When set, DP sequence returns to EXEC
20 = When set, DP sequence calls matrix sequence for 1 bit SD write
21 = When set, executive sequence match leads to mate are high all
state F/F are 0 read only
23 = When set, DP sequence is stopped by DP auxiliary stop. Read
only

EDSTM—Executive and DP Output Sequencer Data as Modified by Fault Recognition

Same layout as EDST

SDST—Scan and Digit Reception Sequencer

- Bit 0 = Scan read request to matrix sequence
 - 1 = When set, inhibit buffer full leads
 - 2 = When set, ZT23 F/F forces T-bits T2, T3, to zero
 - 3 = When set, REX F/F returns control to executive sequencer
- 4-8 = Digit reception state F/F
 - 9 = When set, dial pulse work list full
 - 10 = When set, IAUX indicates coder = 2
 - 11 = When set, MUD F/F indicates update of memory T-BITS
 - 12 = When set, carry over F/F bridges states 6 and 7
 - 13 = When set, INS inhibits T-BIT shift
 - 14 = When set, up F/F indicates update of T-BIT shift registers
 - 15 = T-BIT update auxiliary F/F
 - 16 = When set, the universal scan field is accessed
 - 17 = Inhibit work flip-flop
 - 18 = Dial pulse work list AUX. F/F read only
- 19-20 = T-BIT update counter
 - 21 = When set, holds decision to modify T4T5 T-BITS on return to ST7 from work state which could overwrite DPWR
 - 22 = When set, INSA keeps INS reset
 - 23 = Digit reception AUX. stop, read only

AP33—Additional Scan Sequencer F/F

Bit 0 = Inhibit DP in mode when set

SDSTM—Scan and Digit Reception Sequencer Data as Modified by Fault Recognition

Same layout as SDST

MMST—Matrix and MF Out Sequencers

Bit 0-3 = These bits define the matrix point within the row. Read access only

4-6 = Matrix state F/F GDFFD, E, F

7-9 = Matrix function F/F's GDFFA, B, C

10 = Matrix sequence stop flip-flop, BOGO, read only

11-14 = MF sequence state F/F's

15 = Read only—MF sequence stop F/F write only—set matrix call F/F (AUX)

16 = When set, matrix sequencer does a memory operation rather than a matrix operation

19 = Homogeneity for matrix cutoff "A" leads to mate. When reset, both address cutoff "a" and data cutoff "a" are set "a 1" if either is reset

20 = Homogeneity for matrix cutoff "B" leads to mate. When reset, both address cutoff "B" and data cutoff "B" are set "A 1" if either is reset

21 = Matrix return F/F

22 = Matrix inhibit gate in F/F

23 = MF translator match 0 is match error. Read only

MMSTM—Matrix and MF Out Sequencer Data as Modified by Fault Recognition for Restarting SP Controllers

Same layout as MMST

MSEC—Millisecond Clock

- Bit 0-14 = Contents of millisecond clock register
- 15 = Level detector test in progress, read only access, write access is via SP4CLDW
- 16 = Analog timer test in progress, read only access, write access is via SP4CATW

XMC—Extended Millisecond Clock

- Bit 0-6 = Contents of extended MS clock counter state(s)
 - 0-7 = Unassigned
 - 8 = Clock has elapsed 80-msec state(s)
 - 9-31 = Unassigned
 - 32 = Clock has elapsed 320-msec state(s)
 - 33-127 = Unassigned
- 7-10 = Indicates the clock phase inhibited count 0 or 15—no phase inhibited, count 1—OOT02 inhibited. Count 14—13TOO inhibited—read only, write via SP4CEDD
- 11 = When set, all phases inhibited—read only write via SP4CEDD

PSTAT—Pointer Full—Empty Status Register

- Bit 0 = High priority (HP) buffer full (0 = full, 1 = not full)
- 1 = High priority (HP) buffer empty (0 = empty, 1 = not empty)
- 2 = Low priority (LP) buffer full (0 = full, 1 = not full)
- 3 = Low priority (LP) buffer empty (0 = empty, 1 = not empty)
- 4 = Digit (DG) buffer full (0 = full, 1 = not full)
- 5 = Digit (DG) buffer empty (0 = empty, 1 = not empty)
- 6 = Seizure (SZ) buffer full (0 = full, 1 = not full)
- 7 = Seizure (SZ) buffer empty (0 = empty, 1 = not empty)
- 8 = Dial pulse input work list full
- 9 = Dial pulse input work list empty
- 10 = Dial pulse output work list full
- 11 = Dial pulse output work list empty

FHPB—High Priority Buffer Pointer R-W

- Bit 0-6 = Read pointer
- 9-10 = Grounded returns as ones
- 12-18 = Write pointer
- 21-22 = Grounded returns as ones

FSZB—Seizure Buffer R-W Same Layout as FHPB**FLPB—Low Priority Buffer Pointer R-W**

Same layout as FHPB

FDGB—Digit Buffer Pointer R-W

Same layout as FHPB

FDPI—Dial Pulse in Work List Pointer R-W

Same layout as FHPB

FDPO—Dial Pulse Out Work List Pointer R-W

Same layout as FHPB

MALLO—CO/1 All One Memory Word Parameter

MALLZ—CO/1 All Zero Memory Word Parameter

MZoz—CO/1 Alternating Zero—One Memory Parameter

MOZO—CO/1 Alternating One—Zero Memory Parameter

MEMZ—CO/1 SP Member Identity Word One. If this SP has member number 0-23, the corresponding bit at address SP4MEMZ in SP memory will be set to one

MEMO—CO/1 SP Member Number Identify Word Zero. If this SP has member number 0-23, this corresponding bit at address SP4MEMZ in SP memory will be set to one

SPECT—(Not used)

SVMEMA—SP Fault Recognition Uses this Storage to Save the Address of memory modified in controller 0/1

SVMEMD—SP Fault Recognition Uses this Storage to Save the Data of Memory Modified in Controller 0/1

ESR3—Error Source Register 3

- Bit 0 = Transmitter in trouble
- 1 = Invalid DT OPCODE
- 2 = Mismatch between message sequences
- 3 = Mismatch between I/O sequences
- 4 = DT CLK bit error
- 5 = Frame timing error
- 6 = DT sanity check
- 7 = Reclock register serial mismatch
- 8 = Shift register mismatch
- 9 = Incoming serial bit stream parity error
- 10 = Invalid I/O sequence call state
- 15-18 = The DT port number calculated by the DT and sent to the SP2 during testing
- 23 = When set, indicates that no data and/or no timing was received by the SP2 from the DT during link testing

DTARA—DT Address Register A

Bit 0-9 = Maintenance read address, maintenance write address
10-11 = These bits are set to 1

DTARB—DT Address Register B

Same layout as DTARA

DTDOPA—Shift Register Data, OPCODE and Parity A

Bit 0-15 = Shift register data
16-20 = DT OPCODE
22 = Parity bit

DTDOPB—Shift Register Data, OPCODE And Parity B

Same layout as DTDOPA

DTBST—Temporary Buffer Status for All DT's

Bit 0-15 = Indicates the temporary buffer register for a particular DT/DTS is filled. This field can only be written to all ones or zeros FA655
16 = TBR, IMADBF, BG10, is set when the SP2 receives an idle message from the DT FA655
17 = TBR, IMADBF, AG10 is set when the destination buffer is full—FA655

DTCNT—Bit and DT Count

Bit 0-10 = 11-Bit counter FA650

11-14 = DT counter FA654

15 = GDFF, Data, when set, reclocks DT data bits FA650

16 = GDFF, match, when set, matches outgoing DT data with the
mate FA650

17 = When set, GDFF, APG generates an address for parity A FA650

18 = When set, GDFF, APB generates an address for parity B FA650

19 = Incoming DT message parity will set GDFF, IPC FA650

DTSQFF—Sequencer State and MISC F/F

- Bit 0-2 = Message and data storage sequence state flops GDFF. STBO, GDFF. STB1, GDFF. STB2, FA652
- 3 = GDFF. FRSYNC is set when a DT frame pulse is received FA652
- 4 = When set, TBR. GOIBL, B1 enables the message and storage sequence FA652
- 5 = TBR. GOIBL is set when a DT destined message exists to be sent FA652
- 6 = GDFF. STT is toggled when the message and data storage sequence passes through state ST05 when the I/O sequence is in DT PST04 and DT PST05 or when the message and storage sequence pass through ST02, ST05, and ST07 and I/O sequence is in DT PST09 FA652
- 7-10 = I/O sequence state flops FA654, GDFF. STBO, GDFF. STB1, GDFF. STB2, GDFF. STB3
- 11 = TBR. ITOG. BO, when set, prevents the FA654 GDFF. DTB counter from changing state by inhibiting the toggle FA654
- 12 = TBR. ITOG. AO, when set, allows TBR. ITOG. BO to function once FA654
- 13-15 = State of the counter which determines what DT receives echo suppression DGFF. DTCBO, GDFF. DTCB1, DGFF. DTCB2, FA656
- 16 = TBR. ESDT. BG10, when set, restores the FA650 11-bit counter FA656
- 17 = TBR. ESDT. AG10, when set, indicates that ESD timing is being used FA656
- 18 = TBR. SVLD. B1, when set, indicates the mate controller is also capable of sending a SVLD priming signal to DT FA656
- 19 = TBR. SVLD. A1, when set, generates the timing required to gate out MSVLD FA656
- 20 = TBR. clock generates a stretched clock pulse from 4T6 to 5T7 FA653
- 21 = Monitor point for DTSTOP (read only)
- 22 = Monitor point for DMASTOP (read only)

