

USER
GUIDE

MAP	TITLE	PART NO
0001	BASE DIAGNOSTIC USER GUIDE	6841631
0005	TELEPROCESSING DIAGNOSTIC U/G	6842275
1000	START MAP	6841656
1100	INITIAL FAILURE MAP	6841651
1150	CONFIGURATION DISPLAY MAP	6841633
1200	POWER ON RESET MAP	6841652
1201	POWER ON RESET MAP (FEATURES)	6841638
1205	PROCESSOR MAP	6841712
1210	STORAGE MAP	6841713
1212	UPDATE STORAGE MAP	6842276
1220	TRAP DATA MAP	6841653
1225	INTERMITTENT ERROR MAP	6841716
1250	POWER MAP	6841657
1300	KEYBOARD MAP	6841654
1400	DISPLAY MAP	6841655
1450	WORD PROCESSING MAP	6842277
1500	DISKETTE STRATEGY MAP	6841632
1501	DISKETTE ENTRY MAP	6842271
1502	RPQ EXTENDED FEATURE MAP	6842272
1530	1500/1505 PID FAILURE MAP(DISKETTE)	6841634
1540	READ/WRITE FAILURE MAP (DISKETTE)	6841636
1545	NOT READY MAP (DISKETTE)	6841637
1555	SEEK ERROR MAP (DISKETTE)	6841639
1560	5246 POWER MAP	6842270

5322
5246

5241

5242

DIAGNOSTIC USER GUIDE 0001

Document Number 6841631

**EC 386851 - 864452 - 864609 - 869281 - 987896 - 994445
26OCT79 21MAR80 09JUN80 27OCT80 23FEB81 13AUG81**

(c) Copyright International Business Machines Corporation, 1981

CONTENTS

1.0	INTRODUCTION	1
1.1	SUMMARY OF TEST SEQUENCE	1
2.0	ROS RESIDENT DIAGNOSTIC PROGRAMS	2
2.1	POWER-ON DIAGNOSTIC (POD)	2
2.2	ROS RESIDENT DISKETTE DRIVE 1-4 TEST (PID 1500)	2
3.0	DISKETTE RESIDENT PROGRAMS	4
3.1	DIAGNOSTIC CONTROL PROGRAM (DCP)	4
3.2	DIAGNOSTIC FLT PROGRAMS	5
3.3	CE UTILITY PROGRAMS	5
3.4	PROGRAM RULES	6
3.4.1	ROS RESIDENT POWER-ON DIAGNOSTIC and DISKETTE ADAPTER/DRIVE DIAGNOSTIC	6
3.4.2	DIAGNOSTIC FLT OR UTILITY PROGRAMS	6
3.4.3	KEYBOARD INPUT FORMAT	7
3.4.4	PROGRAM MESSAGE FORMAT	7
4.0	DIAGNOSTIC USER GUIDE (THIS DOCUMENT)	8
5.0	MAINTENANCE ANALYSIS PROCEDURES (MAPS)	9
5.1	MAP ORGANIZATION	9
6.0	SERVICE MANUALS	10
7.0	DOCUMENT TO DOCUMENT REFERENCE	11
8.0	ERROR LOG DATA	12
8.1	ERROR LOG FORMAT	12
8.2	ERROR LOG DISPLAY	12
9.0	TRAP DATA	13
10.0	INTERMITTENT ERROR PROCEDURE	14
11.0	SPECIAL TOOLS/TEST EQUIPMENT	15
11.1	SHIP GROUP TOOLS	15
11.2	BRANCH OFFICE TOOLS	15
11.3	REQUIRED TOOL KIT TOOLS	15
11.4	RECOMMENDED ADDITIONAL TOOLS	16
12.0	PROGRAM OPERATION SUMMARY CHART	17
13.0	GLOSSARY	18
14.0	PID 0001 (DIAGNOSTIC CONTROL PROGRAM)	25
14.1	PROGRAM SUMMARY	25
14.1.1	PURPOSE	25
14.2	OPERATING PROCEDURES	25
14.2.1	LOADING	25
14.2.2	MENU DISPLAY	26
14.2.3	MENU OPTION SELECTION	26
14.2.4	PROGRAM RUN INSTRUCTIONS	27
14.2.4.1	PROGRAM TERMINATE METHOD	27
14.3	ERROR, ACTION AND INFORMATION MESSAGES	27
14.4	DETAILED DESCRIPTION OF ROUTINES	28
14.4.1	ALTERNATE PRINT OPTION	28
14.4.2	OPTION FLAGS	29
15.0	PID 0100 (FORMAT DISKETTE UTILITY)	30
15.1	PURPOSE	30
15.2	OPERATING PROCEDURES	30
15.2.1	LOADING	30

15.2.2	MENU DISPLAY	30
15.2.3	MENU OPTION SELECTION - None.	30
15.2.4	PROGRAM RUN INSTRUCTIONS	30
15.2.4.1	PROGRAM END	30
15.3	ERROR, ACTION AND INFORMATION MESSAGES	31
15.4	DETAILED DESCRIPTION	32
16.0	PID 0105 (COPY DISKETTE UTILITY)	33
16.1	PURPOSE	33
16.2	OPERATING PROCEDURES	33
16.2.1	LOADING	33
16.2.2	MENU DISPLAY	33
16.2.3	MENU OPTION SELECTION - None.	33
16.2.4	PROGRAM RUN INSTRUCTIONS	33
16.2.4.1	PROGRAM END	33
16.3	ERROR, ACTION AND INFORMATION MESSAGES	34
16.4	DETAILED DESCRIPTION	36
17.0	PID 0110 (READ VERIFY DISKETTE UTILITY)	37
17.1	PURPOSE	37
17.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	37
17.2.1	LOADING PID 0110 - DISKETTE READ VERIFY UTILITY -	37
17.2.2	MENU DISPLAY	37
17.2.3	MENU OPTION SELECTION	37
17.2.4	PROGRAM RUN INSTRUCTIONS	38
17.2.4.1	END COMMAND	38
17.2.4.2	LOOP COMMAND	38
17.2.5	CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT	39
17.3	ERROR, ACTION AND INFORMATION MESSAGES	39
17.4	DETAILED DESCRIPTION OF ROUTINES	47
17.4.1	ROUTINE 1	47
17.4.2	ROUTINE 2 - READ CE DISKETTE	47
17.4.3	ROUTINE 3 - READ SINGLE RECORD	47
17.4.4	ROUTINE 4 - READ EXCHANGE DISKETTE	47
17.4.5	ROUTINE 5 - READ CUSTOMER DISKETTE	48
17.4.6	ROUTINE 6 - HEAD ALIGNMENT CHECK	48
17.5	GENERAL INFORMATION	48
17.5.1	UTILITY USE	48
17.5.2	STATUS BYTE DEFINITION FOR MESSAGE E-2782	49
17.5.3	COMMAND TYPE REQUESTS	49
18.0	PID 0115 (VTOC DISPLAY UTILITY)	50
18.1	PURPOSE	50
18.2	OPERATING PROCEDURES	50
18.2.1	LOADING	50
18.2.2	MENU DISPLAY	50
18.2.3	MENU OPTION SELECTION - NONE	50
18.2.4	PROGRAM RUN INSTRUCTIONS	50
18.2.4.1	PROGRAM TERMINATE METHOD	50
18.3	ERROR, ACTION AND INFORMATION MESSAGES	51
18.4	DETAILED DESCRIPTION	52
19.0	PID 0120 (ERROR LOG DISPLAY UTILITY)	53
19.1	PURPOSE	53
19.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	53
19.2.1	LOADING PID 0120 - SYSTEM/23 DISKETTE ERROR LOG UTILITY	53
19.2.2	MENU DISPLAY	53
19.2.3	MENU OPTION SELECTION	53
19.2.4	PROGRAM RUN INSTRUCTIONS	54
19.2.4.1	END COMMAND	54
19.2.4.2	LOOP COMMAND NOT USED.	54
19.2.5	CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT	54
19.3	ERROR, ACTION AND INFORMATION MESSAGES	55
19.4	DETAILED DESCRIPTION OF ROUTINES	61
19.4.1	ROUTINE 1	61
19.4.2	ROUTINE 2 - ERROR LOG DISPLAY	61

19.4.3	ROUTINE 3 - READ/WRITE STATISTICS	61
19.4.4	ROUTINE 4 - CLEAR ERROR LOG	62
19.5	GENERAL INFORMATION	62
19.5.1	UTILITY USE	62
19.5.2	STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424	63
19.5.3	COMMAND TYPE REQUESTS	63
19.5.4	DISPLAY FORMAT FOR ERROR LOG DATA MESSAGE I-2424	64
20.0	PID 0125 (EC/PTF SUPPORT UTILITY)	65
20.1	PURPOSE	65
20.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	65
20.2.1	LOADING PID 0125 - EC/PTF UTILITY -	65
20.2.2	MENU DISPLAY	65
20.2.3	MENU OPTION SELECTION	65
20.2.4	PROGRAM RUN INSTRUCTIONS	66
20.2.4.1	END COMMAND	66
20.2.4.2	LOOP COMMAND NOT USED.	66
20.2.5	CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT	66
20.3	ERROR, ACTION AND INFORMATION MESSAGES	67
20.4	DETAILED DESCRIPTION OF ROUTINES	74
20.4.1	ROUTINE 1	74
20.4.2	ROUTINE 2 - ROS EC AND PART NUMBER DISPLAY	74
20.4.3	ROUTINE 3 - FLT EC NUMBER DISPLAY	74
20.4.4	ROUTINE 4 - PID UPDATE	75
20.4.5	ROUTINE 5 - RECORD UPDATE	75
20.5	GENERAL INFORMATION	75
20.5.1	UTILITY USE	75
20.5.2	STATUS BYTE DEFINITION FOR MESSAGE E-2382	76
20.5.3	COMMAND TYPE REQUESTS	76
21.0	PID 0150 (CONFIGURATION DISPLAY)	77
21.1	PURPOSE	77
21.2	OPERATING PROCEDURES (DCP CONTROLLED SECTION)	77
21.2.1	LOADING	77
21.2.2	MENU DISPLAY - NONE	77
21.2.3	MENU OPTION SELECTION - NONE	77
21.2.4	PROGRAM RUN INSTRUCTIONS	77
21.2.4.1	END COMMAND	77
21.2.4.2	LOOP PROGRAM COMMAND - NONE	77
21.2.4.3	LOOP ROUTINE COMMAND - NONE	77
21.3	ERROR, ACTION AND INFORMATION MESSAGES - NONE	78
21.4	DETAILED DESCRIPTION OF TESTS - NONE	78
22.0	PID 1200 (PROCESSOR POWER-ON TEST)	79
22.1	PURPOSE	79
22.1.1	POWER ON RESET ERROR INDICATOR	79
22.1.2	ERROR REPORTING	79
22.2	OPERATING PROCEDURES	79
22.2.1	LOADING	79
22.2.2	MENU DISPLAY -- NONE	80
22.2.3	MENU OPTION SELECTION	80
22.2.4	PROGRAM OPTIONS	80
22.2.4.1	LOOP PROGRAM OPTION	80
22.2.4.2	STOP ON ERROR OPTION	80
22.3	INDEX OF ROUTINES	81
22.4	DETAILED DESCRIPTION OF ROUTINES	82
22.4.1	POWER-ON ROUTINES	82
22.4.1.1	ROUTINE 01	82
22.4.1.2	ROUTINE 02	82
22.4.1.3	ROUTINE 03	82
22.4.1.4	ROUTINE 04	82
22.4.1.5	ROUTINE 05	82
22.4.1.6	ROUTINE 06	82
22.4.1.7	ROUTINE 07	82
22.4.1.8	ROUTINE 08	83
22.4.1.9	ROUTINE 09 THROUGH 17	83

22.4.1.10	ROUTINE 18 THROUGH 29	83
22.4.1.11	ROUTINE 2A-30	83
22.4.1.12	ROUTINE 31	83
22.4.1.13	ROUTINE 32	83
22.4.1.14	ROUTINE 33	84
22.4.1.15	ROUTINE 34	84
22.4.1.16	ROUTINE 35: KEYBOARD RESET TEST	84
22.4.1.17	ROUTINE 36: ELECTRONIC WRAP OF PRINTER ATTACHMENT	84
22.4.1.18	ROUTINE 37: PRINTER DIAGNOSE.	85
22.4.1.19	ROUTINE 38	85
22.4.1.20	ROUTINE 39	85
22.4.1.21	ROUTINE FD	85
22.4.2	FEATURE ROUTINES	85
22.4.2.1	ROUTINE 3A	85
22.4.2.2	ROUTINE 3B	85
23.0	PID 1205 (CPU PROCESSOR FLT)	86
23.1	PURPOSE	86
23.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	86
23.2.1	LOADING PID 1205 - CPU INSTRUCTION SET TEST -	86
23.2.2	MENU DISPLAY	86
23.2.3	MENU OPTION SELECTION	86
23.2.4	PROGRAM RUN INSTRUCTIONS	87
23.2.4.1	END COMMAND	87
23.2.4.2	LOOP COMMAND	87
23.2.5	CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT	87
23.3	ERROR, ACTION AND INFORMATION MESSAGES	88
23.4	DETAILED DESCRIPTION OF ROUTINES	90
23.4.1	ROUTINE 1	90
23.4.2	ROUTINE 2 - INSTRUCTION SET TEST	90
23.4.3	ROUTINE 3 - PROCESSOR LOGIC TEST	90
23.4.4	ROUTINE 8 - TRAP DISPLAY CHECK	90
23.5	GENERAL INFORMATION	90
24.0	PID 1210 (CPU STORAGE FLT)	91
24.1	PURPOSE	91
24.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	91
24.2.1	LOADING PID 1210 - CPU STORAGE TEST -	91
24.2.2	MENU DISPLAY	91
24.2.3	MENU OPTION SELECTION	91
24.2.4	PROGRAM RUN INSTRUCTIONS	92
24.2.4.1	END COMMAND	92
24.2.4.2	LOOP COMMAND	92
24.2.5	CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT	92
24.3	ERROR, ACTION AND INFORMATION MESSAGES	93
24.4	DETAILED DESCRIPTION OF ROUTINES	96
24.4.1	ROUTINE 1	96
24.4.2	ROUTINE 2 - BASE STORAGE TEST	96
24.4.3	ROUTINE 3 - FULL STORAGE TEST	96
24.4.4	ROUTINE 4 - ROS STORAGE CHECK	96
24.4.5	ROUTINE 5 - CONTROL STORAGE	97
24.4.6	ROUTINE 8 - STORAGE EXERCISER	97
24.5	GENERAL INFORMATION	98
25.0	PID 1212 (UPDATE STORAGE TEST)	99
25.1	PURPOSE	99
25.2	OPERATING PROCEDURES	99
25.2.1	LOADING	99
25.2.2	MENU DISPLAY	99
25.2.3	MENU OPTION SELECTION:	99
25.2.4	PROGRAM RUN INSTRUCTIONS	99
25.2.4.1	OPERATION	99
25.2.4.2	OPERATION	100
25.2.4.3	END COMMAND	100
25.3	ERROR, ACTION AND INFORMATION MESSAGES	100
25.3.1	INFORMATION	100

25.3.2	OPERATOR ACTION	100
25.3.3	ERROR MESSAGES	101
25.4	DETAILED DESCRIPTION OF ROUTINES	101
25.4.1	ROUTINE 0	101
25.4.2	ROUTINE 1	101
25.4.3	ROUTINE 2	101
25.4.4	ROUTINE 3	101
26.0	PID 1300 (KEYBOARD FLT)	102
26.1	PURPOSE	102
26.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	102
26.2.1	LOADING	102
26.2.2	MENU DISPLAY	102
26.2.3	SUBROUTINE MENUS	102
26.2.3.1	ROUTINE 0	102
26.2.3.2	ROUTINE 1	103
26.2.4	PROGRAM RUN INSTRUCTIONS	103
26.2.4.1	END COMMAND	103
26.2.4.2	EXIT ROUTINE PROCEDURE	103
26.2.4.3	LOOP ROUTINE COMMAND - Not affected	103
26.2.5	CONTROL PROGRAM ERROR MESSAGES	103
26.3	ERROR, ACTION AND INFORMATION MESSAGES	104
26.4	DETAILED DESCRIPTION OF ROUTINES	104
26.4.1	ROUTINE 0	104
26.4.2	ROUTINE 1	104
27.0	PID 1400 (SCREEN IMAGE TEST PATTERNS)	105
27.1	PURPOSE	105
27.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	105
27.2.1	LOADING	105
27.2.2	MENU DISPLAY	105
27.2.3	MENU OPTION SELECTION	106
27.2.4	PROGRAM RUN INSTRUCTIONS	106
27.2.4.1	END COMMAND	106
27.2.4.2	LOOP PROGRAM COMMAND -- NONE	106
27.2.4.3	LOOP ROUTINE COMMAND -- NONE	106
27.3	ERROR, ACTION AND INFORMATION MESSAGES	106
27.4	DETAILED DESCRIPTION OF ROUTINES (CRT PATTERN AND ATTRIBUTE TEST)	106
27.4.1	ROUTINE 0 ALIGNMENT PATTERN	106
27.4.2	ROUTINE 1 THROUGH 7 CHARACTER SET DISPLAYS	106
27.4.3	ROUTINE 8 ATTRIBUTE TEST	106
28.0	PID 1500 (ROS RESIDENT DISKETTE DRIVE 1-4 TEST)	108
28.1	PURPOSE	108
28.2	OPERATING PROCEDURES	108
28.2.1	SELECTING	108
28.2.2	MENU DISPLAY	109
28.2.2.1	MENU ITEMS:	109
28.2.3	MENU OPTION SELECTION	109
28.2.4	PROGRAM RUN INSTRUCTIONS	109
28.2.4.1	END COMMAND	109
28.2.4.2	LOOP PROGRAM COMMAND	109
28.2.4.3	LOOP ROUTINE COMMAND - NONE	110
28.2.4.4	MAP CHART SUPPORT ROUTINE OPERATION	110
28.2.4.5	SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)	110
28.3	ERROR, ACTION AND INFORMATION MESSAGES	111
28.4	DETAILED DESCRIPTION OF ROUTINES	114
28.4.1	ROUTINE 0	114
28.4.2	ROUTINE 1	114
28.4.3	ROUTINE 2	114
28.4.4	ROUTINE 3	114
28.4.5	ROUTINE 4	114
28.4.6	ROUTINE 5	114
28.4.7	ROUTINE 6	114
28.4.8	ROUTINE 7	115
28.4.9	ROUTINE 8 (RESERVED)	115

28.4.10	ROUTINE 9	115
28.4.11	ROUTINE 0A	115
28.4.12	ROUTINE CE	115
28.4.13	ROUTINE 0D	115
29.0	PID 1505 (DISKETTE FLT, PART 1)	116
29.1	PURPOSE	116
29.2	OPERATING PROCEDURES	116
29.2.1	LOADING	116
29.2.2	MENU DISPLAY	117
29.2.3	MENU OPTION SELECTION	117
29.2.4	PROGRAM RUN INSTRUCTIONS	118
29.2.4.1	END COMMAND	118
29.2.4.2	LOOP PROGRAM COMMAND - NONE.	118
29.2.4.3	LOOP ROUTINE COMMAND	118
29.2.4.4	MAP CHART SUPPORT ROUTINE	119
29.2.4.5	SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)	119
29.3	ERROR, ACTION AND INFORMATION MESSAGES	120
29.4	DETAILED DESCRIPTION OF ROUTINES	122
29.4.1	ROUTINE 0	122
29.4.2	ROUTINE 1	122
29.4.3	ROUTINE 2	122
29.4.4	ROUTINE 3	123
29.4.5	ROUTINE 4	123
29.4.6	ROUTINE 5	123
29.4.7	ROUTINE 6	123
29.4.8	ROUTINE 7	123
29.4.9	ROUTINE 8 (RESERVED)	123
29.4.10	ROUTINE 9	123
29.4.11	ROUTINE 0A	123
29.4.12	ROUTINE CE	124
29.4.13	ROUTINE 0C	124
29.4.14	ROUTINE 0E	124
30.0	PID 1510 (DISKETTE FLT, PART 2)	125
30.1	PURPOSE	125
30.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	125
30.2.1	LOADING	125
30.2.2	MENU DISPLAY	126
30.2.3	MENU OPTION SELECTION	126
30.2.4	PROGRAM RUN INSTRUCTIONS	126
30.2.4.1	END COMMAND	126
30.2.4.2	LOOP PROGRAM COMMAND	126
30.2.4.3	LOOP ROUTINE COMMAND - NONE	126
30.2.4.4	SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)	127
30.2.5	STATUS MESSAGES	127
30.2.5.1	START STATUS MESSAGE FOR DISKETTE TYPE 1.	127
30.2.5.2	START STATUS MESSAGE FOR DISKETTE TYPE 2D.	128
30.2.5.3	RUN STATUS MESSAGES	128
30.2.5.4	END MESSAGE	128
30.3	ERROR, ACTION AND INFORMATION MESSAGES	129
30.4	DETAILED DESCRIPTION OF TESTS	131
31.0	PID 2300 (5241/5242 PRINTER FLT)	132
31.1	PURPOSE	132
31.2	OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)	132
31.2.1	LOADING	132
31.2.2	MENU DISPLAY	133
31.2.3	MENU OPTION SELECTION	133
31.2.4	PROGRAM RUN INSTRUCTIONS	133
31.2.4.1	OPERATION	133
31.2.4.2	END COMMAND	134
31.2.4.3	LOOP PROGRAM COMMAND	134
31.3	ERROR, ACTION AND INFORMATION MESSAGES	134
31.3.1	INFORMATION	134
31.3.2	OPERATOR ACTION	135

31.3.3	SYSTEM ERRORS	136
31.3.4	USART ERRORS	137
31.3.5	END AND WARNINGS	138
31.4	DETAILED DESCRIPTION OF ROUTINES	138
31.4.1	ROUTINE 0	138
31.4.2	ROUTINE 1	138
31.4.3	ROUTINE 2	138
31.4.4	ROUTINE 3	139
31.4.5	ROUTINE 4	140
31.4.6	ROUTINE 5	140
31.4.7	ROUTINE 6	140
31.4.8	ROUTINE 7	141
31.4.9	ROUTINE 8	141
31.4.10	ROUTINE A	142
31.4.11	ROUTINE B	142
31.4.12	ROUTINE C	142
31.5	GENERAL INFORMATION	143
31.5.1	PRINTER RESPONSE DATA DISPLAY	143
31.5.1.1	DAT RESPONSE	143
31.5.1.2	DIAGNOSE RESPONSE	144
31.5.1.3	SENSE RESPONSE	144
31.5.1.4	STATUS RESPONSE	144
31.5.1.5	CPU USART STATUS	144
32.0	PID DMON (ROS RESIDENT MONITOR)	145
32.1	PURPOSE	145
32.2	OPERATING PROCEDURES	145
32.2.1	SELECTING	145
32.2.1.1	'BASIC' PROGRAM IN 'READY' MODE OR IN OPERATION.	145
32.2.1.2	TRAP '0' OR TRAP '40' CONDITION.	145
32.2.2	MENU DISPLAY - NONE	145
32.2.3	MENU OPTION SELECTION - NONE	145
32.2.4	PROGRAM RUN INSTRUCTIONS	146
32.2.4.1	DISPLAY STORAGE COMMAND	146
32.2.4.2	CHANGE STORAGE COMMAND	146
32.2.4.3	SAVE STORAGE (WRITE R/W STORAGE TO DISKETTE)	146
32.2.4.4	END MONITOR	147
32.3	ERROR, ACTION AND INFORMATION MESSAGES - NONE	147
32.4	DETAILED DESCRIPTION OF ROUTINES	147
33.0	PID 1450 (WORD PROCESSING SUPPORT TEST)	148
33.1	PURPOSE	148
33.2	OPERATING PROCEDURES	148
33.2.1	LOADING	148
33.2.2	MENU DISPLAY	148
33.2.3	MENU OPTION SELECTION:	148
33.2.4	PROGRAM RUN INSTRUCTIONS	149
33.2.4.1	OPERATION - OPTION 0 OR 1	149
33.2.4.2	OPERATION -OPTION 2-	149
33.2.5	END COMMAND	150
33.3	ERROR, ACTION AND INFORMATION MESSAGES	150
33.3.1	INFORMATION	150
33.3.2	OPERATOR ACTION	150
33.3.3	ERROR MESSAGES	150
33.4	DETAILED DESCRIPTION OF ROUTINES	151
33.4.1	ROUTINE 0	151
33.4.2	ROUTINE 1	151
33.4.3	ROUTINE 2	151
33.4.4	ROUTINE 3	151
33.4.5	OPTION 2	151

1

1.0 INTRODUCTION

Start each call with the START MAP (MAP 1000, ENTRY POINT A).

The maps list the sequence of diagnostic steps necessary to identify, isolate and repair failures. Maps will request that specific diagnostic programs be run. When selected, the programs will display prompt messages for the user. Error conditions identified by the diagnostic programs are indicated by error codes and messages. These error codes and messages are used as a guide to additional diagnostic steps.

Maintenance is performed using only the documents shown below, the GENERAL LOGIC PROBE PN 453212, the CE METER PN 1749231 and the parts contained in the CARD CADDY. Card exchange is a part of the maintenance procedure.

This document includes a summary of the various parts of the maintenance library and the standards which refer to that library.

The maintenance library includes the following parts:

1. 'ROS' RESIDENT DIAGNOSTIC PROGRAMS.
2. DISKETTE RESIDENT PROGRAMS including the DIAGNOSTIC CONTROL PROGRAM, DIAGNOSTIC FAULT LOCATION TEST (FLT) PROGRAMS and CE UTILITY PROGRAMS (contained on the CE DIAGNOSTIC DISKETTE P/N 6841645).
3. DIAGNOSTIC USER GUIDE.
4. MAINTENANCE ANALYSIS PROCEDURES (MAPS).
5. SERVICE MANUALS (SM).

BOOK #1 of the MAINTENANCE LIBRARY MANUALS contains the SERVICE MANUALS. BOOK #2 of the MAINTENANCE LIBRARY MANUALS contains the DIAGNOSTIC USER GUIDE, MAPS and the DIAGNOSTIC DISKETTE.

1.1 SUMMARY OF TEST SEQUENCE

1. At POWER-ON TIME the ROS RESIDENT POWER-ON DIAGNOSTIC is run automatically. If this test runs correctly, it indicates that a major part of the circuits on the CPU PLANAR BOARD, the KEYBOARD CONTROLLER, the DISPLAY DRIVE CIRCUITS, the PRINTER PROCESSOR, the DISKETTE attachment and the system POWER SUPPLY are operating OK.
2. The user will then attempt to load the DIAGNOSTIC CONTROL (DCP) from DISKETTE DRIVE 1, 2, 3 or 4.
 - a. If the DCP loads correctly, it indicates that the DIAGNOSTIC (FLT) PROGRAMS can be loaded and run.
 - b. If the DCP PROGRAM cannot be loaded correctly, the ROS RESIDENT DISKETTE DRIVE (1-4) DIAGNOSTIC is selected and run to isolate the failure.
3. After the DCP is loaded, the user may load various DIAGNOSTIC FLT PROGRAMS by entering the correct program selection option from the DCP MENU DISPLAY.
4. The DIAGNOSTIC FLT PROGRAMS are run to test the SYSTEM I/O units.
5. If a DIAGNOSTIC FLT PROGRAM detects a failure, an error code and a message will be displayed. Each DIAGNOSTIC FLT PROGRAM has an associated map which is used to isolate the failure to the smallest FIELD REPLACEABLE UNIT (FRU).

2.0 ROS RESIDENT DIAGNOSTIC PROGRAMS

The ROS RESIDENT DIAGNOSTIC PROGRAMS are used to test and verify the operation of the BASE SYSTEM including the CONTROL PROCESSING UNIT (CPU), the PLANAR BOARD LOGIC, the DISKETTE ATTACHMENT LOGIC, and if it is possible to read data from DISKETTE DRIVE (1-4).

2.1 POWER-ON DIAGNOSTIC (POD)

(See "PID 1200 (PROCESSOR POWER-ON TEST)" on page 79 for PROGRAM DESCRIPTION).

This ROS RESIDENT PROGRAM will be executed at each POWER-ON RESET time or when the program returns to LOCATION 0000.

The purpose of this program is to test and verify the operation of the BASE SYSTEM including:

1. CPU PLANAR BOARD
2. ROS CRC CHECK
3. R/W STORAGE CHECK (DATA, ADDRESS)
4. DMA
5. INTERRUPT LOGIC
6. TRANSLATOR
7. TIMERS
8. CRT, VIDEO DRIVE, HORIZONTAL and VERTICAL DRIVE
9. KEYBOARD CONTROLLER/ROS
10. DISKETTE ADAPTER
11. PRINTER WRAP
12. PRINTER CONTROLLER

Test results are held in a set of CE LATCHES and displayed on the SYSTEM CRT. Failure conditions are indicated by a single display message. See "ERROR REPORTING" on page 79 for additional detail.

2.2 ROS RESIDENT DISKETTE DRIVE 1-4 TEST (PID 1500)

(See "PID 1500 (ROS RESIDENT DISKETTE DRIVE 1-4 TEST)" on page 108 for PROGRAM description).

The purpose of this ROS RESIDENT PROGRAM is to test the DISKETTE CONTROL LOGIC contained on the DISKETTE ATTACHMENT CARD and the READ DISKETTE DATA PATH from DISKETTE DRIVES (1-4). (The CE DISKETTE must be inserted before selecting drive number.)

This program is selected by pressing and holding the CMD key and pressing the TEST key, then PRESS and hold the CMD key and PRESS the ERROR RESET key after the POWER-ON DIAGNOSTIC has completed. After PID 1500 is selected the following message is displayed in the LOWER RIGHT CORNER of the CRT:

SECURE Z - PID 1500 DR X (X=DRIVE #, Z=0 (not secured) or 1 (secured))

When selected, this program permits the selection of FIVE OPTIONS:

PROGRAM OPTIONS (displayed one at a time). Answer YES (1) or NO (0) to questions.

1. SELECT DRIVE (1-4) (This option SELECTS DRIVE)
2. DISKETTE DIAG? (If YES, OPTION 3 is displayed. If NO, OPTION 4 is displayed.) (This option RUNS ROUTINES 01 thru 0A)
3. DIAG WITH LOOP? (This option LOOPS ROUTINES 01 thru 0A)
4. MAP CHART ROUTINES? (This option SELECTS ROUTINE CE)
5. LOAD DCP? (This option SELECTS ROUTINE 0D)

Results are displayed on the CRT. Failure conditions are indicated by a TWO DIGIT HEX-ADecimal ERROR CODE. If the operation indicates more than one error, all errors will be displayed. For example:

ROUTINE XX ENDING STATUS YY ZZ

XX - CURRENT ROUTINE EXECUTING

YY, ZZ - See "ERROR, ACTION AND INFORMATION MESSAGES" on page 111.

3.0 DISKETTE RESIDENT PROGRAMS

These programs are on the CE DIAGNOSTIC DISKETTE PN 6841645. The following programs are included:

1. DIAGNOSTIC CONTROL PROGRAM (DCP)
2. DIAGNOSTIC FAULT LOCATION TEST (FLT) PROGRAMS
3. CE UTILITY PROGRAMS

3.1 DIAGNOSTIC CONTROL PROGRAM (DCP)

(See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for PROGRAM description)

This program has the following support functions for all programs loaded from the CE DIAGNOSTIC DISKETTE:

1. PROGRAM SELECTION/LOAD
2. MESSAGE DISPLAY
3. KEYBOARD INPUTS
4. INTERRUPT PROCESSING (except for the device being tested).

The DCP PROGRAM is loaded by first selecting the ROS RESIDENT DISKETTE DRIVE (1-4) TEST (see "ROS RESIDENT DISKETTE DRIVE 1-4 TEST (PID 1500)" on page 2) and then selecting the LOAD DCP? option of that program.

When the DCP PROGRAM is loaded the following PRIMARY PROGRAM SELECTION MENU is displayed:

- 0 - PID 1505 DISKETTE FLT (PART 1)
- 1 - PID 1300 KEYBOARD FLT
- 2 - PID 2300 PRINTER FLT
- 3 - PID 1205 CPU PROCESSOR FLT
- 4 - PID 1210 CPU STORAGE FLT
- 5 - PID 5000 TP FLT
- 6 - PID 5010 TP DOWNLINE
- 7 - PID 1400 SCREEN IMAGE TEST PATTERNS
- 8 - PID 1510 DISKETTE FLT (PART 2)
- 10 - FEATURE/RPQ PID
- 18 - DISPLAY CE UTILITY MENU
- 9 - END DCP

When the DCP PRIMARY MENU OPTION '18' is selected, the following SECONDARY DCP MENU is displayed:

- 21 - PID 0150 CONFIGURATION DISPLAY
- 23 - PID 0125 EC/PTF SUPPORT UTILITY
- 24 - PID 0120 ERROR LOG DISPLAY UTILITY
- 25 - PID 0100 FORMAT DISKETTE UTILITY
- 26 - PID 0105 COPY DISKETTE UTILITY
- 27 - PID 0110 READ VERIFY DISKETTE UTILITY
- 28 - PID 0115 VTOC DISPLAY UTILITY
- 29 - RETURN TO INITIAL DISPLAY

DIAGNOSTIC FLT PROGRAMS or CE UTILITY PROGRAMS are loaded by entering the correct DCP MENU OPTION NUMBER.

When using OPTION '10' enter DRIVE NUMBER and PID NUMBER of the desired program in the form X YYYY.

WHERE X = DRIVE NUMBER OF DRIVE CONTAINING DIAGNOSTIC DISKETTE
YYYY = PID NUMBER OF REQUESTED PROGRAM.

3.2 DIAGNOSTIC FLT PROGRAMS

DIAGNOSTIC FLT PROGRAMS are used to run tests on the SYSTEM I/O hardware and determine failure conditions. These programs, used with the MAP CHARTS and the procedures contained in the SERVICE MANUALS, will determine, isolate and solve system failures.

