DIMENSION® 2000 AND CUSTOM PBX

PAM AMPLIFIER TESTS (PART 2)

(PROC 580)

CONTENTS

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1. GENERAL

1.1 This section provides information for interrogating PROC 580 in the event that the craftsperson is directed to this procedure due to a NETWORK PAM failure. Whenever this type of failure occurs, the ALARM PANEL - PAM plus MINOR and/or MAJOR alarm lamps will be lit.

1.2 The tests performed in this procedure are intercabinet transmission tests within each module, between all combinations of control carriers and a listening test on each carrier for a stuck port transmit switch.

2. RECORDS

2.1 Form SD-97-1313 is required for the recording the results of this test.

3. MAAP DISPLAY FIELDS

3.1 The following describes each of the display fields for the Network - Pam Amplifier Tests (PROC 580) format:

FIELD	DESCRIPTION
1	TEST NO - Displays active test number (Maximum of 4) per the following encodes.

ENCODE	DESCRIPTION
1	Displays failure history per each unit type, as detected by on-line maintenance.
2	Tests all circuits per a unit type (Displays failure summary only).
3	Tests all circuits per a unit type (Displays each failure).
4	Tests a particular circuit per a unit type.

2	UNIT TYPE - Displays unit type under test per the following encodes:

ENCODE	DESCRIPTION
0	Maintenance Circuit (LC105)
1	Amplifiers and Bus Select Switches (LC101, LC102, LC103 and LC104).
2	Amplifier Cables. (Intercabinet)
3	Port Transmit switch stuck closed.

3	MTCE CKT EQPT LOC - MODULE displays module under test.
4,5	MTCE CKT EQPT LOC - SOURCE - CAB/CARR - displays cabinet and carrier containing LC101 that a LC105 source signal is connected.
6,7	MTCE CKT EQPT LOC - RECEIVED-CAB/CARR - displays cabinet and carrier containing LC101 that a LC105 receiver is connected.

8 MTCE CKT EQPT LOC - TIME SLOT BUS - displays time slot bus under test. (0 = Bus 0 , 1 = Bus 1).

9 MTCE BUSY STAT OF BUS - displays maintenance busy status of bus (displayed in field 8) under test, (0 = bus not busied out, 1 = all time slots busied out).

10 FAILURE CODE - displays failure code for circuit path displayed in fields 4 - 7.

11 NTWK GAIN - displays network gain for circuits under test. Encodes for normal gains per each type of connection should be as follows:

CONNECTION	ENCODE
Line to Line	1
Line to Trunk	2
Line to Link	2
Link to Trunk	2
Trunk to Link	2
Trunk to Trunk	2
Link to Trunk	3
Trunk to Line	3

NOTE: When a failure is detected, the encodes will be different from what is displayed above - (higher or lower).

12 NUMBER OF FAILURES (test 1) - displays total number of failures detected by on-line maintenance (maximum of 6).

TOTAL CIRCUITS TESTED (Tests 2 and 3) - displays total number of circuits tested.

13 FAILING CIRCUIT INDEX (Test 1) - displays an index, which indicate a display of the total of all failing circuits detected by on-line maintenance (index = 0) or the failure history for a particular circuit (index = 1 to 6).

TOTAL CIRCUITS FAILED - (Tests 2 and 3) - displays total number of all failed circuits.

14. FAILURES PER HOUR - (test 1) - displays average failure rate per every two hours. (Maximum of 99).

15. FAILURES BEGAN (Hours Ago) - displays number of hours since failures began to the nearest hour, (17 hours maximum).

4. MAAP CONTROL KEY SEQUENCES

4.1 PROC NO., 5, 0, 8, ENTER - causes program to be loaded from the tape to the memory.

4.2 BUSY OUT - (Tests 3 and 4), busier out displayed time slot bus in a module for unit type 1 only.

4.3 NEXT CIRCUIT - (Tests 1, 3 and 4), in Test 1 and 3, causes display of next failing circuit. In Test 4, increments to next equipped LC105 circuit of PAM network path.

4.4 NEXT TEST - (Tests 1, 2, 3 and 4), causes procedure to advance to the next test number. (field 1)

4.5 NEXT UNIT - (Tests 1, 2, 3 and 4), causes procedure to advance to the next unit. (field 2)

4.6 RELEASE BUSY OUT - (Tests 3 and 4), causes displayed time slot bus to be released from a busied out condition.

4.7 RESET - (Tests 1, 2, 3 and 4), causes procedure to be reset to the beginning.

4.8 STOP - (Tests 2, 3 and 4), causes a test that is executing to be stopped.

4.9 CLEAR DATA, EXECUTE - (Test 1 only), causes on-line maintenance failure history, for the displayed unit type to be cleared.