DTSANT—Sanity Timer Check Flip-Flops

- Bit 0 = When set by SP2 CLK 1T3, GDFF.BTBO awaits reset by DT CLK FA657
- 1 = When set, GDFF.BTBO did not receive DT CLK reset before SP2 CLK OT2 FA657
- 2 = GDFF.F32B is set when the DT frame has occurred and the low ordered bits of the 11-bit counter fail to equal 32 FA657
- 3 = GDFF.MFR is set when the low ordered bits of the 11-bit counter equal 32 and the DT frame is not present FA657
- 4 = TBR.CT015 is set if DT count = 0 and SP2 clock = 7T9 and PSEQ = State 10. Reset occurs at 7-ms mark of the base cycle FA657
- 5 = TBR. CTSB is set when a serial bit transmit mismatch occurs FA657
- 6 = Accesses TBR.MOVINGO, when set by the matrix sequence a DT interrupt request is accepted. Frame control passes to the message sequence. TBR.MOVINGO is reset when the message sequence enters state 4 or 0 (FA657)

DTRCVL—DT Port Routing—Lower

Port values are: 00 = Derouted, 01 = Routed to controller 0,
10 = Routed to controller 1, 11 = Invalid state

Bit 0-1 = Port 0
2-3 = Port 1
4-5 = Port 2
6-7 = Port 3
8-9 = Port 4
10-11 = Port 5
12-13 = Port 6
14-15 = Port 7
20 = Send on link zero
21 = Send on link one
22 = ERTOK

DTRCVU—DT Port Routing—Upper

Port Values are: 00 = Derouted, 01 = Routed to controller 0,
10 = Routed to controller 1, 11 = Invalid state

Bit 0-1 = Port 8
2-3 = Port 9
4-5 = Port 10
6-7 = Port 11
8-9 = Port 12
10-11 = Port 13
12-13 = Port 14
14-15 = Port 15
20 = Send on link zero
21 = Send on link one
22 = ERTOK

SP Status, Error Summary and MA Data

SP4STAT—Software Status

- Bit 0 = Maintenance access bit
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Divorce controller from mate
 - 5 = Stop autonomous operation
 - 6 = Indicates clock source that this controller operates from
 - 7 = Diagnostic has been requested
 - 8 = Controller to be restored only by TTY
- 12 = Controller out of service
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on bus 0
- 17 = Controller cannot send on bus 0
- 18 = Controller cannot receive on bus 1
- 19 = Controller cannot send on bus 1
- 20-23 = PU maintenance code

SP4STAT—Hardware Status

- Bit 0 = Maintenance access bit
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on bus 0
 - 3 = Send on bus 1
 - 4 = Divorce controller from mate
 - 5 = Stop autonomous operation
 - 6 = Active—indicates which controller's clock supplies basic clock to this controller
 - 7 = Matrix address cutoff A
 - 8 = Matrix address cutoff B
 - 9 = Matrix data cutoff B
- 10 = Send memory update data to mate
- 11 = Matrix data cutoff A
- 12 = Maintenance access enable bit
- 13 = PU bus to receive on enable bit
- 14 = Send on PU bus 0 enable bit
- 15 = Send on PU bus 1 enable bit
- 16 = Divorce enable bit
- 17 = Stop enable bit
- 19 = Matrix address cutoff A enable bit
- 20 = Matrix address cutoff B enable bit
- 21 = Matrix data cutoff B enable
- 22 = Memory update send enable bit
- 23 = Matrix data cutoff A enable

SP4ESR1—Error Source Register 1

- Bit 0 = An error has occurred in this controller while executing a peripheral order
- 1 = An error has occurred in this controller while not executing a peripheral order
- 2 = There was a parity error over the even bits of the PU bus on a preceding PU order
- 3 = There was a parity error over the odd bits of the PU bus on a preceding PU order
- 4 = An interject request has been sent to the CC over APUT of the control bus for the digit buffer is full
- 5 = A gross clock failure has occurred or the controller has been stopped too long and the analog timer has timed out
- 6 = There is a mismatch between matrix address registers
- 7 = Mismatch between PU reply bus registers
- 8 = Dial pulse work list full CC has tried to add too many entries
- 9 = **SP2** DT message lost **SP2**
- 10 = Sequencer states mismatch
- 11 = Memory registers address and or data mismatch
- 12 = Controller has received an invalid OPCODE
- 13 = A clock phase has been lost or improper clock voltage has been detected
- 14 = Parity over the first group of memory address and data bits has failed

SP4ESR1—Error Source Register 1 (Contd)

- Bit 15 = Parity over the second group of memory address and data bits
has failed
- 16 = Set when coder scan address exceeds scan address of
contents of DP work register
- 17 = A sequencer has entered an invalid state
- 18 = Executive sequencer has lost sanity
- 19 = Extended millisecond clock has an error
- 20 = Clock ring counters not synced
- 21 = Dial pulse in work list flag missing

SP4CPR—MA Error Summary

- Bit 0 = Maintenance access bit set by pulse
- 1 = Receive on bus flip-flop toggled by pulse
- 2 = State of send on bus zero flip-flop
- 3 = State of send on bus one flip-flop
- 4 = State of divorce flip-flop
- 5 = State of stop flip-flop
- 6 = State of clock activity
- 7 = Matrix data cutoff A
- 8 = Peripheral bus even parity failure
- 9 = Peripheral bus odd parity failure
- 10 = Peripheral bus K code match indication
- 11 = Peripheral bus M-bit indication
- 12 = Receive on bus flip-flop complement
- 13 = Autonomous interrupt indication
- 14 = All-seems-well interrupt indication
- 15 = An invalid OPCODE has been detected
- 16 = Peripheral sequencer has timed out
- 17 = Matrix cutoff A set
- 18 = Matrix cutoff B set
- 19 = Level detector clock error or phase detector clock error
- 20 = Matrix data cutoff B
- 21 = MS clock error
- 22 = Peripheral order translator parity error odd
- 23 = Peripheral order translator parity error even

TMS—Time Multiplexed Switch Frame Printouts

TMS Critical Registers (FLEV Reports)

TG4STAT	TG4STRD	TG4ESR+0	TG4ESR+1	00000000	00000000
MEMN	UTTRANS	55555555	55555555	55555555	55555555
TG4STAT	TG4STRD	TG4ESR+0	TG4ESR+1	00000000	00000000

Upper half controller 0

Lower half controller 1

TG4STAT—Software Status

Bit 0 = Maintenance access bit
1 = Receive on (PU bus 0 or 1)
2 = Send on PU bus 0
3 = Send on PU bus 1
4 = Divorce controller from mate
5 = Stop autonomous operation
7 = Diagnostic has been requested
8 = Controller to be restored only by TTY
12 = Controller out of service
13 = Bus access circuit 0 power off
14 = Bus access circuit 1 power off
15 = Power off controller
16 = Controller cannot receive on PU bus 0
17 = Controller cannot send on PU bus 0
18 = Controller cannot receive on PU bus 1
19 = Controller cannot send on PU bus 1
20-23 = PU maintenance code

TG4STRD—Hardware Status

- Bit 0 = Maintenance access bit
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on bus 0
 - 3 = Send on bus 1
 - 4 = Divorce controller from mate
 - 5 = Stop autonomous operation
 - 6 = Inhibit busy/idle bit checks
 - 7 = Inhibit data matching on writes
 - 8 = Inhibit interrupts
 - 9 = Unit is synced with TDS subsystem
- 10 = Soft stop autonomous operation
- 11 = Inhibit gating to memory registers
- 12 = Allow self-start
- 13 = Soft stop at phase 6
- 14 = Force zeros across matcher interface
- 15 = Force ones across matcher interface