The following DIAGNOSTIC FLT PROGRAMS may be loaded from the CE DIAGNOSTIC DISKETTE by entering the correct DCP MENU OPTION NUMBER:

CPU	PROGRAM DESCRIPTION
PID 1205	CPU PROCESSOR FLT(See 23.0)
PID 1210	CPU STORAGE FLT(See 24.0)
PID 1212	UPDATE STORAGE TEST(See 25.0)
<u>KEYBOARD</u>	
PID 1300	KEYBOARD FLT(See 26.0)
<u>DISPLAY</u>	
PID 1400	SCREEN IMAGE TEST PATTERNS(See 27.0)
PID 1450	WORD PROCESSING SUPPORT FLT.....(See 33.0)
<u>DISKETTES</u>	
PID 1505	DISKETTE FLT (PART 1)(See 29.0)
PID 1510	DISKETTE FLT (PART 2)(See 30.0)
<u>PRINTER</u>	
PID 2300	PRINTER FLT(See 31.0)
<u>COMMUNICATIONS</u>	
PID 5000	TP FLT(SEE COMMUNICATION'S USER GUIDE 0005)
PID 5010	TP DOWNLINE(SEE COMMUNICATION'S USER GUIDE 0005)
PID 5020	SERVICE AIDS.....(SEE COMMUNICATION'S USER GUIDE 0005)

3.3 CE UTILITY PROGRAMS

These programs supply utility functions such as DISK FORMAT, DISK COPY and DISKETTE READ VERIFY. The following CE UTILITY PROGRAMS may be loaded from the CE DIAGNOSTIC DISKETTE by entering the correct DCP MENU OPTION NUMBER:

	PROGRAM DESCRIPTION
PID 0100	FORMAT DISKETTE UTILITY(See 15.0)
PID 0105	COPY DISKETTE UTILITY(See 16.0)
PID 0110	READ VERIFY DISKETTE UTILITY(See 17.0)
PID 0115	VTOC DISPLAY UTILITY(See 18.0)
PID 0120	ERROR LOG DISPLAY UTILITY(See 19.0)
PID 0125	EC/PTF SUPPORT UTILITY(See 20.0)
PID 0150	CONFIGURATION DISPLAY.....(See 21.0)

3.4 PROGRAM RULES

The following standard rules are used for the diagnostic programs:

3.4.1 ROS RESIDENT POWER-ON DIAGNOSTIC and DISKETTE ADAPTER/DRIVE DIAGNOSTIC

1. KEYBOARD INPUTS ARE MADE BY USING THE NUMERIC KEYPAD KEYS ONLY.
2. KEY 0 = NO ANSWER
3. KEY 1 = YES ANSWER
4. KEY 9 = TERMINATE THE DISKETTE DIAGNOSTIC PROGRAM AND RETURN TO THE START OF THE POWER-ON DIAGNOSTIC PROGRAM.
5. ERROR CODES = TWO DIGIT HEXADECIMAL

3.4.2 DIAGNOSTIC FLT OR UTILITY PROGRAMS

1. KEYBOARD INPUTS ARE MADE USING THE STANDARD TYPEWRITER KEYS (EXCEPT NUMERIC KEYS) AND THE NUMERIC KEYPAD KEYS. (See NOTE 1 below).
2. KEY 0 = NO ANSWER
3. KEY 1 = YES ANSWER
4. KEYS ATTN-9 = TERMINATE THIS PROGRAM AND RETURN TO THE NEXT HIGHER MENU.
5. KEYS ATTN-E = EXIT FROM PROGRAM/ROUTINE LOOP
6. PID NO. DISPLAY - THE PID NO. OF THE PROGRAM LAST LOADED IS DISPLAYED IN THE LOWER RIGHT HAND CORNER OF THE SYSTEM CRT.
7. DRIVE NUMBER DISPLAY - DRIVE 1, 2, 3 OR 4 IS DISPLAYED IN LOWER RIGHT HAND CORNER OF SYSTEM CRT, NEXT TO PID NUMBER.
8. WHEN A KEYBOARD RESPONSE IS EXPECTED, THE DISPLAY SCREEN WILL SHOW A QUESTION MARK (?) FOLLOWED BY A FLASHING CURSOR IN THE LOWER LEFT CORNER OF THE SCREEN.
9. DISPLAY MESSAGES ARE SCROLLED FROM THE BOTTOM TO THE TOP OF THE SCREEN.
10. ERROR CODE - IS A PART OF THE ERROR MESSAGE. THE ERROR CODE FORMAT IS AS FOLLOWS:
 - 3-DIGIT ERROR CODE - DIAGNOSTIC FLT PROGRAMS
 - 4-DIGIT ERROR CODE - DCP AND UTILITY PROGRAMS

Note: 1. KEYBOARD INPUTS MAY INCLUDE ANY OF THE FOLLOWING KEYS:

- ALPHABETIC (A-Z)
- NUMERIC KEYPAD KEYS (0-9)
- +, -, ATTN, ENTER KEYS

SPECIAL FUNCTIONS

- ATTN = (COPY D), TURN ON THE ALTERNATE PRINT MODE
- ATTN 0, TURN OFF THE ALTERNATE PRINT MODE
- <-- , BACKSPACE

3.4.3 KEYBOARD INPUT FORMAT

The following terms are used by the programs and maps to request an input from the keyboard:

1. PRESS '9' INDICATES PRESS AND RELEASE THE 9 KEY.
2. ATTN-E INDICATES PRESS AND RELEASE THE ATTN KEY, THEN PRESS AND RELEASE THE E KEY.
3. CMD-TEST INDICATES PRESS AND HOLD THE CMD KEY, THEN PRESS AND RELEASE THE TEST KEY.
4. PRESS 'ENTER' INDICATES PRESS THE 'ENTER' KEY.

3.4.4 PROGRAM MESSAGE FORMAT

The following MESSAGE FORMATS are used by the programs:

1. INFORMATION MESSAGE:
I-NNN INFORMATION MESSAGE TEXT
2. ACTION MESSAGE TO INDICATE THAT AN INPUT FROM THE OPERATOR IS REQUIRED:
A-NNN ACTION MESSAGE TEXT
3. ERROR MESSAGE:
E-NNN ERROR MESSAGE TEXT

4.0 DIAGNOSTIC USER GUIDE (THIS DOCUMENT)

The DIAGNOSTIC USER GUIDE contains information on the content of the MAINTENANCE LIBRARY, DIAGNOSTIC STANDARDS AND RULES, and a program description for each of the DIAGNOSTIC PROGRAMS.

Program descriptions contain the following information:

1. PURPOSE OF THE PROGRAM.
2. PROGRAM OPERATING PROCEDURES.
3. INDEX OF STOPS AND MESSAGES.
4. DETAILED DESCRIPTION OF TESTS.

5.0 MAINTENANCE ANALYSIS PROCEDURES (MAPS)

MAPS are used to guide the CE through the various system test procedures. The MAPS will instruct the user to select and run a specific DIAGNOSTIC PROGRAM or perform a specific test and note the results. For some failures, the MAPS will refer the user to detailed REMOVAL/ADJUSTMENT/REPLACEMENT procedures contained in the SERVICE MANUALS (SM).

See 5322 COMPUTER SERVICE MANUAL (SY34-0171), CHAPTER 1, for an example of MAP format.

5.1 MAP ORGANIZATION

Start each call with the START MAP 1000. This MAP ensures that enough of the system is operating to use other MAPS or to run DIAGNOSTIC FLT PROGRAMS.

The START MAP 1000 requests that you record the STATUS BYTES, ERROR LOGS, and HISTORY LOGS since this information is lost on POWER DOWN or SYSTEM RESTART. The START MAP will instruct the user to run tests that will verify the operation of the system, starting with the BASE CPU and adding other units until the operation of the complete system has been verified. In case of failures, the START MAP will direct the user to the correct map or procedure.

If the user is positive of the failing unit, the START MAP gives the following map list to enable the user to go to the correct map.

FAILURE	MAP
-----	----
POWER-ON DIAGNOSTIC	1200
KEYBOARD	1300
DISPLAY	1400
DISKETTE(S) (DRIVE 1,2,3,4)	1500
5241 PRINTER	2000
5242 PRINTER	3000
COMMUNICATION	NONE

6.0 SERVICE MANUALS

The information contained in these manuals is used as reference material when you are diagnosing machine failures. The SERVICE MANUAL contains the LOCATION FIGURES, MAINTENANCE PROCEDURES and THEORY OF OPERATION.

The LOCATION FIGURES and the MAINTENANCE PROCEDURES are assigned a four digit section number. MAPS and DIAGNOSTIC PROGRAMS will use this four digit number to refer to SERVICE MANUAL sections. The SERVICE MANUALS are assigned four digit number series as follows:

<u>IBM FORM NO.</u>	<u>SYSTEM UNIT</u>	<u>NUMBER SERIES</u>
SY34-0171	5322 COMPUTER	1000 - 1999
SY34-0172	5241 PRINTER (80 CPS)	2000 - 2999
SY34-0173	5242 PRINTER (160 CPS)	3000 - 3999
SY34-0174	5246 EXTERNAL DISKETTE	4000 - 4999
SY34-0617	RPQ EXTENDED FEATURE	R4900 - R4910
SY34-0175	COMMUNICATIONS	5000 - 5999

The 4-digit number indicates which manual and which section of that manual is being selected. The following is an example of the form used when programs or maps refer to a SERVICE MANUAL procedure:

"DO HEAD CARRIAGE ASSEMBLY SERVICE CHECK (SEE SM 1530)"

7.0 DOCUMENT TO DOCUMENT REFERENCE

The following standard methods are used to refer the user to another maintenance document:

1. PROGRAM TO SERVICE MANUAL..... (SEE SM XXXX)
2. PROGRAM TO MAP..... (GO TO MAP XXXX, ENTRY X)
3. PROGRAM TO PROGRAM..... (SEE PID XXXX)
4. MAP TO PROGRAM..... (SEE PID XXXX)
5. MAP TO SERVICE MANUAL..... (SEE SM XXXX)
6. MAP TO MAP..... (GO TO MAP XXXX, ENTRY X)

8.0 ERROR LOG DATA

Data associated with errors that are identified by the BASIC translator and IOCS routines will be stored in the ERROR LOG section of the CPU READ/WRITE STORAGE. At intervals determined by the SYSTEM CONTROL PROGRAM this ERROR LOG data will also be sent to a diskette.

8.1 ERROR LOG FORMAT

See "PID 0120 (ERROR LOG DISPLAY UTILITY)" on page 53.

8.2 ERROR LOG DISPLAY

Select PID 0120 to display and/or print the ERROR LOG data.

9.0 TRAP DATA

When a MACHINE CHECK occurs either during the running of a BASIC CUSTOMER PROGRAM or during the running of a DIAGNOSTIC PROGRAM, the system will display a line of TRAP DATA at the bottom of the CRT screen. MAP 1220 is used to interpret this data. The data format is shown below.

DATA DISPLAY is as follows:

```
TRAP XXXX AB00 CCCC DDEE FFGG HHII JJJJ KKKK LLLL MMMM NNPP QQQQ RRRR SSSS TTTT
UUUU VVVV WWWV YYYY ZZZZ 1111 2222 3333 4444 5555 6666 7777 8888 9999 aaaa ????
```

```
XXXX = TRAP CLASS BITS
'80XX' = POWER CHECK
'40XX' = WRITE TO ROS TRAP
'20XX' = I/O CHANNEL TRAP
'10XX' = STORAGE PARITY CHECK
'00XX' = SYSTEM PROGRAMMING ERROR TRAP    SEE MAP 1220
```

```
A    = PAGE IN USE AT THE TIME OF THE TRAP
B    = HIGH ORDER ADDRESS BITS AT TIME OF TRAP
00   = ALWAYS 00
CCCC = DMA CHANNEL 0 ADDRESS (DISKETTE)
DD   = INTERRUPT CONTROLLER INTERRUPT MASK
EE   = PROCESSOR INTERRUPT MASK
FF   = R/W STORAGE WRITE PAGE REGISTER
GG   = R/W STORAGE READ PAGE REGISTER
HH   = ROS PAGE REGISTER
II   = DMA PAGE REGISTER
JJJJ = STACK POINTER VALUE LESS EIGHT AT TIME OF TRAP
KKKK = H/L REGISTER CONTENTS
LLLL = D/E REGISTER CONTENTS
MMMM = B/C REGISTER CONTENTS
NN   = A REGISTER
PP   = FLAGS
QQQQ = PROGRAM COUNTER AT TIME OF TRAP
RRRR THROUGH ??? = STACK CONTENTS (MAY NOT HAVE ANY MEANING)
```

10.0 INTERMITTENT ERROR PROCEDURE

Correction of INTERMITTENT FAILURES relies on the analysis of ERROR STATUS DATA. When this fails to isolate the problem, the CE will be instructed to attempt to generate and analyze the failure through the use of the ROUTINE and PROGRAM LOOP options of the DIAGNOSTIC PROGRAMS.

INTERMITTENT MAP 1225 lists the steps to be used for INTERMITTENT FAILURE correction.

11.0 SPECIAL TOOLS/TEST EQUIPMENT**11.1 SHIP GROUP TOOLS**

<u>DESCRIPTION</u>	<u>PART NUMBER</u>
DIAGNOSTIC DISKETTE	6841645
3 EACH JUMPER	4410751
4 EACH JUMPER	829117

11.2 BRANCH OFFICE TOOLS

<u>DESCRIPTION</u>	<u>PART NUMBER</u>
TEKTRONIX 465 SCOPE OR EQUAL	453214
ROS MODULE PULLER	1715889
MODULE PIN STRAIGHTENER	453473
GROUND CHECK TOOL	9900453

RECOMMENDED CARD KIT FOR BASE PROCESSORS:

<u>QTY</u>	<u>DESCRIPTION</u>
1	CPU PLANAR BOARD
1	STORAGE CARD (32K)
1	STORAGE CARD (64K)
1	DISKETTE ATTACHMENT CARD
1	KEYBOARD

RECOMMENDED ADDITIONS IF FEATURE/DEVICE ATTACHED:

<u>QTY</u>	<u>DESCRIPTION</u>
1	TP ADAPTER CARD
1	DISKETTE MULTIPLEXER CARD
1	UPDATE STORAGE CARD
1	PRINTER PORT II FEATURE CARD
1	5241 PRINTER PLANAR BOARD
1	5242 PRINTER PLANAR BOARD
1	31SD DRIVE CONTROL CARD
1	51TD DRIVE CONTROL CARD
1	WORD PROCESSING SUPPORT CARD

11.3 REQUIRED TOOL KIT TOOLS

<u>DESCRIPTION</u>	<u>PART NUMBER</u>
CE METER	1749231
METRIC TOOL KIT (BILL OF MATERIAL)	1749235
GLP II LOGIC PROBE	453212
CRT ADJUSTMENT TOOL(PLASTIC SCREWDRIVER)	460811
PRINTER CODE PLATE ALIGNMENT TOOL	460028

11.4 RECOMMENDED ADDITIONAL TOOLS

<u>DESCRIPTION</u>	<u>PART NUMBER</u>
IBM 'MINIPROBE'	453718
SCALE PUSH PULL (0-6 LBS.)	460870

12.0 PROGRAM OPERATION SUMMARY CHART**A. | POWER-ON DIAG. (PID 1200) |**

1. TURN POWER OFF
2. TURN POWER ON
3. OBSERVE TEST STATUS DISPLAY.

B. | DISK DRIVE DIAG. (PID 1500) | (SEE NOTE 1)

NOTE 1: Use numeric keypad keys only

1. POWER-ON DIAG. IS COMPLETED. (SEE A)
2. PRESS 'CMD/TEST' KEYS.
3. PRESS 'CMD/ERROR RESET' KEYS.
4. SELECT DRIVE AND PROGRAM OPTIONS: (DISPLAYED ONE AT A TIME)
 - * SELECT DRIVE (1-4). (KEY: 1,2,3 OR 4)
 - * DISKETTE DIAG.? (KEY: 1=YES,0=NO)
 - * DIAG. WITH LOOP? (KEY: 1=YES,0=NO) (SEE NOTE 2)
 - * MAP CHART ROUTINE? (KEY: 1=YES,0=NO)
 - * LOAD DCP? (KEY: 1=YES,0=NO)
5. OBSERVE TEST STATUS MESSAGES.
6. KEY: '9' - TO TERMINATE PROGRAM.

NOTE 2: Displayed only if diskette diag. is selected.

C. | LOAD DCP PROGRAM (PID 0001) |

1. SELECT DISK DRIVE DIAGNOSTIC. (SEE B)
2. SELECT 'LOAD DCP?' OPTION.
3. PROGRAM WILL DISPLAY THE DCP MAIN MENU.

- | | |
|------------------------------------|------------------------------------|
| -0- PID 1505 DISKETTE FLT (PART 1) | -21- PID 0150 CONFIG. DISPLAY |
| -1- PID 1300 KEYBOARD FLT | -23- PID 0125 EC/PTF SUPPORT |
| -2- PID 2300 PRINTER FLT | -24- PID 0120 ERROR LOG DISPLAY |
| -3- PID 1205 CPU PROC. FLT | -25- PID 0100 FORMAT DISKETTE |
| -4- PID 1210 CPU STORAGE FLT | -26- PID 0105 COPY DISKETTE |
| -5- PID 5000 T.P. FLT | -27- PID 0110 READ VERIFY DISKETTE |
| -6- PID 5010 T.P. DOWNLINE | -28- PID 0115 VTOC DISPLAY UTILITY |
| -7- PID 1400 SCREEN IMAGE TEST | -29- RETURN TO DCP MAIN MENU |
| -8- PID 1510 DISKETTE FLT (PART 2) | |
| -10- FEATURE/RPQ PID | |
| -18- DISPLAY CE UTILITY MENU | |
| -9- END DCP | |

D. | LOAD DIAGNOSTIC FLT OR UTILITY PROGRAM |

1. SELECT DCP MENU OPTION. (SEE C)
2. PROGRAM WILL DISPLAY A MENU OR PROMPT MESSAGE.
3. SELECT MENU OPTIONS (REQUESTED).
4. SET PROGRAM PARAMETERS (REQUESTED).
5. OBSERVE TEST STATUS/PROMPT MESSAGES.
6. ENTER 'ATTN E' - TO END A LOOP.
7. ENTER 'ATTN 9' - TO TERMINATE A PROGRAM AND RETURN TO THE OPTION MENU OF THAT PROGRAM.

13.0 GLOSSARY

This GLOSSARY includes definitions of terms and abbreviations used in the SM'S and MAP'S that are not part of the IBM LIMITED VOCABULARY.

- ABEND:** Not normal end.
- ABORTED:** Any job or action that fails to reach an end result.
- ABSENT:** Not present.
- ACTUAL:** Real.
- ADAPTER:** A hardware device that connects two channels on the same computing system or on different systems.
- ADDR:** Abbreviation for address.
- ALPHA:** Abbreviation for alphabetic.
- ALPHAMERIC KEYS:** That part of a keyboard that is similar to a typewriter keyboard.
- ARROW:** Pointer.
- ATTN:** Attention key.
- ATTRIBUTE:** A distinct feature of the display image including: REVERSE VIDEO, BLINKING REVERSE VIDEO, CHARACTER UNDERLINE and BLINKING CHARACTER UNDERLINE.
- BASIC:** Beginners all purpose symbolic instruction code.
- BAUD:** Bits per second on T.P. line.
- BCD:** Binary Coded Decimal.
- BITS PER SECOND:** Communications line transmission rate.
- BLINKING:** To flash intermittently.
- BPS:** Bits per second.
- BSC:** BINARY SYNCHRONOUS COMMUNICATIONS.
- BSCA:** BINARY SYNCHRONOUS COMMUNICATIONS ADAPTER.
- BUFFER:** A set of latches.
- CADDY:** Kit.
- CARTRIDGE:** Plastic container for the printer ribbon. Also a plastic container that contains the microcode for the 5242 MODEL 2 printer.
- CHANNEL:** Logic used to connect an I/O device to the CPU.
- CHAR:** Abbreviation for character.
- CMD:** Keyboard command key. Second key from left on top row. For GERMANY/AUSTRIA/SWISS, the key is marked BE-FEHL. For FRANCE/BELGIUM/FRANCE/BELGIUM/SWISS, the key is marked SEL CDE. For FRENCH CANADIAN, the key is marked SEL FONC.
- CONTROLLER:** The microcode processor units used in the CPU, KEYBOARD, and PRINTER units.

CONFIG: Abbreviation for configuration.

CPS: Cycles per second printer.

CPU: CONTROL PROCESSING UNIT. It is the base processor located on the CPU board.

CPU BOARD: The BASE PLANAR BOARD which contains the LOGIC for the CPU, BASE ROS, PAGE REGISTER/CONTROL, CRT PORT and CHARACTER GENERATOR KEYBOARD PORT, PRINTER PORT, TIMERS, DMA, INTERRUPT CONTROL, SENSE REGISTERS and I/O DECODE.

COMPOSITE VIDEO RPQ: IBM internal use only RPQ that allows the attachment of external monitors or projection TV.

CRC: Cyclic redundancy check.

CRT: Cathode ray tube.

CYCLIC: Repeating.

CYCLIC REDUNDANCY CHECK: An error check. Counting of the bits on a record.

CYLINDERS: A number of in line tracks on a diskette.

DA: Device address.

DC: Direct current.

DCP: Diagnostic control program.

DESERIALIZER: Logic to convert serial data to parallel data.

DETECT: To sense.

DIAG: Abbreviation for diagnostic.

DID: Document insertion device.

DIRECTORY: Index.

DOWNLINE: In communication, an over the line test.

DMA: Direct Memory Access.

DRAFT MODE: Standard 8 X 7 character matrix on the printer.

DRIVER: A circuit that drives a signal.

DURATION: Length in time of a pulse.

EDIT: To format.

EOF: End of file.

ERMAP: Error map.

ERRATIC: Not stable.

ERROR RESET: Keyboard key. First key on left of third row from top. For:
GERMANY/AUSTRIA/SWISS, the key is marked FEHL KERR.
FRANCE/BELGIUM/SWISS/CANADIAN FRENCH, the key is marked REST APRES ERR.
ITALY, the key is marked RIPR TAST.

EXIT: Leave or go from.

EXTENT: Limit.

FAST: Opposite of slow.

FAULT: Failure.

FILAMENT: A wire heated electrically in an electronic tube.

FIX: Repair.

FLT: Fault Locating Test.

FM: Frequency modulation.

FONT: Printer character mode.

FRU: Field Replacement Unit. It is the smallest replacement part.

GBGI: General Business Group International.

GLP: General Logic Probe.

GND: Abbreviation for ground.

HEADER RECORD: A record containing identifying information about a group of records that follow.

HEX: Hexadecimal number.

HI: Abbreviation for high.

HIGHLIGHT: Important detail.

ID: Identification.

I/O: Input/Output.

INITIAL: First.

INT.: Abbreviation for interrupt.

INTERPRETER: A processor program stored in ROM that controls operation of the basic instructions.

INTERRUPT: To break the normal flow.

INVALID: Not valid.

IOCS: Input Output Control Subroutine.

ISR: Interrupt Status Register.

KBD: Keyboard.

LABELED: Past tense of label.

LBS: Pounds.

LED: Light emitting diode.

LIFTER: To lift the print head.

LOGICAL RECORD: A group of data that is not connected with its physical location.

LOOP: A group of instructions that are executed repeatedly.

MAP: Maintenance Analysis Procedures.

MASK: A bit pattern that is used to control the selection of specific data bits.

MAX: Abbreviation for maximum.

MEMORY: Storage.

MENU: A list of selections.

MFM: Modified frequency modulation.

MHZ: Megahertz.

MICROINSTRUCTION: A step of microcode.

MICROPROCESSOR: Small controller.

MIN: Abbreviation for minimum.

MISC: Abbreviation for miscellaneous.

MODIFIED: Different.

MODULATION: To change the frequency or amplitude.

MONITOR: Supervisor.

MPU: Microprocessor unit.

MS: Millisecond.

MULTI: Many.

MULTIBYTE: More than one byte.

MULTIPLEXER: A circuit having several inputs or outputs.

NIBBLE: Four bits.

NS: Nanosecond.

NUMERIC KEYPAD: That part of the keyboard that is similar to a calculator keyboard.

OPTION: A selection such as an optional program entry.

OVERPRINT: To print more than once in the same space.

OWNERID: Owner identification.

PARAMETERS: Values.

PID: Program identification.

PLANAR BOARD: A printed circuit board with the logic for a functional part of the system. Such as the CPU Planar Board and the Printer Planar Board.

PC BOARD: A printed circuit board that has electrical circuits placed on a board to distribute signals and voltages. Normally used to indicate the Power Supply control board.

PN: Abbreviation for part number.

POD: Power-on Diagnostic.

POR: Power-on Reset.

PORT: Connector.

POWER ON RESET: A signal occurring during power up time. Used to reset all circuits to an operational starting condition.

PRERECORDED: Recorded earlier.

PROCESSOR: Processing unit.

PROC.: Abbreviation for processor.

PRT: Abbreviation for print or printer.

PTF: Program temporary fix.

PTX: Photocell transistor.

QTY: Abbreviation for quantity.

RAMP: A device that pulls the print head away from the platen when at left margin.

RASTER: Display image.

RC: Return code. A byte used to indicate end status of a diskette operation.

READ ONLY STORAGE: A storage in which the contents are not changed by processor instructions.

RECAL: Abbreviation for recalibration.

RECALIBRATE: In diskettes, to seek to track zero.

RECEIVER: Device that receives a transmitted message.

RECLEN: Record length indicator.

RECORD: A group of similar data items.

REF.: Reference.

REFER: To point to.

REGISTER: A series of electronic latches that hold data.

REPLACE: To remove a failing part and install a new one.

REQUIRED: Needed.

RESIDENT: Located in a specific place.

RESTORE: Put back to original.

RESUME: Printer to CPU command to indicate that the printer is ready to receive more data following a hold status.

RET: Return (Power Supply).

RETRACT(S): Being pulled back.

RETRY: Attempt again.

RIM: Read interrupt mask.

RIPPLE: Voltage change in power. Sequential print pattern in printers.

ROS: Read only storage.

ROS RESIDENT: Stored in ROS.

ROTATE: To turn.

ROTATIONAL: Adjective form of rotation.

RTN: Routine.

R/W STORAGE: READ/WRITE STORAGE. A storage in which processor instructions can read data from it or store data into it.

SCROLL: Move data on the display screen up or down.

SECTOR: A section of diskette track.

SECURE: To make safe. In diskettes, to prevent access.

SLASH: A printer character.

SM: Service manual.

STG.: Storage.

STRESS: To force.

SYNC: Abbreviation of synchronize or synchronous.

THROUGHPUT: Measure of effective work of a system.

THRU: Abbreviation of through.

TIMEOUT: Time end.

TRANSFER: Move.

TRANSLATOR: A device or program that is used to translate basic language into machine operations.

TRANSMITTER: A circuit that transmits.

T.P.: Abbreviation for teleprocessing.

T.P.: Abbreviation for test point.

TRK: Abbreviation for track.

TVT: Transfer vector table.

TXRDY: Abbreviation for transmit ready.

TYPAMATIC: A keyboard signal generated by the repeat action keys when held down for more than 700 ms.

UNATTENDED: No supervisor.

UNDERLINE: To underscore.

UNDERSCORE: To mark a line under.

UNEXPECTED: Not expected.

US: Microsecond.

USART: Universal/Synchronous/Asynchronous/Receiver/Transmitter.

UTILITY: Service. Such as, Customer Utility Program.

- VECTOR:** A pointer.
- VFO:** Variable Frequency Oscillator.
- VIDEO:** Information referred to or used in receiving an image on the display screen.
- VOLID:** Volume Identification.
- VTOC:** Volume Table of Contents.

14.0 PID 0001 (DIAGNOSTIC CONTROL PROGRAM)

14.1 PROGRAM SUMMARY

14.1.1 PURPOSE

This program gives a supervisor function to the Fault Locating Tests and CE utilities.

*** CAUTION ***

The alphabetic keys (A-Z only), the numeric keypad (0-9 only), the <-- (left arrow), the COPY D key and the ENTER key are the only keys active while DCP is operating.

14.2 OPERATING PROCEDURES

14.2.1 LOADING

After PID 1500 has been selected enter a '1' in response to the LOAD DCP? menu (Refer to PID 1500 "MENU DISPLAY" on page 109). After loading, the DCP MAIN MENU will be displayed.

14.2.2 MENU DISPLAY

DCP MAIN MENU

- 0 - PID 1505 DISKETTE FLT (PART 1)
- 1 - PID 1300 KEYBOARD FLT
- 2 - PID 2300 PRINTER FLT
- 3 - PID 1205 CPU PROCESSOR FLT
- 4 - PID 1210 CPU STORAGE FLT
- 5 - PID 5000 TP FLT
- 6 - PID 5010 TP DOWNLINE TEST
- 7 - PID 1400 SCREEN IMAGE TEST PATTERNS
- 8 - PID 1510 DISKETTE FLT (PART 2)
- 10 - FEATURE/RPQ PID
- 18 - DISPLAY CE UTILITY MENU
- 9 - END DCP

ENTER CHARACTER FOR DESIRED ROUTINE
THEN PRESS ENTER

CE UTILITY MENU

- 21 - PID 0150 CONFIGURATION DISPLAY
- 23 - PID 0125 EC / PTF SUPPORT UTILITY
- 24 - PID 0120 ERROR LOG DISPLAY UTILITY
- 25 - PID 0100 FORMAT DISKETTE UTILITY
- 26 - PID 0105 COPY DISKETTE UTILITY
- 27 - PID 0110 READ VERIFY DISKETTE UTILITY
- 28 - PID 0115 VTOC DISPLAY UTILITY
- 29 - RETURN TO INITIAL DISPLAY

ENTER CHARACTERS FOR DESIRED UTILITY
THEN PRESS ENTER

14.2.3 MENU OPTION SELECTION

When the DCP MAIN MENU is displayed, enter the number for the test you want to run (or):

'18' to display the CE UTILITY MENU.

'9' to EXIT DCP and return control to the system.

When the CE UTILITY MENU is displayed, enter the number for the utility desired or '29' to return to the DCP MAIN MENU.

Options available under DCP - not shown on the display - are:

- ATTN E = Set a flag so that an FLT will reset a LOOP PROGRAM or LOOP ROUTINE option.
- ATTN 9 = Set a flag so that an FLT will terminate and return to its last menu.
- ATTN COPY D = Enable the alternate print option. (See "ALTERNATE PRINT OPTION" on page 28)
- ATTN 0 = Disable the alternate print option. (See "ALTERNATE PRINT OPTION" on page 28)

14.2.4 PROGRAM RUN INSTRUCTIONS

All input to DCP will be requested by prompting messages. When DCP is waiting for input, a '?' (question mark) will be displayed on the lower left corner of the screen. The alarm will also signal when DCP is waiting for input from the keyboard. A cursor will indicate the position of the next input character. Pressing a '<--' (left arrow) key will cause the cursor to back up, erasing the character entered. By repeatedly pressing the '<--' key or by holding the '<--' key down all characters on the input line may be deleted. The ENTER key is used to indicate the end of input.

Note: Drive number is a one digit numeric character (1-4).

14.2.4.1 PROGRAM TERMINATE METHOD

DCP operations may be terminated by entering a '9' when the DCP MAIN MENU is displayed.

DCP operation may also be terminated at any time by turning the power switch to OFF.

***** CAUTION *** REMOVE DISKETTE BEFORE POWERING ON OR OFF.**

14.3 ERROR, ACTION AND INFORMATION MESSAGES

E-0001 WRONG ENTRY - PRESS ENTER

NOTE: Verify that correct keyboard entries were made. If display does not match key entries, GO TO MAP 1400, ENTRY POINT A.

A-0002 ENTER DRIVE NUMBER AND PID NUMBER (X YYYY)

A-0020 ENTER DRIVE NUMBER (X)

E-0021 DRIVE X NOT READY

Note: CHECK - DISKETTE inserted correctly and handle closed.
- TYPE 1 DISKETTE ONLY inserted in 31SD DRIVE.

IF ERROR CONTINUES:

1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTE(S)
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

E-022 PID NAME NOT FOUND
PRESS ENTER

Note: PROGRAM IS NOT ON THE CE DISKETTE.

E-0023 WRONG DISKETTE INSERTED
INSERT CE DISKETTE

Note: Verify that a CE DISKETTE is inserted in drive. If error continues - REPLACE THE CE DISKETTE - TRACK 0 may have been destroyed.

E-0024 RESULTS ERROR - ISR = WW ST0 = XX ST1 = YY ST2 = ZZ
ERROR OCCURRED ON TRACK VV

NOTE WW = 80 READ/WRITE END
20 DRIVE WENT NOT READY
10 OPERATION NOT COMPLETED
08 DRIVE 4 ATTENTION
04 DRIVE 3 ATTENTION
02 DRIVE 2 ATTENTION
01 DRIVE 1 ATTENTION

XX = 00 NORMAL END

Any other value indicates error end

YY = 20 CRC ERROR
04 SECTOR NOT FOUND
01 ADDRESS MARK NOT FOUND

ZZ = 20 DATA FIELD CRC ERROR
10 CYLINDER ADDRESS NO COMPARE
01 MISSING DATA ADDRESS MARK

IF THIS ERROR OCCURS:

1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTES
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

E-0025 UNEXPECTED INTERRUPT LEVEL MASK = XX REQUEST = YY

NOTE: REPLACE CPU PLANAR BOARD. SEE SM 1230.

E-0026 DRIVE X CANNOT BE SECURED.

E-0027 NO RESPONSE FROM DISKETTE AFTER I/O REQUEST

IF ERROR CONTINUES:

1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTES
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

14.4 DETAILED DESCRIPTION OF ROUTINES

14.4.1 ALTERNATE PRINT OPTION

This is an optional feature of DCP that will print all screen messages and operator inputs to the printer, if possible. Any error condition will cancel the option with no error message. The ATTN sequence to enable or disable (See "MENU OPTION SELECTION" on page 26) may be entered at any time. The print option is disabled during operation of the KEYBOARD FLT, SCREEN IMAGE TEST PATTERNS and the PRINTER FLT.

14.4.2 OPTION FLAGS

ATTN E and ATTN 9 can be entered when an FLT is executing. These entries will set an option flag for the FLT.

ATTN E will indicate that an earlier set LOOP ROUTINE option should be reset.

ATTN 9 will indicate that FLT operation should end execution of the current routine and return to the FLT MENU.

15.0 PID 0100 (FORMAT DISKETTE UTILITY)

15.1 PURPOSE

This utility will write addresses and labels on a diskette for CE diagnostic use.

15.2 OPERATING PROCEDURES

15.2.1 LOADING

Select the UTILITY MENU (18 on the DCP MENU). Select the FORMAT UTILITY (25 on the UTILITY MENU). Message A-0250 will then be displayed on the screen.

15.2.2 MENU DISPLAY

None - All input is through prompting.

15.2.3 MENU OPTION SELECTION - None.

15.2.4 PROGRAM RUN INSTRUCTIONS

All operator input required is through prompting messages. The drive number is a one digit numeric character (1-4 only), indicating the drive containing the diskette to be formatted, followed by a 6 character numeric label or ID to be written on the diskette. The drive number and the label should be separated by one space.

If the diskette has valid information on TRACK 0, a message A-0257 will be displayed to permit the drive number and diskette to be verified before doing the format.

15.2.4.1 PROGRAM END

Many diskettes can be formatted by entering the drive number and label information when requested. To exit the program, a '9' may be entered in place of a drive number.

15.3 ERROR, ACTION AND INFORMATION MESSAGES**A-0250** ENTER DRIVE NUMBER (X) AND ID (YYYYYY) (6 NUMERIC CHARACTER)

X YYYYYY

OR 9 TO EXIT PROGRAM

E-0251 WRONG ENTRY**Note:** Verify that correct keyboard entries were made. If display does not match key entries - GO TO MAP 1400, ENTRY POINT A.**E-0252** DRIVE X NOT READY**Note:** (This will be followed by an A-0250 message).**Note:** CHECK - DISKETTE inserted correctly and handle closed.
- TYPE 1 DISKETTE ONLY inserted in 31SD DRIVE.

IF ERROR CONTINUES:

1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTE(S)
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

E-0253 RESULTS ERROR - ISR = WW ST0 = XX ST1 = YY ST2 = ZZ
ERROR OCCURRED ON TRACK VV

FORMAT OF THIS DISKETTE ABORTED

ENTER VALID DRIVE NUMBER AND ID

OR 9 TO EXIT PROGRAM

NOTE: WW = 80 READ/WRITE END
 20 DRIVE WENT NOT READY
 10 OPERATION NOT COMPLETED
 08 DRIVE 4 ATTENTION
 04 DRIVE 3 ATTENTION
 02 DRIVE 2 ATTENTION
 01 DRIVE 1 ATTENTION

XX = 00 NORMAL END
 ANY OTHER VALUE INDICATES ERROR END

YY = 20 CRC ERROR
 04 SECTOR NOT FOUND
 01 ADDRESS MARK NOT FOUND

ZZ = 20 DATA FIELD CRC ERROR
 10 CYLINDER ADDRESS NO COMPARE
 01 MISSING DATA ADDRESS MARK

IF THIS ERROR OCCURS:

1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTE(S)
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

- I-0254** NO BAD SECTORS
ENTER VALID DRIVE NUMBER AND ID
OR 9 TO EXIT PROGRAM
- E-0255** ERRORS DETECTED ON 1 OR MORE TRACKS
FORMAT OF THIS DISKETTE ABORTED
ENTER VALID DRIVE NUMBER AND ID
OR 9 TO EXIT PROGRAM
- NOTE:** This diskette may not be used for CE DIAGNOSTICS. A diskette that is formatted error free must be used. A reformat of this diskette may run error free.
- A-0256** END OF FORMAT PROGRAM - PRESS ENTER
- A-0257** DISKETTE IN DRIVE X CONTAINS 1 OR MORE FILES
DO YOU WANT TO FORMAT THIS DISKETTE? (1 = YES, 0 = NO)
*** WARNING ***
ANSWER = 1 WILL CLEAR ALL INFORMATION FROM THIS DISKETTE
- E-0258** DRIVE X CANNOT BE SECURED.