5. PROCEDURES

5.1 The following describes the repair procedures that should be used in the event of a NETWORK PAM ALARM.

5.2 These tests should be performed whenever an intercabinet PAM cable (UNIT 2) or stuck port circuit transmit switch (UNIT 3) is a suspected trouble.

5.3 It is assumed that Test 1 in PROC 508 has been performed and that all of the detected on-line maintenance failures have been recorded. If this is not so, execute Test 1 and record the on-line maintenance failures for each unit.

5.4 UNIT 2 TYPE FAILURES (failure code = 41)

5.41 If failures (failure code 41) were recorded for unit type 2 or if intercabinet PAM cable failures are suspected, execute Test 3. If no failures are detected, use Test 4 to test circuits recorded in Test 1. If failures are detected during Test 3 or 4, use the repair procedures listed below, and re-execute Test 4 for the failing circuit. If the test passes, go to step 5.8, otherwise go to the next repair procedure.

a. Check cables, especially those associated with the CFG--, CTG-- cables. Refer to tables in Section 508.

b. Replace LC103 (line or trunk failures) or LC104 (link failures).

c. Replace LC102 in receiver carrier for failing bus.

d. Replace LC121 for failing bus.

5.5 UNIT 3 TYPE FAILURES (failure code = 51)

5.51 If failures were recorded for unit type "3", execute Test 3. If no failures are detected, use test 4 to test the circuits recorded in Test 1 for unit 3. If failures are detected, either during test 3 or 4, use the following repair procedures and then re-execute test 4 for the failing circuit. If the test passes, go to step 5.8, otherwise go to the next repair procedure.

a. Unit type 3 failures (fail code = 51) are only detectable if the customer is talking loud enough through the faulty circuit. If a failing circuit is detected, record the failure and replace

the failing circuit. The failing circuit may be determined by noting which port circuits are in use (for the carrier under test) at the time the failure occurs and then replacing each of those port boards, one at a time, until the trouble is cleared. Stuck port circuit sum or distribute switches will also cause double connects.

5.6 FAILURE CODE 98 (Network order incomplete)

a. Use PROC 505, 506 and 507.

5.7 FAILURE CODE 99

Note this trouble indicates that there is no time slot available to complete the tests.

a. If traffic is heavy, all time slots may be in use, (a time slot that is idle on both time slot buses is required for these tests). In this case, continue executing tests until a time slot becomes available.

5.8 After the troubles have been cleared for unit types 2 and 3, go to Test 1 and clear the on-line maintenance records for both unit type 2 and 3. (Use MAAP - CLEAR DATA, EXECUTE keys).

6. TROUBLE-SHOOTING AIDS

6.1 General Test Information

6.11 TEST 1 - Test 1 is the default test when procedure 580 is first read in from the tape, or when the MAAP-RESET key is operated. In either case, field 1 will display a 1, field 2 will flash, and fields 3 through 15 will be dashed. When the MAAP-EXECUTE key is operated, the failure history for the unit type displayed in field 2 is displayed. Initially the failure history will display the totals (failure index = 0) of all failures for a particular unit type. Operation of the MAAP-NEXT CIRCUIT key causes a failure history display for particular equipment locations. If the MAAP-NEXT UNIT key is operated, field 2 will be increased to the next unit type.

Operation of the MAAP-CLEAR DATA, EXECUTE keep clears the on-line maintenance records, for the unit type displayed in field 2.

6.12 TEST 2 - Tests all circuits per a unit type, displays a testing summary and controls the PAM alarm. When the MAAP and EXECUTE key is operated, the MAAP-WAIT lamp turns on, fields 3 through 8 display the PAM circuit equipment locations under test and fields 12 and 13 display the testing progress. When the test is finished, the MAAP-WAIT lamp is turned off and fields 12 and 13 display the test results. If no failures were detected, the PAM and MINOR alarm indicator are turned off. The test may be stopped at any time by operating the MAAP-STOP key.

6.13 TEST 3 - Test 3 does the same thing as test 2 except that it will stop on the first failure detected. To continue testing, operate the MAAP-NEXT CIRCUIT key.