TG4ESRO—Error Source Register 0

- Bit 0 = All-seems-well failure
- 1 = Autonomous interrupt
- 2 = Parity failure even (PUB)
- 3 = Parity failure odd (PUB)
- 4 = Mode failure
- 5 = Order sequencer sequence check
- 6 = Memory address failure
- 7 = Time slot memory parity failure
- 8 = Audit error
- 9 = Time slot address mismatch
- 10 = Memory write mismatch
- 11 = Order sequencer abort check
- 12-19 = Memory address written on first write of
connects and disconnects (small office).
Determine by P26P25P24P10P14-P11
- 20-23 = Data written to memory on first write.
Determine by F2X1X0P17

TG4ESR1—Error Source Register 1 (AINT Sources)

- Bit 0 = Clock error (internal)
- 1 = Time slot counter sequence check
- 2 = Time slot counter mismatch
- 3 = Clock mismatch
- 4 = Time slot memory parity failure
- 6 = Link of memory that failed
- 7-13 = Time slot memory that failed
- 14 = Overflow-multiple interrupts have occurred
- 15-21 = Time slot during which failure occurred

MEMN—Member Number

- Bit 0-6 = TMS member number

UTTRANS—First Word Unit-Type Translator

- Bit 0-23 = First word of Unit-Type Translator

TMS MA Pulse Point Reply

- Bit 0 = MA F/F
- 1 = RO F/F
- 2 = SO F/F
- 3 = S1 F/F
- 4 = Divorce F/F
- 5 = Stop F/F
- 7 = Clock error
- 8 = Even bits parity failure
- 9 = Odd bits parity failure
- 10 = K-Code match (1=match)
- 11 = M Bit
- 12 = RO F/F complemented
- 13 = Clock input check (0=failure)
- 14 = Order sequencer ignore signal
- 15 = Order sequencer abandon signal
- 16 = Order sequencer mode failure signal
- 17 = Out-of-service sequence check
- 18 = Out-of-service abort check

Auxiliary Data—(TMS MEMPF)

DUMP	SOFTWARE	SOFTWARE	HARDWARE	HARDWARE	UTYPE
SIZE/TYPE	STATUS C0	STATUS C1	STATUS C0	STATUS C1	TRANS
ASW ESR C0	ASW ESR C1	AINT ESR C0	AINT ESR C1	0.....0	0.....0
K-CODE	TSM	0.....0	0.....0	SUSPECT	0.....0
			CONTR		
NETWORK	TIME SLOT	MEMORY	MEMORY	RETRY	MEMORY
STATUS		READ C0	READ C1	PASS/FAIL	CORRECTION
				FLAGS	FLAG

Dump Size (Word 0)

Bits 0-23 value = octal 00001460

Bit 0 = TAG (0)

1-7 = Dump size (24 decimal)

8-9 = Dump type (MEMPF=3)

SOFTWARE STATUS—Controller 0 or 1 (Words 1, 2)

Bit 0 = Maintenance access bit

1 = Receive on (PU bus 0 or 1)

2 = Send on PU bus 0

3 = Send on PU bus 1

4 = Divorce controller from mate

5 = Stop autonomous operation

7 = Diagnostic has been requested

8 = Controller to be restored only by TTY

12 = Controller out of service

13 = Bus access circuit 0 power off

14 = Bus access circuit 1 power off

15 = Power off controller

16 = Controller cannot receive on PU bus 0

17 = Controller cannot send on PU bus 0

18 = Controller cannot receive on PU bus 1

19 = Controller cannot send on PU bus 1

20-23 = PU maintenance code

HARDWARE STATUS—Controller 0 or 1 (Words 3, 4)

- Bit 0 = Maintenance access bit
1 = Receive on (PU bus 0 or 1)
2 = Send on PU bus 0
3 = Send on PU bus 1
4 = Divorce controller from mate
5 = Stop autonomous operation
6 = Inhibit busy/idle bit checks
7 = Inhibit data matching on writes
8 = Inhibit interrupts
9 = Unit is synced with TDS subsystem
10 = Soft stop autonomous operation
11 = Inhibit gating to memory registers
12 = Allow self-start
13 = Soft stop at phase 6
14 = Forces zeros across matcher interface
15 = forces ones across matcher interface

UTYPE TRANS—Unit-Type Translator (Word 5)

- Bit 0-23 = First word of Unit-Type Translator for failing TSI

ASW ESR—Controller 0 or 1 (Words 6, 7)

- Bit 0 = All-seems-well failure
1 = Autonomous interrupt
2 = Parity failure even (PUB)
3 = Parity failure odd (PUB)
4 = Mode failure
5 = Order sequencer sequence check
6 = Memory address failure
7 = Time slot address mismatch
8 = Audit error
9 = Time slot address mismatch
10 = Memory write mismatch
11 = Order sequencer abort check

AIN T ESR—Controller 0 or 1 (Words 8, 9)

- Bit 0 = Clock error (Internal)
1 = Time slot counter sequence check
2 = Time slot counter mismatch
3 = Clock mismatch
4 = Time slot memory parity failure
6 = Link of memory that failed
7-13 = Time slot memory that failed
14 = Overflow-multiple interrupts have occurred
15-21 = Time slot during which failure occurred

K-Code (Word 12)

- Bit 0-6 = Member number
7-11 = Unit type (TMS=4)

TSM (Word 13)

Bit 0-6 = Time slot memory

Suspect CONTR (Word 16)

Bit 0-1 = 0 — Controller 0
1 — Controller 1
2 — Both controllers

Network Status (Word 18)

Bit 0-1 = 0 — Duplex failure
1 — Controller 0 only
2 — Controller 1 only
3 — Duplex operation

Time Slot (Word 19)

Bit 0-6 = Time slot

MEMORY READ—Controller 0 or 1 (Words 20, 21)

0-11 = Odd TSM

Bit 0-3 = Data (even side)

4 = Busy/idle bit

5 = Parity bit

6-9 = Data (odd side)

10 = Busy/idle bit

11 = Parity bit

12-23 = Same format as bits 0-11 but represents even TSM

Retry Pass/Fail Flags (Word 22)

Bit 0-1 = 0 — Both controllers passed retry

1 — Controller 0 only failed retry

2 — Controller 1 only failed retry

3 — Both controllers failed retry

Memory Correction Flag (Word 23)

Bit 0-1 = 0 — No correction attempted

1 — Correction attempted

2 — Update via mate controller

TSI—Time Slot Interchange Frame Printouts

TSI-1 Critical Registers—J4A001A (Vintage and Near-Term TSI)

SOFTWARE STATUS	HARDWARE STATUS	ASW ESR	AINT ESR	S&L ESR	MISC1 ESR
TSMP	0....0	TTSMP	0....0	MISC2 ESR	0....0
BMAPF	0....0	BMBPF	0....0	0....0	0....0
TRPF	0....0	TSW	0....0	RSW	0....0
RMM	0....0	TMM	0....0	0....0	0....0
RMT0	RMT1	RMT2	RMT3	RMT4	0....0
TMT0	TMT1	TMT2	TMT3	TMT4	0....0
SPC0 PEST	SPC1 PEST	0....0	0....0	SOFTWARE PEST	0....0
TSIMN	UTTRANS	5....5	5....5	5....5	5....5

Upper half controller 0

Lower half controller 1 (Not shown)

TSI-2 Critical Registers—J4A001B
(Cost Reduced TSI - CRTSI)

SOFTWARE STATUS	HARDWARE STATUS	ASW ESR	AIN ESR	S&L ESR	MISC1 ESR
RTSMP0	RTSMP1	TTSMP0	TTSMP1	BIMPF0	BIMPF1
BMAPF0	BMAPF1	BMBPF0	BMBPF1	0....0	0....0
TRPF0	TRPF1	TSW0	TSW1	RSW0	RSW1
RMM0	RMM1	TMM0	TMM1	0....0	0....0
S&L0	S&L1	S&L2	S&L3	FLYW	0....0
0....0	0....0	0....0	0....0	0....0	0....0
SPC0 PEST	SPC1 PEST	SPC2 PEST	SPC3 PEST	SOFTWARE PEST0	SOFTWARE PEST1
TSI MN	UTTRANS	5....5	5....5	5....5	5....5

Upper half controller 0

Lower half controller 1 (Not shown)