15.4 DETAILED DESCRIPTION

This program will write all addresses and a data pattern on all tracks (0-76). A type 2D DISKETTE may be formatted for CE DIAGNOSTIC use, however, the diskette will be formatted SIDE 0 ONLY. A type 2D DISKETTE may be used in a 51TD DRIVE ONLY. A 'NOT READY' message will be displayed if a type 2D DISKETTE is used in a 31SD DRIVE. After all addresses are written, all tracks will be read to check addresses and data pattern. If no errors are detected, CE label information will be written. The CE DISKETTE COPY UTILITY may then be used to make a CE DIAGNOSTIC DISKETTE.

*** CAUTION ***

THE FORMAT AND LABEL INFORMATION WRITTEN IS SPECIFIC TO THE CE DIAGNOSTIC DISKETTE AND WILL NOT BE USABLE FOR CUSTOMER DATA OR PROGRAM FILES.

16.0 PID 0105 (COPY DISKETTE UTILITY)

16.1 PURPOSE

This utility will copy a CE DIAGNOSTIC DISKETTE or a single diagnostic PID to another CE DIAGNOSTIC DISKETTE. A diagnostic PID may also be deleted.

16.2 OPERATING PROCEDURES

16.2.1 LOADING

Select the UTILITY MENU (18 on the DCP MENU). Select the COPY UTILITY (26 on the UTILITY MENU) message I-0260 will then be displayed on the screen.

16.2.2 MENU DISPLAY

None - All input is through prompting.

16.2.3 MENU OPTION SELECTION - None.

16.2.4 PROGRAM RUN INSTRUCTIONS

All operator input is through prompting messages. The drive number is a single numeric character (1-4). To copy all of the diskette correctly, the T0 diskette should be formatted first with the CE FORMAT UTILITY.

16.2.4.1 PROGRAM END

The copy program can be ended by entering a '9' when message I-0260 is displayed.

16.3 ERROR, ACTION AND INFORMATION MESSAGES**I-0260 COPY DISKETTE UTILITY**

- 1- COPY ONE FILE
- 2- IMAGE COPY ALL FILES
- 3- DELETE ONE FILE
- 9- RETURN TO DCP MENU

SELECT OPTION, PRESS ENTER

A-0261 HOW MANY DRIVES WILL BE USED?

- 1- ONE DISKETTE DRIVE
- 2- TWO DISKETTE DRIVES

SELECT OPTION, PRESS ENTER

A-0262 INSERT DISKETTE BEING COPIED FROM INTO DISKETTE DRIVE

ENTER DRIVE NUMBER (X)

A-0263 INSERT DISKETTE BEING COPIED TO INTO DRIVE

ENTER DRIVE NUMBER (X)

A-0264 INSERT DISKETTE BEING COPIED TO THEN PRESS ENTER**A-0265 INSERT DISKETTE BEING COPIED FROM THEN PRESS ENTER****A-0266 ENTER PID NUMBER TO BE COPIED (XXXX)****E-0267 PID XXXX NOT FOUND**

Note: PROGRAM IS NOT ON THE CE DISKETTE.

I-0268 DISKETTE COPY COMPLETED**E-0269 WRONG ENTRY**

Note: Verify that correct keyboard entries were made. If display does not match key entries - GO TO MAP 1400, ENTRY POINT A.

I-026B NOT ENOUGH DISKETTE SPACE, OPERATION ABORTED

E-026C RESULTS ERROR - ISR=WW ST0=XX ST1=YY ST2=ZZ
ERROR OCCURRED ON TRACK VV

NOTE: WW = 80 READ/WRITE END
 20 DRIVE WENT NOT READY
 10 OPERATION NOT COMPLETED
 08 DRIVE 4 ATTENTION
 04 DRIVE 3 ATTENTION
 02 DRIVE 2 ATTENTION
 01 DRIVE 1 ATTENTION

XX = 00 NORMAL END
 ANY OTHER VALUE INDICATES ERROR END

YY = 20 CRC ERROR
 04 SECTOR NOT FOUND
 01 ADDRESS MARK NOT FOUND

ZZ = 20 DATA FIELD CRC ERROR
 10 CYLINDER ADDRESS NO COMPARE

IF THIS ERROR OCCURS:
 1. RECORD FAILING DRIVE NUMBER
 2. REMOVE DISKETTE(S)
 3. POWER OFF
 4. POWER ON
 5. GO TO MAP 1501, ENTRY POINT A

E-026D WRONG DISKETTE INSERTED

INSERT A CE DISKETTE THEN PRESS
 ENTER

Note: Verify that a CE DISKETTE is inserted in drive. If error continues -
 replace CE DISKETTE - TRACK 0 may have been destroyed.

E-026E DRIVE X NOT READY - MAKE READY

Note: CHECK - DISKETTE inserted correctly and handle closed.
 - TYPE 1 DISKETTE ONLY inserted in 31SD DRIVE.

IF ERROR CONTINUES:
 1. RECORD FAILING DRIVE NUMBER
 2. REMOVE DISKETTE(S)
 3. POWER OFF
 4. POWER ON
 5. GO TO MAP 1501, ENTRY POINT A

A-026F DCP COPY UTILITY ENDED - PRESS ENTER**A-026G** PID XXXX ALREADY ON DISKETTE, DELETE?**A-026H** ENTER PID NUMBER TO BE DELETED (XXXX)**I-026I** PID XXXX DELETED**E-026J** DRIVE X CANNOT BE SECURED**E-026K** COPY FUNCTION ABORTED, 'TO' DISKETTE MAY NOT BE USABLE

16.4 DETAILED DESCRIPTION

This program will copy TO or FROM a CE DIAGNOSTIC DISKETTE ONLY.

*** CAUTION ***

The format and label information read or written is specific to the CE DIAGNOSTIC DISKETTE and will not be usable for CUSTOMER DATA or PROGRAM FILES.

17.0 PID 0110 (READ VERIFY DISKETTE UTILITY)

17.1 PURPOSE

This program does a read verify of a CE DISKETTE on the selected drive. The diskette type and format is displayed. Each record on CYLINDER ZERO and ONE is read FOUR times. Then each CYLINDER is read FOUR times. If a soft error is sensed, then each record on the CYLINDER is read EIGHT times to find the record. A single record on a CE DISKETTE (MODE= FM WITH RECL= 02 (512 BYTES)) may be selected and read. EXCHANGE DISKETTES and CUSTOMER DISKETTES, SYSTEM/23 formatted, can be tested.

17.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)

17.2.1 LOADING PID 0110 - DISKETTE READ VERIFY UTILITY -

With the primary DCP MENU displayed, enter an '18' and an ENTER to display the UTILITY MENU. Next enter a '27' and an ENTER.

PID 0110 will load and display start message I-2700 followed by ROUTINE 1 information message I-2710. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 39 for any error messages. After ROUTINE 1 executes without error, the OPTIONS MENU will be displayed.

17.2.2 MENU DISPLAY

```

I-2701      OPTIONS:      LOOP MODE OFF - DISKETTE DRIVE SELECTED = #
X-0- SET / RESET LOOP MODE
X-1- SELECT DISKETTE DRIVE
X-2- READ VERIFY CE DISKETTE
X-3- READ VERIFY RECORD
X-4- READ VERIFY EXCHANGE DISKETTE
X-5- READ VERIFY SYSTEM/23 FORMAT DISKETTE
X-6- HEAD ALIGNMENT CHECK
X-9- RETURN TO DCP
A-2702      ENTER OPTION

?_

```

17.2.3 MENU OPTION SELECTION

Enter the selected option number using the numeric keys on the right end of the keyboard followed by the ENTER key.

The 'X' by the option number indicates an optional routine not part of automatic sequence.

OPTION 0 Will set or reset routine loop mode and display the options menu with the loop mode indicated as on or off.

OPTION 1 Will display message I-2709 requesting the drive number of the diskette drive to be selected for the next test. An entry of 1, 2, 3 or 4 is needed to change the selected drive. The drive is then tested for a ready condition

and the VOL1 checked for the diskette type and format. If drive 3 or 4 is selected it will be secured and then released for the VOL1 header read.

- OPTION 2** Will read verify the CE DISKETTE on the selected diskette drive testing for errors. If drive 3 or 4 is selected, then the drive will be secured and held during the test.
- OPTION 3** Will read verify a selected record on a CE DISKETTE. If drive 3 or 4 is selected the drive will be held secured for each ten reads and then released.
- OPTION 4** Will read verify a standard labeled exchange type diskette.
- OPTION 5** Will read verify a SYSTEM/23 format diskette on the selected drive.
- OPTION 6** Will do a quick check of diskette head alignment using Branch Office Tool part number 2455026.
- OPTION 9** Will end PID 0110 and return to DCP.

17.2.4 PROGRAM RUN INSTRUCTIONS

Normal program operation is to select OPTION 1 to select the diskette needed. Next, the 2 OPTION is used to start the read verify routine. If a hard error is sensed, the routine will stop with an entry needed to continue. If soft errors are sensed, an error message will be displayed giving the CYLINDER, HEAD and RECORD number. An error counter will then be updated on the screen. At the end of the routine, the OPTIONS MENU will be displayed.

The status line, above the keyboard input line, will display the last drive number selected (DR #). If errors occur, a decimal count of the number of errors will be displayed to the left of the drive indicator. If loop mode is set, then a decimal loop counter is displayed to the left of the error counter. These indicators may be moved up the screen before a keyboard input request. During DISKETTE READ and WRITE operations the CYLINDER, HEAD and RECORD(S) selected are displayed at the center of the status line (CCHRR=#####). Soft errors are normal on used diskettes.

17.2.4.1 END COMMAND

Use the ATTN and E entry to end routine loops and go to the next routine when in loop mode or to return to the OPTIONS MENU.

Use the ATTN and 9 entry to return to the menu after the selected routine is executed.

With the menu displayed, enter OPTION 9 and ENTER to return to DCP. An ENTER is needed after the ending message.

At ERROR and ENTRY stops a '9' and ENTER will return to the main OPTIONS MENU.

17.2.4.2 LOOP COMMAND

OPTION 0 is used to set or reset ROUTINE or PROGRAM LOOP mode. The present mode selected will be displayed as part of the menu. If a routine is selected with LOOP MODE set, the ROUTINE will loop until an ATTN command or an ERROR.

17.2.5 CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT

If an error is sensed, an ERROR MESSAGE(S) (E-27XX) and optional INFORMATION MESSAGES (I-27XX) will be displayed, followed by an entry STOP MESSAGE (A-27XX ERROR OCCURRED):

See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for CONTROL PROGRAM STOPS (other than ?-27XX).

See "TRAP DATA" on page 13 for TRAP stops.

17.3 ERROR, ACTION AND INFORMATION MESSAGES

MSG ID	ERROR MESSAGE AND STATUS MESSAGE MEANINGS
I-2700	PID 0110 START -DISKETTE READ VERIFY UTILITY- The utility has been loaded and has displayed its start message.
I-2701	OPTIONS: LOOP MODE OFF - DISKETTE DRIVE SELECTED = # X-0- SET / RESET LOOP MODE X-1- SELECT DISKETTE DRIVE X-2- READ VERIFY CE DISKETTE X-3- READ VERIFY RECORD X-4- READ VERIFY EXCHANGE DISKETTE X-5- READ VERIFY SYSTEM/23 FORMAT DISKETTE X-6- HEAD ALIGNMENT CHECK X-9- RETURN TO DCP
A-2702	ENTER OPTION The OPTIONS MENU is displayed and a DIGIT (0 TO 9) OPTION ENTRY followed by ENTER is needed.
I-2703	START AUTOMATIC SEQUENCE
I-2704	'ATTN-X' ACKNOWLEDGE Acknowledgment of an ATTN request and the end of routine.
A-2705	ERROR OCCURRED IN ROUTINE # '9' TO END LOOP 'ENTER' TO CONTINUE An error has occurred and an ENTER is needed to continue testing. Any other entry returns to OPTIONS MENU.
I-2706	LOOP MODE SET ROUTINE/PROGRAM LOOP MODE has been turned on.
I-2707	LOOP MODE RESET ROUTINE/PROGRAM LOOP MODE has been turned off.
E-2708	'X' IS NOT A VALID OPTION The first character entered was not an expected option. Enter a valid option number.

- A-2709** THE PRESENT DISKETTE DRIVE SELECTED IS 'X'
ENTER NEW DRIVE NUMBER (1,2,3 OR 4)
The selected drive number is displayed. A new drive number between 1 and 4 must be entered to change drives.
- I-2710** RTN-1 INSERT DISKETTE TO BE READ VERIFIED INTO ANY DRIVE AND THEN
SELECT DRIVE USING OPTION '1'.
- E-2711** READ/WRITE STORAGE PARITY CHECK FRU= BASE STORAGE CARD
A R/W PARITY CHECK was sensed in the first 32K of storage by the INITIALIZA-
TION ROUTINE. Suspect the BASE STORAGE CARD.
- E-2712** I/O CHANNEL TRAP SEE MAP 1225
The I/O CHANNEL ERROR LINE was activated by an attachment card.
- E-2713** READ/WRITE STORAGE DATA FAILURE FRU= BASE STORAGE CARD
Data read during INITIALIZATION TESTING from a storage location in the first
32K was not as expected. Suspect BASE STORAGE CARD or the CPU PLANAR BOARD.
- E-2714** WRITE TO ROS SPACE TRAP SEE MAP 1205 AND MAP 1210
A write to ROS address space error has been sensed. Either the program is
destroyed and must be loaded again or the hardware failed.
- E-2716** LOGIC FAILED FRU= CPU PLANAR BOARD
A failure was sensed in the storage control logic on the CPU Planar Board.
The CPU Planar Board should be exchanged.
- E-2718** POWER CHECK SEE MAP 1225
The POWER GOOD LINE from the POWER SUPPLY went OFF.
- I-2720** RTN-2 READ VERIFY CE DISKETTE ROUTINE STARTED
- E-2721** HARD ERROR OCCURRED ON CYLINDER 76 OF CE DISKETTE IN DRIVE= #
RUN PID 1510 TO CORRECT ERROR 'ENTER' TO CONTINUE '9' TO END
A hard error was sensed on the CE READ/WRITE TEST TRACK.
PID 1510 should be used to correct the error condition.
- I-2730** RTN-3 READ VERIFY RECORD ROUTINE STARTED
- A-2731** BYPASS HARD ERROR STOPS ? (1 FOR YES)
Use ENTER for normal operations. Use a '1' and ENTER to bypass error stop
messages during testing and scope loops.

I-2756 SKIPPED ##### DELETED FAILING RECORDS

The count of skipped records is displayed. The map of IN USE records and the map of available records are combined and checked for records that are not accessible. The skipped records were found by system microcode to be causing read/write errors and were removed from the data set label IN USE map. A large number of skipped records indicate that the diskette is worn or that a hardware failure occurred during a customer program run. Use PID 0120 to display the diskette error log data and the read/write statistics. Errors found by the read verify of IN USE and available records are not associated with these skipped records. A high skipped record count may effect performance.

E-2757 RECORD(S) USED MORE THAN ONCE

One or more records are assigned by data set label pointers as IN USE more than once. Data integrity is suspect. The customer should copy each file to a good diskette and verify that all data is valid.

E-2758 RECORD(S) USED AND IN AVAILABLE RECORD MAP.

One or more records are assigned by data set label pointers as IN USE and are also in the available record map. Data integrity is suspect. The customer should copy all files to a good diskette and verify that the data is valid.

I-2760 HEAD ALIGNMENT CHECK ROUTINE STARTED

WAIT UNTIL THE ALIGNMENT DISKETTE TEMPERATURE IS STABLE IN DRIVE

The head alignment service check routine has started. The temperature of the 3742 alignment check diskette (part number 2455026) must be stable and permitted to reach machine environment temperature.

A-2761 INSERT ALIGNMENT CHECK DISKETTE P/N 2455026 INTO DRIVE TO BE CHECKED

THE PRESENT DRIVE SELECTED IS 'X'
ENTER DRIVE NUMBER (1,2,3 OR 4) OR '9' AND 'ENTER' TO END ROUTINE

The branch office tool part number 2455026 is needed for the alignment service check. The drive selected is displayed. Press ENTER to start the service check on that drive. To select another drive, enter the drive number and press ENTER. Press '9' and ENTER to end the service check routine and return to PID 0110 options menu. With a valid entry, the selected drive will be checked for the correct diskette. Then the head alignment of HEAD 0 will be checked.

I-2762 DRIVE= X HEAD ALIGNMENT OK

The head alignment is correct for the drive displayed. No adjustment is needed. The second head, if present, is not checked because it is fixed relative to HEAD ZERO.

E-2763 DISKETTE IN DRIVE IS NOT ALIGNMENT CHECK DISKETTE P/N 2455026

The VTOC header is not correct for a 3742 alignment diskette. Use the correct diskette in the selected drive.

I-2764 READ ERROR COUNT ** OUT= ### * IN= ###

The number of records that cannot be read because they were written too far in or out relative to the diskette center hole are displayed. This message is displayed if the alignment is not correct or an ATTN-E is entered during the service check. If most errors occurred in one direction, use the service check 1530 or 4530 in the Service Manual to correct the head position. Errors in both directions indicate a loose or worn mechanical part.

E-2765 DRIVE= X HEAD ALIGNMENT NOT CORRECT
** CHECK 'HEAD/CARRIAGE ASSEMBLY' (SEE SM 1530 OR 4530)

The minimum number of even and odd records cannot be read repeatedly. The head alignment is not correct or the carriage access assembly is loose. First, remove the alignment check diskette and then insert it again in the drive and repeat the alignment check. The diskette may not have been aligned on the drive collar. Errors will occur if the diskette temperature is not stable or the diskette is damaged.

Do the service check in the Service Manual using the ROS routine in PID 1500.

If the mechanical alignment and the service check is correct, no mechanical problems are found and the drive still does not pass the quick head alignment routine, then exchange the head alignment diskette. A damaged head assembly will also cause alignment problems.

A-2766 HEAD POSITION PRECISION ERRORS AFTER SEEK ON DRIVE X
** CHECK 'DRIVE BAND' TRACKING AND TENSION (SEE SM 1562 OR 4562)

Alignment records could not be read when the access assembly was moved in and out after first reading the records OK. The head position cannot be repeated. Check for a loose or worn access assembly or drive band.

This error may indicate a head alignment problem. The mechanical alignment should also be checked (See SM 1530 or 4530).

E-2767 CYLINDER ID ADDRESS NOT EXPECTED ADDRESS

The CYLINDER ID read from the diskette by a READ DATA or READ ID COMMAND did not match the expected cylinder address. The head access has moved to the wrong cylinder. The alignment may not be correct or the diskette is damaged. If the mechanical alignment and band tension is OK, check for binding parts and then run the diskette diagnostics.

E-2770 RC -80- DRIVE NOT READY - DRIVE= '#'

The diskette drive was not ready or went not ready and the operation failed or was not attempted. Ready the selected drive and use ENTER to continue the routine or end the routine and select different drive.

E-2771 RC -40- SHARED DRIVE NOT SECURED

An attempt was made to secure a shared drive (DRIVE 3 or 4) and a time out occurred before the sharing system released the drive.

E-2775 ISR-10- OPERATION NOT COMPLETE TIME OUT

A READ or WRITE operation was not completed in 500 MILLISECONDS. Other error messages may not be valid. First, attempt the operation again. This error is caused by an ID ADDRESS MARK soft read error or a missing record.

E-2776 ISR-0X- DRIVE ATTENTION

A DRIVE ATTENTION ERROR INTERRUPT occurred for a specific drive. See "STATUS BYTE DEFINITION FOR MESSAGE E-2782" on page 49 for drive number.

E-2777 ST1-20- CRC ERROR

A hard CRC ERROR in the address or data field of a record. The record cannot be correctly read.

- E-2778** ST1-10- DATA OVERRUN
- A data overrun occurred in the diskette controller after a DATA READ or WRITE request was made. The request was not responded to before a byte of data needed was lost. Suspect a hardware failure.
- E-2779** ST1-04- RECORD NOT FOUND
- The record (RR) requested by a diskette READ or WRITE operation was not found by the diskette controller on the cylinder. The record ID is missing or the record requested is not valid for this cylinder format. Check the diskette type and format for correct CE format.
- E-277A** ST1-01- ADDRESS MARK NOT FOUND
- Either NO ID ADDRESS MARK or NO DATA ADDRESS MARK was found on the cylinder at this head position in response to a READ or WRITE command. If error message E-277F does not follow this message then the error is an ID ADDRESS MARK not found. The cylinder data has been destroyed or the cylinder was not formatted in the correct mode. If most records on a diskette have this error then the 'VOL1' record may have been changed.
- E-277B** ST2-40- CONTROL RECORD (DELETED DATA ADDRESS MARK)
- A control record (DELETED DATA ADDRESS MARK) was sensed after cylinder ZERO and is not valid on a CE DISKETTE. On an EXCHANGE DISKETTE, the control record was sensed on a record not reserved as a header label.
- E-277C** ST2-20- DATA FIELD CRC ERROR
- During READ or VERIFY of a record, the CRC CHECK BYTES from the diskette did not match the CHECK BYTES calculated by the diskette controller. The ID address mark was OK but the error occurred in the data field. The data is lost.
- E-277D** ST2-10- CYLINDER ADDRESS TO ID COMPARE ERROR
- During a READ, WRITE or VERIFY operation, the cylinder ID read from the diskette did not match the ID in the cylinder counter of the controller. Either the controller is out of step with the diskette drive (heads on wrong track) or the ID address mark is written on the diskette wrong.
- E-277E** ST2-02- BAD CYLINDER
- An error flag read from the diskette indicates that this cylinder was written and marked as a bad cylinder. The bad cylinder flag is not valid on a CE DISKETTE and is not supported by CE programs. Use a valid CE FORMAT DISKETTE for the test or bypass the error.
- E-277F** ST2-01- MISSING DATA ADDRESS MARK
- For a READ, WRITE or VERIFY operation, the ID address mark for a record was correctly read from the diskette but the data address mark was not found. Data in the data field is lost and the diskette must be formatted to be usable.
- A-2780** ERROR OCCURRED 'ENTER' TO RETRY '3' TO BYPASS '9' TO END
- A hard error was sensed and a response is needed to continue testing. The error message(s) are displayed on the screen before this message. To attempt the last operation again and continue with the routine, use just ENTER.
- A '3' and ENTER is used to bypass a hard diskette error and testing will continue with the next record, skipping the record in error.
- Any other entry will end the routine.

E-2781 SOFT READ ERROR ON DRIVE= # AT CC= ## H= # RR= ##

A READ ERROR was sensed at the displayed cylinder and head. The operation was repeated with no error (ten attempts). If RR= ?? then the error occurred during a cylinder read operation and the program will attempt to find the record in error.

E-2782 ERROR: DR= # AT CCHRR= ##### OP= X RC= XX STATUS= XX,XX,XX,XX

A hard error has been sensed after ten attempts. The CYLINDER (CC), HEAD (H) and RECORD (RR) being read is displayed along with the request COMMAND TYPE (OP). The status byte returned from DCP is displayed along with the four diskette controller status bytes ISR,ST0,ST1 and ST2. See "STATUS BYTE DEFINITION FOR MESSAGE E-2782" on page 49 and "COMMAND TYPE REQUESTS" on page 49 for status byte definition if the error messages following do not describe the error(s).

E-2783 SELECTED DRIVE NUMBER '#' WAS NOT READY / ATTACHED

The selected diskette drive was not connected or was not ready. Select the correct diskette drive or make the drive ready. Verify that the diskette is the correct type for the drive model and that it is inserted correctly. A two-sided (TYPE 2) diskette cannot be used in a single head drive.

E-2784 SHARED DRIVE '#' NOT SECURED

The status byte returned by DCP indicates that the diskette controller could not secure and hold a shared drive (3 or 4) in the number of attempts permitted by DCP. Ensure that the system sharing DRIVE 3 and 4 is not hung and that the drive is ready. Use the DISKETTE DIAGNOSTICS to find and correct the problem or use a different drive.

E-2785 NOT A VALID CE DISKETTE

The diskette on the selected drive does not have the correct recording MODE, SIDES, RECLen and/or SYSTEM IDENTIFICATION (in the VOL1 header) to be read as a CE FORMATTED DISKETTE. Other errors may occur.

E-2786 READ DATA NOT MOVED TO STORAGE ?

The first 128 bytes of the data field did not change. Before a read operation, the read field is initialized to a fixed test pattern. After the read, the field is checked to verify that the pattern changed. If the pattern did not change, then a data transmission to storage may have failed or went to the wrong address if no other diskette attachment error occurred.

E-2787 COMMAND TO DCP IOCS WAS NOT VALID ?

The control block passed by the utility program was found by DCP to be not valid and was not executed. The program should be ended and then loaded and attempted again. If the error continues, then check any input data and ensure that it is correct.

E-2788 "VOL1" HEADER NOT VALID (RECORD SEVEN)

RECORD SEVEN of CYLINDER ZERO did not have a valid VOL1 header in either EBCDIC or ASCII format.

I-2789 DRIVE= # INDEX= # SIDES= # MODE= XXX FORMAT= XXXXXX RECLEN= ##

Information from the diskette VOL1 header on the selected drive where:

DRIVE = 1, 2, 3 OR 4
 INDEX = TYPE '1' OR '2' DISKETTE INDICATED BY THE INDEX PULSE
 SIDES = THE NUMBER OF SIDES FORMATTED (1 OR 2)
 MODE = 'FM' OR 'MFM'
 FORMAT = EITHER 'EBCDIC' OR 'ASCII' FORMAT
 RECLEN = THE RECORD LENGTH INDICATOR OF RECORD SIZE
 (00=128, 01=256, 02=512 AND 03=1024 BYTE RECORDS).

Note: IF SIDES= 2, INDEX= 2 AND MODE= MFM,
 THEN A '2D' DISKETTE IS INDICATED.

E-278A DRIVE POWER CHECK (24V)

The diskette power good line was off for DRIVE 1 and 2. Check 24 VOLTS.

E-278B LABEL TYPE 'X' DISKETTE NOT VALID

The label type indicated is not supported.

Only type 'W' diskettes are supported by diagnostic programs.

I-278D BAD CYLINDER FLAG FOR 'CC'= ## ##

The diskette selected was formatted with the physical cylinder(s) indicated marked as bad. Alternate cylinders are assigned sequentially. Two cylinders may be marked as bad on a usable diskette.

E-278E 'ERMAP' RECORD NOT VALID (RECORD FIVE)

An entry in the ERROR MAP RECORD (CCHRR=00005) is not valid or not supported by diagnostic programs.

E-278F ALTERNATE PHYSICAL RECORD NOT VALID

The ALTERNATE PHYSICAL RECORD method for assigning records to replace bad records is not supported by diagnostic programs.

I-2790 PID 0110 END -READ VERIFY UTILITY-

I-2791 PID 0110 TERMINATED, PRESS 'ENTER'

I-2794 DATA: DRIVE= # CYLINDER= ## HEAD= # RECORD= ##

E-2795 NUMBER OF DIGITS ENTERED NOT VALID?

Only five decimal digits are valid for a CCHRR entry.

E-2796 'CC' NOT VALID?

The CC value of the CCHRR entry is not valid. It must be a decimal value in the range of '00' to '76'.

E-2797 'H' NOT VALID?

The H value of the CCHRR entry is not valid. It must be a '0' or '1'.

E-2798 'RR' NOT VALID FOR 'CC' ENTRY?

The RR value of the CCHRR entry is not valid. It must be a decimal value in the range of:

01 to 26 for 'CC=00'.
01 to 08 for 'CC' other than '00' on a CE DISKETTE.

17.4 DETAILED DESCRIPTION OF ROUTINES

This utility is used to read all the records on a CE DISKETTE. The loop option is available for extended testing with the loop counter displayed on the status line. As each record or block of records is read, the CCHRR is displayed on the status line. Any recovered error is logged as a soft error and the error counter on the status line is updated. Hard errors are logged by error types with a positive response needed to continue or bypass.

17.4.1 ROUTINE 1

Automatically executes after the program is loaded by DCP and does a test of the first 32K of storage to verify program integrity.

17.4.2 ROUTINE 2 - READ CE DISKETTE

Is the CE DISKETTE READ VERIFY UTILITY used to check the diskette for soft and hard read errors. The routine reads each record on CYLINDER 0 and 1 four times and then reads all other cylinders four times in cylinder mode. If a soft read error (readable in ten attempts) occurs, then an error message is displayed and each record is then read seven times with an error message displayed giving the CYLINDER, HEAD and RECORD number for each additional soft read error. After a hard error, a message is displayed and an ENTER response is needed to continue.

17.4.3 ROUTINE 3 - READ SINGLE RECORD

Is used to select and read a single record on a CE formatted diskette ten times. The routine will request the five digit CYLINDER, HEAD and RECORD (CCHRR) entry of the record to be read. If the entry is valid, the selected record will be read ten times with the loop counter updated. If loop mode is on, then the record will be read until an ATTN and 'E' end command is entered. Drives 3 and 4 will be held secured for ten reads and then released.

The bypass hard error stop option is used for scope loop mode when needed by the diskette maps. A good record on the selected track should be used if possible. All errors will be logged and counted.

17.4.4 ROUTINE 4 - READ EXCHANGE DISKETTE

Is used to read verify any standard label IBM formatted diskette. The routine reads the VOL1 header label. The label is checked and the diskette type is checked (1,2,2D). Then each record on the diskette is read with an error message displayed for each error.

17.4.5 ROUTINE 5 - READ CUSTOMER DISKETTE

Is used to read verify a CUSTOMER PREPARED DISKETTE. The routine will read a SYSTEM/23 format diskette, bypassing records not used because of errors during normal use. System microcode will bypass records that become bad during normal operation. If a large number of records are bypassed the customer should copy the files to another diskette.

First, the diskette is checked for a valid SYSTEM/23 format. Then the data set labels are read and a table of IN USE records is made. This table is then used to read verify all of the IN USE records. Next, the bit map table from the table of contents is used to read verify the available records. If any records have been skipped because they have been removed by system microcode as bad, then a count of skipped records is displayed.

17.4.6 ROUTINE 6 - HEAD ALIGNMENT CHECK

Is used to make a quick COVERS ON service check of diskette head alignment using the branch office tool part number 2455026. Run the diskette diagnostics before using this routine. The routine first checks that the correct diskette is in the selected drive. The special alignment tracks are then read. First, the fine alignment tracks are read and then the coarse alignment tracks are read if necessary. The routine attempts to read records written on opposite sides of the diskette on two different tracks. The records are written with offset identification and data fields.

Tracks 05 through 15 of the alignment diskette will not be readable by the verify diskette routines. The special tracks are precision written with the ID fields alternately written offset a specific distance from the normal center of the track. The data field for each record is offset the opposite direction. If the head alignment is correct and compatible with other drives, the alignment check routine can read some of the records, but not necessarily all of the special records.

The alignment check diskette should be protected from temperature and humidity changes. Replacement is needed if dimension changes from temperature or physical damage occur. The alignment check diskette is used as a service check only. If the diskette drive mechanical alignment is correct and this service check still fails, then exchange the alignment checks diskette and repeat the service check.

17.5 GENERAL INFORMATION

17.5.1 UTILITY USE

This diagnostic utility does not display a FRU list except during the ROUTINE 1 initialization. The utility is used to verify that the diskette is readable and to indicate the number of normal attempts necessary to read the diskette after normal wear. This PID will not change records on the CE DISKETTE. No map is associated with this PID. If hardware errors are sensed, the error messages should be recorded and used as an intermittent symptom with the START MAP 1000.

17.5.2 STATUS BYTE DEFINITION FOR MESSAGE E-2782

DCP RETURN CODES

- RC - 80 DISKETTE DRIVE NOT READY
 - 40 SHARED DRIVE NOT SECURED
 - 20 CONTROL RECORD (DELETED DATA ADDRESS MARK)
 - 10 CRC ERROR
 - 04 RECORD NOT FOUND
 - 02 DRIVE ERROR
 - 01 OTHER ERROR

STATUS= ISR, ST0, ST1, ST2

- ISR - 80 READ/WRITE COMMAND END
 - 20 DRIVE WENT NOT READY
 - 10 OPERATION NOT COMPLETE TIME OUT
 - 08 DRIVE 4 ATTENTION
 - 04 DRIVE 3 ATTENTION
 - 02 DRIVE 2 ATTENTION
 - 01 DRIVE 1 ATTENTION
- ST0 - 00 NORMAL END
 - 80 NOT A VALID OPERATION
 - XX ERROR END
- ST1 - 80 LAST RECORD MOVED
 - 20 CRC ERROR IN ID OR DATA FIELD
 - 10 DATA OVERRUN
 - 04 RECORD NOT FOUND
 - 01 ADDRESS MARK NOT FOUND
- ST2 - 40 CONTROL RECORD (DELETED DATA ADDRESS MARK)
 - 20 DATA FIELD CRC ERROR
 - 10 CYLINDER ADDRESS TO ID COMPARE ERROR
 - 02 BAD CYLINDER FLAG
 - 01 MISSING DATA ADDRESS MARK

17.5.3 COMMAND TYPE REQUESTS

- OP - 1 NORMAL DRIVE SELECT
 - 2 READ DATA RECORD(S)
 - 3 WRITE DATA RECORD(S)
 - 4 READ ID
 - 5 WRITE CONTROL (DELETED DATA MARK) RECORD(S)
 - 6 SELECT DRIVE FOR FORMAT MODE
 - 7 FORMAT TRACK
 - 8 RECALIBRATE DRIVE
 - 9 RELEASE SHARED DRIVE
 - A READ DATA RECORD(S) (NOT CE FORMAT)
 - B WRITE DATA RECORD(S) (NOT CE FORMAT)
 - D WRITE CONTROL RECORD (NOT CE FORMAT)

18.0 PID 0115 (VTOC DISPLAY UTILITY)

18.1 PURPOSE

This program will display a list of the fault locating tests and CE utilities available on the CE DISKETTE.

18.2 OPERATING PROCEDURES

18.2.1 LOADING

Select the UTILITY MENU ('18' on the DCP MENU). Select the VTOC LIST UTILITY ('28' on the UTILITY MENU). Message A-0282 will then be displayed on the screen.

18.2.2 MENU DISPLAY

NONE - All input is through prompting messages.

18.2.3 MENU OPTION SELECTION - NONE

18.2.4 PROGRAM RUN INSTRUCTIONS

All operator input required is through prompting messages. The drive number is a one digit numeric character (1-4 ONLY) indicating the drive containing the CE DISKETTE to be displayed. If there are 14 or more entries on the diskette, only the first 14 entries will be displayed. In this case a message will be displayed requesting the ENTER key be pressed. The next 14 entries will then be displayed. When all VTOC entries have been displayed, message A-0282 will again be displayed to permit selection of another drive, if desired.