6.14 TEST 4 - Tests, particular PAM circuit as displayed in field 3 thru 8. If a default PAM circuit is not displayed, the craftsperson must enter one. When the MAAP-EXECUTE key is operated, the MAAP-LAMP is not turned on (since the test is continuous); however, field 10 will flash the failure code. The test must be stopped before the MAAP-NEXT CIRCUIT key is operated.

6.2 GENERAL TROUBLE-SHOOTING INFORMATION

6.21 PROC 580 is used to test the intercabinet cabling (Unit 2) and to check for stuck port circuit transmit switches (Unit 3). To test LC105 maintenance circuits (Unit 0) and to test the PAM amplifiers and introcabinet cabling (Unit 1), PROC 508 should be used.

6.22 UNIT 2 TESTS (Intercabinet cabling)

6.221 These tests are performed in the same manner as those for Unit 1 (See PROC 508) except that only the PAM circuits between the Line, Trunk and Link groups are used. Unit 2 tests all combinations between the three possible groups, within a module. It does this by utilizing LC105 maintenance circuits in different cabinets, (i.e. control groups), setting up connections between two different groups and then verifying that the correct level was detected.

6.23 UNIT 3 TESTS (Part circuit switch stuck)

6.231 These tests perform a listening test on each carrier, on a per cabinet basis, within each module. The Group Select and Carrier Select are enable for a particular carrier, with just the LC105 maintenance circuit receiver enabled. If any detectable level is found, error code 51 is displayed.

TEST 1: DISPLAYS FAILURE HISTORY FOR EACH UNIT TYPE. USE 'CLEAR DATA', 'EXECUTE' TO CLEAR FAILURE HISTORY.

TEST 2: TESTS ALL CIRCUITS FOR A UNIT TYPE (DISPLAYS SUMMARY ONLY).

TEST 3: TESTS ALL CIRCUITS FOR A UNIT TYPE (DISPLAYS EACH FAILURE).

TEST 4: TESTS A PARTICULAR CIRCUIT CONTINUOUSLY FOR A UNIT TYPE.

USE 'BUSY OUT' & 'RLS BUSY OUT' TO CHANGE MTCE BUSY STAT(UNIT TYPE=2)

USE 'NEXT CIRCUIT' TO ADVANCE TO NEXT EQPT LOC (NOT TEST 2).
NOTE: IN FLDS 5 AND 7, 5-7 ARE THE RIGHT HALF OF LINK CARRIERS 2-4

UNIT TYPES:
0=MTCE CKT (LC105)
1=AMPLIFIERS AND BUS SELECT SWITCHES
2=AMPLIFIER CABLES
3=PORT TRANSMIT SWITCHES
USE 'NEXT UNIT' TO ADVANCE TYPE

FAILURE CODES: 0=PASS 98=NTWK ORDER INCOMPLETE 99=NO TIME SLOT

UNIT TYPE=0
1=TIME SLOT SR
2=RCVR INIT
3-17=LOOP AROUND
18=PWR RTRN FF
19=NTWK CLK GATE
20=18 &19

UNIT TYPE=1
31=GAIN
32=SUM SELECT SW
33=DIST SELECT SW
34=32 & 33
35=3-WAY PAD

UNIT TYPE=2
41=GAIN

UNIT TYPE=3
51=STUCK CLOSED

SPEC ERROR CODES:
80-USE PROC 508 FOR UNIT TYPES 0 & 1
81-BUS CANNOT BE BUSIED OUT IN SINGLE BUS SYSTEM

NTWK GAIN:
0=LOW
1=BAND 1
2=BAND 2
3=BAND 3
4=HIGH
5=MORE THAN ONE OF ABOVE

ISSUE 2 PROC 580

ISSUE 2

PAM AMPLIFIER TESTS (PART 2)

PROC 580

TEST NO 1	UNIT TYPE 2	TEST 4: MTCE CKT EQPT LOC(SEE NOTE FOR FLDS 5&7): MODULE 3	SOURCE: CAB 4	SOURCE: CARR 5	RECEIVER: CAB 6	RECEIVER: CARR 7	TIME SLOT BUS 8	MTCE BUSY STAT OF BUS 9	FAILURE CODE 10	NTWK GAIN 11	FAILURE HISTORY (TEST 1): NUMBER OF FAILURES / SUMMARY (TESTS 2&3): TOTAL CIRCUITS TESTED 12	FAILING CIRCUIT INDEX / SUMMARY (TESTS 2&3): TOTAL CIRCUITS FAILED 13	FAILURES PER HOUR 14	FAILURES BEGAN (HOURS AGO) 15

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