SOFTWARE STATUS — (TSI-1 Word 0, TSI-2 Word 0)

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on PU bus 0
- 3 = Send on PU bus 1
- 4 = Divorce cross-coupled data from mate
- 5 = Stop controller autonomous operation
- 6 = Indicates active controller number
- 7 = Diagnostic of this controller requested
- 8 = Remove via TTY
- 9 = Indicates which TSI half sends to TMS network 0
- 10 = Indicates which TSI half sends to TMS network 1
- 11 = Indicates from which TMS network this TSI half receives
- 12 = Controller out of service
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on PU bus 0
- 17 = Controller cannot send on PU bus 0
- 18 = Controller cannot receive on PU bus 1
- 19 = Controller cannot send on PU bus 1
- 20-23 = PU maintenance code

Hardware Status (TSI-1 Word 1)

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Divorce cross-coupled data from mate
 - 5 = Stop autonomous operation
 - 6 = Active controller number
 - 7 = Update mode
 - 8 = PEST inhibit interrupts
 - 9 = Indicates which TSI bay sends to TMS network 0
 - 10 = Indicates which TSI bay sends to TMS network 1
 - 11 = Indicates from which TMS network this TSI bay receives
- 12-13 = FIS0, FIS1—Enables bits 19-22 and selects master, secondary, or TACC fan-in packs for diagnostics (normally = 00)
- 14 = FS—Forces zeros or ones across matchers when bit 15 = 1
- 15 = FE—Force enable for bit 14
- 16 = Loop around
- 17 = PTS—BMA in maintenance mode
- 18 = SSFE—Serial switch force enable
- 19 = HFIS—When bits 12-13 are not 00 selects fan-in from SPC 0 or 1
- 20-22 = BIS0, BIS1, BIS2—Enables 1 of 8 branches of the fan-in packs selected by bits 12-13, 19
- 23 = Not used

Hardware Status Register (TSI-2 Word 1)

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on (PU bus 0)
- 3 = Send on (PU bus 1)
- 4 = Divorce cross-coupled data from mate
- 5 = Stop autonomous action
- 6 = Active unit
- 7 = Update mode
- 8 = PEST inhibit interrupts
- 9 = Indicates which TSI half sends to TMS network 0
- 10 = Indicates which TSI half sends to TMS network 1
- 11 = Indicates from which TMS network this TSI half receives
- 12 = Diagnose internal read access
- 13 = Buffer memory C maintenance mode
- 14 = FS—forces zeros or ones across matcher when bit 15 = 1
- 15 = FE—force enable for bit 14
- 16 = Loop around
- 17 = PTS—Places BMAs in maintenance mode
- 18 = Diagnose SPC select
- 19 = Not used
- 20 = Diagnose matcher (data and address)
- 21 = Buffer memory B maintenance mode
- 22 = Enable all levels on memory writes
- 23 = Not used

ASWESR (TSI-1 Word 2, TSI-2 Word 2)

- Bit 0 = All-seems-well failure
- 1 = Autonomous interrupt
- 2 = PUB parity failure even bits
- 3 = PUB parity failure odd bits
- 4 = Mode failure
- 5 = Receive time slot memory audit failure
- 6 = Transmit time slot memory audit failure
- 7 = Busy/idle memory audit failure
- 8 = Receive time slot memory parity failure
- 9 = Transmit time slot memory parity failure
- 10 = Busy/idle memory parity failure
- 11 = Address mismatch
- 12 = Data write mismatch
- 13 = Busy/idle memory write mismatch

AINTESR—(TSI-1 Word 3, TSI-2 Word 3)

- Bit 0 = Clock error (internal)
- 1 = Time slot counter sequence check
- *2 = Time slot counter mismatch
- 3 = Clock mismatch
(TSI-2—Twisted ring counter mismatch)
- 4 = Receive time slot memory parity failure
- 5 = Transmit time slot memory parity failure
- 6 = Busy/idle memory parity failure
- 7 = Buffer memory A parity failure
- 8 = Buffer memory B parity failure
- 10 = Leading one DET parity failure
- 11 = Transmitter seems well failure
- 12 = Receiver seems well failure
- 13 = Receive mismatch
- 14 = Transmit mismatch
- *15 = STAR seems well failure
- 17-23 = Time slot during which failure occurred-Phase A

* Not used in TSI-2.

S&LESR—(TSI-1 Word 4, TSI-2 Word 4)

- Bit 1 = Time slot counter sequence check
- 4 = RTSM parity failure
- 5 = TTSM parity failure
- 6 = BIMM parity failure
- 7 = BMA parity failure
- 8 = BMB parity failure
- 10 = Transmission parity failure
- 11 = Transmitter seems well failure
- 12 = Receiver seems well failure
- 13 = Receive mismatch
- 14 = Transmit mismatch

MISC1ESR—(TSI-1 Word 5)

- Bit 0 = Ring counter out-of-phase clock error
- 1 = Frame missing clock error
- 2 = Time slot counter parity check
- 3 = Time slot counter framing check
- 4 = Time slot counter mismatch Phase B
- 5 = Time slot counter mismatch Phase E
- 6 = B/I memory parity failure SPC0
- 7 = B/I memory parity failure SPC1
- 8 = Sample of receive errors
- 9 = Primary sense and lock

MISC1ESR—(TSI-2 Word 5)

- Bit 0 = Out of frame
- 1 = Framing pulse missing
- 2 = Time slot counter sequence check
- 3 = Time slot counter parity
- 4 = Controller 0 unique error summary
- 5 = Controller 1 unique error summary
- 6 = Controller 0 RMM error summary
- 7 = Controller 1 RMM error summary
- 8 = Inhibit read seems well

RTSMP—(TSI-1 Word 6, TSI-2 Words 6, 7)

- Bit 0-7 = Receive time slot memory P.F. SPC0 or 2
- 8-15 = Receive time slot memory P.F. SPC1 or 3

TTSMP—(TSI-1 Word 8, TSI-2 Words 8, 9)

- Bit 0-7 = Transmit time slot memory P.F. SPC0 or 2
- 8-15 = Transmit time slot memory P.F. SPC1 or 3

MISC2ESR—(TSI-1 Word 10)

- Bit 0 = Ring counter out-of-phase clock error
- 1 = Frame missing clock error
- 2 = Time slot counter parity check
- 3 = Time slot counter framing check
- 4 = Time slot counter mismatch phase B
- 5 = Time slot counter mismatch phase E
- 6 = B/I memory parity failure SPC0
- 7 = B/I memory parity failure SPC1
- 8 = Sample of receive errors
- 9 = Primary sense and lock

BIMPF—(TSI-2 Words 10, 11)

- Bit 0 = B/I memory parity failure SPC0 or 2
- 8 = B/I memory parity failure SPC1 or 3

BMAPF—(TSI-1 Word 12, TSI-2 Words 12, 13)

- Bit 0-7 = Buffer memory "A" P.F. SPC0 or 2
- 8-15 = Buffer memory "A" P.F. SPC1 or 3

BMBPF—(TSI-1 Word 14, TSI-2 Words 14, 15)

- Bit 0-7 = Buffer memory "B" P.F. SPC0 or 2
- 8-15 = Buffer memory "B" P.F. SPC1 or 3

TRPF—(TSI-1 Word 18, TSI-2 Words 18, 19)

- Bit 0-7 = Leading one DET parity failure SPC0 or 2
- 8-15 = Leading one DET parity failure SPC1 or 3

TSW—(TSI-1 Word 20, TSI-2 Words 20, 21)

Bit 0-6 = Transmitter seems well failure SPC0 or 2
8-14 = Transmitter seems well failure SPC1 or 3

RSW—(TSI-1 Word 22, TSI-2 Words 22, 23)

Bit 0-6 = Receiver seems well failure SPC0 or 2
8-14 = Receiver seems well failure SPC1 or 3

RMM—(TSI-1 Word 24)

Bit 0-4 = Receiver mismatch SPC0
8-12 = Receiver mismatch SPC1

RMM—(TSI-2 Words 24, 25)

Bit 0-7 = Receiver mismatch SPC0 or 2
8-15 = Receiver mismatch SPC1 or 3

TMM—(TSI-1 Word 26)

Bit 0-4 = Transmitter mismatch SPC0
8-12 = Transmitter mismatch SPC1

TMM—(TSI-2 Words 26, 27)

Bit 0-7 = Transmitter mismatch SPC0 or 2
8-15 = Transmitter mismatch SPC1 or 3

RMT0—24 (TSI-1 Words 30-34)