18.2.4.1 PROGRAM TERMINATE METHOD

To exit the program, a '9' may be entered in place of a drive number.

18.3 ERROR, ACTION AND INFORMATION MESSAGES**E-0280** WRONG ENTRY

Note: Verify that correct keyboard entries were made. If display does not match key entries - GO TO MAP 1400, ENTRY POINT A.

I-0281 VTOC LIST UTILITY ENDED - PRESS ENTER**A-0282** ENTER DRIVE NUMBER (X)**E-0283** WRONG DISKETTE INSERTED
INSERT CE DISKETTE, AND/OR
ENTER DRIVE NUMBER (X) OR 9 TO EXIT PROGRAM.

Note: Verify that a CE DISKETTE was inserted in drive. If error continues - REPLACE CE DISKETTE - TRACK 0 may have been destroyed.

A-0284 PRESS ENTER FOR MORE LABELS**E-0285** RESULTS ERROR - ISR = WW STO = XX ST1 = YY ST2 = ZZ
ERROR OCCURRED ON TRACK VV

NOTE: WW = 80 READ/WRITE END
20 DRIVE WENT NOT READY
10 OPERATION NOT COMPLETED
08 DRIVE 4 ATTENTION
04 DRIVE 3 ATTENTION
02 DRIVE 2 ATTENTION
01 DRIVE 1 ATTENTION

XX = 00 NORMAL END
ANY OTHER VALUE INDICATES ERROR END

YY = 20 CRC ERROR
04 SECTOR NOT FOUND
01 ADDRESS MARK NOT FOUND

ZZ = 20 DATA FIELD CRC ERROR
10 CYLINDER ADDRESS NO COMPARE
01 MISSING DATA ADDRESS MARK

IF THIS ERROR OCCURS:
1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTE(S)
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

E-0286 DRIVE X NOT READY

Note: CHECK - DISKETTE inserted correctly and handle closed.
- TYPE 1 DISKETTE ONLY inserted in 31SD DRIVE.

IF ERROR CONTINUES:
1. RECORD FAILING DRIVE NUMBER
2. REMOVE DISKETTE(S)
3. POWER OFF
4. POWER ON
5. GO TO MAP 1501, ENTRY POINT A

E-0287 DRIVE X CANNOT BE SECURED

18.4 DETAILED DESCRIPTION

This program will display the LABEL, PART NUMBER and EC LEVEL of the CE DISKETTE, followed by a list of all programs on the diskette. The list of programs will display the PART NUMBER, EC LEVEL, REA NUMBER, PID NUMBER, DISKETTE ADDRESS (CC - CYLINDER, H - HEAD, AND RR - SECTOR NUMBER) STORAGE LOADING ADDRESS and the LENGTH OF THE PROGRAM.

19.0 PID 0120 (ERROR LOG DISPLAY UTILITY)

19.1 PURPOSE

This program is used to display the CUSTOMER SYSTEM/23 FORMATTED DISKETTE ERROR LOG DATA and to clear the ERROR LOG TABLE if necessary. The ERROR LOG is used by the SYSTEM SOFTWARE to log drive and diskette problems for soft errors. A count of the number of read and write operations to a diskette is recorded by the system microcode and can be displayed.

19.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)

19.2.1 LOADING PID 0120 - SYSTEM/23 DISKETTE ERROR LOG UTILITY

With the PRIMARY DCP MENU displayed, enter an '18' and an ENTER to display the UTILITY MENU. Next, enter a '24' and an ENTER.

PID 0120 will load and display START MESSAGE I-2400 followed by ROUTINE 1 INFORMATION MESSAGE I-2410. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 55 for any error messages. After ROUTINE 1 executes without error, the OPTIONS MENU will be displayed.

19.2.2 MENU DISPLAY

```
I-2401   OPTIONS:   - DISKETTE DRIVE SELECTED = #
X-1-   SELECT DISKETTE DRIVE
-2-   DISPLAY DISKETTE ERROR LOG
-3-   READ/WRITE STATISTICS
X-4-   CLEAR DISKETTE ERROR LOG
X-9-   RETURN TO DCP
A-2402   ENTER OPTION

?_
```

19.2.3 MENU OPTION SELECTION

Enter the selected option number using the numeric keys on the right end of the keyboard followed by the ENTER key.

The 'X' by the option number indicates an optional routine not part of automatic sequence.

- OPTION 1** Will display MESSAGE A-2409 requesting the drive number of the diskette drive to be selected for the next test. An entry of 1, 2, 3 or 4 is needed to change the selected drive. The drive is then tested for a ready condition and the VOL1 checked for the diskette type and format. If drive 3 or 4 is selected, it will be secured and then released for the VOL1 header read.
- OPTION 2** Will format and display the error data in the ERROR LOG TABLE from a CUSTOMER SYSTEM/23 FORMATTED DISKETTE.
- OPTION 3** Will display a count of the number of read and write operations recorded by the SYSTEM MICROCODE on a SYSTEM/23 diskette.

OPTION 4 Will clear the ERROR LOG TABLE on a CUSTOMER SYSTEM/23 FORMATTED DISKETTE and display the diskette statistics.

OPTION 9 Will end PID 0120 and return to DCP.

19.2.4 PROGRAM RUN INSTRUCTIONS

Normal program operation is to select **OPTION '1'** to select the diskette drive needed. Next, **OPTION '2'** is selected to display the ERROR LOG from the CUSTOMER SYSTEM/23 FORMATTED DISKETTE.

The status line, above the keyboard input line, will display the last drive number selected (DR #). If errors occur, a decimal count of the number of errors will be displayed to the left of the drive indicator. These indicators may be moved up the screen before a keyboard input request. During diskette read and write operations, the CYLINDER, HEAD and RECORD selected is displayed at the center of the status line (CCHRR=#####).

19.2.4.1 END COMMAND

Use the ATTN and '9' entry to end routine and return to the menu.

With the menu displayed, enter **OPTION '9'** and ENTER to return to DCP. An ENTER is needed after the ending message.

19.2.4.2 LOOP COMMAND NOT USED.

19.2.5 CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT

If an error is sensed, an ERROR MESSAGE(S) (E-24XX) and OPTIONAL INFORMATION MESSAGES (I-24XX) will be displayed, followed by an entry STOP MESSAGE (A-24XX ERROR OCCURRED).

See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for control program stops (other than ?-24XX).

SEE "TRAP DATA" on page 13 for TRAP stops.

19.3 ERROR, ACTION AND INFORMATION MESSAGES

MSG ID	ERROR MESSAGE AND STATUS MESSAGE MEANINGS
I-2400	PID 0120 START -SYSTEM/23 ERROR LOG UTILITY- The utility has been loaded and has displayed its START message.
I-2401	OPTIONS: - DISKETTE DRIVE SELECTED = # X-1- SELECT DISKETTE DRIVE -2- DISPLAY DISKETTE ERROR LOG -3- READ/WRITE STATISTICS X-4- CLEAR DISKETTE ERROR LOG X-9- RETURN TO DCP
A-2402	ENTER OPTION The OPTIONS MENU is displayed and a digit (0 TO 9) option entry followed by ENTER is needed.
I-2403	START AUTOMATIC SEQUENCE The utility has started a sequential run of its automatic routines.
I-2404	'ATTN-X' ACKNOWLEDGE Acknowledgment of an ATTN request and the end of the routine.
A-2405	ERROR OCCURRED IN ROUTINE # 'ENTER' TO CONTINUE '9' TO END An error has occurred and an ENTER is needed to continue testing. Any other entry returns to OPTIONS MENU.
E-2408	'X' IS NOT A VALID OPTION The first character entered was not an expected option. Enter a valid option.
A-2409	THE PRESENT DISKETTE DRIVE SELECTED IS '#' ENTER NEW DRIVE NUMBER (1,2,3 OR 4) The selected drive number is displayed. A new drive number between 1 and 4 must be entered to change drives.
E-240D	NOT A VALID SYSTEM/23 FORMAT DISKETTE The diskette in the selected drive was not prepared as a SYSTEM/23 DISKETTE and does not have an ERROR LOG RECORD. This error message may be displayed if records at CCHRR= 00008 or CCHRR= 00009 have been changed. Select a drive with a CUSTOMER DISKETTE or insert a valid CUSTOMER PREPARED DISKETTE.
I-2410	RTN-1 USE OPTION '1' TO SELECT DRIVE WITH SYSTEM/23 FORMAT DISKETTE. USE OPTION '2' TO DISPLAY DISKETTE ERROR LOG AND ERROR COUNTS. USE OPTION '3' TO DISPLAY DISKETTE READ/WRITE STATISTICS. USE OPTION '4' TO RESET ERROR LOG ENTRIES.
E-2411	READ/WRITE STORAGE PARITY CHECK FRU= BASE STORAGE CARD A R/W PARITY CHECK sensed in the first 32K of storage. Suspect the BASE STORAGE CARD.

- E-2412** I/O CHANNEL TRAP SEE MAP 1225
The I/O CHANNEL ERROR LINE was activated by an attachment card.
- E-2413** READ/WRITE STORAGE DATA FAILURE FRU= BASE STORAGE CARD
Data read from storage location was not as expected.
- E-2414** WRITE TO ROS SPACE TRAP SEE MAP 1205 AND MAP 1210
A WRITE TO ROS ADDRESS SPACE ERROR has been sensed. Either the program is destroyed and must be loaded again or the hardware failed.
- E-2416** LOGIC FAILED FRU= CPU PLANAR BOARD
A failure was sensed in the storage control logic on the CPU Planar Board. The CPU Planar Board should be exchanged.
- E-2418** POWER CHECK SEE MAP 1225
The POWER GOOD LINE from the POWER SUPPLY went OFF.
- I-2420** RTN-2 SYSTEM/23 DISKETTE ERROR LOG DISPLAY
- E-2421** LOG HEADER ERROR - NOT A SYSTEM/23 FORMAT DISKETTE WITH ERROR LOG
THE ERROR LOG RECORD read from the SYSTEM/23 FORMATTED DISKETTE did not have a valid DATA BLOCK HEADER or a VALID LOG HEADER ID. Verify that the selected diskette is a SYSTEM/23 FORMAT CUSTOMER DISKETTE.
This error message may be displayed if records at CCHRR= 00008, CCHRR= 00009, CCHRR= 01001 or CCHRR= 01002 has been changed.
- I-2422** VOLID= ?????? OWNERID= ?????????????? INITIALIZED YY/MM/DD
TOTAL ERROR COUNT ASSOCIATED WITH DISKETTE ON DRIVE # IS # ### ## ##.
ENTRIES IN ERROR LOG. LOG RECORD LAST RESET YY/MM/DD.
The total number of errors associated with this diskette after it was last formatted is displayed in decimal along with the number of error entries in the LOG TABLE and the DATE the LOG TABLE was LAST CLEARED. The VOLID, OWNER-ID, and SYSTEM DATE, inserted when the diskette was last initialized, are also displayed for reference.
- I-2423** SEQ TYPE CMD DR NUM ST0 ST1 ST2 CYL HEAD REC RL CNT
Header for the ERROR LOG DATA DISPLAY. SEE "DISPLAY FORMAT FOR ERROR LOG DATA MESSAGE I-2424" on page 64 for display format.
- I-2424** ## - XX
Data from one entry of the ERROR LOG TABLE. SEE "DISPLAY FORMAT FOR ERROR LOG DATA MESSAGE I-2424" on page 64 for format and data meaning.
- A-2425** 'ENTER' FOR NEXT ## LOG ENTRIES OR A SEQUENCE NUMBER FOR LOG DECODE
An ENTER is needed to display the next group of log entries. The count of entries to be displayed next is included in the message. Enter the sequence number of an ERROR LOG ENTRY and ENTER for a formatted display of the single entry.
- A-2426** 'ENTER' TO END ROUTINE OR A LOG SEQUENCE NUMBER TO DECODE
1. Press ENTER to return to utility menu.
2. Enter the sequence number of an ERROR LOG ENTRY and press ENTER for a formatted display of the entry.

E-2427 SEQUENCE NUMBER ENTRY NOT VALID

I-2428 COMMAND= READ RECORD(S) AT CCHRR= 00000 ON DRIVE= #
 SOFT ERROR NUMBER OF RECORDS= # RECORD LENGTH= 512 BYTES
 ERROR TYPE= READ/WRITE ERROR

The formatted display of the data from an error log entry. The command request and error type are displayed. Error messages for ST1 and ST2 result bytes will follow this message.

I-2430 RTN-3 SYSTEM/23 DISKETTE STATISTICS DISPLAY

I-2431 DATE CHANGED TYPE DATA SET NAME READS WRITES

I-2432 -DELETED DATA SETS # ### ### ### # ### ### ###
 =CCHRR YY/MM/DD YY/MM/DD ## XXXXXXXXXXXXXXXX # ### ### ### # ### ### ###

Displayed are the statistics from a SYSTEM/23 FORMAT CUSTOMER DISKETTE. The first line has the count of read and write operations moved from the data set label of any deleted data set and from system operations. Each following line of data is from a data set label on the diskette. Displayed is the CCHRR of the data set label, the SYSTEM DATE the data set was placed on the diskette, the SYSTEM DATE the file was last changed, the DATA SET TYPE (see CUSTOMER OPERATIONS MANUALS), the DATA SET NAME and the number of READS and WRITES. The read and write count is the SYSTEM COUNT of reads and writes to this diskette when the file was closed and not a count of operations just to this file.

E-2435 DSL RECORD AT CCHRR= XXXXX ON DRIVE # NOT VALID?

The data set label at the CCHRR displayed has a header flag byte that is not valid. The record is not correct or the count of data set labels on the diskette is not correct. The customer should attempt to recover the data files.

A-2438 ERRORS= # TOTAL R/W= # ### ### ### # ### ### ###

The total count of soft errors associated with this diskette is first displayed along with the total count of read and write operations associated with the diskette as of the last prepare operation. These counts are used to determine diskette use and wear. Soft errors are normal on diskettes, but high error to read/write counts indicate a worn or damaged diskette that should be replaced. The counters are initialized to zero when the diskette is prepared by the customer. The largest count is 4 294 967 295.

A-2439 'ENTER' TO CONTINUE (OR '9' TO END)

I-2440 RTN-4 CLEAR ERROR LOG TABLE

A-2441 ENTER DATE
 YYMMDD

The data to be entered into the error log is needed. Its format is YYMMDD for YEAR, MONTH and DAY.

E-2442 ENTRY LENGTH NOT VALID

The date entry did not have only SIX DIGITS and is not valid.

E-2443 YY NOT VALID

The YY (YEAR) value for the date entry was not numeric.

E-2444 MM NOT VALID

The MM (MONTH) value for the date entry is not '01' to '12'.

- E-2445** DD NOT VALID
The DD (DAY) value for the date entry is not '01' to '31'.
- E-2446** DATE ENTRY NOT VALID
The date entry was not valid. Either the MM or DD value was out of range or one of the characters entered was not numeric. Check the error message above this one for source of problem.
- A-2447** VERIFY ERROR LOG ON DRIVE # IS TO BE CLEARED. ('1' = YES)
A YES response (use '1' and ENTER) is needed to continue and clear all of the entries in the ERROR LOG and update the date. Any other entry will abort the clear operation and return to the menu. The error count is not cleared.
- I-2448** ERROR LOG NOT CLEARED
- I-2449** ERROR LOG CLEARED
- E-2470** RC -80- DRIVE NOT READY - DRIVE= '#'
The diskette drive was not ready or went not ready and the operation failed or was not attempted. Ready the selected drive and use ENTER to continue the routine or end the routine and select different drive.
- E-2471** RC -40- SHARED DRIVE NOT SECURED
An attempt was made to secure a shared drive (DRIVE 3 or 4) and a time out occurred before the sharing system released the drive.
- E-2475** ISR-10- OPERATION NOT COMPLETE TIME OUT
- E-2476** ISR-0X- DRIVE ATTENTION
- E-2477** ST1-20- CRC ERROR
A hard CRC ERROR occurred in the address or data field of a record. The record cannot be correctly read.
- E-2478** ST1-10- DATA OVERRUN
A DATA OVERRUN occurred in the diskette controller after a data read or write request was made. The request was not responded to before a byte of data needed was lost. Suspect a hardware failure.
- E-2479** ST1-04- RECORD NOT FOUND
The RECORD (RR) requested by a diskette read or write operation was not found by the diskette controller on the cylinder. The record ID is missing or the record requested is not valid for this cylinder format. Check the diskette type and format for correct SYSTEM/23 format.
- E-247A** ST1-01- ADDRESS MARK NOT FOUND
Either no ID ADDRESS MARK or no DATA ADDRESS MARK was found on the cylinder at this head position in response to a read or write command. If ERROR MESSAGE E-247F does not follow this message then the error is an ID ADDRESS MARK NOT FOUND. The cylinder data has been destroyed or the cylinder was not formatted in the correct mode. If most records on a diskette have this error, then the VOL1 record may have been changed.
- E-247B** ST2-40- CONTROL RECORD (DELETED DATA ADDRESS MARK)
A control record (DELETED DATA ADDRESS MARK) was sensed after cylinder zero and is not valid on a SYSTEM/23 DISKETTE.

E-247C ST2-20- DATA FIELD CRC ERROR

During read or verify of a record, the CRC check bytes from the diskette did not match the check bytes calculated by the diskette controller. The ID ADDRESS MARK was OK but the error occurred in the data field. The data is lost.

E-247D ST2-10- CYLINDER ADDRESS TO ID COMPARE ERROR

During a read, write or verify operation, the cylinder ID READ from the diskette did not match the ID in the cylinder counter of the controller. Either the controller is out of step with the diskette drive (heads on wrong track) or the ID address mark written on the diskette is wrong.

E-247E ST2-02- BAD CYLINDER

An error flag read from the diskette indicates that this cylinder was written and marked as a bad cylinder. The bad cylinder flag is not valid on a CE DISKETTE and is not supported by CE programs. Use a valid CE FORMAT DISKETTE for the test or bypass the error.

E-247F ST2-01- MISSING DATA ADDRESS MARK

For a read, write or verify operation, the ID ADDRESS MARK for a record was correctly read from the diskette but the data address mark was not found. Data in the data field is lost and the diskette must be formatted to be usable.

A-2480 ERROR OCCURRED 'ENTER' TO RETRY '3' TO BYPASS '9' TO END

A hard error was sensed and a response is needed to continue testing. The error message(s) are displayed on the screen before this message. To attempt the last operation again and continue with the routine, use just ENTER.

A '3' and ENTER is used to bypass a hard diskette error and testing will continue with the next record, skipping the record in error.

Any other entry will end the routine.

E-2481 SOFT READ ERROR ON DRIVE= # AT CC= ## H= # RR= ##

A READ ERROR was sensed at the displayed cylinder and head. The operation was repeated with no error (TEN ATTEMPTS). If RR= ?? then the error occurred during a cylinder read operation and the program will attempt to find the record in error.

E-2482 ERROR: DR= # AT CCHRR= ##### OP= X RC= XX STATUS= XX,XX,XX,XX

A hard error has been sensed after ten attempts. The CYLINDER (CC), HEAD (H) and RECORD (RR) being read is displayed along with the request COMMAND TYPE (OP). The status byte returned from DCP is displayed along with the four diskette controller status bytes ISR,ST0,ST1 and ST2. See "STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424" on page 63 and "COMMAND TYPE REQUESTS" on page 63 for status byte definition if the error messages following do not describe the error(s).

E-2483 SELECTED DRIVE NUMBER '#' WAS NOT READY / ATTACHED

The selected diskette drive was not connected or was not ready. Select the correct diskette drive or make the drive ready. Verify that the diskette is the correct type for the drive model and that it is inserted correctly. A two sided (TYPE 2) diskette cannot be used in a single head drive.

E-2484 SHARED DRIVE '#' NOT SECURED

The status byte returned by DCP indicates that the diskette controller could not secure and hold a shared drive (3 or 4) in the number of attempts permitted by DCP. Ensure that the system sharing drive 3 and 4 is not hung and that the drive is ready. Use the diskette diagnostics to find and correct the problem or use a different drive.

E-2485 NOT A VALID CE DISKETTE

The diskette on the selected drive does not have the correct recording MODE, SIDES, RECLEN and/or SYSTEM IDENTIFICATION (in the VOL1 header) to be read as a CE FORMATTED DISKETTE. Other errors may occur.

E-2486 READ DATA NOT MOVED TO STORAGE?

The first 128 bytes of the data field did not change. Before a read operation, the read field is initialized to a fixed test pattern. After the read, the field is checked to verify that the pattern changed. If the pattern did not change, then a data transmission to storage may have failed or went to the wrong address if no other diskette attachment error occurred.

E-2487 COMMAND TO DCP IOCS WAS NOT VALID?

The control block passed by the utility program was found by DCP to be not valid and was not executed. The program should be ended and then loaded and attempted again. If the error continues, then check any input data and ensure that it is correct.

E-2488 'VOL1' HEADER NOT VALID (RECORD SEVEN)

Record seven of cylinder zero did not have a valid VOL1 header in either EBCDIC or ASCII format.

I-2489 DRIVE= # INDEX= # SIDES= # MODE= XXX FORMAT= XXXXXX RECLEN= ##

Information from the diskette VOL1 header on the selected drive where:

DRIVE = 1, 2, 3 OR 4
INDEX = TYPE 1 OR 2 DISKETTE INDICATED BY THE INDEX PULSE
SIDES = THE NUMBER OF SIDES FORMATTED (1 OR 2)
MODE = 'FM' OR 'MFM'
FORMAT = EITHER 'EBCDIC' OR 'ASCII' FORMAT
RECLEN = THE RECORD LENGTH INDICATOR OF RECORD SIZE
(00=128, 01=256, 02=512 AND 03=1024 BYTE RECORDS).

Note: IF SIDES= 2, INDEX= 2 AND MODE= MFM, then a '2D' diskette is indicated.

E-248A DRIVE POWER CHECK (24V)

The diskette power good line was off for drive 1 and 2. Check 24 volts.

E-248B LABEL TYPE 'X' DISKETTES ARE NOT VALID.

The label type indicated is not supported.
Only type 'W' diskettes are supported by diagnostic programs.

I-248D BAD CYLINDER FLAG FOR 'CC'= ## ##

The diskette selected was formatted with the physical cylinder(s) indicated marked as bad. Alternate cylinders are assigned sequentially. Two cylinders may be marked as bad on a usable diskette.

- E-248E** 'ERMAP' RECORD NOT VALID (RECORD FIVE)
An entry in the error map record is not valid or not supported by diagnostic programs.
- E-248F** ALTERNATE PHYSICAL RECORD NOT VALID
The alternate physical record method for assigning records to replace bad records is not supported by diagnostic programs.
- I-2490** PID 0120 END -ERROR LOG UTILITY-
- A-2491** PID 0120 TERMINATED, PRESS 'ENTER'
- I-2494** DATA: DRIVE=# CYLINDER= ## HEAD= # RECORD= ##
- E-2495** NUMBER OF DIGITS ENTERED NOT VALID?
- E-2496** 'CC' NOT VALID?
- E-2497** 'H' NOT VALID?
- E-2498** 'RR' NOT VALID FOR 'CC' ENTRY?'

19.4 DETAILED DESCRIPTION OF ROUTINES

19.4.1 ROUTINE 1

Automatically executes after the program is loaded by DCP and does a test of the first 32K of storage to verify program integrity.

19.4.2 ROUTINE 2 - ERROR LOG DISPLAY

Displays a formatted error log from CYLINDER 1, HEAD 0, RECORD 2. The error log is recorded by the system software for errors associated with the diskette. It includes the system date the diskette was last initialized, the date the log was last reset, the total number of errors, and an entry for each error. The error entry includes the drive number the diskette was on, the operation, record location, error status and the number of attempts. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 55, MESSAGE I-2422, MESSAGE I-2424 and "DISPLAY FORMAT FOR ERROR LOG DATA MESSAGE I-2424" on page 64 for detailed format.

A formatted display of a single entry can be displayed by sequence number. This option will translate the hexadecimal data to decimal format or status byte messages.

19.4.3 ROUTINE 3 - READ/WRITE STATISTICS

Will display a count of the number of read and write operations associated with a CUSTOMER DISKETTE. The system microcode counts each read and write operation and updates counters in the directory when a file is closed. This count is used as an indicator of diskette wear. The counts recorded in any one file are not necessarily associated with just that file, only the diskette. When a file is deleted, the counts are transferred to the history counters. The largest count is 4 294 967 295.

The routine will display each counter entry and a count of read and write operations along with the total number of errors associated with the diskette. See MESSAGE A-2438.

Each data set label display line will display the record address, the system date the data set was initialized, and the system date of the last change to the data set.

19.4.4 ROUTINE 4 - CLEAR ERROR LOG

Will reset the error log table pointer and update the reset date. The detailed error log entries will be cleared, but the total error count will not be changed. The error log will contain the last 41 errors recorded by the system microcode and it is usually not necessary to clear the log area. The error log is a wrap around type.

19.5 GENERAL INFORMATION

19.5.1 UTILITY USE

This diagnostic utility does not display a FRU LIST except during the ROUTINE 1 initialization. This utility is used to display the CUSTOMER SYSTEM FORMATTED DISKETTE error log of the errors associated with the diskette. It is used by the CE to identify diskette problems and to aid in locating intermittent problems associated with a diskette drive. No map is associated with this PID. If hardware errors are sensed, the error messages should be recorded and used as an intermittent symptom with the START MAP 1000.

19.5.2 STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424

DCP RETURN CODES

- RC - 80 DISKETTE DRIVE NOT READY
- 40 SHARED DRIVE NOT SECURED
- 20 CONTROL RECORD (DELETED DATA ADDRESS MARK)
- 10 CRC ERROR
- 04 RECORD NOT FOUND
- 02 DRIVE ERROR
- 01 OTHER ERROR

STATUS= ISR, ST0, ST1, ST2

- ISR - 80 READ/WRITE COMMAND END
- 20 DRIVE WENT NOT READY
- 10 OPERATION NOT COMPLETE TIME OUT
- 08 DRIVE 4 ATTENTION
- 04 DRIVE 3 ATTENTION
- 02 DRIVE 2 ATTENTION
- 01 DRIVE 1 ATTENTION

- ST0 - 00 NORMAL END
- 80 NOT A VALID OPERATION
- XX ERROR END

- ST1 - 80 LAST RECORD MOVED
- 20 CRC ERROR IN ID OR DATA FIELD
- 10 DATA OVERRUN
- 04 RECORD NOT FOUND
- 01 ADDRESS MARK NOT FOUND

- ST2 - 40 CONTROL RECORD (DELETED DATA ADDRESS MARK)
- 20 DATA FIELD CRC ERROR
- 10 CYLINDER ADDRESS TO ID COMPARE ERROR
- 02 BAD CYLINDER FLAG
- 01 MISSING DATA ADDRESS MARK

19.5.3 COMMAND TYPE REQUESTS

- OP - 1 NORMAL DRIVE SELECT
- 2 READ DATA RECORD(S)
- 3 WRITE DATA RECORD(S)
- 4 READ ID
- 5 WRITE CONTROL (DELETED DATA MARK) RECORD(S)
- 6 SELECT DRIVE FOR FORMAT MODE
- 7 FORMAT TRACK
- 8 RECALIBRATE DRIVE
- 9 RELEASE SHARED DRIVE
- A READ DATA RECORD(S) (NOT CE FORMAT)
- B WRITE DATA RECORD(S) (NOT CE FORMAT)
- D WRITE CONTROL RECORD (NOT CE FORMAT)

19.5.4 DISPLAY FORMAT FOR ERROR LOG DATA MESSAGE I-2424

One line of data is displayed for each log entry for hard and soft errors logged by the system microcode while running customer applications. The errors in the log are associated with the system formatted diskette. The log is a wrap around type.

The display fields are as follows:

SEQ This is the REFERENCE SEQUENCE NUMBER for each entry assigned by PID 0120. Entry NUMBER 1 is the oldest entry in the log record.

TYPE This is the ERROR LOG FLAG TYPE BYTE where:

- 80- Indicates error sensed during a record to buffer comparison after a write.
- 40- Indicates a 500 MILLISECOND time out occurred during the operation. The status bytes logged may not be valid.
- 00- Indicates an error occurred during a read or write operation.

CMD Is the command issued to the DISKETTE CONTROLLER/MICROCODE interface.

- 05- WRITE RECORD(S)
- 06- READ RECORD(S)
- 09- WRITE CONTROL RECORD(S)
- 0A- READ ID
- 0D- FORMAT TRACK
- 0F- SEEK
- 11- COMPARE RECORD(S) AND DATA BUFFER
- 26- READ RECORDS, IGNORE CONTROL RECORDS

DR Is the DRIVE NUMBER the diskette was in when the error occurred.

NUM Is the number of records in the READ or WRITE operation.

ST0 Returned status byte. See "STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424" on page 63

ST1 Returned status byte. See "STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424" on page 63

ST2 Returned status byte. See "STATUS BYTE DEFINITION FOR MESSAGE E-2482 AND I-2424" on page 63

CYL Is the CYLINDER NUMBER on which the error occurred in Hexadecimal.

HEAD Is the SURFACE NUMBER on which the error occurred.

REC Is the RECORD NUMBER on which the error occurred in Hexadecimal.

RL Is the RECLEN indicator of record size.
(00=128, 01=256, 02=512, and 03=1024 byte records)

CNT Is the remaining value of the retry counter. The counter is initialized to eleven (0B) for a read and four for a write and decreased after each error. If the retry counter reaches one, the error is a hard error. A value of 09 indicates three errors before a correct result.

20.0 PID 0125 (EC/PTF SUPPORT UTILITY)

20.1 PURPOSE

This program is used to display the engineering change level of the SYSTEM ROS, the engineering change level of the CE DISKETTE and DISKETTE DATA. It is also used to update programs on the CE DISKETTE and for installing PTF's to the DIAGNOSTIC FLT's.

20.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)

20.2.1 LOADING PID 0125 - EC/PTF UTILITY -

With the PRIMARY DCP MENU displayed, enter an '18' and an ENTER to display the UTILITY MENU. Next, enter a '23' and an ENTER.

PID 0125 will load and display START MESSAGE I-2300 followed by ROUTINE 1 INFORMATION MESSAGE I-2310. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 67 for any messages. After ROUTINE 1 executes without error, the OPTIONS MENU will be displayed.

20.2.2 MENU DISPLAY

```

I-2301  OPTIONS:      - DISKETTE DRIVE SELECTED = #
          X-1- SELECT DISKETTE DRIVE
          X-2- ROS EC NUMBER DISPLAY
          X-3- FLT EC NUMBER DISPLAY
          X-4- FLT PROGRAM UPDATE
          X-5- RECORD UPDATE
          X-9- RETURN TO DCP
A-2302  ENTER OPTION

?_

```

20.2.3 MENU OPTION SELECTION

Enter the selected option number using the numeric keys on the right end of the keyboard followed by the ENTER key.

The 'X' by the option number indicates an optional routine not part of automatic sequence.

OPTION 1 Will display MESSAGE A-2309 requesting the drive number of the diskette drive to be selected for the next test. An entry of 1, 2, 3 or 4 is needed to change the selected drive. The drive is then tested for a ready condition and the VOL1 checked for the diskette type and format. If DRIVE 3 or 4 is selected, it will be secured and then released for the VOL1 header read.

OPTION 2 Will display the EC NUMBER of each ROS MODULE in the system.

OPTION 3 Will display the EC NUMBER, PART NUMBER and REA NUMBER of the FLT's on the CE DISKETTE.

OPTION 4 Will permit updating of the selected FLT on the CE DISKETTE in HEXADECIMAL.

OPTION 5 Will permit updating of any record on the CE DISKETTE in HEXADECIMAL.

OPTION 9 Will end PID 0125 and return to DCP.

20.2.4 PROGRAM RUN INSTRUCTIONS

Normal program operation is to select **OPTION '1'** to select the diskette drive if a diskette operation is needed. Next, the needed option is selected.

The status line, above the keyboard input line, will display the last drive number selected (DR #). If errors occur, a decimal count of the number of errors will be displayed to the left of the drive indicator. These indicators may be moved up the screen before a keyboard input request. During diskette read and write operations the CYLINDER, HEAD and RECORD selected is displayed at the center of the status line (CCHRR=#####).

20.2.4.1 END COMMAND

Use the **ATTN** and **'9'** entry to end routine and return to the menu.

With the menu displayed, enter **OPTION '9'** and **ENTER** to return to DCP. An **ENTER** is needed after the ending message.

20.2.4.2 LOOP COMMAND NOT USED.

20.2.5 CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT

If an error is sensed, an **ERROR MESSAGE(S)** (E-23XX) and optional **INFORMATION MESSAGES** (I-23XX) will be displayed followed by an **ENTRY STOP MESSAGE** (A-23XX ERROR OCCURRED).

See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for control program stops (other than ?-23xx).

See "TRAP DATA" on page 13 for TRAP stops.

20.3 ERROR, ACTION AND INFORMATION MESSAGES**MSG
ID ERROR MESSAGE AND STATUS MESSAGE MEANINGS**

- I-2300 PID 0125 START -EC / PTF UTILITY-**
The utility has been loaded and has displayed its start message.
- I-2301 OPTIONS: - DISKETTE DRIVE SELECTED = #**
X-1- SELECT DISKETTE DRIVE
X-2- ROS EC NUMBER DISPLAY
X-3- FLT EC NUMBER DISPLAY
X-4- FLT PROGRAM UPDATE
X-5- RECORD UPDATE
X-9- RETURN TO DCP
- A-2302 ENTER OPTION**
The OPTIONS MENU is displayed and a digit (0 TO 9) option entry followed by ENTER is needed.
- I-2303 START AUTOMATIC SEQUENCE**
- I-2304 'ATTN-X' ACKNOWLEDGE**
Acknowledgment of an ATTN request and the end of the routine.
- A-2305 ERROR OCCURRED IN ROUTINE # 'ENTER' TO CONTINUE '9' TO END**
An error has occurred and an ENTER is needed to continue testing. Any other entry returns to OPTIONS MENU.
- E-2308 'X' IS NOT A VALID OPTION**
The first character entered was not an expected option. Enter a valid option.
- A-2309 THE PRESENT DISKETTE DRIVE SELECTED IS '#'**
ENTER NEW DRIVE NUMBER (1,2,3 OR 4)
The selected drive number is displayed. A new drive number between 1 and 4 must be entered to change drives.
- I-2310 RTN-1 USE OPTION '1' TO SELECT DRIVE WITH CE DISKETTE.**
- E-2311 READ/WRITE STORAGE DATA FAILURE FRU= BASE STORAGE CARD**
A R/W PARITY CHECK sensed in the first 32K of storage.
- E-2312 I/O CHANNEL TRAP SEE MAP 1225**
The I/O CHANNEL error line was activated by an attachment card.
- E-2313 READ/WRITE STORAGE DATA FAILURE FRU= BASE STORAGE CARD**
Data read from storage location was not as expected.
- E-2314 WRITE TO ROS SPACE TRAP SEE MAP 1205 AND MAP 1210**
A WRITE TO ROS address space error has been sensed. Either the program is destroyed and must be loaded again or the hardware failed.

E-2316 LOGIC FAILED FRU= CPU PLANAR BOARD

A failure was sensed in the storage control logic on the CPU Planar Board. The CPU Planar Board should be exchanged.

E-2318 POWER CHECK SEE MAP 1225

The POWER GOOD LINE from the Power Supply went off.

I-2320 RTN-2 ROS ENGINEERING CHANGE AND PART NUMBER DISPLAY

I-2321 PAGE ADDR EC # PART # PAGE ADDR EC # PART #

I-2322 # ## #####

For the ROS MODULES found, the PAGE number (0 TO F), the starting ADDRESS, the ENGINEERING CHANGE NUMBER (EC) and the MODULE PART NUMBER are displayed.