Bit 0-7 = Receiver mismatch level SPC0
12-19 = Receiver mismatch level SPC1

S&L 0-3—(TSI-2 Words 30-33)

Bit 1 = Time slot counter sequence CK error sense and lock
4 = RTSM parity failure sense and lock
5 = TTSM parity failure sense and lock
6 = BIMM parity failure sense and lock
7 = BMA parity failure sense and lock
8 = BMB parity failure sense and lock
10 = Leading one DET PAR. failure sense and lock
11 = Transmitter seems well error sense and lock
12 = Receiver seems well error sense and lock
13 = Receive mismatch error sense and lock
14 = Transmit mismatch error sense and lock

FLYW—(TSI-2 Word 34)

Bit 0-6 = 8-ms stuffing counter SPC0
12-18 = 8-ms stuffing counter SPC1

TMT0-4—(TSI-1 Words 36-40)

Bit 0-7 = Transmitter mismatch level SPC0
12-19 = Transmitter mismatch level SPC1

SPC PEST—(TSI-1 Words 42-43, TSI-2 Words 42-45)

BIT 0-7 = Port PEST

SOFTWARE PEST—(TSI-1 Word 46, TSI-2 Words 46-47)

Bit 0-6 = Port PEST SPC0 or 2
7-14 = Port PEST SPC1 or 3

TSIMN—(TSI-1 Word 48, TSI-2 Word 48)

Bit 10-16 = TSI member number (octal)

UTTRANS—(TSI-1 Word 49, TSI-2 Word 49)

Bit 0-23 = First word of Unit-Type Translator

TSI MA Pulse Point Reply

- Bit 0 = MA F/F
- 1 = RO F/F
- 2 = SO F/F
- 3 = S1 F/F
- 4 = Divorce F/F
- 5 = Stop F/F
- 6 = Active unit F/F
- *7 = Clock error
- 8 = Even bits parity failure
- 9 = Odd bits parity failure
- 10 = K-code match error
- 11 = M-bit
- 12 = RO F/F complemented
- *13 = Clock input check (1=failure)
- 14 = 1=order sequence hung or running
- *15 = B/I matcher match point
- 16 = Enable bay (controller) 0 to TMS
- 17 = Enable bay (controller) 1 to TMS (for bits 16 and 17,
pulsing the 0 half gives the configuration to net 0,
pulsing the 1 half gives the configuration to net 1)
- 18 = Sum of NOOPS
- 19 = Mode error
- *20 = Unique error bay 0
- *21 = Unique error bay 1
- *22 = Configuration control flip-flop for Controller 0
- *23 = Configuration control flip-flop for Controller 1

*TSI-2—Not assigned—returned as ones

Auxiliary Data—(TSI MEMPF)

DUMP	SOFTWARE	SOFTWARE	HARDWARE	HARDWARE	UTYPE
SIZE/TYPE	STATUS C0	STATUS C1	STATUS C0	STATUS C1	TRANS
ASW ESR C0	ASW ESR C1	AINT ESR C0	AINT ESR C1	SAL ESR C0	SAL ESR C1
K-CODE	LEVEL	SEC ESR EVEN	SEC ESR ODD	SUSPECT CONTR	0.....0
ERROR	TIME SLOT	MEMORY READ C0	MEMORY READ C1 FLAGS	RETRY PASS/FAIL FLAG	MEMORY CORRECTION

DUMP SIZE (Word 0)

Bits 0-23 value = octal 00001060

Bit 0 = TAG (0)

1-7 = Dump size (24 decimal)

8-9 = Dump type (MEMPF=2)

SOFTWARE STATUS—Controller 0 or 1 (Words 1, 2)

- Bit 0 = Maintenance access
1 = Receive on (PU Bus 0 or 1)
2 = Send on PU bus 0
3 = Send on PU bus 1
4 = Divorce cross-coupled data from mate
5 = Stop controller autonomous operation
6 = Indicates active controller
7 = Diagnostic of this controller requested
8 = Remove via TTY
9 = Indicates which TSI half sends to TMS Network 0
10 = Indicates which TSI half sends to TMS Network 1
11 = Indicates from which TMS network this TSI half receives
12 = Controller OS
13 = Bus access Circuit 0 power off
14 = Bus access Circuit 1 power off
15 = Controller power off
16 = Controller cannot receive on PU Bus 0
17 = Controller cannot send on PU Bus 0
18 = Controller cannot receive on PU Bus 1
19 = Controller cannot send on PU Bus 1
20-23 = PU maintenance code

HARDWARE STATUS—Controller 0 or 1 (TSI-1 J4A001A)
(Words 3, 4)

- Bit 0 = Maintenance access
1 = Receive on (PU Bus 0 or 1)
2 = Send on PU Bus 0
3 = Send on PU Bus 1
4 = Divorce
5 = Stop autonomous operation
6 = Active unit
7 = Update mode
8 = PEST—inhibit interrupts
9 = Indicates which TSI half sends to TMS Network 0
10 = Indicates which TSI half sends to TMS Network 1
11 = Indicates from which TMS network this TSI half receives
12-13 = FIS0, FIS1—enables bits 19-22 and selects master,
secondary, or TACC FAN-IN packs for diagnostics
(Normally = 00)
14 = FS — Forces zeros or ones across matchers
when bit 15 = 1
15 = FE—force enable for bit 14
16 = Loop around
17 = PTS—Places BMAs in maintenance mode
18 = SSFE—Serial switch force enable
19 = HFIS—When bits 12-13 are not 00, selects FAN-IN from
SPC 0 or 1
20-22 = BIS0, BIS1, BIS2—Enables 1 of 8 branches of the
FAN-IN packs selected by bits 12-13, 19
23 = Not used

HARDWARE STATUS—Controller 0 or 1 (TSI-2 J4A001B)
(Words 3, 4)

- Bit 0-11 = Same as TSI-1
 - 12 = Diagnose internal read access
 - 13 = BMC maintenance mode
- 14-17 = Same as for TSI-1
 - 18 = Diagnose SPC select
 - 19 = Not used
 - 20 = Diagnose matcher enable
 - 21 = BMB maintenance mode
 - 22 = Enable all levels on memory writes
 - 23 = Not used

UTYPE TRANS—Unit Type Translator (Word 5)

- Bit 0-23 = First word of Unit-Type Translator for failing TSI

ASW ESR—Controller 0 or 1 (Words 6, 7)

- Bit 0 = All-seems-well failure
 - 1 = Autonomous interrupt
 - 2 = PUB parity failure even bits
 - 3 = PUB parity failure odd bits
 - 4 = Mode failure
 - 5 = Receive time slot memory audit failure
 - 6 = Transmit time slot memory audit failure
 - 7 = Busy/idle memory audit failure
 - 8 = Receive time slot memory parity failure
 - 9 = Transmit time slot memory parity failure
 - 10 = Busy/idle memory parity failure
 - 11 = Address mismatch
 - 12 = Data write mismatch
 - 13 = Busy/idle memory write mismatch

AINT ESR—Controller 0 or 1 (Words 8, 9)

- Bit 0 = Clock error (internal)
- 1 = Time slot counter sequence check
- 2 = Time slot counter mismatch
- 3 = Clock mismatch (TSI-2—twisted ring counter mismatch)
- 4 = Receive time slot memory parity failure
- 5 = Transmit time slot memory parity failure
- 6 = Busy/idle memory parity failure
- 7 = Buffer memory A parity failure
- 8 = Buffer memory B parity failure
- 10 = Leading one DET parity failure
- 11 = Transmitter seems well failure
- 12 = Receiver seems well failure
- 13 = Receive mismatch
- 14 = Transmit mismatch
- *15 = Star seems well failure
- 17-23 = Time slot during which failure occurred—Phase A

* Not used in TSI-2.

SAL ESR—Controller 0 or 1 (Words 10, 11)

Bit 0 = Clock error (internal)

1 = Time slot counter sequence check

2 = Time slot counter mismatch

3 = Clock mismatch (TSI-2—twisted ring counter mismatch)

4 = Receive time slot memory parity failure

5 = Transmit time slot memory parity failure

6 = Busy/idle memory parity failure

7 = Buffer Memory A parity failure

8 = Buffer Memory B parity failure

10 = Leading one DET parity failure

11 = Transmitter seems well failure

12 = Receiver seems well failure

13 = Receive mismatch

14 = Transmit mismatch

*15 = STAR seems well failure

17-23 = Time slot during which failure occurred—Phase A

* Not used in TSI-2.

K-Code (Word 12)

Bit 0 = SPC
1-6 = Member number
7-11 = Unit type (TSI=5)

LEVEL (Word 13)

Bit 0-2 = Failing level (0-7)

SEC ESR even (Word 14) (Any TSI-1 Member or Even TSI-2 Member)

Bit 0-7 = SPC 0, MEMPF Level 0-7
8-15 = SPC 1, MEMPF Level 0-7

SEC ESR Odd (Word 15) (TSI-2 only—Odd Member)

Bit 0-7 = SPC 0, MEMPF Level 0-7
8-15 = SPC 1, MEMPF Level 0-7

Suspect Controller (Word 16)

Bit 0-1 = 0 — Controller 0
1 — Controller 1
2 — Both controllers

Error (Word 18)

Bit 0 = 0 — RTSMPF
1 — TTSMFP

Time Slot (Word 19)

Bit 0-6 = Time slot

Memory Read CO (Word 20)

Bit 0-6 = Channel

7-9 = Serial switch level

10 = Busy/idle bit

11 = Parity bit

Memory Read C1 (Word 21)

Bit 0-6 = Channel

7-9 = Serial switch level

10 = Busy/idle bit

11 = Parity bit

Retry Pass/Fail Flags (Word 22)

Bit 0-1 = 0 — Both controllers passed retry

1 — Controller 0 only failed retry

2 — Controller 1 only failed retry

3 — Both controllers failed retry

Memory Correction Flag (Word 23)

Bit 0 = 0 — No correction attempted

1 — Correction attempted

Auxiliary Data—(TSI RSW)

DUMP SIZE/TYPE	SOFTWARE STATUS C0	SOFTWARE STATUS C1	HARDWARE STATUS C0	HARDWARE STATUS C1	0.....0
UTYPE TRANS	ASW ESR C0	ASW ESR C1	AINT ESR C0	AINT ESR C1	0.....0
K-CODE EVEN	LEVEL ODD	RSW ESR 0....0	RSW ESR 0....0		

Dump Size/Type (Word 0)

Bits 0-23 value = octal 00000444 or 00000445

Bit 0 = TAG = 0

1-7 = Dump size = 18 decimal

8-9 = Dump type - RSW = 1

SOFTWARE STATUS—Controller 0 or 1 (Words 1, 2)

- Bit 0 = Maintenance access
- 1 = Receive on (PU bus 0 or 1)
- 2 = Send on PU bus 0
- 3 = Send on PU bus 1
- 4 = Divorce cross-coupled data from mate
- 5 = Stop controller autonomous operation
- 6 = Indicates active controller
- 7 = Diagnostic of this controller requested
- 8 = Remove via TTY
- 9 = Indicates which TSI half sends to TMS network 0
- 10 = Indicates which TSI half sends to TMS network 1
- 11 = Indicates from which TMS network this TSI half receives
- 12 = Controller OS
- 13 = Bus access circuit 0 power off
- 14 = Bus access circuit 1 power off
- 15 = Controller power off
- 16 = Controller cannot receive on PU bus 0
- 17 = Controller cannot send on PU bus 0
- 18 = Controller cannot receive on PU bus 1
- 19 = Controller cannot send on PU bus 1
- 20-23 = PU maintenance code

HARDWARE STATUS—Controller 0 or 1 (TSI-1 J4A001A)
(Words 3, 4)

- Bit 0 = Maintenance access
 - 1 = Receive on (PU bus 0 or 1)
 - 2 = Send on PU bus 0
 - 3 = Send on PU bus 1
 - 4 = Divorce
 - 5 = Stop autonomous operation
 - 6 = Active unit
 - 7 = Update mode
 - 8 = PEST—Inhibit interrupts
 - 9 = Indicates which TSI half sends to TMS network 0
 - 10 = Indicates which TSI half sends to TMS network 1
 - 11 = Indicates from which TMS network this TSI half receives
- 12-13 = FIS0, FIS1—Enables bits 19-22 and selects master, secondary, or TACC FAN-IN packs for diagnostics (Normally = 00)
- 14 = FS—Forces zeros or ones across matchers when bit 15 = 1
- 15 = FE—Force enable for bit 14
- 16 = Loop around
- 17 = PTS—Places BMAs in maintenance mode
- 18 = SSFE—Serial switch force enable
- 19 = HFIS—When bits 12-13 are not 00, selects FAN-IN from SPC 0 or 1
- 20-22 = BIS0, BIS1, BIS2—Enables 1 of 8 branches of the FAN-IN packs selected by bits 12-13, 19
- 23 = Not used

HARDWARE STATUS—Controller 0 or 1 (TSI-2 J4A001B) (Words 3, 4)

- Bit 0-11 = Same as TSI-1
 - 12 = Diagnose internal read access
 - 13 = BMC maintenance mode
- 14-17 = Same as for TSI1
 - 18 = Diagnose SPC select
 - 19 = Not used
 - 20 = Diagnose matcher enable
 - 21 = BMB maintenance mode
 - 22 = Enable all levels on memory writes
 - 23 = Not used

UTYPE TRANS—Unit-Type Translator (Word 6)

- Bit 0-23 = First word of Unit-Type Translator for failing TSI

ASW ESR—Controller 0 or 1 (Words 7, 8)

- Bit 0 = All-seems-well failure
- 1 = Autonomous interrupt
- 2 = PUB parity failure even bits
- 3 = PUB parity failure odd bits
- 4 = Mode failure
- 5 = Receive time slot memory audit failure
- 6 = Transmit time slot memory audit failure
- 7 = Busy/idle memory audit failure
- 8 = Receive time slot memory parity failure
- 9 = Transmit time slot memory parity failure
- 10 = Busy/idle memory parity failure
- 11 = Address mismatch
- 12 = Data write mismatch
- 13 = Busy/idle memory write mismatch

AINT ESR—Controller 0 or 1 (Words 9, 10)

- Bit 0 = Clock error (internal)
- 1 = Time slot counter sequence check
- 2 = Time slot counter mismatch
- 3 = Clock mismatch (TSI-2—twisted ring counter mismatch)
- 4 = Receive time slot memory parity failure
- 5 = Transmit time slot memory parity failure
- 6 = Busy/idle memory parity failure
- 7 = Buffer Memory A parity failure
- 8 = Buffer Memory B parity failure
- 10 = Leading one DET parity failure
- 11 = Transmitter seems well failure
- 12 = Receiver seems well failure
- 13 = Receive mismatch
- 14 = Transmit Mismatch
- *15 = STAR seems well failure
- 17-23 = Time slot during which failure occurred—Phase A

* Not used in TSI-2

K-Code (Word 12)

Bit 0-6 = Member ID (TMS)
= 0 = SPC
= 1-6 = Member ID (TSI)
7-11 = Unit ID

Level (Word 13)

Bit 0-2 = Level

RSW ESR—Even Member TSI (Word 14)

Bit 0-6 = Receiver seems well failure SPC 0
8-14 = Receiver seems well failure SPC 1

RSW ESR—Odd Member TSI (Word 15)

Bit 0-6 = Receiver seems well failure SPC 0
8-14 = Receiver seems well failure SPC 1

Auxiliary Data—(TSI TRPF, XTSI TRPF, PCMM)

See Appendix.

TUC—Tape Unit Controller Frame Printouts

TUC Hot-Line Functions

Scan Back Results

- Bit 0 = Hot-line pulse was activated
- 1 = Bus 1 flip-flop
- 2 = Trouble flip-flop
- 3 = Clock out of sync
- 4 = Inhibit clock out of sync
- 5 = AUT clock set request
- 6 = Not used
- 7 = Not used
- 8 = Slow-down request has occurred
- 9 = No correction necessary has occurred
- 10 = Speed up request has occurred
- 11 = Clock initialization has occurred
- 12 = Not used
- 13 = Not used
- 14 = Clock out of sync has occurred
- 15-23 = Not used

Hot-Line Functions	Add.

Select Bus 0	60
Select Bus 1	63
Clock Set Request	65
Power Initialization	66
Scan Back only	71
Clear Clock Summary	72
Operational Initialization	74
Maintenance Freeze	77

VIF—Voice Interface Frame Printouts

VIF Critical Registers

VC4STAT	VC4VIUSTAT1	0.....0	0.....0	0.....0	0.....0
VC4R0-1	VC4R2-3	VC4R4-5	VC4R6-7	VC4R8-9	VC4R10-11
VC4R12-13	VC4R14-15	0.....0	0.....0	0.....0	0.....0
VC4R0-1	VC4R2-3	VC4R4-5	VC4R6-7	VC4R8-9	VC4R10-11
VC4R12-13	VC4R14-15	0.....0	0.....0	0.....0	0.....0



NOTE:

The first group VC4R0-1 through VC4R14-15 is Controller 0. The second group VC4R0-1 through VC4R14-15 is Controller 1.