A-2323 END ROS EC AND PART NUMBER DISPLAY - 'ENTER' TO CONTINUE

All of the ROS STORAGE INFORMATION has been displayed and an ENTER will return to the OPTIONS MENU.

E-2325 ROS PAGE REGISTER ERROR SEE MAP 1210

I-2330 RTN-3 FLT EC NUMBER DISPLAY ROUTINE STARTED

I-2331 DRIVE= # 'HDR1' RECORD - 'FLT' HEADER SEQUENCE= ##
AT CCHRR= ##### NAME - NAME= PID ##### AT CCHRR= #####
LOAD ADDR= ##### PID ##### - START ADDR= ##### DATE= MM/DD/YY
END ADDR= ##### P/N= ##### EC= ##### REA= #####

The data from the HDR1 header is displayed on the left and the data from the FLT HEADER is displayed on the right. The two name entries should be the same. The SEQUENCE NUMBER is the sequence of the program in the DISKETTE VTOC.

A-2332 'ENTER' FOR NEXT ENTRIES (OR SEQUENCE / PID NUMBER)

One or more I-2331 messages are displayed and an ENTER is needed to display the next three in sequence. If a one or two digit sequence number is entered then the I-2331 message for that VTOC sequence entry will be displayed. If a four digit PID number is entered, then the I-2331 message for that PID will be displayed.

A-2333 'ENTER' TO END (OR SEQUENCE / PID NUMBER)

One or more I-2331 messages are displayed and an ENTER is needed to return to the PTF UTILITY MENU. If a one or two digit sequence number is entered, then the I-2331 message for that VTOC sequence entry will be displayed. If a four digit PID NUMBER is entered, then the I-2331 message for that PID will be displayed.

E-2334 ENTRY REQUEST NOT VALID

The digits entered are not valid for a SEQUENCE NUMBER (1-50) or a PID NUMBER (0001-9999) on the CE DISKETTE.

I-2335 CE DISKETTE PN= ##### EC= ##### ID LABEL= ##### ON DRIVE= #

Data from the VOL1 header on the CE DISKETTE in the selected drive.

I-2336 AT REA= ##### REA= ##### REA= ##### REA= #####

The REA LEVELS indicated in the VOL1 header for the diskette.

I-2340 RTN-4 FLT PROGRAM UPDATE ROUTINE STARTED

A-2341 ENTER NUMBER OF PID TO BE CHANGED ON DRIVE # (OR '9' FOR MENU)
XXXX

The drive number selected is displayed and the four digit PID NUMBER of the program to be changed is needed. A '9' and ENTER will return to the utility OPTIONS MENU.

I-2342 PID ##### AT CCHRR= ##### ON DRIVE # LOAD ADDRESS = #####
EC NUMBER = ##### START ADDRESS = #####
REA NUMBER = ##### END ADDRESS = #####

Data from the HDR1 record and the program header of the PID to be changed. Displayed is the CCHRR of the FLT record on the diskette in the SELECTED DRIVE, the ENGINEERING CHANGE NUMBER, the PID REA NUMBER, the PROGRAM LOAD ADDRESS, the PROGRAM EXECUTE ADDRESS and the last address of the program that can be changed on the diskette.

A-2343 ENTER ADDRESS AND DATA TO CHANGE OR 'ENTER' FOR PID OPTION.
AAAA DD <

The data input for the change is needed. AAAA is the address or the offset in the FLT of the first byte of data to be changed. Next, each sequential byte of data ('0' to 'FF') to be changed, separated by spaces, is entered. Up to 63 characters can be entered in one line followed by an ENTER. A '..<' on the status line is used to mark the last entry position. The input data will be checked and displayed.

I-2344 RRRR/ 0 1 2 3 4 5 6 7 8 9 A B C D E F
ADDR=##### XX
CHANGE TO: DD DD

Displayed is the data to be changed. RRRR is the offset from the load address of the PID for the data to be changed. '#####' is the address in the PID of the source data displayed. 'XX' is the source data on the diskette at the address displayed. 'DD' is to change to data input from the A-2343 message, that will be written to the diskette if a verify response is given to MESSAGE A-2345.

Verify that the 'RRRR' and the '#####' is correct and that the 'XX' data is the correct source. Next, verify that the 'DD' data displayed is the correct change to data. If not correct, use just ENTER in response to the following A-2345 message and the data will not be written to the diskette and the A-2343 request message will be displayed.

A-2345 'V' AND 'ENTER' TO WRITE CHANGED DATA

A positive response is needed before the changed data will be written to the diskette. Any other response will bypass the write operation and display MESSAGE A-2343 for new change data. A 'V' and ENTER will write the changed record to the diskette and display MESSAGE I-2359.

A-2346 'ENTER' (OR NEW REA NUMBER - OLD REA= #####)
XXXXXXXX

One or more records in a PID have been changed. The REA NUMBER now in the PID HEADER is displayed. Enter a new eight digit REA NUMBER if the old number is to be changed. Use just ENTER for no change to the REA NUMBER.

E-2347 INPUT ADDRESS NOT VALID?

The change address or offset entered was not a valid address value inside the address range of this PID. MESSAGE I-2342 will be displayed with the valid address range followed by MESSAGE A-2343 for the correct change data.

E-2348 INPUT DATA NOT VALID?

The input data was not valid. Either the format was not correct or characters entered were not hexadecimal or the input data was too long.

E-2349 ADDRESS OF LAST DATA BYTE LARGER THAN END ADDRESS OF PID

The START INPUT ADDRESS and DATA was valid but the change address of one or more of the data bytes extended past the end of PID as stored on the diskette. Enter the correct address and data.

I-2350 RTN-5 RECORD UPDATE ROUTINE STARTED**A-2351 ENTER RECORD TO BE UPDATED ON DISKETTE DRIVE #.**

```

      _____CYLINDER NUMBER (00-76)
      |_____HEAD NUMBER (0-1)
      |_____RECORD NUMBER (01-26)
CCHRR (OR '9' TO RETURN TO MENU) (ATTN-E TO END LOOP)

```

The record to be read is needed in the format CCHRR.

RR = 01 TO 26 IF 'CC = 00'

OR

RR = 01 TO 08 IF 'CC OTHER THAN 00'

If the entry values are not valid, an error message will be displayed.

The record will be displayed if the entry is valid.

I-2352 CONTROL (DELETED DATA ADDRESS MARK) RECORD

The record to be updated was found to be a control record (DELETED DATA ADDRESS MARK). If the record is changed, it will be written as a control record only if it is on CYLINDER 0, HEAD 0.

A-2354 ENTER 'AAA DD DD DD DD DD ...' OR 'V' TO WRITE DATA OR '9' TO END

The source of the data is displayed showing the DRIVE, the CYLINDER, the HEAD, and the RECORD NUMBER ('CCHRR'). This is followed by the data from the record in hexadecimal. Each line starts with the offset into the record of the first byte of the line and is followed by 32 bytes of data from the record.

The data input is needed. First the offset into the record of the first byte of data to be changed ('0' to '1FF') and then one or more spaces. Next, each sequential byte of data ('0' to 'FF') to be changed, separated by spaces, is entered. Up to 63 characters of data can be entered in one line followed by an ENTER. The input data will be checked and the display updated. If the input data extends past the end of the record, the extra data will not be used.

If the first digit entered is a '9', then the routine willabend and return to the OPTIONS MENU.

If a 'V' is entered, then the record as changed will be written on the diskette.

I-2359 *** RECORD UPDATED *******

The changed record has been written on the diskette.

- E-2370** RC -80- DRIVE NOT READY - DRIVE= '#'
The diskette drive was not ready or went not ready and the operation failed or was not attempted. Ready the selected drive and use ENTER to continue the routine or end the routine and select different drive.
- E-2371** RC -40- SHARED DRIVE NOT SECURED
An attempt was made to secure a shared drive (DRIVE 3 or 4) and a time out occurred before the sharing system released the drive.
- E-2375** ISR-10- OPERATION NOT COMPLETE TIME OUT
- E-2376** ISR-0X- DRIVE ATTENTION
- E-2377** ST1-20- CRC ERROR
A hard CRC ERROR in the address or data field of a record.
- E-2378** ST1-10- DATA OVERRUN
A DATA OVERRUN occurred in the diskette controller after a data read or write request was made. The request was not responded to before a byte of data needed was lost. Suspect a hardware failure.
- E-2379** ST1-04- RECORD NOT FOUND
The RECORD (RR) requested by a diskette read or write operation was not found by the diskette controller on the cylinder. The record ID is missing or the record requested is not valid for this cylinder format. Check the diskette type and format for correct CE format.
- E-237A** ST1-01- ADDRESS MARK NOT FOUND
Either no ID ADDRESS MARK or no DATA ADDRESS MARK was found on the cylinder at this head position in response to a read or write command. If error MESSAGE E-237F does not follow this message, then the error is an ID ADDRESS MARK NOT FOUND. The cylinder data has been destroyed or the cylinder was not formatted in the correct mode. If most records on a diskette have this error, then the VOL1 record may have been changed.
- E-237B** ST2-40- CONTROL RECORD (DELETED DATA ADDRESS MARK)
A CONTROL RECORD (DELETED DATA ADDRESS MARK) was sensed after cylinder zero and is not valid on a CE DISKETTE.
- E-237C** ST2-20- DATA FIELD CRC ERROR
During read or verify of a record, the CRC check bytes from the diskette did not match the check bytes calculated by the diskette controller. The ID ADDRESS MARK was OK, but the error occurred in the data field. The data is lost.
- E-237D** ST2-10- CYLINDER ADDRESS TO ID COMPARE ERROR
During a READ, WRITE or VERIFY operation, the cylinder ID read from the diskette did not match the ID in the cylinder counter of the controller. Either the controller is out of step with the diskette drive (heads on wrong track) or the ID ADDRESS MARK written on the diskette is wrong.
- E-237E** ST2-02- BAD CYLINDER
An error flag read from the diskette indicates that this cylinder was written and marked as a bad cylinder. The bad cylinder flag is not valid on a CE DISKETTE and is not supported by CE programs. Use a valid CE FORMAT DISKETTE for the test or bypass the error.

E-237F ST2-01- MISSING DATA ADDRESS MARK

For a READ, WRITE or VERIFY operation, the ID ADDRESS MARK for a record was correctly read from the diskette, but the DATA ADDRESS MARK was not found. Data in the data field is lost and the diskette must be formatted to be usable.

A-2380 ERROR OCCURRED 'ENTER' TO RETRY '3' TO BYPASS '9' TO END

A hard error was sensed and a response is needed to continue testing. The error message(s) are displayed on the screen before this message. To attempt the last operation again and continue with the routine, use just ENTER.

A '3' and ENTER is used to bypass a hard diskette error and testing will continue with the next record, skipping the record in error.

Any other entry will end the routine.

E-2381 SOFT READ ERROR ON DRIVE= # AT CC= ## H= # RR= ##

A READ ERROR was sensed at the displayed cylinder and head. The operation was repeated with no error (TEN ATTEMPTS). If RR= ??, then the error occurred during a cylinder read operation and the program will attempt to find the record in error.

E-2382 ERROR: DR= # AT CCHRR= ##### OP= X RC= XX STATUS= XX,XX,XX,XX

A hard error has been sensed after ten attempts. The CYLINDER (CC), HEAD (H) and RECORD (RR) being read is displayed along with the request COMMAND TYPE (OP). The status byte returned from DCP is displayed (RC) along with the four diskette controller status bytes ISR,ST0,ST1 and ST2. See "STATUS BYTE DEFINITION FOR MESSAGE E-2382" on page 76 and "COMMAND TYPE REQUESTS" on page 76 for status byte definition, if the error messages following do not describe the error(s).

E-2383 SELECTED DRIVE NUMBER '#' WAS NOT READY / ATTACHED

The selected diskette drive was not connected or was not ready. Select the correct diskette drive or make the drive ready. Verify that the diskette is the correct type for the drive model and that it is inserted correctly. A TYPE 2 DISKETTE cannot be used in a single head drive.

E-2384 SHARED DRIVE '#' NOT SECURED

The status byte returned by DCP indicates that the diskette controller could not secure and hold a shared drive (3 or 4) in the number of attempts permitted by DCP. Ensure that the system sharing drive 3 and 4 is not hung and that the drive is ready. Use the diskette diagnostics to find and correct the problem or use a different drive.

E-2385 NOT A VALID CE DISKETTE

The diskette on the selected drive does not have the correct recording MODE, SIDES, RECLEN and/or SYSTEM IDENTIFICATION (in the VOL1 header) to be read as a CE FORMATTED DISKETTE. Other errors may occur.

E-2386 READ DATA NOT MOVED TO STORAGE ?

The first 128 bytes of the data field did not change. Before a read operation, the read field is initialized to a fixed test pattern. After the read, the field is checked to verify that the pattern changed. If the pattern did not change, then a data transmission to storage may have failed or went to the wrong address if no other diskette attachment error occurred.

E-2387 COMMAND TO DCP IOCS WAS NOT VALID ?

The control block passed by the utility program was found by DCP to be not valid and was not executed. The program should be ended and then loaded and attempted again. If the error continues, then check any input data and ensure that it is correct.

E-2388 'VOL1' HEADER NOT VALID (RECORD SEVEN)

Record seven of cylinder zero did not have a valid VOL1 header in either EBCDIC or ASCII format.

I-2389 DRIVE= # INDEX= # SIDES= # MODE= XXX FORMAT= XXXXXX RECLEN= ##

Information from the diskette VOL1 header on the selected drive where:

INDEX = TYPE '1' OR '2' DISKETTE INDICATED BY THE INDEX PULSE
SIDES = THE NUMBER OF SIDES FORMATTED (1 OR 2)
MODE = 'FM' OR 'MFM'
FORMAT = EITHER 'EBCDIC' OR 'ASCII' FORMAT
RECLEN = THE RECORD LENGTH INDICATOR OF RECORD SIZE
(00=128, 01=256, 02=512 AND 03=1024 BYTE RECORDS).

Note: IF SIDES= 2, INDEX= 2 AND MODE= MFM, then a '2D' diskette is indicated.

E-238A DRIVE POWER CHECK (24V)

The diskette power good line was off for drive 1 and 2. Check 24 volts.

E-238B LABEL TYPE 'X' DISKETTE NOT VALID

The label type indicated is not supported.
Only TYPE 'W' diskettes are supported by diagnostic programs.

I-238D BAD CYLINDER FLAG FOR 'CC'= ## ##

The diskette selected was formatted with the physical cylinder(s) indicated marked as bad. Alternate cylinders are assigned sequentially.

E-238E 'ERMAP' RECORD NOT VALID (RECORD FIVE)

An entry in the error map record is not valid or not supported by diagnostic programs.

E-238F ALTERNATE PHYSICAL RECORD NOT VALID

The ALTERNATE PHYSICAL RECORD method for assigning records to replace bad records is not supported by diagnostic programs.

I-2390 PID 0125 END -EC / PTF UTILITY-**A-2391** PID 0125 TERMINATED, PRESS 'ENTER'**I-2394** DATA: DRIVE= # CYLINDER= ## HEAD= # RECORD= ##**E-2395** NUMBER OF DIGITS ENTERED NOT VALID?

Only five decimal digits are valid for a 'CCHRR' entry.

Only four decimal digits are valid for a PID NUMBER entry.

E-2396 'CC' NOT VALID?

The 'CC' value of the CCHRR entry is not valid. It must be a decimal value in the range of '00' to '76'.

E-2397 'H' NOT VALID?

The 'H' value of the CCHRR entry is not valid. It must be a '0'.

E-2398 'RR' NOT VALID FOR 'CC' ENTRY?

The 'RR' value of the CCHRR entry is not valid. It must be a decimal value in the range of:

01 TO 26 FOR 'CC=00'.
01 TO 08 FOR 'CC OTHER THAN 00' ON A CE DISKETTE

E-23A1 PID ##### NOT FOUND ON DRIVE #

The PID displayed was not found on the selected drive. Select the correct diskette and drive or enter the correct PID NUMBER. Use Routine 3 to check the diskette for the PID.

E-23A2 EXTENTS FOR PID IN 'HDR1' AT CCHRR= ##### NOT VALID?

The VTOC HEADER check routine has found an error in the HDR1 data that makes the header not valid. Errors may occur if the PID is used. A valid diskette or copy of the PID should be obtained.

E-23A3 ERROR: PID HEADER RECORD AT CCHRR= ##### NOT VALID?

The PID HEADER check routine has found an error in the header record that makes the header not valid. Errors may occur if the PID is used. Use Routine 3 to check that the HDR1 PID number and the FLT header PID number are the same. A valid diskette or copy of the PID should be obtained.

20.4 DETAILED DESCRIPTION OF ROUTINES**20.4.1 ROUTINE 1**

Automatically executes after the program is loaded by DCP and does a test of the first 32K of storage to verify program integrity.

20.4.2 ROUTINE 2 - ROS EC AND PART NUMBER DISPLAY

Reads the EC NUMBER and PART NUMBER from each ROS module and displays it along with page address. This permits the CE to verify the level of the system software and feature microcode.

20.4.3 ROUTINE 3 - FLT EC NUMBER DISPLAY

Permits the CE to check the level of the FLT's on the diskette.

The information from both the VTOC HEADER RECORD and the PID HEADER will be displayed.

20.4.4 ROUTINE 4 - PID UPDATE

Is used to update a program on a CE DISKETTE.

The PID to be changed is entered. Next, the address or the offset into the program is entered, followed by the data separated by spaces. Up to 63 digits may be entered before the ENTER key. The OLD data will be displayed before the change is written to the diskette record.

This routine can be used to install release updates to the CE DISKETTE from an engineering change document.

20.4.5 ROUTINE 5 - RECORD UPDATE

Is used to update a single record on a CE FORMATTED DISKETTE. The CYLINDER, HEAD and RECORD NUMBER (CCHRR) is entered. The routine will test for a valid entry and then read and display the record. To end the update with no change, use a '9' and ENTER.

For changes:

1. Enter the location offset in hexadecimal of the first byte to be changed and a space.
2. Follow with the data separated by spaces (free format permitted). Up to 63 digits may be entered before the ENTER key. After the ENTER key, the display will be updated with the changed data marked with an underline and the next entry requested.
3. To write a changed record to the diskette, use a 'V' and ENTER.
4. Use a '9' and ENTER to abend the routine.

20.5 GENERAL INFORMATION

20.5.1 UTILITY USE

This diagnostic utility does not display a FRU LIST, except during the Routine 1 initialization. The utility is used to display ROS EC information and to maintain the CE DISKETTE under the direction of field support or an engineering change document. This PID is not usable to change CUSTOMER DISKETTES. No MAP is associated with this PID. If hardware errors are sensed, the error messages should be recorded and used as an intermittent symptom with the START MAP 1000.

20.5.2 STATUS BYTE DEFINITION FOR MESSAGE E-2382

DCP RETURN CODES

- RC - 80 DISKETTE DRIVE NOT READY
 - 40 SHARED DRIVE NOT SECURED
 - 20 CONTROL RECORD (DELETED DATA ADDRESS MARK)
 - 10 CRC ERROR
 - 04 RECORD NOT FOUND
 - 02 DRIVE ERROR
 - 01 OTHER ERROR

STATUS= ISR, ST0, ST1, ST2

- ISR - 80 READ/WRITE COMMAND END
 - 20 DRIVE WENT NOT READY
 - 10 OPERATION NOT COMPLETE TIME OUT
 - 08 DRIVE 4 ATTENTION
 - 04 DRIVE 3 ATTENTION
 - 02 DRIVE 2 ATTENTION
 - 01 DRIVE 1 ATTENTION
- ST0 - 00 NORMAL END
 - 80 NOT A VALID OPERATION
 - XX ERROR END
- ST1 - 80 LAST RECORD MOVED
 - 20 CRC ERROR IN ID OR DATA FIELD
 - 10 DATA OVERRUN
 - 04 RECORD NOT FOUND
 - 01 ADDRESS MARK NOT FOUND
- ST2 - 40 CONTROL RECORD (DELETED DATA ADDRESS MARK)
 - 20 DATA FIELD CRC ERROR
 - 10 CYLINDER ADDRESS TO ID COMPARE ERROR
 - 02 BAD CYLINDER FLAG
 - 01 MISSING DATA ADDRESS MARK

20.5.3 COMMAND TYPE REQUESTS

- OP - 1 NORMAL DRIVE SELECT
 - 2 READ DATA RECORD(S)
 - 3 WRITE DATA RECORD(S)
 - 4 READ ID
 - 5 WRITE CONTROL (DELETED DATA MARK) RECORD(S)
 - 6 SELECT DRIVE FOR FORMAT MODE
 - 7 FORMAT TRACK
 - 8 RECALIBRATE DRIVE
 - 9 RELEASE SHARED DRIVE
 - A READ DATA RECORD(S) (NOT CE FORMAT)
 - B WRITE DATA RECORD(S) (NOT CE FORMAT)
 - D WRITE CONTROL RECORD (NOT CE FORMAT)

21.0 PID 0150 (CONFIGURATION DISPLAY)

21.1 PURPOSE

The purpose of this program is to display:

1. R/W STORAGE CONFIGURATION.
2. BAUD RATE OF ATTACHED PRINTER (If there is a printer connected).
3. COUNTRY SELECT JUMPER OPTIONS.
4. TEST JUMPERS THAT ARE PRESENT.
5. ATTACHED DISKETTE INFORMATION.
6. IF 2ND PRINTER ATTACHMENT IS INSTALLED.
7. BAUD RATE OF PRINTER ATTACHED TO 2ND PRINTER ATTACHMENT.
8. IF COMMUNICATIONS ATTACHMENT IS INSTALLED.

21.2 OPERATING PROCEDURES (DCP CONTROLLED SECTION)

21.2.1 LOADING

Select the DCP UTILITY MENU and then select PID 0150. There are no other inputs needed.

21.2.2 MENU DISPLAY - NONE

21.2.3 MENU OPTION SELECTION - NONE

21.2.4 PROGRAM RUN INSTRUCTIONS

21.2.4.1 END COMMAND

After the configuration is displayed, an ENTER key entry will return control to DCP.

21.2.4.2 LOOP PROGRAM COMMAND - NONE

21.2.4.3 LOOP ROUTINE COMMAND - NONE

21.3 ERROR, ACTION AND INFORMATION MESSAGES - NONE

21.4 DETAILED DESCRIPTION OF TESTS - NONE

22.0 PID 1200 (PROCESSOR POWER-ON TEST)

22.1 PURPOSE

22.1.1 POWER ON RESET ERROR INDICATOR

The purpose of this program is to test and verify the correct operation of the BASE CPU SYSTEM. The program is stored in ROS and is run at each POWER-ON TIME or when program flow branches to location 0000. Run time is 25 to 35 seconds (as determined by the system configuration).

22.1.2 ERROR REPORTING

Errors are identified by two different methods during POWER-ON RESET TESTING. During the first section of the test (before the CRT is started, Routines 01-06) an error will cause the machine to stop and an error code will be contained in a set of hardware latches. These latches may be probed by the customer engineer to determine the error code. (See SM 1230 for location of the latch probe pins and MAP 1100 for probe set up).

After the CRT is started, the contents of the error code latches are displayed on the screen. Attribute characters are used to report the ending status of each test. Definitions of ending attributes are:

NORMAL DISPLAY -- Test routine ran without error.

FLASHING REVERSE VIDEO DISPLAY -- An error was found during a test of a system part that is critical to system operation. System stops after ending the POWER-ON SEQUENCE.

REVERSE VIDEO DISPLAY -- An error was found during the test of a system part that is not critical to system operation. Depression of the ERROR RESET key permits system initialization to continue.

UNDERLINE DISPLAY -- The feature that this specific test checks is not present on this system.

TRAP ERROR -- If a TRAP occurs during POD testing, the failure occurred in the routine following the last routine displayed.

22.2 OPERATING PROCEDURES

22.2.1 LOADING

POWER-ON DIAGNOSTICS are started by:

1. POWERING ON THE PROCESSING UNIT.
2. TERMINATING THE ROS RESIDENT DISKETTE TEST BY PRESSING THE '9' KEY COMMAND.
3. TERMINATING DCP.

22.2.2 MENU DISPLAY -- NONE

22.2.3 MENU OPTION SELECTION

NONE (See "PROGRAM OPTIONS" for run options).

22.2.4 PROGRAM OPTIONS

There are two options that may be selected by the customer engineer by the installation of jumpers on the CPU board. See SM 1230 for location of jumpers.

22.2.4.1 LOOP PROGRAM OPTION

The program will loop until the jumper is removed.

Note: If external diskettes are attached to the system, disconnect the external diskette attachment cable before looping the POWER-ON-TEST.

22.2.4.2 STOP ON ERROR OPTION

Without this option, the test sequence will not terminate until all test routines have been run. With this option jumper installed, the system will enter a stop condition after the failure indicator has been displayed on the CRT. It is recommended that this jumper be installed if the loop jumper is installed and the system is left unattended.

22.3 INDEX OF ROUTINES

TEST DESCRIPTION TABLE		
ROUT TEST	AREA TESTED	CRITICAL=C NOT CRITICAL=N
01	CPU AND DATA BUS	C
02	ROS	C
03	RESERVED	C
04	R/W STORAGE	C
05-07	CRT CONTROLLER	C
08	PAGE REGISTERS	C
09-17	ROS INSTALLED ON PLANAR BOARD	C
18-29	FEATURE ROS INSTALLED ON I/O CARDS	C
2A-30	R/W STORAGE	C
31	R/W STORAGE PAGE REGISTER	C
32	DMA PAGE REGISTER	C
33	INTERRUPT CONTROLLER	C
34	INTERVAL TIMER	C
35	KEYBOARD	C
36	PRINTER ATTACHMENT	N
37	DIAGNOSE COMMAND TO PRINTER	N
38	DISKETTE ATTACHMENT	N
39	+24 VOLTS TO DISKETTE (INTERNAL)	N
3A	SECOND PRINTER ATTACHMENT (FEATURE)	N
3B	DIAGNOSE CMD TO SECOND PRINTER (FEATURE)	N
FD	SYSTEM DISKETTE INSTALLATION	N/A

22.4 DETAILED DESCRIPTION OF ROUTINES

22.4.1 POWER-ON ROUTINES

22.4.1.1 ROUTINE 01

1. ADDRESS and DATA BUS CHECK
2. CPU FLAGS and REGISTERS are tested

22.4.1.2 ROUTINE 02

CRC CHECK of first ROS MODULE.

This is the module containing this test.

22.4.1.3 ROUTINE 03

Reserved.

22.4.1.4 ROUTINE 04

Test of the first 16K of standard R/W STORAGE.

22.4.1.5 ROUTINE 05

INITIALIZATION AND SYNCHRONIZATION TEST of CRT CONTROLLER

22.4.1.6 ROUTINE 06

Test of CRT interface lines (HORIZONTAL, VERTICAL and VIDEO).

Note: OFF CARD DRIVE CIRCUITS ARE 'NOT' CHECKED BY THIS TEST. They may be verified by probing the CRT connector with a General Logic Probe.

22.4.1.7 ROUTINE 07

Same as ROUTINE 06.

22.4.1.8 ROUTINE 08

Basic test of ROS, R/W STORAGE and DMA PAGE REGISTERS.

22.4.1.9 ROUTINE 09 THROUGH 17

CRC TEST of ROS on Planar Board

22.4.1.10 ROUTINE 18 THROUGH 29

CRC TEST of ROS on I/O FEATURE CARDS

22.4.1.11 ROUTINE 2A-30

Test of 16K blocks of R/W STORAGE (up to 128K).

If a TRAP message is displayed at the bottom of the screen during these tests, the test 'FOLLOWING' the last displayed test number is the failing test.

TEST	BASE SOCKET	FEATURE SOCKET
2A	X	
2B		X
2C		X
2D	X	
2E	X	
2F		X
30		X

22.4.1.12 ROUTINE 31

Test to verify that the R/W STORAGE PAGE REGISTERS will access the correct section of R/W STORAGE.

22.4.1.13 ROUTINE 32

TEST DMA PAGE REGISTERS.

22.4.1.14 ROUTINE 33

Test of INTERRUPT CONTROLLER. If a HOT interrupt is found, the POWER ON DIAGNOSTICS will stop and the level of interrupt causing the failure will be displayed on the fourth line of the display

LEVEL	
0	KEYBOARD
1	PRINTER RECEIVE
2	PRINTER TRANSMIT
3	N/A
4	DISKETTE
5	N/A
6	TP RECEIVE OR PRINTER 2 RECEIVE
7	TP TRANSMIT OR PRINTER 2 TRANSMIT

22.4.1.15 ROUTINE 34

Interval timer is tested for correct operation.

22.4.1.16 ROUTINE 35: KEYBOARD RESET TEST

A reset is issued to the keyboard. The keyboard processor then executes a diagnostic routine and reports back with an 'X'2A55 data pattern.

1. If the diagnostic routine fails, an 'X'552A is returned.
2. If 'X'2A55 is not returned, the 2 characters that are returned are printed on the fourth line of the display.
3. If the keyboard has an active key, the scan code of the key is shown on the fourth line of the display.

22.4.1.17 ROUTINE 36: ELECTRONIC WRAP OF PRINTER ATTACHMENT

The attachment of a printer is sensed. If there is a cable attached, an electronic wrap of the printer attachment is performed. If no cable is sensed, this test and the next one (PRINTER DIAGNOSE COMMAND) are bypassed.

22.4.1.18 ROUTINE 37: PRINTER DIAGNOSE.

A DIAGNOSE COMMAND is issued to the attached printer and the response is analyzed for correct status.

Note: This test and ROUTINE 36 are NOT CRITICAL and system initialization may continue after the ERROR RESET key is pressed.

22.4.1.19 ROUTINE 38

Diskette attachment is tested for correct communications with the CPU. It is NOT necessary to have a diskette installed in the drives for this test to run correctly.

22.4.1.20 ROUTINE 39

+24 VOLTS to the diskette drives is tested.

22.4.1.21 ROUTINE FD

'FD' is displayed on the CRT at the end of the POWER ON TEST routines to indicate that system diskette initialization is in process.

If the POWER ON TEST hangs with 'FD' shown as the last routine indicator and no errors (REVERSE VIDEO) are shown, it means that the diskette initialization could not be completed. This is usually caused by failure to access an external diskette.

This may be caused by:

1. HARDWARE FAILURE.
2. EXTERNAL DISKETTE IS BEING USED IN SHARED MODE BY ANOTHER PROCESSOR.

22.4.2 FEATURE ROUTINES

22.4.2.1 ROUTINE 3A

Electronic wrap of second printer attachment feature. If no printer cable is attached, this Routine and Routine 3B are skipped.

22.4.2.2 ROUTINE 3B

A diagnose command is issued to the printer attached to the second printer attachment feature, and the response is analyzed for correct status.

23.0 PID 1205 (CPU PROCESSOR FLT)

23.1 PURPOSE

This program tests the system processor and instruction set for correct operation.

23.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)

23.2.1 LOADING PID 1205 - CPU INSTRUCTION SET TEST -

With the PRIMARY DCP MENU displayed, enter a '3' and an ENTER.

PID 1205 will load and display START MESSAGE I-300 followed by Routine 1, start message I-310. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 88 for any error messages. After Routine 1 executes without error, the OPTIONS MENU will be displayed.

23.2.2 MENU DISPLAY

```

I-301      OPTIONS:      LOOP MODE OFF
          X-0- SET / RESET LOOP MODE
          X-1- RUN AUTOMATIC ROUTINES
             -2- INSTRUCTION SET TEST
             -3- PROCESSOR TEST
          X-8- TRAP INTERRUPT TEST
          X-9- RETURN TO DCP
A-302      ENTER OPTION

?_

```

23.2.3 MENU OPTION SELECTION

Enter the selected option number, using the numeric keys on the right end of the keyboard, followed by the ENTER key.

The 'X' by the option number indicates an optional routine not part of automatic sequence.

- OPTION 0 Will set or reset routine/program loop mode and display the menu with the loop mode indicated as on or off.
- OPTION 1 Will execute all the automatic routines and loop the program if loop mode is set.
- OPTION 2 Will execute the CPU instruction set test and loop the routine if loop mode is set.
- OPTION 3 Will test error checking and processor logic.
- OPTION 8 An optional test of TRAP interrupt logic and microcode.
- OPTION 9 Will end PID 1205 and return to DCP.

23.2.4 PROGRAM RUN INSTRUCTIONS

Normal program operation is to select OPTION '1' and run the automatic routines. If additional testing is needed, first select OPTION '0' to set loop mode and then select OPTION '1' to loop routines.

The status line, above the keyboard input line, will display the last drive number selected (DR #). If loop mode is set, then a decimal loop counter is displayed to the left of the drive number. A decimal pass count for the instruction set test is displayed to the left of the loop counter. These indicators may be moved up the screen before a keyboard input request.

23.2.4.1 END COMMAND

Use the ATTN and 'E' entry to end routine loops and return to the menu or continue with the next routine.

Use ATTN and '9' entry to return to the menu after normal running of selected routine(s) when loop mode is set.

With the menu displayed, enter OPTION '9' and ENTER to return to DCP. An ENTER is needed after the ending message.

23.2.4.2 LOOP COMMAND

OPTION '0' is used to set or reset routine or program loop mode. The present mode selected will be displayed as part of the menu. If a routine is selected with loop mode set, the routine will loop until an ATTN 'E', ATTN '9' command or an error. If OPTION '1' is selected when in loop mode, all of the automatic routines will be executed in sequence and then the sequence repeated until an end command is entered to stop program looping.

23.2.5 CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT

If an error is sensed, an ERROR MESSAGE(S) (E-3XX) and optional INFORMATION MESSAGES (I-3XX) will be displayed followed by an entry STOP MESSAGE (A-3XX ERROR OCCURRED).

See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for control program STOPS (other than ?-3XX).

See "TRAP DATA" on page 13 for TRAP stops.

23.3 ERROR, ACTION AND INFORMATION MESSAGES

MSG ID	ERROR MESSAGE AND STATUS MESSAGE MEANINGS
I-300	PID 1205 START -CPU FLT- The utility has been loaded and has displayed its start message.
I-301	OPTIONS: LOOP MODE OFF X-0- SET / RESET LOOP MODE X-1- RUN AUTOMATIC ROUTINES -2- INSTRUCTION SET TEST -3- PROCESSOR TEST X-8- TRAP INTERRUPT TEST X-9- RETURN TO DCP
A-302	ENTER OPTION The options menu is displayed and a digit (0 TO 9) option entry followed by ENTER is needed.
I-303	START AUTOMATIC SEQUENCE
I-304	'ATTN-X' ACKNOWLEDGE Acknowledgment of an ATTN request and the end of the routine.
A-305	ERROR OCCURRED IN ROUTINE # 'ENTER' TO CONTINUE '9' TO END An error has occurred and an ENTER is needed to continue testing.
I-306	LOOP MODE SET Routine/program loop mode has been turned on.
I-307	LOOP MODE RESET Routine/program loop mode has been turned off.
E-308	'X' IS NOT A VALID OPTION The first character entered was not an expected option. Enter a valid option.
I-310	RTN-1 INITIALIZATION STARTED
E-311	READ/WRITE STORAGE PARITY CHECK FRU= BASE STORAGE CARD A R/W PARITY CHECK was sensed in the first 32K of storage.
E-312	I/O CHANNEL TRAP SEE MAP 1225 The I/O CHANNEL ERROR line was activated by an attachment card.
E-313	READ/WRITE STORAGE DATA FAILURE FRU= BASE STORAGE CARD Data read from storage location in the first 32K was not as expected.
E-314	WRITE TO ROS SPACE TRAP FRU= CPU PLANAR BOARD A WRITE TO ROS ADDRESS SPACE error has been sensed. Either the program is destroyed and must be loaded again or the hardware failed.