VC4STAT—VIC Software Status

Bit 0-3 = VIU status 0-3 (Controller 0), 4-7 (Controller 1)

4 = BASM has been set

5 = State of VIU control bus flip-flop

6 = Multiple VIU failure

7 = Diagnostic requested

8 = Removed via TTY

9 = Matcher PESTs set

10 = PU Bus 0 send-on

11 = PU Bus 1 send-on

12 = Controller out of service

13 = Bus access Circuit 0 power off

14 = Bus access Circuit 1 power off

15 = Power off controller

16 = Controller cannot receive from base SP

17 = Controller cannot send on PU Bus 0

18 = Controller cannot receive from duplicate SP

19 = Controller cannot send on PU Bus 1

20-23 = PU maintenance code

VC4VIUSTAT1—Controller 1 Status

- Bit 0 = VIU 4 service status
- 1 = VIU 5 service status
- 2 = VIU 6 service status
- 3 = VIU 7 service status

VC4R0-1—Registers 0 and 1 Read Format

- Bit 0-7 = Read format for Register 0
- 8-15 = Read format for Register 1

VC4R2-3—Registers 2 and 3 Read Format

- Bit 0-7 = Register 2 read format
- 8 = VIC 0 Send 0
- 9 = VIC 0 Send 1
- 10 = VIC 1 Send 0
- 11 = VIC 1 Send 1

VC4R4-5—Registers 4 and 5 Read Format

- Bit 0 = VIU 0 failing
- 1 = VIU 1 failing
- 2 = VIU 2 failing
- 3 = VIU 3 failing
- 4 = VIU 4 failing
- 5 = VIU 5 failing
- 6 = VIU 6 failing
- 7 = Spare failing—1 in this item prohibits protection switch
- 8 = VIU 0 protection switched
- 9 = VIU 1 protection switched
- 10 = VIU 2 protection switched
- 11 = VIU 3 protection switched
- 12 = VIU 4 protection switched
- 13 = VIU 5 protection switched
- 14 = VIU 6 protection switched
- 15 = No protection switch active

VC4R6-7—Registers 6 and 7 Read Format

- Bit 0 = PEST check frame mismatch
- 1 = PEST ESM mismatch
- 2 = PEST reply register mismatch
- 3 = PEST multiplexer mismatch
- 4 = PEST status register mismatch
- 5 = PEST control buffer parity violation
- 6 = PEST control buffer parity violation
- 7 = PEST PSL mismatch
- 8 = PEST digital signal generator mismatch
- 9 = PEST digital signal generator mismatch
- 10 = PEST reply register parity violation

VC4R8-9—Registers 8 and 9 Read Format

- Bit 0-7 = Read format for register 8
- 8-15 = Read format for register 9

VC4R10-11—Registers 10 and 11 Read Format

- Bit 0 = F-level PEST
- 1 = Interject PEST
- 2 = Set when mate controller is maintenance isolated
- 3 = Set when mate sends are cut off
- 5 = Autonomous F-level flag
- 6 = Interject flag
- 7 = Multiple VIU failure
- 8 = Unit select relay state
- 9 = Ground relay state
- 10 = PCM relay state

VC4R12-13—VIC Error Source Registers 12 and 13

- Bit 0 = VIC 0 input register parity violation
- 1 = VIC 1 input register parity violation
- 3 = Timing receiver out of frame
- 4 = Trunk selector logic 0 violation
- 5 = Trunk selector logic 1 violation
- 6 = Trunk selector logic 2 violation
- 7 = Trunk selector logic 3 violation
- 8 = Timing receiver code violation
- 9 = Word/frame counter violation

VC4R14-15—VIC Error Source Registers 14 and 15

- Bit 0 = Indicator check frame mismatch
- 1 = ESM mismatch on input register
- 2 = Input to reply register mismatch
- 3 = Indicator multiplexer mismatch
- 4 = Status memory mismatch
- 5 = VIU control buffer parity violation
- 6 = VIU control buffer parity violation
- 7 = PSL function code mismatch
- 8 = Digital signal generator mismatch
- 9 = Reply register parity violation
- 10 = Error source register mismatch
- 11 = Remote input parity violation
- 12 = Remote timing receiver code violation
- 13 = Remote frame counter violation

VC4R12-13—VIU Error Source Registers 12 and 13

- Bit 1 = Signal failure-test Trunk 3
- 2 = Signal failure-test Trunk 2
- 3 = Signal failure-test Trunk 1
- 4 = Signal failure-test Trunk 0
- 5 = Parity violation-Decoder 0 input
- 6 = Transmitter parity violation
- 9 = High distortion-test Trunk 3
- 10 = High distortion-test Trunk 2
- 11 = High distortion-test Trunk 1
- 12 = High distortion-test Trunk 0
- 13 = Parity violation-maintenance control
- 14 = Parity violation-decoder 1 input

VC4R14-15—VIU Error Source Registers 14 and 15

- Bit 1 = Upper output translator failure
- 2 = Lower output translator failure
- 3 = Upper input translator failure
- 4 = Lower input translator failure
- 5 = Parity violation-access control
- 6 = Parity violation-receiver
- 10 = Power supply failure
- 11 = Clock state
- 12 = Clock switchover
- 14 = Carrier alarm

VIC Alarms SD-5G158-01

Alarm	Source of Alarm
PO*	Bad Incoming Parity to Controller (FS2) FA 741 148-11 (0) 148-26 (1)
OOF	Out of Frame on Incoming PCM (FS8) FB481— 144-07(0) 144-31 (1)
TCO	FA 754: 156-12 (FS12)
TC1	FA 754: 156-13 (FS12) 1—and only—1 out of 128 Failure Trunk Loop Select Logic
TC2	FA 754: 156-14 (FS12)
TC3	FA 754: 156-15 (FS12)
CC0*	GBC Counter Failure (Checks that Parity Alternates) (FS8) FA 747: 144-08 (0) 144-29 (1)
CC1*	GWC Master and Slave Counters Mismatch (FS8) FA 748: 144-09 (0) 144-28 (1)
MMICF	Mismatch of Indicator Check frame “P” Pulses between Controllers (FS8) FA 749: 144-10 (0) 144-27(1)
MMESM	Mismatch of Enable Select Mode “F/F” between Controllers (FS2) FA 741: 148-11 (0) 148-26 (1)

Alarm	Source of Alarm
MMREP	Mismatch of 17-bit Matcher Between Controllers (FS6) FA 760: 152-18 (0) 152-19 (1)
MMMUX	Mismatch of Status Memory Multiplexer Outputs Between Controllers (FS11) FA 756: 144-17, 18 & 148-17, 18 (0) 144-20, 19 & 148-20, 19 (1)
MMSM	Mismatch of Status Memory Data Inputs Between Controllers (FS10) FA 757: 144-14 (0) 144-23(1) FA 758
MMP1	Mismatch of VIU Maintenance Control Bus Parity Bit Controllers (FS10) FA 753: 148-03 (0) 148-34 (1)
MMP2	Mismatch of VIU Access Control Bus Parity Bit Controllers (FS10) FA 753: 148-03 (0) 148-34 (1)
MMPSL	Mismatch of 5-Bit Matcher Between Controllers (FS6) FA 760: 152-18 (0) 152-19 (1)
MMDSG	Mismatch of Digital Signal Generator Output between Controllers (FS9) FA 750: 144-12 (0) 144-25 (1)
RRPE	Parity Difference between Input and Output of Reply Register (FS4) FA 745: 152-16, FA 744: 152-17 (0) FA 745: 152-21, FA 744: 152-20 (1)
MMIIB	Mismatch of II Bit Matcher Between Controllers (FS6) FA 760: 152-18 (0) 152-19 (1)
*	Suffix (L) Indicates Controller's Indication of His Own Alarm Suffix (R) Indicates Controller's Indication of His Mate's Alarm

VIF Controller Phase 1 Tests

Test 7—R13/12

BIT 0	=	POL
3	=	OOF
4	=	TC0
5	=	TC1
6	=	TC2
7	=	TC3
8	=	CCOL
9	=	CCIL

Test 8—R15/14

BIT 0	=	MMICF
1	=	MMESM
2	=	MMREP
3	=	MMMUX
4	=	MMSM
5	=	MMP1
6	=	MMP2
7	=	MMPSL
8	=	MMDSG
9	=	RRPE
10	=	MMIIB
11	=	POR
12	=	CC0R
13	=	CC1R

Voice Interface Unit (VIU) Phase 1 Tests

Test 7—R13/12

Bit 1	=	S3
2	=	S2
3	=	S1
4	=	S0
5	=	P2
6	=	P1
9	=	D3
10	=	D2
11	=	D1
12	=	D0
13	=	P4
14	=	P3

Test 8—R15/14

Bit 1	=	TRU
2	=	TRL
3	=	TTU
4	=	TTL
5	=	P6
6	=	P5
10	=	PWR
11	=	CST
12	=	CSO
14	=	REF

Voice Interface Unit (VIU)

Error Source Register Reformatted

RCNT = 54 VIU O.....RCMT 61 = VIU 7

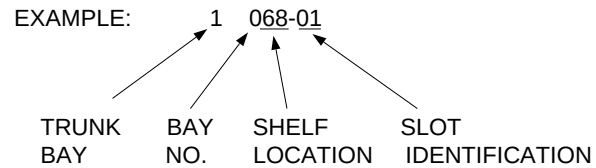
Bit	Name	Description
0	RS3	Signal alarm in block containing trunk 125
1	RS2	Signal alarm in block containing trunk 127
2	RS1	Signal alarm in block containing trunk 126
3	RS0	Signal alarm in block containing trunk 0
4	RPV2	Alarms when there is a parity failure in decoder input processor (DIP)—Even information
5	RPV1	Parity over data passed between packs FA727, FA571, AND FB220
6	RD3	High distortion in block containing trunk 125
7	RD2	High distortion in block containing trunk 127
8	RD1	High distortion in block containing trunk 126
9	RD0	High distortion in block containing trunk 0
10	RPV4	Alarms when parity transmitted to access FA732 control and that formed within the access control differ
11	RPV3	Alarms when there is a parity failure in decoder input processor (DIP)—Odd information
12	RTRU	Alarms when a failure occurs in FA721, slot 15-22. the alarm monitors the output clocks from this circuit pack
13	RTRL	Alarms when a failure occurs in FA721, slot 03-22. The alarm monitors the output clocks from this circuit pack

Bit	Name	Description
14	RTTU	Alarms when a failure occurs in FA721, slot 15-09. The alarm monitors the output clocks from this circuit pack
15	RTTL	Alarms when a failure occurs in FA721, slot 03-09. The alarm monitors the output clocks from this circuit pack
16	RPV6	Parity violation in maintenance control FA731, or when parity transmitted from controller is in error
17	RPV5	Parity violation in serial reframing detector FA733, in slot 03-16, or retiming register FA730 in slot 03-17
18	RPWR	Indicates failure in 80A or 81A power supply
19	RCST	State of VIU clock not used because when set (-1), VIU alarms
21	—	—
22	RREF	Failure to frame on PCM data can be caused by (1) TSI problem, (2) coaxial line problem, or (3) problem in FB480
23	—	—

Voice Interface Frame (VIF)

JA14 Circuit Pack Locations

The table, on the following page, lists the equipment locations of the JA14 circuit packs for each trunk. The example explains how to read the table.



Equipment Locations

1	068-01	25	075-01	49	175-01	73	268-01	97	275-01
2	068-02	26	075-02	50	175-02	74	268-02	98	275-02
3	068-03	27	075-03	51	175-03	75	268-03	99	275-03
4	068-04	28	075-04	52	175-04	76	268-04	100	275-04
5	068-05	29	075-05	53	175-05	77	268-05	101	275-05
6	068-06	30	075-06	54	175-06	78	268-06	102	275-06
7	068-07	31	075-07	55	175-07	79	268-07	103	275-07
8	068-08	32	075-08	56	175-08	80	268-08	104	275-08
9	068-09	33	075-09	57	175-09	81	268-09	105	275-09
10	068-10	34	075-10	58	175-10	82	268-10	106	275-10
11	068-11	35	075-11	59	175-11	83	268-11	107	275-11
12	068-12	36	075-12	60	175-12	84	268-12	108	275-12
13	068-13	37	075-13	61	175-13	85	268-13	109	275-13
14	068-14	38	075-14	62	175-14	86	268-14	110	275-14
15	068-15	39	075-15	63	175-15	87	268-15	111	275-15
16	068-16	40	075-16	64	175-16	88	268-16	112	275-16
17	068-17	41	075-17	65	175-17	89	268-17	113	275-17
18	068-18	42	075-18	66	175-18	90	268-18	114	275-18
19	068-19	43	075-19	67	175-19	91	268-19	115	275-19
20	068-20	44	075-20	68	175-20	92	268-20	116	275-20
21	068-21	45	075-21	69	175-21	93	268-21	117	275-21
22	068-22	46	075-22	70	175-22	94	268-22	118	275-22
23	068-23	47	075-23	71	175-23	95	268-23	119	275-23
24	068-24	48	075-24	72	175-24	96	268-24	120	275-25

VIF JA1/JA2 Circuit Pack Layout

This table lists the associated equipment locations corresponding to each trunk and equipment locations corresponding to single and double VIU alarms.

JA1 Slot		1	2		3	4	5	6		7	8
JA2 Slot		23	24		25	26	27	28		29	30
Double Alarm											
	S	31	63		95	127	32	64		96	0
	H	27	59		91	123	28	60		92	124
D0+D2	E	23	55		87	119	24	56		88	120
(S0+S2)	L	19	51	D	83	115	20	52	D	84	116
JA4	F	15	47	2	79	111	16	48	0	80	112
(09-30)		11	43		75	107	12	44		76	108
	1	7	39		71	103	8	40		72	104
	5	3	35		67	99	4	36		68	100

	S	29	61		93	125	30	62		94	126
	H	25	57		89	121	26	58		90	122
D1+D3	E	21	53		85	117	22	54		86	118
(S1+S3)	L	17	49	D	81	113	18	50	D	82	114
JA4	F	13	45	3	77	109	14	46	1	78	110
(09-29)		9	41		73	105	10	42		74	106
	3	5	37		69	101	6	38		70	102
		1	33		65	97	2	34		66	98

Double Alarm	Double Alarm

D2+D3 (S2+S3)	D0+D1 (S0+S1)
JA3 (09-02)*	JA3 (09-04)*
JA6 (09-03)*	JA6 (09-05)*
JA7 (09-25)*	JA7 (09-27)*
JA5 (09-26)*	JA5 (09-28)*
S2+S3 ONLY	S0+S1 ONLY
FA723 (15-11)	FA723 (15-13)
FA724 (03-19)	FA724 (03-20)

* Input PAM

Single Alarm Resolution (See Note)

1. Swap the JA1s and JA2s associated with a single alarm into pack locations that correspond to the other alarm pair; move the four JA1s into one alarm position and the four JA2s into the other.
2. The next single alarm to occur implicates either the JA1s or JA2s. (If the single alarm did not change, see double alarm resolution.)
3. Move three of the four suspect packs into the other alarm quadrants.
4. The next single alarm to occur identifies the faulty pack.

Double Alarm Resolution (See Note)

1. Swap the JA3 and JA6 associated with a double alarm with the other JA3 and JA6.
2. If the double alarm moves with the pack swap, move one of the suspect packs back to its original location. The next double alarm identifies the faulty pack. If the double alarm remains the same, swap the JA5 and JA7 associated with double alarm with the other JA5 and JA7. The next double alarm identifies the faulty pack.
3. If a single alarm condition still exists, suspect JA4 packs.
4. If the double alarm condition still exists for signal alarms, suspect FA723 or FA724.

⇒ NOTE:

Revert back to the next previous pack move if the VIU shows an abnormal increase in number of alarms with the current pack move. Restrict the number of packs to be swapped, and proceed with a similar strategy.

Other Alarms

S0	FA 731 (03-11)
S1	FA 731 (03-11)
S2	FA 731 (03-11)
S3	FA 731 (03-11)
P1	FA 571 (15-17), FB 220 (15-21), FA727 (15-15)
P2	FA 726 (03-18)
P3	FA 726 (03-18)
P4	FA 732 (03-13)
P5	FA 733 (03-16), FA 730 (03-17)
P6	FA 731 (03-11)
CSO	FA 729(15-19)
CST	FA 729 (15-19)
PWR	80A (09-08), 81A (09-23)
REF	FB 480 (03-15) FA 733 (03-16), FA 730 (03-17)
TRL	FA 721 (03-22)
TRU	FA 721 (15-22)
TTL	FA 721 (03-09)
TTU	FA 721 (15-09)

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