- E-316** LOGIC FAILED FRU=CPU PLANAR BOARD
A failure was sensed in the storage control logic on the CPU Planar Board. The CPU Planar Board should be exchanged.
- E-318** POWER CHECK SEE MAP 1225
The power good line from the power supply went off.
- I-320** RTN-2 INSTRUCTION SET TEST STARTED
- I-321** TEST PASSED. REPEATING 255 TIMES
The first pass of the CPU instruction set test ran OK and will be repeated 255 times with the loop counter displayed.
- E-329** INSTRUCTION FAILED -ABEND- FRU= CPU PLANAR BOARD
A CPU error has been sensed by the FLT during the testing of the instruction set. The CPU is stopped after the message is displayed.
- I-330** RTN-3 PROCESSOR TEST STARTED
- E-331** PROCESSOR TEST ERROR NUMBER= ## STATUS= ?? FRU= CPU PLANAR BOARD
An error was sensed while testing the PLANAR BOARD LOGIC. Error code STATUS is the TRAP INTERRUPT CONTROL REGISTER. Error numbers are:
01 = page register error
02 = trap interrupt failed to reset
03 = trap interrupt after read and write to R/W STORAGE
04 = control of trap enable error
05 = trap error after a read from ROS STORAGE
06 = write to ROS TRAP INTERRUPT failed when expected
07 = CE error latch failed to latch correct address
- I-380** RTN-8 TRAP INTERRUPT TEST STARTED
- A-381** THIS ROUTINE WILL GENERATE A 'TRAP' ERROR TO TEST ERROR CHECKING LOGIC.
USE '1' AND 'ENTER' FOR 'TRAP' OR 'ENTER' FOR MENU OPTIONS.
- I-382** CHECK FOLLOWING 'TRAP' DISPLAY. SEE MAP 1205 IF NOT CORRECT.
POWER OFF THEN ON TO RESTART SYSTEM.

?023 0000 ???? ???? F0F0 F0F0 ???? 0123 4567 89AB C044 ???? ????

The TRAP INTERRUPT test has been started and the system trap routine should display a TRAP message that matches the reverse video status line above the trap status line. If the two lines do not match then a PROCESSOR or MICRO-CODE error has occurred. Use the trap display information in MAP 1220 to determine what is different. The trap error should be caused by either a WRITE TO ROS TRAP or a STORAGE PARITY CHECK. Suspect the CPU PLANAR BOARD if not correct.
- E-384** TRAP INTERRUPT ERROR FRU= CPU PLANAR BOARD
An error was detected by the TRAP INTERRUPT test. The TRAP INTERRUPT did not interrupt the processor and execute the trap microcode and then stop the system. The CPU PLANAR BOARD cannot respond to trap hardware errors and should be replaced if possible.
- I-390** PID 1205 END -CPU FLT-
- A-391** PID 1205 TERMINATED, PRESS 'ENTER'

23.4 DETAILED DESCRIPTION OF ROUTINES

23.4.1 ROUTINE 1

Automatically executes after the program is loaded by DCP and does a test of the first 32K of storage to verify program storage integrity.

23.4.2 ROUTINE 2 - INSTRUCTION SET TEST

Is the CPU INSTRUCTION SET TEST. After the first pass the routine is automatically repeated 255 times. If an error is sensed, the FLT attempts to display an error message before stopping the CPU.

23.4.3 ROUTINE 3 - PROCESSOR LOGIC TEST

Is a test of the TRAP ERROR CHECKING LOGIC and selected processor logic not tested by POWER ON TESTS. Errors are generated and reset under program control and tests are made for correct response. Should a TRAP error message be displayed during this routine, then the Planar Board Logic cannot control or reset error conditions.

23.4.4 ROUTINE 8 - TRAP DISPLAY CHECK

Is an optional test of the TRAP INTERRUPT LOGIC and of the TRAP DISPLAY MICROCODE. A storage parity check is generated (or failing that, a write to ROS check is used) and the expected TRAP status is displayed. Then the TRAP error is permitted to interrupt the system microcode. The status displayed should match the system trap error message. Power must be turned off to reset the TRAP error condition.

23.5 GENERAL INFORMATION

This diagnostic test attempts to display an error message indicating the failing FRU. This FLT tests the instruction set for correct function and it is assumed that the remainder of the system is OK. Unusual failures of the system during this test can also be caused by STORAGE CARDS, ELECTRICAL NOISE and HIGH TEMPERATURE. Most system failures will be sensed by the POWER ON DIAGNOSTICS and that test should be used for INTERMITTENT FAILURE ISOLATING. See the CPU MAP 1205 for additional information on problem diagnosis.

24.0 PID 1210 (CPU STORAGE FLT)**24.1 PURPOSE**

This program tests the system READ/WRITE STORAGE, ROS STORAGE and CPU BOARD HARDWARE associated with the STORAGE PAGE ADDRESS and ERROR SENSING. FRU's are displayed when hardware errors are sensed. An exerciser routine is included.

24.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)**24.2.1 LOADING PID 1210 - CPU STORAGE TEST -**

With the PRIMARY DCP MENU displayed, enter a '4' and an ENTER.

PID 1210 will load and display start message I-400 followed by ROUTINE 1 start message I-410 and R/W STORAGE size configuration message I-419. See "ERROR, ACTION AND INFORMATION MESSAGES" on page 93 for any error messages. After ROUTINE 1 executes without error, the OPTIONS MENU will be displayed.

24.2.2 MENU DISPLAY

```

I-401      OPTIONS:      LOOP MODE OFF
X-0- SET / RESET LOOP MODE
X-1- RUN AUTOMATIC ROUTINES
  -2- BASE R/W STORAGE TEST
  -3- FULL R/W STORAGE TEST
  -4- ROS CRC STORAGE TEST
  -5- CONTROL STORAGE TEST
X-8- STORAGE EXERCISER
X-9- RETURN TO DCP
A-402     ENTER OPTION

?_

```

24.2.3 MENU OPTION SELECTION

Enter the selected option number using the numeric keys on the right end of the keyboard followed by the ENTER key.

The X by the option number indicates an optional routine not part of automatic sequence.

- OPTION 0** Will set or reset ROUTINE/PROGRAM LOOP MODE and display the menu with the loop mode indicated as on or off.
- OPTION 1** Will execute all the automatic routines and then loop the program if loop mode is set. (ROUTINES 1,2,3 and 4).
- OPTION 2** Will execute the BASE STORAGE TEST (FIRST 32K) and loop the routine if loop mode is set.

- OPTION 3** Will execute the full READ/WRITE STORAGE TEST and loop the routine if loop mode is set. ATTN commands are disabled during much of this routine.
- OPTION 4** Will execute the ROS CRC TEST and loop the routine if loop mode is set.
- OPTION 5** Will execute the feature CONTROL STORAGE TEST and loop the routine if loop mode is set.
- OPTION 8** Will execute the STORAGE EXERCISER. This routine will run until an error is sensed or system power is switched off.
- OPTION 9** Will end PID 1210 and return to DCP.

24.2.4 PROGRAM RUN INSTRUCTIONS

Normal program operation is to select OPTION 1 and run the automatic routines. If storage is suspect and additional testing is needed, first select OPTION 0 to set loop mode and then select OPTION 1 to loop the automatic routines. For extended full storage testing use OPTION 8 for the STORAGE EXERCISER.

The status line, above the keyboard input line, will display the last drive number selected (DR #). If errors occur, a decimal count of the number of errors will be displayed to the left of the drive indicator. If loop mode is set, then a decimal loop counter is displayed to the left of the error counter. These indicators may be moved up the screen before a keyboard input request.

It is normal to see extra characters flash on the screen during all storage routines (display storage being tested). During ROUTINE 3, the screen image may go blank for two seconds.

24.2.4.1 END COMMAND

Use the ATTN and E entry to end routine loops and go to the menu or next routine.

Use ATTN and 9 entry to return to the menu after normal running of selected ROUTINE(s) when loop mode is set.

With the menu displayed, enter option 9 and ENTER to return to DCP. An ENTER is needed after the ending message.

24.2.4.2 LOOP COMMAND

OPTION 0 is used to set or reset routine or program loop mode. The present mode selected will be displayed as part of the menu. If a routine is selected with loop mode set, the routine will loop until an ATTN command or an error. If OPTION 1 is selected when in loop mode, then all of the automatic routines will be executed in sequence and repeated until an end command is entered to stop program looping.

24.2.5 CONTROL PROGRAM ERROR, ACTION AND INFORMATION FORMAT

If an error is sensed, an ERROR MESSAGE(s) (E-4XX) and optional INFORMATION MESSAGES (I-4XX) will be displayed followed by an entry STOP MESSAGE (A-4XX ERROR OCCURRED).

See "PID 0001 (DIAGNOSTIC CONTROL PROGRAM)" on page 25 for control program STOPS (other than ?-4XX).

See "TRAP DATA" on page 13 for TRAP stops.

24.3 ERROR, ACTION AND INFORMATION MESSAGES

MSG ID	ERROR MESSAGE AND STATUS MESSAGE MEANINGS
I-400	PID 1210 STARTED -STG FLT- The utility has been loaded and has displayed its start message.
I-401	OPTIONS: LOOP MODE OFF X-0- SET / RESET LOOP MODE X-1- RUN AUTOMATIC ROUTINES -2- BASE R/W STORAGE TEST -3- FULL R/W STORAGE TEST -4- ROS CRC STORAGE TEST -5- CONTROL STORAGE TEST X-8- STORAGE EXERCISER X-9- RETURN TO DCP
A-402	ENTER OPTION The OPTIONS MENU is displayed and a digit (0 TO 9) option entry followed by ENTER is needed.
I-403	START AUTOMATIC SEQUENCE
I-404	'ATTN-X' ACKNOWLEDGE Acknowledgment of an ATTN request and the end of the routine.
A-405	ERROR OCCURRED IN ROUTINE # 'ENTER' TO CONTINUE '9' TO END An error has occurred and an ENTER is needed to continue testing.
I-406	LOOP MODE SET ROUTINE/PROGRAM LOOP MODE has been turned on.
I-407	LOOP MODE RESET ROUTINE/PROGRAM LOOP MODE has been turned off.
E-408	'X' IS NOT A VALID OPTION The first character entered was not an expected option. Enter a valid option.
I-410	RTN-1 INITIALIZATION STARTED
E-411	READ/WRITE STORAGE PARITY CHECK FRU= BASE STORAGE CARD A R/W PARITY CHECK was sensed in the first 32K of storage.
E-412	I/O CHANNEL TRAP SEE MAP 1225 The I/O CHANNEL error line was activated by an attachment card.
E-413	READ/WRITE STORAGE DATA ERROR FRU= BASE STORAGE CARD

Data read from storage location in the first 32K was not as expected.

- E-414** WRITE TO ROS SPACE TRAP FRU= CPU PLANAR BOARD
A WRITE TO ROS ADDRESS SPACE ERROR has been sensed. Either the program is destroyed and must be loaded again or the hardware failed.
- E-416** LOGIC FAILED FRU= CPU PLANAR BOARD
A failure was sensed in the storage control logic on the CPU Planar Board. The CPU Planar Board should be exchanged.
- E-417** R/W STORAGE CONFIGURATION ERROR - STATUS= ? SEE MAP 1210
The R/W STORAGE SIZE determined from the jumpers connected by the storage cards is not valid. The storage configuration is not valid and base storage size of 32K is assumed. Go to MAP 1210.
- E-418** POWER CHECK SEE MAP 1225
The power good line from the power supply went off.
- I-419** ###K R/W STORAGE CONFIGURATION
Indicates the R/W STORAGE size determined from jumpers connected by the base storage card and the feature storage card being plugged in.
- I-420** RTN-2 BASE STORAGE TEST STARTED - PAGE= 0 ADDR= 80
- I-421** TEST PASSED. REPEATING 2 TIMES - PAGE= 0 ADDR= 80
The first pass of the base storage test for the first 32K ran OK and the routine is being repeated. This routine tests the program storage space without destroying data. Routine 3 should also be run. An OK is displayed to the right of the message if no errors are sensed.
- E-423** READ/WRITE STORAGE DATA ERROR FRU= BASE STORAGE CARD
Data read from storage location in the first 32K was not as expected.
- I-430** RTN-3 FULL STORAGE TEST STARTED - PAGE= 0 ADDR= 80
- E-431** STORAGE DATA ERROR FRU= BASE STORAGE CARD
A R/W PARITY CHECK was sensed by the trap interrupt logic or data read from a storage location was not correct. Suspect the base storage card.
- E-432** PAGE REGISTER ERROR FRU= CPU PLANAR BOARD
The diagnostic sensed a failure in the page register logic for storage. The CPU Planar is bad.
- E-433** STORAGE DATA ERROR FRU= FEATURE STORAGE CARD
Data read from a storage location in the feature storage card was not as expected during test. The feature storage card is suspect. If no R/W PARITY CHECK is sensed, the parity checking logic may be failing and the CPU Planar Board must also be exchanged. This failure can also be caused by electrical noise or bad grounding.
- E-437** READ/WRITE STORAGE DATA/PARITY ERROR AT I/O BUS PAGE= #.
A R/W PARITY CHECK or a data not as expected error was sensed at a page address on the I/O bus. Run feature tests.
- E-438** STORAGE CONTROL ERROR FRU= CPU PLANAR BOARD

An error was sensed that indicates the processor board may be causing READ/WRITE STORAGE ERRORS. The CPU Planar Board is suspect first and then the storage cards.

- I-440** RTN-4 ROS STORAGE TEST STARTED - PAGE= 0 ADDR= 00
- E-441** ROS STORAGE ERROR - PAGE= # - ADDRESS= #### - SEE MAP 1210
- ROS STORAGE DATA READ ERROR or a ROS CRC TEST FAILURE. The PAGE number is displayed. If PAGE= is '8' through 'F', then the ROS error is on a feature card plugged into the I/O bus.
- E-442** ROS PAGE ERROR WAS= # WRITTEN= # FRU=CPU PLANAR BOARD
- ROS PAGE ADDRESS hardware failed. Suspect CPU Planar Board. The PAGE written and read are displayed.
- I-443** ###K ROS STORAGE CONFIGURATION
- Indicates the ROS STORAGE SIZE found and tested during the check for valid ROS modules.
- I-450** RTN-5 FULL CONTROL STORAGE TEST
- I-451** UPDATE STORAGE JUMPER INSTALLED - PAGE= F ADDR= 40
- The MACHINE UPDATE CARD INSTALLED jumper was sensed (SM 1230) and the control storage on the card at PAGE= F will be tested. Run PID 1212 or use MAP 1212 if any error.
- I-452** WORD PROCESSING CONTROL STORAGE - PAGE= 8 ADDR= 40
- Read/Write storage was sensed at PAGE= 8 on the WORD PROCESSING FEATURE CARD and will be tested. Run PID 1450 or use MAP 1450 to test the correct operation of the word processing feature.
- E-456** CONTROL STORAGE DATA COMPARE ERROR- PAGE= ?
- Data read from a storage location in the FEATURE CONTROL STORAGE being tested was not as expected. Use the PAGE= data to determine the feature card that failed. If no I/O CHANNEL CHECK is sensed (message E-457), then the edge connector contacts may be causing the failure. This failure can also be caused by electrical noise or bad grounding. Use the feature diagnostic to test the feature card.
- E-457** CONTROL STORAGE I/O PARITY CHECK - PAGE= ?
- An I/O CHANNEL CHECK was sensed during the control storage test. A feature card being tested sensed a STORAGE PARITY CHECK and activated the I/O channel check line. Use the PAGE= data to determine the feature being tested. Use the feature diagnostic to test the feature card.
- I-458** xxxK OF FEATURE CONTROL STORAGE - PAGE= ? ADDR= 40
- The size of control storage found and tested is displayed. The control storage is tested again.
- I-459** NO FEATURE CONTROL STORAGE
- No standard features with control storage were sensed during the test. If a feature is installed, then use the PID and MAP for that feature to test the feature.
- I-480** RTN-8 STORAGE EXERCISER STARTED
- A-481** THIS EXERCISER ROUTINE RUNS UNTIL POWER OFF (OR UNTIL '9' FOR POD)

ENTER A '1' TO CONTINUE.

The storage exerciser has been selected and if a '1' is entered this routine will run until power is switched off. See Routine 8 description.

I-482 STORAGE EXERCISER PASS 0000

The storage exerciser has started. The decimal pass count will be updated and displayed at the start of each pass. Power off system to stop.

E-485 ERROR

A data error was sensed during the exerciser routine.

Run PID 1210 Routines 2 and 3.

E-486 ERROR

A page register error was sensed. Suspect Planar Board.

I-490 PID 1210 END -STG FLT-

A-491 PID 1210 TERMINATED, PRESS 'ENTER'

24.4 DETAILED DESCRIPTION OF ROUTINES

24.4.1 ROUTINE 1

Automatically executes after the program is loaded by DCP and does a test of the first 32K of storage to verify program storage integrity. It then displays the READ/WRITE storage size indicated by configuration jumpers connected by the storage cards. If the configuration is not valid and supported, error message E-417 will be displayed with a response needed.

24.4.2 ROUTINE 2 - BASE STORAGE TEST

Is the BASE STORAGE TEST for the first 32K of storage. It tests the program storage area without destroying the program. The ATTN commands are available during routine operation.

24.4.3 ROUTINE 3 - FULL STORAGE TEST

Is a full storage test of the READ/WRITE STORAGE, the ERROR SENSE CIRCUITS and the PAGE LOGIC for storage. The storage used by the program is not tested by this routine. The ATTN commands are disabled, but if the '9' key is pressed, the routine will end.

24.4.4 ROUTINE 4 - ROS STORAGE CHECK

Is the test for ROS STORAGE DATA INTEGRITY and PAGE ADDRESSING. Each ROS storage module has check bytes that are used to test for missing or extra data bits. Any single bit error and most other failures will be sensed during this test routine. The WRITE TO ROS ERROR SENSE CIRCUITS are also tested.

24.4.5 ROUTINE 5 - CONTROL STORAGE

Is the test of the write/read FEATURE CONTROL STORAGE on standard features. If the MACHINE UPDATE CARD INSTALLED jumper is present (see SM 1230), then the write/read UPDATE STORAGE (PAGE= F) is tested. If the WORD PROCESSING FEATURE CARD is installed, then the write/read control storage (PAGE= 8) is tested.

After all standard features are checked, the total feature control storage size is displayed and all feature control storage is tested again.

24.4.6 ROUTINE 8 - STORAGE EXERCISER

Is an optional routine that will test all of storage with data patterns and a moving test routine until an error is sensed or power is switched off. Status information is displayed and error messages are attempted.

Errors are indicated by:

1. Error messages E-485 or E-486.
2. No status display (I-482) or screen update.
3. TRAP error message.
4. The running of power on tests.

The ATTN commands are disabled by this routine and there is no return to DCP. Pressing the '9' key will end the routine at the end of the pass and run the power on diagnostics.

24.5 GENERAL INFORMATION

This diagnostic test attempts to display an error message indicating the failing FRU. When test results are not clear, storage cards should be swapped when possible. The card in the feature position will be more completely tested. See the STORAGE MAP 1210 for additional information on problem diagnosis. ROS failures may need the removal of feature cards to identify the failing FRU.

The TRAP DATA display format is included here to aid in failure analysis. It can be used to indicate the source of errors. If a machine check occurred either during the running of a BASIC customer program or during the running of a diagnostic program, the system will display one or two lines of TRAP DATA on the display. MAP 1220 is used to interpret this data. The data format is shown below. If the problem is an intermittent storage parity check ('10??'), the PAGE IN USE value ('A') can be used as the PAGE= value in MAP 1210 to determine the suspect card. A write to ROS address space TRAP ('40??') can result from CPU ERRORS, STORAGE ERRORS, MICROCODE LOGIC PROBLEMS or WRONG NESTING of BASIC STATEMENTS.

Data display is as follows:

```
TRAP XXXX AB00 CCCC DDEE FFGG HHII JJJJ KKKK LLLL MMMM NNPP QQQQ RRRR SSSS TTTT
UUUU VVVV WWWW YYYY ZZZZ 1111 2222 3333 4444 5555 6666 7777 8888 9999 aaaa ????
```

```
XXXX = TRAP CLASS BITS
'80XX' = POWER CHECK
'40XX' = WRITE TO ROS TRAP
'20XX' = CHANNEL TRAP
'10XX' = STORAGE PARITY CHECK
'00XX' = SYSTEM PROGRAMMING ERROR TRAP          SEE MAP 1220

A = PAGE IN USE AT THE TIME OF THE TRAP
B = HIGH ORDER ADDRESS BITS AT TIME OF TRAP
00 = ALWAYS 00
CCCC = DMA CHANNEL 0 ADDRESS (DISKETTE)
DD = INTERRUPT CONTROLLER INTERRUPT MASK
EE = PROCESSOR INTERRUPT MASK
FF = R/W STORAGE WRITE PAGE REGISTER
GG = R/W STORAGE READ PAGE REGISTER
HH = ROS PAGE REGISTER
II = DMA PAGE REGISTER
JJJJ = STACK POINTER VALUE LESS EIGHT AT TIME OF TRAP
KKKK = H/L REGISTER CONTENTS
LLLL = D/E REGISTER CONTENTS
MMMM = B/C REGISTER CONTENTS
NN = A REGISTER
PP = FLAGS
QQQQ = PROGRAM COUNTER AT TIME OF TRAP
RRRR THROUGH ??? = STACK CONTENTS (MAY NOT HAVE ANY MEANING)
```

25.0 PID 1212 (UPDATE STORAGE TEST)

25.1 PURPOSE

This program tests the 16K of memory used for IMF's.

25.2 OPERATING PROCEDURES

25.2.1 LOADING

PID 1212 is loaded by DCP by entering a -10- (FEATURE/RPQ PID). See "MENU DISPLAY" on page 26 for PRIMARY MENU.

After a -10- is entered, the menu will display ENTER DRIVE NUMBER and PID NAME (X - YYYY).

ENTER 1 1212 TO LOAD THE PROGRAM.

25.2.2 MENU DISPLAY

The following MENU will be displayed:

I-200 UPDATE STORAGE TEST OPTIONS
 -0- RUN ROUTINE 1 TIME
 -1- LOOP STORAGE TEST
 -9- RETURN TO DCP
A-221 SELECT OPTION

25.2.3 MENU OPTION SELECTION:

- OPTION 0 Selecting this option either by entering a 0 or just pressing the ENTER key will run the storage test once.
- OPTION 1 Will loop the test until either ATTN E or ATTN 9 is pressed.
- OPTION 9 Will return to DCP MENU.

25.2.4 PROGRAM RUN INSTRUCTIONS

25.2.4.1 OPERATION

A message will appear on the screen as follows:

I-209 IF SCREEN GOES BLANK
 REPLACE THE STORAGE UPDATE CARD
 REPLACE THE CPU PLANAR BOARD
 PRESS ENTER TO START TEST

25.2.4.2 OPERATION

As the program is executed, a storage test start message and routine started and routine complete messages will display as follows:

```

I-200  START STORAGE TEST
I-202  ROUTINE 0  STARTED
I-203  ROUTINE 0  COMPLETED
I-202  ROUTINE 1  STARTED
I-203  ROUTINE 1  COMPLETED
I-202  ROUTINE 2  STARTED - THIS ROUTINE RUNS FOR ABOUT 4 MINUTES
I-203  ROUTINE 2  COMPLETED
I-202  ROUTINE 3  STARTED
I-203  ROUTINE 3  COMPLETED
I-204  STORAGE TEST COMPLETE.

```

25.2.4.3 END COMMAND

1. Enter ATTN - 9 to terminate program and display PRIMARY MENU.
Enter '9' then press ENTER key to return to DCP.
2. Enter ATTN - E to end loop program or exit Routine 2 and return to PRIMARY MENU.

25.3 ERROR, ACTION AND INFORMATION MESSAGES**25.3.1 INFORMATION**

```

I-200  UPDATE MEMORY TEST OPTIONS
I-201  START STORAGE TEST
I-202  ROUTINE X  STARTED
I-203  ROUTINE X  COMPLETE

Note: Routine 2 will give the message that this routine runs for about 4
minutes.

I-204  STORAGE TEST COMPLETE
I-207  ERROR OCCURRED
I-208  STORAGE TEST TERMINATED
I-209  IF SCREEN GOES BLANK
        REPLACE THE STORAGE UPDATE CARD
        REPLACE THE CPU PLANAR BOARD

```

25.3.2 OPERATOR ACTION

```

A-221  SELECT OPTION
A-223  PRESS ENTER TO RETURN TO MENU

```

- A-226 REPLACE UPDATE STORAGE CARD
 REPLACE CPU PLANAR BOARD
- A-228 PRESS ENTER TO RETURN TO DCP MENU

25.3.3 ERROR MESSAGES

- E-251 INVALID ENTRY, RETRY
- E-252 STORAGE DATA ERROR OCCURRED
- E-253 STORAGE PARITY ERROR
- E-254 STORAGE DISABLE ERROR
- E-255 UPDATE STORAGE CARD NOT INSTALLED
- E-256 I/O CHECK ERROR

25.4 DETAILED DESCRIPTION OF ROUTINES

25.4.1 ROUTINE 0

Initializes the update storage logic and checks that it is correctly operating. It then checks to see if the I/O check (PARITY CHECK) is working. Note this test should be run after the system has been powered off and powered on.

25.4.2 ROUTINE 1

Writes a pattern of 00 FF throughout the 16K of storage. It waits 20 MILLISECONDS for several refresh cycles and reads the pattern written and writes back a reverse pattern. This routine runs alternate patterns 10 times. It also checks that the correct page register is selected.

25.4.3 ROUTINE 2

This routine takes about 4 minutes to run. It writes each pattern as determined by the address and reads it back. This pattern writes every bit and runs 256 times through the 16K.

25.4.4 ROUTINE 3

Writes several instructions throughout the 16K of storage. It then executes these instructions and checks to see if it executed 16K of instructions. This routine runs 10 times.

Note: If a TRAP or LOOP occurs or if the screen goes blank, replace the STORAGE CARD or the CPU PLANAR BOARD. Go to MAP 1212 Entry A.

26.0 PID 1300 (KEYBOARD FLT)**26.1 PURPOSE**

SECTION	ROUTINE DESCRIPTIONS
0	TEST SEPARATE KEYS
1	TEST FULL KEYBOARD

26.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)**26.2.1 LOADING**

Enter test number 1 from the DCP MAIN MENU.

26.2.2 MENU DISPLAY

Enter desired option on numeric keypad.

KEY	
0	TEST SINGLE KEY
1	TEST FULL KEYBOARD
9	RETURN TO DCP

26.2.3 SUBROUTINE MENUS**26.2.3.1 ROUTINE 0**

1. Press any key as many times as you want.
2. Press the TEST key one time to reset count.
3. Press the TEST key twice to return to MENU.

26.2.3.2 ROUTINE 1

An image of the keyboard is displayed along with instructions on how to execute the test.

DIRECTIONS DISPLAYED ON THE SCREEN MUST BE FOLLOWED EXACTLY!

26.2.4 PROGRAM RUN INSTRUCTIONS**26.2.4.1 END COMMAND**

A '9' key entry on the numeric keypad returns control to DCP.

26.2.4.2 EXIT ROUTINE PROCEDURE

1. ROUTINE 0 - may be ended by pressing the TEST key twice.
2. ROUTINE 1 - may be ended by forcing 2 ERRORS (hitting the wrong key on purpose) and then pressing the TEST key.

26.2.4.3 LOOP ROUTINE COMMAND - Not affected**26.2.5 CONTROL PROGRAM ERROR MESSAGES**

1. ROUTINE 0 - There are no error messages.
2. ROUTINE 1 - One retry is permitted after each of these error messages.

ERROR CODES	MESSAGE	ACTION REQUIRED
E-110	WRONG SCAN CODE	ENTER KEY AGAIN
E-120	NO SCAN CODE RECEIVED	ENTER KEY AGAIN
E-130	MORE THAN ONE SCAN CODE RECEIVED ON MAKE-ONLY KEYS	ENTER KEY AGAIN
E-140	CORRECT SCAN CODE RECEIVED BUT TYPAMATIC FUNCTION FAILED	DO OPERATION AGAIN

26.3 ERROR, ACTION AND INFORMATION MESSAGES

1. ROUTINE 0 (TEST SINGLE KEY) - There are no error messages in this routine.
2. ROUTINE 1 - If after one retry, failure still occurs, the following message(s) will be displayed:

ERROR CODES	MESSAGE	ACTION
E-150	AN INVALID SCAN CODE WAS RECEIVED FROM KEYBOARD	REPLACE KBD
E-160	A WRONG SCAN CODE WAS RECEIVED ON THE SECOND ATTEMPT	REPLACE KEYBOARD
E-170	NO INPUT RECEIVED ON SECOND ATTEMPT	REPLACE KBD
E-180	TWO OR MORE SCAN CODES RECEIVED FROM A KEY THAT SHOULD HAVE ONLY SENT A SINGLE INTERRUPT	REPLACE KEYBOARD
E-190	TYPAMATIC FUNCTION FAILED ON SECOND ATTEMPT	REPLACE KBD

26.4 DETAILED DESCRIPTION OF ROUTINES**26.4.1 ROUTINE 0**

This routine receives interrupts from any key (with the exception of the test key) and displays the scan code received on the CRT. See SM 1310 for scan codes.

A running count of the total number of interrupts serviced is also displayed (in HEX) to verify correct operation of the typamatic keys.

26.4.2 ROUTINE 1

This is a test of the complete keyboard to verify correct operation of each key. The program requests that a key be pressed by blinking the desired key on an image of the keyboard that is displayed on the CRT screen. The program indicates the correct action by a message on the ACTION line of the CRT (PRESS and HOLD, PRESS and RELEASE). The response for each key is inspected and the results are displayed on a STATUS LINE showing KEY TYPE (MAKE ONLY, MAKE BREAK or typamatic SHOULD BE scan codes and RECEIVED scan codes.

Error messages (See "CONTROL PROGRAM ERROR MESSAGES" on page 103 and "ERROR, ACTION AND INFORMATION MESSAGES") are displayed if necessary.

27.0 PID 1400 (SCREEN IMAGE TEST PATTERNS)**27.1 PURPOSE**

This program displays patterns and character sets to test CRT alignment and verify the correct display of all character sets and visual attributes. See SM 1450 for examples of the display patterns. If the pattern is not as expected, go to MAP 1400.

OPTION	ROUTINE DESCRIPTIONS
0	DISPLAY CRT ALIGNMENT PATTERN 80 X 24
1	DISPLAY CHARACTER SET 1 (UNITED STATES/ENGLISH)
2	DISPLAY CHARACTER SET 2 (CANADIAN FRENCH)
3	DISPLAY GBGI CHARACTER SET 3 (AUSTRIA, GERMANY, BELGIUM, DENMARK, FINLAND, FRANCE, ITALY, NETHERLANDS, NORWAY, SWEDEN, SWITZERLAND, U.K., AUSTRALIA, INTERNATIONAL)
4	DISPLAY CHARACTER SET 4 (NORDIC)
5	DISPLAY CHARACTER SET 5 (SPANISH)
6	DISPLAY CHARACTER SET 6 (RESERVED)
7	DISPLAY CHARACTER SET 7 (JAPAN-KATAKANA)
8	DISPLAY ATTRIBUTE TEST

27.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)**27.2.1 LOADING**

With the MAIN DCP MENU displayed, enter a '7' followed by ENTER. Follow directions given on screen.

27.2.2 MENU DISPLAY

ENTER OPTION NUMBER

0. ALIGNMENT PATTERN 80 X 24
1. DISPLAY CHARACTER SET 1 (UNITED STATES/ENGLISH)
2. DISPLAY CHARACTER SET 2 (CANADIAN FRENCH)
3. DISPLAY GBGI CHARACTER SET 3 (AUSTRIA, GERMANY, BELGIUM, DENMARK, FINLAND, FRANCE, ITALY, NETHERLANDS, NORWAY, SWEDEN, SWITZERLAND, U.K., AUSTRALIA, INTERNATIONAL)
4. DISPLAY CHARACTER SET 4 (NORDIC)
5. DISPLAY CHARACTER SET 5 (SPANISH)
6. DISPLAY CHARACTER SET 6 (RESERVED)
7. DISPLAY CHARACTER SET 7 (JAPAN-KATAKANA)
8. ATTRIBUTE TEST
9. TERMINATE PROGRAM

27.2.3 MENU OPTION SELECTION

See the program menu, enter the option number desired, then press ENTER to select the option.

27.2.4 PROGRAM RUN INSTRUCTIONS

27.2.4.1 END COMMAND

ATTN and '9' returns the program to its main option menu.

'9' and ENTER will terminate the program and return control to DCP.

27.2.4.2 LOOP PROGRAM COMMAND -- NONE

27.2.4.3 LOOP ROUTINE COMMAND -- NONE

27.3 ERROR, ACTION AND INFORMATION MESSAGES

There are no messages in this program except for messages to the C.E. about invalid test selection and directions on how to go from one display to another.

27.4 DETAILED DESCRIPTION OF ROUTINES (CRT PATTERN AND ATTRIBUTE TEST)

27.4.1 ROUTINE 0 ALIGNMENT PATTERN

This routine displays an alignment pattern for the purpose of performing adjustments on the CRT assembly.

27.4.2 ROUTINE 1 THROUGH 7 CHARACTER SET DISPLAYS

These routines select and display each of the character sets available. See SM 1450 for example of the output of each routine.

If the character set is not correct, see MAP 1400, ENTRY POINT A.

27.4.3 ROUTINE 8 ATTRIBUTE TEST

This test shows the ability of the CRT controller to generate visual attributes. Attribute fields shown are UNDERLINE, HIGHLIGHT, REVERSE VIDEO, FLASHING, CHARACTER GRAPHICS, and NO DISPLAY. If faulty operation of any of the attributes is found while this test is running, go to MAP 1400, ENTRY POINT A.

28.0 PID 1500 (ROS RESIDENT DISKETTE DRIVE 1-4 TEST)**28.1 PURPOSE**

This ROS RESIDENT PROGRAM will test and verify operation of the diskette attachment card control logic and the read data logic path for DISKETTE DRIVE 1 through DRIVE 4 (as selected). This program, along with MAPS 1500 through 1560, will isolate failures to the failing FRU.

ROUTINE	ROUTINE DESCRIPTIONS
00	INITIALIZE
01	MICRO CONTROLLER ATTACHMENT ROUTINE
02	ATTACHMENT WRAP DATA ROUTINE (NO DMA)
03	ATTACHMENT WRAP DATA ROUTINE (DMA)
04	VFO IN-SYNC ROUTINE
05	SELECT DISKETTE DRIVE ROUTINE
06	INDEX DURATION CHECK ROUTINE
07	SEEK READ ID 'ALL TRACKS EXCEPT TRACK 76'
08	(RESERVED)
09	READ STRESS PATTERN ROUTINE
0A	RANDOM SEEK ROUTINE
0D	LOAD DCP PROGRAM
CE	MAP CHART SUPPORT

28.2 OPERATING PROCEDURES**28.2.1 SELECTING**

This program is ROS RESIDENT and is selected as follows:

1. TURN CPU POWER OFF.
2. TURN CPU POWER ON.
3. After the end of the POWER-ON DIAGNOSTIC, PRESS and HOLD the CMD key and press TEST key, then PRESS and HOLD the CMD key and press the ERROR RESET key to select this program. After PID 1500 is selected, the following message is displayed in the lower right corner of the CRT:

SECURE - Z PID 1500 DR X (X = DRIVE #, Z = 0 (NOT SECURED), 1 (SECURED))

4. INSERT CE DISKETTE BEFORE CONTINUING.

28.2.2 MENU DISPLAY

The PROGRAM MENU is displayed one line at a time at the top of the screen. The first option is used to select the DRIVE NUMBER (1 through 4). Ensure that the CE DISKETTE is inserted before selecting drive. After the drive is selected, when each MENU is displayed, enter 1 = YES to select the option or 0 = NO to bypass the option.

28.2.2.1 MENU ITEMS:

1. SELECT DRIVE (1-4) (THIS OPTION SELECTS DRIVE)
 2. DISKETTE DIAG? (IF YES, OPTION 3 IS DISPLAYED. IF NO, OPTION 4 IS DISPLAYED.) (THIS OPTION RUNS ROUTINES 01 THRU 0A)
 3. DIAG WITH LOOP? (THIS OPTION LOOPS ROUTINES 01 THRU 0A)
 - *4. MAP CHART ROUTINE? (THIS OPTION SELECTS ROUTINE CE)
 5. LOAD DCP? (THIS OPTION SELECTS ROUTINE OD)
- *See "MAP CHART SUPPORT ROUTINE OPERATION" on page 110

Test results are displayed on the SYSTEM CRT. Failure conditions are indicated by a TWO DIGIT HEXADECIMAL ERROR CODE. If the current operation indicates more than one error, all errors will be displayed. For example:

ROUTINE XX ENDING STATUS YY ZZ

XX - CURRENT ROUTINE EXECUTING

YY, ZZ - SEE "ERROR, ACTION AND INFORMATION MESSAGES" on page 111

28.2.3 MENU OPTION SELECTION

The first option is used to select the diskette drive to be used (enter 1, 2, 3 OR 4).

After the drive has been selected, when each menu item is displayed, enter 1 = YES to select the option or 0 = NO to bypass the option. If no option has been selected following the last option display, the MENU DISPLAY will be restarted.

28.2.4 PROGRAM RUN INSTRUCTIONS

28.2.4.1 END COMMAND

Press the '9' key (located on the numeric keypad) to terminate this program and return to the start of the POWER-ON DIAGNOSTIC.

28.2.4.2 LOOP PROGRAM COMMAND

See "MENU DISPLAY"

Select the 'DIAG WITH LOOP?' option to loop this program.

Line one of the CRT will show a pass count. It is the HEX value of the number of passes correctly completed.

28.2.4.3 LOOP ROUTINE COMMAND - NONE**28.2.4.4 MAP CHART SUPPORT ROUTINE OPERATION**

When the MAP CHART ROUTINE? option is selected, the following message is displayed:

ROUTINE CE END STATUS

After this message is displayed, the CE may use any of the following options:

ENTER	KEY(S)	FUNCTION
-----	-----	-----
0		RECAL.
1	(AND) FIELD +	SEEK IN ONE TRACK
4	(AND) FIELD +	SEEK IN FOUR TRACKS
4	(AND) FIELD -	SEEK OUT FOUR TRACKS
1	(AND) FIELD -	SEEK OUT ONE TRACK
7		HEAD ALIGN (TRK 40,39,40)
9		END, GO TO POWER-ON DIAGNOSTICS

Note: Command will be rejected if an attempt to seek past TRACK 0 or TRACK 76.

28.2.4.5 SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)

PID 1500 ROUTINES with or without loop option may be executed by both processors, to either external drive, by selecting Drive 3 or 4 on both processors.

PID 1505, PART 1, OPTION 2 may be run on one processor with PID 1500 running on the other processor.

MAP CHART ROUTINES will secure the external drives until the routine is ended.

A PROCESSOR will attempt to secure an external drive for approximately 4 MINUTES. If external drives could not secure after this time, an ending status '32' is displayed.

All write tests secure until completed.

BOTH PROCESSORS may load DCP from the same external drive.

28.3 ERROR, ACTION AND INFORMATION MESSAGES

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
00	DMA TERMINAL COUNT 0 DID NOT STOP TRANSFER	09
01	PORT REGISTER FAILURE DISKETTE ATTACHMENT	01
02	CURRENT ENABLED	ALL
03	VFO DID NOT GO IN SYNC	03
04	DIAGNOSTIC WRAP OF INDEX FAILURE	01
05	DATA NOT AS EXPECTED	02,03,04
06	MISSING DATA/DMA REQUEST	02,03,04
07	TERMINAL COUNT 0 NOT INDICATED BY DMA (DISKETTE)	03,09
08	DISKETTE CONTROLLER DID NOT RESPOND	
09	DISKETTE NOT READY	05,0A,CE
0A	COULD NOT SELECT A DISKETTE	05,CE,0D
0B	(RESERVED)	
0C	(RESERVED)	
0D	CRC ERROR	07-0A
0E	MISSING INTERRUPT	07-0A
0F	NO RECORD FOUND	07-0A
10	MISSING 24V TO DISKETTE	07-0A
11	UNEXPECTED BUSY	07-0A
12	SEEK ERROR	07-0A
13	DATA OVERRUN (LOST DATA)	07-0A
15	UNEXPECTED VFO IN SYNC.	04
16	ROTATIONAL SPEED TOO SLOW	06
17	ROTATIONAL SPEED TOO FAST	06
18	INDEX DURATION TOO SMALL	06
19	INDEX DURATION TOO LARGE	06
1A	DID NOT COME BUSY AS EXPECTED	02,03

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
1B	DATA DOES NOT COMPARE	09
1C	MISSING INDEX PULSES	06
1D	READY IS ACTIVE AND SHOULD NOT BE	01
1E	BUSY DID NOT COME ACTIVE	01
1F	DATA DID NOT TRANSFER WITH DMA SHORTER THAN SECTOR SIZE	03
21	UNEXPECTED INT. LEVEL 1	ALL
22	UNEXPECTED INT. LEVEL 2	ALL
23	UNEXPECTED INT. LEVEL 3	ALL
24	UNEXPECTED INT. LEVEL 4	ALL
25	UNEXPECTED INT. LEVEL 5	ALL
26	UNEXPECTED INT. LEVEL 6	ALL
27	UNEXPECTED INT. LEVEL 7	ALL
31	UNEXPECTED 'DRIVE WAS NOT READY' INTERRUPT	ALL
32	COULD NOT SECURE EXTERNAL DRIVE	05-0A, CE, 0D
E1	MICRO PROCESSOR SEQUENCE 001	ALL
E2	MICRO PROCESSOR SEQUENCE 002	ALL
E3	MICRO PROCESSOR SEQUENCE 003	ALL
E4	MICRO PROCESSOR SEQUENCE 004	ALL
E5	MICRO PROCESSOR SEQUENCE 005	ALL
E6	MICRO PROCESSOR SEQUENCE 006	ALL
E7	MICRO PROCESSOR SEQUENCE 007	ALL
E8	MICRO PROCESSOR SEQUENCE 008	ALL
E9	MICRO PROCESSOR SEQUENCE 009	ALL
EA	MICRO PROCESSOR SEQUENCE 010	ALL
EB	MICRO PROCESSOR SEQUENCE 011	ALL
F1	FILE CONTROLLER SEQUENCE 001	ALL
F2	FILE CONTROLLER SEQUENCE 002	ALL

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
F3	FILE CONTROLLER SEQUENCE 003	ALL
F4	FILE CONTROLLER SEQUENCE 004	ALL
F5	FILE CONTROLLER SEQUENCE 005	ALL
F6	MISSING ADDRESS MARKS	ALL
F7	BAD CYLINDER	ALL
F8	AFTER SEEK COMMAND AND READ ID, THE ADDRESS DID NOT COMPARE	ALL
F9	ERROR END AFTER ATTACHMENT COMMAND	ALL
FA	INVALID COMMAND TO DISKETTE CONTROLLER	ALL
FB	DCP NOT FOUND ON DISKETTE	0D
FC	COMMAND TIMEOUT INTERRUPT	ALL
FF	GOOD ENDING SEQUENCE	ALL

28.4 DETAILED DESCRIPTION OF ROUTINES

(See "MENU ITEMS:" on page 109 for routine run sequence).

28.4.1 ROUTINE 0

Initialize system in preparation for diskette testing.

28.4.2 ROUTINE 1

Perform tests on diskette attachment card. Test the ports for the controller and issue a restart to the micro controller.

This restart causes the micro controller to run internal diagnostics. An 'AA','55' response from the micro controller indicates a good sequence.

28.4.3 ROUTINE 2

Test diagnostic wrap. Verifies the data path and deserializer. A READ ID command is issued and a line of data is supplied to simulate an ID.

28.4.4 ROUTINE 3

Check diagnostic wrap of read data. Verifies the DATA PATH, DESERIALIZER and DMA TRANSFER OF DATA TO STORAGE. A simulated data pattern is supplied to the diskette controller after a READ SECTOR command is issued. Status at the end is checked as well as the data that is transferred.

28.4.5 ROUTINE 4

Check the time for VFD IN SYNC line to become active. A FORMAT TRACK command is issued to the diskette controller without a drive selected (DIAG. MODE). The index pulse will be supplied by a write to the control register. A R/W RESET ends the operation (DMA is used).

28.4.6 ROUTINE 5

Select and ready DRIVE 1-4 (as selected).

28.4.7 ROUTINE 6

Will check index pulse width and time between index pulses. (PULSE WIDTH 1.5 - 3.0 MS) (INDEX TO INDEX 166 + OR - 4.2 MS). This routine is looped 16 times.

28.4.8 ROUTINE 7

This routine will perform a SEEK ONE TRACK and perform a READ ID. The data path between the diskette and the attachment card is checked. After each command, the status bytes are checked.

28.4.9 ROUTINE 8 (RESERVED)**28.4.10 ROUTINE 9**

Will read a prerecorded TRACK 03. The data recorded on this sector is 512 BYTES and in worst case DB6DB6DB6. After each command, status will be checked for correct operation. All sectors for TRACK 3 are read and verified.

28.4.11 ROUTINE 0A

Performs RANDOM SEEKS with the verify option and checks status after every operation.

28.4.12 ROUTINE CE

Special routines to interface with MAP CHARTS for the diskette. The routine will perform on command, a RECAL, a SEEK ONE TRACK IN OR OUT, a SEEK 4 TRACKS IN OR OUT, or position the access for head alignment. (The option for head alignment will: ISSUE A RECAL, SEEK TO TRACK 40, SEEK TO TRACK 39, SEEK TO TRACK 40).

28.4.13 ROUTINE 0D

Load DCP will search header records on the CE DISKETTE for the DCP program. Locates DCP on diskette and loads it.

29.0 PID 1505 (DISKETTE FLT, PART 1)**29.1 PURPOSE**

This program is loaded by and runs under control of the DCP. The purpose of the program is to test and verify the operation of the diskette attachment card control logic and the diskette read/write ability. The program test routines may be run on any attached diskette drive.

ROUTINE	ROUTINE DESCRIPTIONS
00	INITIALIZE
01	MICRO CONTROLLER ATTACHMENT ROUTINE
02	ATTACHMENT WRAP DATA ROUTINE (NO DMA)
03	ATTACHMENT WRAP DATA ROUTINE (DMA)
04	VFO IN-SYNC ROUTINE
05	SELECT DISKETTE DRIVE ROUTINE
06	INDEX DURATION CHECK ROUTINE
07	SEEK-READ ID-READ (ALL TRACKS EXCEPT 76)
08	(RESERVED)
09	READ STRESS PATTERN ROUTINE
0A	RANDOM SEEK ROUTINE
0C	WRITE TEST - TRACK 3 AND TRACK 76
0E	WRITE TRACK 76 SELECT PATTERN TEST
CE	MAP CHART SUPPORT

29.2 OPERATING PROCEDURES**29.2.1 LOADING**

This program is loaded by the DCP. Refer to the DCP PRIMARY MENU and enter '0' to load this program.

29.2.2 MENU DISPLAY

The following menu will be displayed when program load is complete:

- | | |
|---|---------------------------------------|
| 1. FILE CONTROL UNIT TEST | (THIS OPTION RUNS ROUTINE 01 THRU 04) |
| 2. DISKETTE DRIVE TESTS | (THIS OPTION RUNS ROUTINE 05 THRU 0A) |
| *3. MAP CHART ROUTINES | (THIS OPTION SELECTS ROUTINE CE) |
| 4. WRITE TRACK 3 AND 76 STRESS PATTERN TEST | (THIS OPTION SELECTS ROUTINE 0C) |
| 5. WRITE TRACK 76 SELECT PATTERN TEST | (THIS OPTION SELECTS ROUTINE 0E) |
| 9. RETURN TO DCP | |

A-005 - SELECT ONE OF THE ABOVE.

* REFER TO "MAP CHART SUPPORT ROUTINE" on page 119.

29.2.3 MENU OPTION SELECTION

1. Enter the option, then press ENTER to select the routines desired.
2. Once the option is selected, the following message will be displayed:

A-00F BYPASS ERROR STOPS
I-019 0=NO BYPASS 1=BYPASS 9=RETURN TO DCP

A-007 ENTER LOOP OPTION
I-009 0=NO LOOPING 1=LOOP TEST 2=LOOP ONE ROUTINE

Note: To use 'LOOP ONE ROUTINE (2)' see "LOOP ROUTINE COMMAND" on page 118.

3. If OPTION 2 THRU 5 is selected, the following messages will be displayed:

I-003 THE SENSE INDICATES THE FOLLOWING
DISKETTE CONFIGURATION
0=NO 1=YES
Z - INTERNAL 24 VOLTS PRESENT -(SHOULD BE '1' IF DRIVE 1 IS INSTALLED)
Z - DRIVE 2 ATTACHED
Z - DRIVE 3 ATTACHED
Z - EXTERNAL DRIVES POWERED ON
Z - CONNECTED TO EXTERNAL PORT 1
Z - CONNECTED TO EXTERNAL PORT 2
Z - DRIVE 4 ATTACHED AND POWERED ON

A-003 ENTER DRIVE NUMBER (1-4)

I-00Y DISKETTE SENSE FOR THE SELECTED
DRIVE INDICATES A TYPE X DISKETTE

NOTE Y= MESSAGE NUMBER
X= TYPE OF DISKETTE
Z= 1 FEATURE PRESENT
Z= 0 FEATURE NOT PRESENT

A-001 -ENTER- KEY TO CONTINUE

29.2.4 PROGRAM RUN INSTRUCTIONS**29.2.4.1 END COMMAND**

1. ENTER: ATTN-9 TO TERMINATE THE PROGRAM AND RETURN TO THE MENU.
2. ENTER: ATTN-E TO END A ROUTINE LOOP.

29.2.4.2 LOOP PROGRAM COMMAND - NONE.**29.2.4.3 LOOP ROUTINE COMMAND**

SEE "MENU OPTION SELECTION" on page 117.

If LOOP ONE ROUTINE is selected, a menu is displayed of routines for the selected group that may be looped. After selection of the routine to be looped, operation starts with the first routine of that group and sequences to the routine to be looped. Looping will continue until ATTN and E keys are entered.

When the FILE CONTROL UNIT TEST (OPTION 1) is selected, the following message is displayed:

```
A-007 ENTER LOOP OPTION
I-009 0=NO LOOPING 1=LOOP TEST 2=LOOP ONE ROUTINE

2
-1- RTN01 MICRO CONTROLLER ATTACHMENT TEST
-2- RTN02 ATTACHMENT WRAP TEST (NO DMA)
-3- RTN03 ATTACHMENT WRAP TEST (DMA)
-4- RTN04 VFO IN SYNC TEST
A-006 ENTER NUMBER OF ROUTINE TO BE LOOPED
```

When the DISKETTE DRIVE TEST (OPTION 2) is selected, the following message is displayed:

```
A-007 ENTER LOOP OPTION
I-009 0=NO LOOPING 1=LOOP TEST 2=LOOP ONE ROUTINE

2
-5- RTN05 SELECT DISKETTE
-6- RTN06 INDEX DURATION TEST
-7- RTN07 SEEK - READ ID - READ TRACK
-8- RTN08 RESERVED
-9- RTN09 READ STRESS TEST
-A- RTN0A RANDOM SEEK ROUTINE
A-006 ENTER NUMBER OF ROUTINE TO BE LOOPED
```

29.2.4.4 MAP CHART SUPPORT ROUTINE

When the MAP CHART ROUTINES, OPTION 3 is selected, the following message is displayed:

KEY	COMMAND
- 0 -	RECAL
- 1 -	SEEK IN ONE TRACK
- 2 -	SEEK IN FOUR TRACKS
- 3 -	SEEK OUT FOUR TRACKS
- 4 -	SEEK OUT ONE TRACK
- 5 -	POSITION HEAD FOR HEAD ALIGNMENT
- 9 -	RETURN TO DISK MENU

A-00E ENTER COMMAND

After this message is displayed, the CE may use any option.

29.2.4.5 SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)

PID 1505 ROUTINES with or without loop option may be executed by both processors, to either external drive, in overlap mode, by selecting DRIVE 3 or 4 on both processors.

PID 1505, PART 1, OPTION 2 may be overlapped with PID 1500.

MAP CHART ROUTINES will secure the external drives until the routine is ended.

A processor will attempt to secure an external drive for approximately 4 MINUTES. If external drives could not secure after this time, an ending status '32' is displayed.

All write tests secure the drive until completed.

Both processors may load DCP from the same external drive.

29.3 ERROR, ACTION AND INFORMATION MESSAGES

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E000	DMA TERMINAL COUNT 0 DID NOT STOP TRANSFER	09
E001	PORT REGISTER FAILURE DISKETTE ATTACHMENT	01
E002	CURRENT ENABLED	ALL
E003	VFO DID NOT GO IN SYNC	03
E004	DIAGNOSTIC WRAP OF INDEX FAILURE	01
E005	DATA NOT AS EXPECTED	02,03
E006	MISSING DATA/DMA REQUEST	02,03
E007	TERMINAL COUNT 0 NOT INDICATED BY DMA (DISKETTE)	03,09
E008	DISKETTE CONTROLLER DID NOT RESPOND	
E009	DISKETTE NOT READY	05,0A,CE
E00A	COULD NOT SELECT A DISKETTE	05,CE,0D
E00B	(RESERVED)	
E00C	(RESERVED)	
E00D	CRC ERROR	07-0A
E00E	MISSING INTERRUPT	07-0A
E00F	NO RECORD FOUND	07-0A
E010	MISSING 24V TO DISKETTE	07-0A
E011	UNEXPECTED BUSY	07-0A
E012	SEEK ERROR	07-0A
E013	DATA OVERRUN (LOST DATA)	07-0A
E014	WRITE FAILURE	0C-0D
E015	UNEXPECTED VFO IN SYNC.	04
E016	ROTATIONAL SPEED TOO SLOW	06
E017	ROTATIONAL SPEED TOO FAST	06
E018	INDEX DURATION TOO SMALL	06
E019	INDEX DURATION TOO LARGE	06

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E01A	DID NOT COME BUSY AS EXPECTED	02,03
E01B	DATA DOES NOT COMPARE	09
E01C	MISSING INDEX PULSES	06
E01D	READY IS ACTIVE AND SHOULD NOT BE	01
E01E	BUSY DID NOT COME ACTIVE	01
E01F	DATA DID NOT TRANSFER WITH DMA SHORTER THAN SECTOR SIZE	03
E021	UNEXPECTED INT. LEVEL 1	ALL
E022	UNEXPECTED INT. LEVEL 2	ALL
E023	UNEXPECTED INT. LEVEL 3	ALL
E024	UNEXPECTED INT. LEVEL 4	ALL
E025	UNEXPECTED INT. LEVEL 5	ALL
E026	UNEXPECTED INT. LEVEL 6	ALL
E027	UNEXPECTED INT. LEVEL 7	ALL
E029	SCAN EQUAL FAILURE FRU = DISKETTE ATTACHMENT CARD	ALL
E031	UNEXPECTED 'DRIVE WAS NOT READY' INTERRUPT	ALL
E032	COULD NOT SECURE EXTERNAL DRIVE	05-0A, CE, 0D
E0E1	MICRO PROCESSOR SEQUENCE 001	ALL
E0E2	MICRO PROCESSOR SEQUENCE 002	ALL
E0E3	MICRO PROCESSOR SEQUENCE 003	ALL
E0E4	MICRO PROCESSOR SEQUENCE 004	ALL
E0E5	MICRO PROCESSOR SEQUENCE 005	ALL
E0E6	MICRO PROCESSOR SEQUENCE 006	ALL
E0E7	MICRO PROCESSOR SEQUENCE 007	ALL
E0E8	MICRO PROCESSOR SEQUENCE 008	ALL
E0E9	MICRO PROCESSOR SEQUENCE 009	ALL
E0EA	MICRO PROCESSOR SEQUENCE 010	ALL
E0EB	MICRO PROCESSOR SEQUENCE 011	ALL

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E0F1	FILE CONTROLLER SEQUENCE 001	ALL
E0F2	FILE CONTROLLER SEQUENCE 002	ALL
E0F3	FILE CONTROLLER SEQUENCE 003	ALL
E0F4	FILE CONTROLLER SEQUENCE 004	ALL
E0F5	FILE CONTROLLER SEQUENCE 005	ALL
E0F6	MISSING ADDRESS MARKS	ALL
E0F7	BAD CYLINDER	ALL
E0F8	AFTER SEEK COMMAND AND READ ID, THE ADDRESS DID NOT COMPARE	ALL
E0F9	ERROR END AFTER ATTACHMENT COMMAND	ALL
E0FA	INVALID COMMAND TO DISKETTE CONTROLLER	ALL
E0FC	COMMAND TIMEOUT INTERRUPT	ALL
E0FE	ERROR OCCURRED DURING A TRACK READ. FAILING TRACK = XX (NOTE: XX IS A HEX VALUE)	07

29.4 DETAILED DESCRIPTION OF ROUTINES

29.4.1 ROUTINE 0

Initialize system in preparation for diskette testing.

29.4.2 ROUTINE 1

Perform tests on diskette attachment card. Test the ports for the controller and issue a restart to the micro controller.

29.4.3 ROUTINE 2

Test diagnostic wrap. Verifies the data path and deserializer. A read command is issued and a line of data is supplied to simulate an ID.

29.4.4 ROUTINE 3

Check diagnostic wrap of read data. Verifies the data path, deserializer and DMA transfer of data to storage. A simulated data pattern is supplied to the diskette controller after a read sector command is issued, status at the end is checked as well as the data that is transferred.

29.4.5 ROUTINE 4

Check the time for VFD IN.SYNC line to become active. A format track command is issued to the diskette controller without a drive selected (DIAG. MODE). The index pulse will be supplied by a write to the control register. A R/W reset ends the operation (DMA is used).

29.4.6 ROUTINE 5

Select and ready drive (as selected).

29.4.7 ROUTINE 6

Will check index pulse width and time between index pulses. (Pulse WIDTH 1.5 - 3.0 MS) (INDEX TO INDEX 166.7 + OR - 4.2 MS). This routine is looped 16 times.

29.4.8 ROUTINE 7

This routine will perform a seek one track and perform a read ID. If OK, a read track command is issued. The status is checked to verify data is OK. The data is not checked for validity. The data path between the diskette and the attachment card is checked. After each command, the status bytes are checked.

29.4.9 ROUTINE 8 (RESERVED)

29.4.10 ROUTINE 9

Will read a prerecorded TRACK 03. The data recorded on this sector is 512 BYTES and is worst case DB6DB6DB6. After each command, status will be checked for correct operation. All sectors for TRACK 3 are read and verified.

29.4.11 ROUTINE 0A

Performs random seeks with the verify option and checks status after every operation.

29.4.12 ROUTINE CE

Special routines to interface to map charts for diskette. It will perform on command:

1. A RECAL
2. A SEEK ONE TRACK IN OR OUT
3. A SEEK FOUR TRACKS IN OR OUT
4. POSITION THE ACCESS FOR HEAD ALIGNMENT. (The option for HEAD ALIGNMENT will: ISSUE A RECAL, SEEK TO TRACK 40, SEEK TO TRACK 39, SEEK TO TRACK 40).

29.4.13 ROUTINE OC

Will write the stress pattern on TRACK 3 and TRACK 76. All sectors are written. Status is checked for correct operation.

29.4.14 ROUTINE OE

Will display a prompt message to enter a data pattern to be written on TRACK 76. After the data is written, a RECAL is issued, a SEEK to 76, and a READ of each sector to ensure data was written correctly.

30.0 PID 1510 (DISKETTE FLT, PART 2)

30.1 PURPOSE

This program is loaded by and runs under control of the DCP. The purpose of the program is to format DISKETTE TRACK 76 in all supported sector sizes and recording modes (FM,MFM). If a DISKETTE 2D is installed, the program will format both sides of the diskette on TRACK 76 in FM and MFM modes. After formatting is complete, a stress test pattern is written and then verified.

Note: NEVER USE A TYPE '2' DISKETTE. A TYPE '2D' MUST BE USED.)

**** CAUTION ****

Data on TRACK 76 will be lost when this program is run.

ROUTINE 0E contains modules to:

1. SELECT DESIRED DISKETTE.
2. DETERMINE IF DISKETTE IS TYPE 1 OR TYPE 2.
3. FORMAT IN 128 BYTE FM, 256 BYTE FM, 512 BYTE FM, 256 BYTE MFM, 512 BYTE MFM AND 1024 BYTE MFM.
4. READ THE FORMATTED TRACK TO ENSURE THE CHARACTER USED TO FILL THE DATA RECORD WAS WRITTEN CORRECTLY.
5. WRITE A STRESS PATTERN TO ALL SECTORS ON THE TRACK THAT WAS FORMATTED.
6. READ AND VERIFY THE STRESS PATTERN.
7. LOOP TEST IF LOOP OPTION SELECTED.

30.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)

30.2.1 LOADING

This program is loaded by the DCP. Refer to the DCP PRIMARY MENU and enter OPTION '8' to load this program.

30.2.2 MENU DISPLAY

There is no menu displayed. The following message will be displayed when program load is complete:

```

- PID 1510 - FORMAT TEST -

A-00F  BYPASS ERROR STOPS
I-019  0=NO BYPASS    1=BYPASS    9=RETURN TO DCP
A-007  ENTER LOOP OPTION
I-009  0=NO LOOPING  1=LOOP TEST

I-003  THE SENSE INDICATES THE FOLLOWING
        DISKETTE CONFIGURATION
        0=NO          1=YES
Z - INTERNAL 24 VOLTS PRESENT - (SHOULD BE '1' IF DRIVE 1 IS INSTALLED)
Z - DRIVE 2 ATTACHED
Z - DRIVE 3 ATTACHED
Z - EXTERNAL DRIVES POWERED ON
Z - CONNECTED TO EXTERNAL PORT 1
Z - CONNECTED TO EXTERNAL PORT 2
Z - DRIVE 4 ATTACHED AND POWERED ON

A-003  ENTER DRIVE NUMBER (1-4)

I-00Y  DISKETTE SENSE FOR THE SELECTED    WHERE Y=MESSAGE ID
        DRIVE INDICATES A TYPE X DISKETTE  X=TYPE OF DISKETTE SELECTED

A-001  -ENTER- KEY TO CONTINUE

```

30.2.3 MENU OPTION SELECTION

Enter the drive number (1-4) to be tested to start the program.

30.2.4 PROGRAM RUN INSTRUCTIONS

30.2.4.1 END COMMAND

1. ENTER: ATTN-9 TO TERMINATE THE PROGRAM AND RETURN TO THE DCP.
2. ENTER: ATTN-E TO RETURN TO THE START OF THIS PROGRAM.

30.2.4.2 LOOP PROGRAM COMMAND

Normal program operation will cause the program to go back to the start after all tests are complete.

30.2.4.3 LOOP ROUTINE COMMAND - NONE

30.2.4.4 SHARED EXTERNAL DRIVES (DRIVE 3 AND 4)

It is not recommended that PID 1510 be run in overlap mode. It secures external drives until the end of test.

30.2.5 STATUS MESSAGES

30.2.5.1 START STATUS MESSAGE FOR DISKETTE TYPE 1.

The following program status message will be displayed once the drive number has been entered:

```
I-001 DISKETTE SENSE FOR THE SELECTED
      DRIVE INDICATES A TYPE 1 DISKETTE

A-001 -ENTER- KEY TO CONTINUE

      PID 1510 FORMAT TEST

I-011 PID 1510 FORMAT TRACK TEST
      CAUTION - DATA ON TRACK 76 WILL BE LOST

      - TO RETURN TO DCP   -KEYS- 9 + ENTER
      - TO END LOOP OPTION -KEYS- ATTN + E
A DISKETTE 1 IS INSTALLED IN DRIVE SELECTED.
THE FORMAT TEST WILL FORMAT SIDE 0 IN FM MODE
128, 256 AND 512 BYTE RECORDS WILL BE FORMATTED AND
A STRESS PATTERN WILL BE WRITTEN AND VERIFIED

      THE ORIGINAL SIZE OF THE RECORDS WILL BE RESTORED

      ORIGINAL DATA WILL BE LOST
A-009 PRESS ENTER TO CONTINUE.
```

30.2.5.2 START STATUS MESSAGE FOR DISKETTE TYPE 2D.

The following program status message will be displayed once the drive number has been entered:

```

I-002 DISKETTE SENSE FOR THE SELECTED
      DRIVE INDICATES A TYPE 2 DISKETTE

A-001 -ENTER- KEY TO CONTINUE

      PID 1510 FORMAT TEST

I-012 PID 1510 FORMAT TRACK TEST
      CAUTION - DATA ON TRACK 76 WILL BE LOST

      - TO RETURN TO DCP -KEYS- 9 + ENTER
      - TO END LOOP OPTION -KEYS- ATTN + E
      A DISKETTE 2 IS INSTALLED IN DRIVE SELECTED.
      THE FORMAT TEST WILL FORMAT SIDE 0 AND 1 IN
      FM AND MFM MODE WITH THE FOLLOWING RECORD
      LENGTHS.
      -1- FM MODE - 128, 256 AND 512 BYTE RECORD
      -2- MFM MODE- 256, 512 AND 1024 BYTE RECORD
      ORIGINAL DATA ON TRACK 76 WILL BE LOST

      ORIGINAL RECORD LENGTH WILL BE RESTORED

A-00C PRESS ENTER TO CONTINUE.

```

30.2.5.3 RUN STATUS MESSAGES

During program operation the following status messages are scrolled on the display:

```
I-00W FORMAT SIDE 'Y' XXX BYTE 'ZZ'
```

```
I-016 TRACK 76 IS BEING VERIFIED
```

```
I-007 WRITE STRESS PATTERN
```

```
I-016 TRACK 76 IS BEING VERIFIED
```

```

WHERE: W = MESSAGE CHARACTER
        Y = 0 OR 1
        ZZ = FM OR MFM
        XXX = RECORD LENGTH

```

30.2.5.4 END MESSAGE

The following message is displayed at the end of all tests:

```

I-004 GOOD ENDING SEQUENCE

PID 0000 -FORMAT TEST-      (0000 = PID NUMBER)
A-00F BYPASS ERROR STOPS
I-019 0=NO BYPASS 1=BYPASS 9=RETURN TO DCP

9
I-008 END OF DISKETTE TESTING
A-010 ENTER KEY TO RETURN TO DCP

```

30.3 ERROR, ACTION AND INFORMATION MESSAGES

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E000	DMA TERMINAL COUNT 0 DID NOT STOP TRANSFER	0E
E001	PORT REGISTER FAILURE DISKETTE ATTACHMENT	0E
E002	CURRENT ENABLED	0E
E005	DATA NOT AS EXPECTED	0E
E006	MISSING DATA/DMA REQUEST	0E
E008	DISKETTE CONTROLLER DID NOT RESPOND	0E
E009	DISKETTE NOT READY	0E
E00A	COULD NOT SELECT A DISKETTE	0E
E00B	ERASE CURRENT FAILURE HEAD 0	0E
E00C	ERASE CURRENT FAILURE HEAD 1	0E
E00D	CRC ERROR	0E
E00E	MISSING INTERRUPT	0E
E00F	NO RECORD FOUND	0E
E010	MISSING 24V TO DISKETTE	0E
E011	UNEXPECTED BUSY	0E
E012	SEEK ERROR	0E
E013	DATA OVERRUN (LOST DATA)	0E
E016	ROTATIONAL SPEED TOO SLOW	0E
E017	ROTATIONAL SPEED TOO FAST	0E
E018	INDEX DURATION TOO SMALL	0E
E019	INDEX DURATION TOO LARGE	0E
E01A	DID NOT COME BUSY AS EXPECTED	0E
E01B	DATA DOES NOT COMPARE	0E
E01C	MISSING INDEX PULSES	0E
E01D	READY IS ACTIVE AND SHOULD NOT BE	0E
E01E	BUSY DID NOT COME ACTIVE	0E

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E021	UNEXPECTED INT. LEVEL 1	0E
E022	UNEXPECTED INT. LEVEL 2	0E
E023	UNEXPECTED INT. LEVEL 3	0E
E024	UNEXPECTED INT. LEVEL 4	0E
E025	UNEXPECTED INT. LEVEL 5	0E
E026	UNEXPECTED INT. LEVEL 6	0E
E027	UNEXPECTED INT. LEVEL 7	0E
E030	STATUS INDICATES HEAD FAILED TO UNLOAD	0E
E031	UNEXPECTED 'DRIVE WAS NOT READY' INTERRUPT	0E
E032	COULD NOT SECURE EXTERNAL DRIVE	0E
E03B	FORMAT TO SIDE 1 FORMATTED SIDE 0	0E
E0E1	MICRO PROCESSOR SEQUENCE 001	0E
E0E2	MICRO PROCESSOR SEQUENCE 002	0E
E0E3	MICRO PROCESSOR SEQUENCE 003	0E
E0E4	MICRO PROCESSOR SEQUENCE 004	0E
E0E5	MICRO PROCESSOR SEQUENCE 005	0E
E0E6	MICRO PROCESSOR SEQUENCE 006	0E
E0E7	MICRO PROCESSOR SEQUENCE 007	0E
E0E8	MICRO PROCESSOR SEQUENCE 008	0E
E0E9	MICRO PROCESSOR SEQUENCE 009	0E
E0EA	MICRO PROCESSOR SEQUENCE 010	0E
E0EB	MICRO PROCESSOR SEQUENCE 011	0E
E0F1	FILE CONTROLLER SEQUENCE 001	0E
E0F2	FILE CONTROLLER SEQUENCE 002	0E
E0F3	FILE CONTROLLER SEQUENCE 003	0E
E0F4	FILE CONTROLLER SEQUENCE 004	0E
E0F5	FILE CONTROLLER SEQUENCE 005	0E

ERROR IDENTIFICATION TABLE		
STOP ID	MEANING	TEST SECTION REFERENCE
E0F6	MISSING ADDRESS MARKS	0E
E0F7	BAD CYLINDER	0E
E0F8	AFTER SEEK COMMAND AND READ ID, THE ADDRESS DID NOT COMPARE	0E
E0F9	ERROR END AFTER ATTACHMENT COMMAND	0E
E0FA	INVALID COMMAND TO DISKETTE CONTROLLER	0E
E0FC	COMMAND TIMEOUT INTERRUPT	0E
E0FD	MISSING CURRENT ENABLED	0E
E0FF	GOOD ENDING SEQUENCE	0E

30.4 DETAILED DESCRIPTION OF TESTS

This program issues a reset to the diskette attachment to ensure a known attachment condition. PID 1510 then issues a select diskette drive after ensuring the selected drive is ready. A SEEK TO TRACK 75 is issued followed by a READ ID COMMAND in FM MODE. If the read was not OK, an attempt to read in MFM MODE is made. This section determines RECORD LENGTH and RECORDING MODE TYPE to restore TRACK 76 after format test is complete. A sense to the selected diskette is issued to determine if a DISKETTE 1 or 2 is installed in the diskette drive. If a DISKETTE 1 and MFM RECORDING is detected, an error message is reported and the test is terminated. A SEEK TO TRACK 76 is issued and the format test is started.

A TYPE 1 DISKETTE will be:

FORMATTED SIDE 0 FM 128 BYTES
FORMATTED SIDE 0 FM 256 BYTES
FORMATTED SIDE 0 FM 512 BYTES

A TYPE 2D DISKETTE will be:

FORMATTED SIDE 0 AND 1 FM 128 BYTES
FORMATTED SIDE 0 AND 1 FM 256 BYTES
FORMATTED SIDE 0 AND 1 FM 512 BYTES
FORMATTED SIDE 0 AND 1 MFM 256 BYTES
FORMATTED SIDE 0 AND 1 MFM 512 BYTES
FORMATTED SIDE 0 AND 1 MFM 1024 BYTES

All of the above will verify that the fill character was written correctly. A stress pattern write and read is also performed.

31.0 PID 2300 (5241/5242 PRINTER FLT)**31.1 PURPOSE**

This program will test and verify the operation of the CPU printer attachment control logic and the 5241 and 5242-1/2 printers. Error sense and fault location are supplied by this program when used with the printer MAPS. This program is loaded by and runs under control of the diagnostic program (DCP).

ROUTINE	ROUTINE DESCRIPTIONS
0	INITIALIZE
1	CPU PRINTER USART TEST
2	PRINTER STATUS COMMANDS
3	MISCELLANEOUS PRINTER COMMANDS TEST
4	PRINT H'S/H AND T OVERPRINT/EXTRA DOTS TEST
5	PRINT RIPPLE PATTERN TEST
6	SELECTIVE - CE ENTER DATA TEST
7	SELECTIVE - SIGNAL CABLE WRAP TEST
8	SELECTIVE - SET PAGE PARAMETERS TEST
A	SELECTIVE - PERFORMANCE (THROUGHPUT) TEST
B	SELECTIVE - TEXT MODE TEST (5242-2)
C	SELECTIVE - FORMS EMITTER BALANCE TEST (5242-1/2)

31.2 OPERATING PROCEDURES (DCP CONTROLLED SECTIONS)**31.2.1 LOADING**

This program is loaded by the DCP. Refer to the DCP PRIMARY MENU and enter 2 to load this program. When program is loaded, the following message is displayed:

A-222 ENTER PRINTER PORT (1-2) DEFAULT=1

Enter the desired PRINTER PORT NUMBER 1 or 2, then press the ENTER key to start. If no port number is entered, this program will default to PORT 1. To select a different printer port after this program has executed, return to DCP (ATTN-9), then select this program again and repeat steps 31.2.1 to 31.2.4.

31.2.2 MENU DISPLAY

The following menu will be displayed:

- 1 - USART TEST
 - 2 - STATUS COMMANDS TEST
 - 3 - MISC COMMANDS TEST
 - 4 - PRT H/H+/EXTRA DOTS TEST
 - 5 - PRT RIPPLE PATTERN
 - X- 6 - CE ENTER DATA TEST
 - X- 7 - SIGNAL CABLE WRAP TEST
 - X- 8 - SET PAGE PARAMETERS TEST
 - X- A - THROUGHPUT TEST
 - X- B - TEXT MODE TEST
 - X- C - FORMS EMITTER BALANCE TEST
 - 9 - RETURN TO DCP
- X = WILL RUN ONLY IF SELECTED
 ENTER CHARACTER FOR DESIRED ROUTINE
 PRESS ONLY 'ENTER' KEY TO RUN AUTOMATIC ROUTINES (1-5)

31.2.3 MENU OPTION SELECTION

1. Enter the selected routine number, then press ENTER key to select desired routine.
2. To run ROUTINES 1 through 5 in automatic mode, only press the ENTER key at selection time.
3. When ROUTINE 3 (MISCELLANEOUS COMMANDS TEST) is executed, the operator will be instructed to enter 1 to test RESTART command. If restart is not to be tested, press only the ENTER key to bypass this optional test. REASON: The operator must cause an end of forms condition by tearing away printer forms and loading the forms at test end so that the restart command can be correctly tested. The restart command test is bypassed if loop program is specified - refer to "LOOP PROGRAM COMMAND" on page 134.

31.2.4 PROGRAM RUN INSTRUCTIONS

31.2.4.1 OPERATION

As the program is executed, each test displays start and end messages. During each test, error messages are displayed as failures are determined. The program will not continue until the operator has pressed the ENTER key to recognize the error condition. The program ends the current test when an error/failure condition is detected. To aid identification of problems, the failing program routine and step number precede error/failure messages in the following format:

ROUTINE XX STEP YY where XX and YY are hexadecimal values.

31.2.4.2 END COMMAND

1. ENTER: ATTN-9 to terminate the program and display the PRIMARY MENU. Enter 9, then press ENTER key to return to DCP.
2. ENTER: ATTN-E to end LOOP PROGRAM (ROUTINES 1-5) and return to PRIMARY MENU. See "LOOP PROGRAM COMMAND" for instructions for looping this program.

31.2.4.3 LOOP PROGRAM COMMAND

If only the ENTER key is pressed at selection time (for automatic mode), the following option is displayed:

A-221 LOOP PROGRAM? (ENTER 1=YES)
PRESS 'ENTER' KEY TO START TEST

Enter 1 (YES) then press ENTER key to loop program, executing automatic routines until ended by entering ATTN-E, ATTN-9 or an error occurs. To cancel automatic mode after error occurs, press ATTN-9 (terminates the program and displays the PRIMARY MENU).

To bypass the LOOP PROGRAM OPTIONS, press only the ENTER key (NO), sequential ROUTINES 1-5 will each run once.

31.3 ERROR, ACTION AND INFORMATION MESSAGES**31.3.1 INFORMATION**

- I-201 USART TEST STARTED
- I-202 PRT STATUS CMDS TEST STARTED
- I-203 PRT CMDS TEST STARTED
- I-204 H/H+T/EXTRA DOTS TEST STARTED
- I-205 RIPPLE PRT TEST STARTED
- I-206 CE DATA TEST STARTED
- I-207 SIG CABLE WRAP TEST STARTED
- I-208 SET PAGE PARAMETERS TEST STARTED
- I-209 PRT THROUGHPUT RESULTS A=WWW N=XXX F=YYY S=ZZZ *D
(WWW IS ACTUAL COUNT)
(XXX IS NORMAL COUNT LIMIT)
(YYY IS FAST COUNT LIMIT)
(ZZZ IS SLOW COUNT LIMIT)
(* IS ERROR INDICATOR, IF SET, INDICATES WRONG PRINTING SPEED)
(D IS DIRECTION F=FAST, S=SLOW)
- I-20A PRT THROUGHPUT TEST STARTED
- I-20B TEXT MODE TEST STARTED

- I-20C FORMS EMITTER TEST STARTED
 (1 = UP, 0 = DOWN)
 TO END TEST, PRESS ATTN-E KEYS
- I-210 PRT TEST ENDED
 PRESS 'ENTER' KEY TO DISPLAY DCP MENU
- I-211 USART TEST ENDED
- I-212 PRT STATUS CMDS TEST ENDED
- I-213 PRT MISC CMDS TEST ENDED
- I-214 H/H+T/EXTRA DOTS TEST ENDED
- I-215 RIPPLE PRT TEST ENDED
- I-216 CE DATA TEST ENDED
- I-217 SIG CABLE WRAP TEST ENDED
- I-218 SET PAGE PARAMETERS TEST ENDED
- I-21A PRT THROUGHPUT TEST ENDED
- I-21B TEXT MODE TEST ENDED
- I-21C FORMS EMITTER TEST ENDED
- I-22D RESTART CMD TEST BYPASSED

31.3.2 OPERATOR ACTION

- A-200 PRINTER TEST ROUTINES
 - 1- USART TEST
 - 2- STATUS COMMANDS TEST
 - 3- MISC COMMANDS TEST
 - 4- PRT H/H+T/EXTRA DOTS TEST
 - 5- PRT RIPPLE PATTERN TEST
 - X-6- CE ENTER DATA TEST
 - X-7- SIGNAL CABLE WRAP TEST
 - X-8- SET PAGE PARAMETERS TEST
 - X-A- THROUGHPUT TEST
 - X-B- TEXT MODE TEST
 - X-C- FORMS EMITTER BALANCE TEST
 - 9- RETURN TO DCP

X=WILL RUN ONLY IF SELECTED
ENTER CHARACTER FOR DESIRED ROUTINE
PRESS ONLY 'ENTER' KEY TO RUN AUTOMATIC ROUTINES (1-5)
- A-220 INVALID ENTRY, RETRY
- A-221 LOOP PROGRAM? (ENTER 1=YES)
 PRESS 'ENTER' KEY TO START TEST
- A-222 ENTER PRT PORT (1-2) DEFAULT=1

- A-223** ENTER LINES TO PRINT OPTION: DEFAULT=0
0 - ALL 91 LINES
1 - 10 LINES
2 - 22 LINES
3 - 45 LINES
9 - END TEST
PRESS 'ENTER' KEY
- A-224** ENTER CHAR-PER-INCH:
10, 15 DEFAULT=10
- A-225** ENTER LINES-PER-INCH:
6, 8, 9 (FOR 9.6) DEFAULT=6
- A-226** ENTER LINES-PER-PAGE:
51/68/81, 66/88/105 DEFAULT=66/88/105
- A-227** ENTER DATA MODE: DEFAULT=0
0 - CHARACTER
1 - CONTROL
- A-228** ENTER CHARACTER DATA (AS: ABCD...XYZ)
- A-229** ENTER CONTROL DATA (AS: HH HH HH...HH)
WHERE HH=HEX 0-F
- A-22A** ENTER RUN OPTION: DEFAULT=0
0 - REPEAT, USE SAME DATA
1 - ENTER NEW DATA (SAME MODE)
2 - CHANGE MODE (AND DATA)
9 - END TEST
PRESS 'ENTER' KEY
- A-22B** IS DATA CORRECT? (ENTER 1=YES)
PRESS 'ENTER' KEY
- A-22C** RESET FONT TO DRAFT MODE? (ENTER 1=YES)
- A-230** TEST RESTART COMMAND? (ENTER 1=YES)
- A-231** TEAR AWAY PRT FORMS FROM THE BACK
- A-232** PRT END OF FORMS OCCURRED
LOAD PRT FORMS TO RESET
- A-234** ERROR OCCURRED PRESS 'ENTER' KEY TO END TEST (RETURN TO MAP)
- A-235** POWER OFF PRT
PUT SIGNAL CABLE IN WRAP POSITION
POWER ON PRT IF YOU WANT TO WRAP PRT
- A-236** POWER OFF PRT IF ON
RETURN WRAP CABLE TO NORMAL POSITION
POWER ON PRT

31.3.3 SYSTEM ERRORS

- E-241** HOLD INT DID NOT OCCUR
- E-242** TXRDY INT RESPONSE TIMEOUT
- E-243** ERROR BYTE INT RESPONSE TIMEOUT

- E-244** STATUS BYTE INT RESPONSE TIMEOUT
- E-245** DATA INT RESPONSE TIMEOUT
- E-246** RESUME INT RESPONSE TIMEOUT
- E-247** DATA REQUEST INT RESPONSE TIMEOUT
- E-248** EXCEPTION INT RESPONSE TIMEOUT, CHECK PRT POWER IS ON
- E-249** STATUS REQUEST INT RESPONSE TIMEOUT, CHECK PRT POWER IS ON
- E-24A** PRT ATTACHMENT FAILED
- E-250** EXCEPTION OCCURRED, ERROR BYTE=XX
(XX is returned data, refer to "DIAGNOSE RESPONSE" on page 144)
- E-251** DIAGNOSE ERROR OCCURRED
DIA RESPONSE=XX
(XX is returned data, refer to "DIAGNOSE RESPONSE" on page 144)
- E-252** NO PRT BUSY
- E-253** BAUD RATE ERROR, SENSE=XX
(XX is returned data, refer to "SENSE RESPONSE" on page 144)
- E-254** DATA REQUEST EXCEPTION ERROR
DAT RESPONSE=XX XX XX XX XX
(XX is returned data, refer to "DAT RESPONSE" on page 143)
- E-255** UNEXPECTED PRT STATUS
STA RESPONSE=XX
(XX is returned data, refer to "STATUS RESPONSE" on page 144)
- E-256** 2ND PRT PORT CARD NOT INSTALLED
- E-257** PRT POWER TURNED OFF
- E-258** LEFT MARGIN NOT SENSED
- E-259** NO VALID DATA ENTERED
- E-25A** TEXT MODE NOT ACTIVE
- E-25B** TEXT MODE NOT RESET OFF
- E-25C** PRT ID NOT 03
- E-25D** PRT ID NOT 02 OR 03

31.3.4 USART ERRORS

- E-261** EXTERNAL RESET FAILED
- E-262** RECEIVER NOT READY
- E-263** INTERNAL RESET FAILED

- E-264 USART ERROR RESET FAILED
- E-265 USART ERROR OCCURRED, STATUS=XX
(XX is returned data, refer to "CPU USART STATUS" on page 144)
- E-266 UNEXPECTED USART STATUS=XX
(XX is returned data, refer to "CPU USART STATUS" on page 144)
- E-267 USART DATA ERROR, S/B=XX WAS=YY
(XX is expected, YY is actual)
- E-269 USART ERROR DETECT FAILED
- E-26A USART NOT READY AFTER RESET, STATUS=XX
(XX is returned data, refer to "CPU USART STATUS" on page 144)
- E-26B CONTINUOUS USART RECEIVE INTERRUPTS
CANNOT CONTINUE TEST,
POWER OFF PRT,
REFER TO MAP 2001 OR 3001

31.3.5 END AND WARNINGS

- I-290 PRT TEST TERMINATED
PRESS 'ENTER' KEY TO RETURN TO DCP
- I-292 NO PRT ATTACHED
- I-294 BAD PRT ID=0

31.4 DETAILED DESCRIPTION OF ROUTINES

31.4.1 ROUTINE 0

Initialize the printer control logic and the system in preparation for device testing.

31.4.2 ROUTINE 1

Perform basic tests of the UNIVERSAL SYNCHRONOUS/ASYNCHRONOUS RECEIVER/TRANSMITTER (USART). The USART is placed in wrap mode while a test of rotating 1's and 0's are transmitted and received verified. USART error detection and correction is also verified.

31.4.3 ROUTINE 2

Will test and verify correct operation of each of the printer status and data commands. The commands tested are:

1. DIAGNOSE (DIA) and EXCEPTION (EXC) response
2. STATUS REQUEST (STR) and STATUS (STA) response
3. DATA REQUEST (DAR) and DATA (DAT) response

31.4.4 ROUTINE 3

Will execute and verify miscellaneous printer commands that are not separately tested in other routines. Visual inspection is required for this test. Each command is numbered 1-8 and identified as they are executed. The following commands are tested in sequence:

1. CARRIAGE RETURN (CR)
2. LINE FEED (LF)
3. FORMS FEED (FF)
4. REQUIRED PAGE IN (RPI)
5. NEW LINE (NL)
6. REQUIRED NEW LINE (RNL)
7. CLEAR (CLR)
8. RESTART (RST) - OPTIONAL

Note: The RESTART COMMAND TEST is bypassed if loop program is specified. The following message is displayed once as program executes in automatic mode:

I-22d RESTART CMD TEST BYPASSED

After commands 1-7 have executed (and loop program is bypassed), the following prompt is displayed:

A-230 TEST RESTART COMMAND? (ENTER 1=YES)

If only ENTER key is pressed (NO), the restart command test is bypassed.

If 1 (YES) is entered, the operator is instructed to:

A-231 TEAR AWAY PTR FORMS FROM THE BACK

Tear away paper forms where forms enter the printer (or tear a notch in the forms on the left side) to cause END OF FORMS condition sensed later in the test. Do not remove paper making contact with the platen, it is needed for test. Press ENTER key to continue. Test messages are printed LINE NUMBER XX where XX is increasing hexadecimal values. When END OF FORMS is sensed, the following prompt is displayed:

**A-232 PRT END OF FORMS OCCURRED
LOAD PRT FORMS TO RESET**

Load the paper forms (or move the notch above the print head) and press ENTER key. The restart command is issued and the printer starts printing test messages until the print buffer is empty. Check results of restart test by observing LINE NUMBER XX messages are in numeric sequence with none missing, after forms have been loaded.

31.4.5 ROUTINE 4

Will print five lines of H's and five lines of H's overprinted with T's to permit visual checking of print quality, printer alignment and registration. Also, two lines each are printed with / (slash) print wires 1-7 and _ (underscore) print wire 8 to test for extra dots present.

31.4.6 ROUTINE 5

Will ripple print maximum 91 lines of 91 characters which includes special, numeric and upper-lower case alpha characters. ASCII values 20-7A in numeric sequence are converted to printer codes (EBCDIC). The following prompt is displayed:

```
A-223   ENTER LINES TO PRINT OPTION:  DEFAULT=0
        0 - ALL 91 LINES
        1 - 10 LINES
        2 - 22 LINES
        3 - 45 LINES
        9 - END TEST
        PRESS 'ENTER' KEY
```

Enter selected option number then press ENTER key. Operator must observe print quality and inspect for missing print wire positions and distorted characters. To exit this routine before all lines have been printed, enter ATTN-9.

31.4.7 ROUTINE 6

Permits operator to enter data from the console keyboard to be sent to the printer being tested. Two modes are supported, the following prompt is displayed:

```
A-227   ENTER DATA MODE:  DEFAULT=0
        0 - CHARACTER
        1 - CONTROL
```

Enter 0 then press ENTER key to select CHARACTER mode. This mode converts keyboard entered data to EBCDIC then outputs the characters to the printer. A new line code is inserted as the last character which causes the printer to start printing. The following prompt is displayed:

```
A-228   ENTER CHARACTER DATA (AS:ABC...XYZ)
```

Enter desired characters (64 MAXIMUM) as alpha and/or numeric characters, then press ENTER key. The same characters entered will be sent to the printer being tested. See below, message A-22A for run options.

Enter 1, then press ENTER key to select CONTROL MODE. This mode converts entered data into hexadecimal bytes; each byte requiring one or two keyboard entered characters. The following prompt is displayed:

```
A-229   ENTER CONTROL DATA (AS:HH HH HH...HH)
        WHERE HH=HEX 0-F
```

Refer to EBCDIC character set in SM 3652 or SM 2652. Enter desired keyboard characters only as values 0-F in groups of two separated by a space (OPTIONAL) for a maximum of 64 characters - including spaces. Then press the ENTER key. The input data is edited to convert ASCII code to EBCDIC and remove spaces. After editing, the following prompt is then displayed to permit the operator to verify data is correct:

```
HH HH HH...HH (WHERE H's ARE EDITTED CHARACTERS)
```

A-22B IS DATA CORRECT? (ENTER 1=YES)
PRESS 'ENTER' KEY

Enter 1 (YES) then press ENTER key if data (HH) is correct. The data displayed (but not spaces) is sent to the printer.

If data is not correct, press only the ENTER key (NO) and the program returns to permit a new entry.

This routine will display any returned data received from the printer and will wait for a response (press ENTER key) from the operator before continuing. See message A-22A below for run options.

For example, enter: 12 11 D 25 then press ENTER key.

The above characters will direct the printer to execute:

1. DATA REQUEST COMMAND 12, RETURNED DATA IS DISPLAYED.
2. DIAGNOSE COMMAND 11, RETURNED DATA IS DISPLAYED.
3. CARRIAGE RETURN COMMAND 0D (PROGRAM INSERTED HIGH ORDER 0 IN LEFT NIBBLE).
4. LINE FEED COMMAND 25.

Note: The printer runs at lower speed while executing this section.

After entered data has been sent to the printer, the following option message is displayed:

A-22A ENTER RUN OPTION: DEFAULT=0
0 - REPEAT, USE SAME DATA
1 - ENTER NEW DATA (SAME MODE)
2 - CHANGE MODE (AND DATA)
9 - END TEST
PRESS 'ENTER' KEY

Enter selected option number, then press ENTER key.

31.4.8 ROUTINE 7

Performs basic tests of the CPU USART and PRINTER SIGNAL CABLE. The printer cable is placed in wrap mode at the printer end while a test of rotating 1's and 0's are transmitted and received verified. The operator is informed to return the cable to normal at test end.

31.4.9 ROUTINE 8

Permits operator to test the printer page parameters. Start by setting the forms at the top of the page, then set the horizontal density of 10 or 15 characters per inch (CPI), vertical print density of 6, 8 or 9.6 lines per inch (LPI), number of lines per page (LPP) for 8.5 and 11 inch length forms. The operator follows the prompting of the routine by entering the requested parameters. If only the ENTER key is pressed, default value is used. If 0 key and ENTER key is pressed, the preceding value is used following each prompt.

After the requested parameters have been sent to the printer, a test pattern is printed as blocks of I's for the specified number of CPI (10 or 15) and LPI (6, 8 or 9) followed by a forms feed command for the specified number of LPP. Observe output for correct between line spacing and forms control.

Note: The printer assumes 10 CPI, 6 LPI and 66 LPP at power on or after a diagnose command.

31.4.10 ROUTINE A

This test checks printer performance by measuring the time required to print 61 lines followed by a 5 line skip. Each line includes 130 characters (RIPPLE PRINTED) at 10 characters/inch and 6 lines/inch. After the page is printed, the total time is displayed as follows:

I-209 PRT THROUGHPUT RESULTS A=XXXX N=XXXX F=XXXX S=XXXX I

Where XXXX is hex count of .25 seconds, A is actual, N is normal, F is fast limit, S is slow limit and I is error indicator (*). If * is set, it will be followed by F for fast or S for slow, to indicate wrong printing speed. If * does not appear, then printing speed is acceptable.

31.4.11 ROUTINE B

(PRINTER ID=03 ONLY) will set font to text mode and print five lines of slash characters (/) that are overprinted placing dots between existing dots. This is followed by an underscore test which prints two lines. The first line prints single underscore at alternate character positions. The second line prints a continuous underscore at all character positions. Visual inspection is required for this test. More testing is possible by pressing only ENTER key when operator is prompted by the following:

A-22C RESET FONT TO DRAFT MODE? (ENTER 1=YES)

If only ENTER key is pressed (NO), the printer will remain in text mode. Other printer tests can be selected (e.g. Routines 3, 4 or 5) to observe print quality.

If 1 (YES) is entered, the printer is placed in draft mode and no automatic overprinting will occur.

Note: - POWER ON OR A DIAGNOSE COMMAND RESETS PRINTER TO DRAFT MODE.

31.4.12 ROUTINE C

(PRINTER ID = 02 OR 03 ONLY) moves the platen forward and reverse for the same specified time. Counts the number of emitter pulses and displays the forward and reverse pulses as 1's and 0's, respectively.

When the test has started to execute, the printer platen should rotate forward and reverse. The accuracy of the emitter adjustment is displayed with a series of 1's and 0's. If there are no binds in the carriage and the emitter is in adjustment, approximately 1 and 1/2 lines of 1's will indicate forward (UP) and 1 and 1/2 lines of 0's will indicate reverse (DOWN). If the lines of 1's and 0's are not +/- two characters of being the same length, the forms emitter needs to be adjusted.

Loosen the forms emitter and move it slightly in the direction of the larger number of 1's or 0's. The length of the lines of 1's and 0's is an indication of the relative amount of binding in the platen.

31.5.1.2 DIAGNOSE RESPONSE

One byte (BITS 7-0 BINARY VALUE) indicating printer exception error is displayed as follows - ¹

DIAGNOSE RESPONSE=XX

XX = EXCEPTION ERROR CODE
 BIT 0 = INTERFACE CHECK
 BIT 1 = PRT CHECK
 BIT 2 = INVALID COMMAND
 BIT 3 = END OF FORMS

31.5.1.3 SENSE RESPONSE

One byte (BITS 7-0 BINARY VALUE) indicating printer not attached or BAUD RATE not known is displayed as follows - ¹

SENSE=XX

XX = SELECTED PRINTER BAUD RATE AT PROCESSOR END, BITS 7, 6 AND 5 OF PRINTER PORT.
 E0 = PRINTER NOT CONNECTED
 80,00 = BAUD RATE NOT KNOWN

31.5.1.4 STATUS RESPONSE

One byte (BITS 7-0 BINARY VALUE) indicating printer status is displayed as follows - ¹

STATUS=XX

XX = CURRENT PRINTER STATUS
 BIT 6 = PRT BUSY

31.5.1.5 CPU USART STATUS

One byte, indicating CPU USART STATUS BITS 7-0 BINARY VALUE is displayed as follows - ¹

STATUS=XX

XX = CURRENT USART STATUS
 BIT 0 = TRANSMITTER READY
 BIT 1 = RECEIVER READY
 BIT 2 = TRANSMITTER EMPTY
 BIT 3 = PARITY ERROR
 BIT 4 = OVERRUN ERROR
 BIT 5 = FRAME ERROR
 BIT 6 = BREAK DETECT (PRT POWER TURNED OFF)
 BIT 7 = DATA SET READY

¹ BIT 0 is right hand bit. All bytes are displayed in Hexadecimal.

32.0 PID DMON (ROS RESIDENT MONITOR)

32.1 PURPOSE

This ROS RESIDENT PROGRAM supplies functions to aid in the analysis and correction of BASIC microcode program problems.

The following functions are supplied:

1. DISPLAY STORAGE (ROS OR R/W STORAGE).
2. CHANGE STORAGE (R/W STORAGE ONLY).
3. WRITE R/W STORAGE TO DISKETTE.

Note: The COPY/DISPLAY function is not available while this monitor is active.

32.2 OPERATING PROCEDURES

32.2.1 SELECTING

This program is ROS RESIDENT and is selected as follows:

32.2.1.1 'BASIC' PROGRAM IN 'READY' MODE OR IN OPERATION.

To select the monitor:

1. PRESS AND HOLD THE 'HOLD' KEY.
2. PRESS AND HOLD THE 'TEST' KEY.
3. PRESS THE '9' KEY (TYPEWRITER KEYBOARD).

32.2.1.2 TRAP '0' OR TRAP '40' CONDITION.

To select the monitor:

1. PRESS THE '9' KEY (TYPEWRITER KEYBOARD).

When the monitor is selected, the upper 20 lines of the display are blank and the word MONITOR appears on the first (1) line from the top of the display.

32.2.2 MENU DISPLAY - NONE

32.2.3 MENU OPTION SELECTION - NONE

32.2.4 PROGRAM RUN INSTRUCTIONS

(For JAPAN, see Note 2 below.)

32.2.4.1 DISPLAY STORAGE COMMAND

THE ENTRY FORMAT IS:

D X YYYY

Where X is the ROS or R/W STORAGE page of the memory to be displayed and YYYY is the hexadecimal address of the first location to be displayed (SEE NOTE 1 BELOW).

In response to the display storage command, 256 bytes of storage starting with location YYYY, on ROS/READ-WRITE STORAGE PAGE X are displayed on the CRT in both HEXA-DECIMAL and EBCDIC format. The display will be removed from the CRT on the next key stroke.

32.2.4.2 CHANGE STORAGE COMMAND

The entry format is:

A X YYYY

Where X is the R/W STORAGE page of the memory to be changed and YYYY is the hexadecimal address of the location to be changed. (SEE NOTE 1 BELOW).

In response to this command, the byte at location YYYY on R/W STORAGE page X is displayed in hexadecimal format. The next two keys pressed will form a byte which will be stored at that location. The command line including the changed byte, will remain displayed until another key is pressed. If YYYY is less than '8000', the command is automatically ended since a write into the ROS area is not permitted.

32.2.4.3 SAVE STORAGE (WRITE R/W STORAGE TO DISKETTE)

1. To save storage on a diskette:
 - a. The diskette must be previously prepared properly (see Part 2.).
 - b. Insert the diskette into drive 1 (or 3 if no internal diskettes).
 - c. Enter: F0.
 - d. When the system has finished saving information on the diskette, a lozenge will appear on the screen.
 - 1) Lozenge not blinking - save finished OK. Go to Step e.
 - 2) Lozenge blinking - save failed. Remove the diskette and save it for reuse. Turn the machine off, then on again, and continue with normal operations.
 - e. (1) Press the 'E' key.
(2) Remove the diskette.
(3) Turn the machine off, then on again, and continue with normal operations.

- f. The LISTFILE Customer Support Function is used to selectively print the storage information from the diskette just created.
2. To prepare a diskette to save List Storage information:
- a. Insert the Customer Support Functions diskette that contains the PREPARE function into any diskette drive.
 - b. Insert the diskette you wish to prepare in any other drive. (Warning: All information on the diskette to be prepared will be destroyed).
 - c. Enter: PROC STGDMP on the input line.
 - d. Press the ENTER key.
 - e. The PREPARE DISKETTE PROCEDURE FILE display will appear on the screen.
 - f. Press the ERROR RESET key.
 - g. Replace the 'X' on the screen with the number of the diskette drive containing the diskette you want to prepare.
 - h. Press the ENTER key.
 - i. When READY INPUT appears on the status line, PREPARE is finished.

32.2.4.4 END MONITOR

The entry format is:

E

The CRT will be restored to the contents before the monitor was selected. If the display is not the same as before, reselect the monitor (see "SELECTING" on page 145), then immediately press 'E' to end the monitor and restore the screen to the correct display.

Following use of the monitor, program operation may be resumed if only the 'D' or 'A' functions were used, although any change of storage made with the 'A' command may affect program operation. If storage was written to disk with the 'F' command or if the monitor was selected because of a TRAP, do not attempt to resume program operation.

Note: 1. Entries are made in HEXADECIMAL CODE (0-9, A-F) from the typewriter section of the keyboard only. (A-F are the positions on the United States keyboard).

Use of all other keys will give a HEXADECIMAL 'F' when used for data, and will be ignored when used for command entry.

Note: 2. On systems that have the Japan (KATAKANA) jumper installed, (see SM 1230) a numeric '1' will be displayed as a 'Ya' character.

32.3 ERROR, ACTION AND INFORMATION MESSAGES - NONE

32.4 DETAILED DESCRIPTION OF ROUTINES

See "PROGRAM RUN INSTRUCTIONS" on page 146.

33.0 PID 1450 (WORD PROCESSING SUPPORT TEST)

33.1 PURPOSE

This program tests the 16K of memory and the attributes used for word processing.

33.2 OPERATING PROCEDURES

33.2.1 LOADING

PID 1450 is loaded by DCP by entering a -10- (FEATURE/RPQ PID). Refer to the DCP PRIMARY MENU.

After a -10- is entered, the menu will display:

ENTER DRIVE NUMBER AND PID NUMBER (X - YYYY).

TO LOAD THE PROGRAM, ENTER: 1 1450

33.2.2 MENU DISPLAY

The following menu will be displayed:

```
I-200 WORD PROCESSING SUPPORT TEST OPTIONS
      -0- RUN ROUTINE 1 TIME
      -1- LOOP STORAGE TEST
      -2- ATTRIBUTE
      -9- RETURN TO DCP
A-221 SELECT OPTION
```

33.2.3 MENU OPTION SELECTION:

OPTION 0 Selecting this option either by entering a 0 or just pressing the ENTER key will run the storage test once.

OPTION 1 Will loop the test until either ATTN 'E' or ATTN '9' is pressed.

OPTION 2 Selects the attribute routine.

OPTION 9 Will return to DCP MENU.

33.2.4 PROGRAM RUN INSTRUCTIONS**33.2.4.1 OPERATION - OPTION 0 OR 1**

A message will appear on the screen as follows:

I-209 IF SCREEN DISAPPEARS
REPLACE THE WORD PROCESSING SUPPORT CARD
REPLACE THE CPU PLANAR BOARD
PRESS ENTER TO START TEST

1. OPERATION - As the program is executed, a storage test start message and routine started and routine complete messages will display as follows:

I-200 START STORAGE TEST
I-202 ROUTINE 0 STARTED
I-203 ROUTINE 0 COMPLETED
I-202 ROUTINE 1 STARTED
I-203 ROUTINE 1 COMPLETED
I-202 ROUTINE 2 STARTED - This routine runs for about 4 minutes
I-203 ROUTINE 2 COMPLETED
I-202 ROUTINE 3 STARTED
I-203 ROUTINE 3 COMPLETED
I-204 STORAGE TEST COMPLETE.

33.2.4.2 OPERATION -OPTION 2-

The following message will appear on the screen:

ATTRIBUTE TEST STARTED

PRESS ENTER TO DISPLAY THE ATTRIBUTES ON THE SCREEN AS FOLLOWS

ATTRIBUTE TEST STARTED ATTENTION E EXITS ROUTINE

BLINKING CHARACTERS (LINE IS BLINKING)

UNDERLINED CHARACTERS (LINE IS UNDERLINED)

HIGHLIGHTED CHARACTERS (LINE IS HIGHLIGHTED)

REVERSE VIDEO (LINE IS IN REVERSE VIDEO)

R/V HIGHLIGHTED (LINE IS REVERSE VIDEO
AND HIGHLIGHTED)

REVERSE VIDEO AND BLINKING CHARACTERS (LINE IS IN REVERSE VIDEO AND BLINKING)

HIGHLIGHTED AND UNDERLINED (LINE IS HIGHLIGHTED
AND UNDERLINED)

ALL ATTRIBUTES (LINE HAS ALL ATTRIBUTES ON)

REVERSEVIDEUBLINKINGHIGHLIGHTEDUNDERLINED (THIS LINE HAS ALL ATTRIBUTES ON)

There should be no spaces between characters and attributes in the above line.

33.2.5 END COMMAND

1. Enter ATTN - E to end loop program or exit Routine 2 and return to PRIMARY MENU.
2. Enter '9', then press ENTER key to return to DCP.

33.3 ERROR, ACTION AND INFORMATION MESSAGES

33.3.1 INFORMATION

I-200 WORD PROCESSING SUPPORT TEST OPTIONS

I-201 START STORAGE TEST

I-202 ROUTINE X STARTED

I-203 ROUTINE X COMPLETE

Note: -ROUTINE 2 will give the message that this routine runs for about 4 minutes.

I-204 STORAGE TEST COMPLETE

I-205 ATTRIBUTE TEST STARTED

I-206 ATTRIBUTE TEST COMPLETE

I-207 ERROR OCCURRED

I-208 SUPPORT TEST TERMINATED

I-209 IF SCREEN DISAPPEARS
REPLACE THE WORD PROCESSING SUPPORT CARD
REPLACE THE CPU PLANAR BOARD

33.3.2 OPERATOR ACTION

A-221 SELECT OPTION

A-223 PRESS ENTER TO RETURN TO MENU

A-226 REPLACE THE WORD PROCESSING SUPPORT CARD
REPAIR OR REPLACE CABLE FROM CARD TO CPU
REPLACE CPU PLANAR BOARD

A-228 PRESS ENTER TO RETURN TO DCP MENU

33.3.3 ERROR MESSAGES

E-251 INVALID ENTRY, RETRY

E-252 STORAGE DATA ERROR OCCURRED

E-253 STORAGE PARITY ERROR

E-254	STORAGE DISABLE ERROR
E-256	I/O CHECK ERROR
E-257	PAGE ERROR
E-258	INTERRUPT ERROR
E-259	TIMEOUT ERROR
E-260	CRT ERROR
E-261	CRT SYNC ERROR

33.4 DETAILED DESCRIPTION OF ROUTINES

33.4.1 ROUTINE 0

Initializes the storage logic and checks that it is correctly operating. It then verifies that the I/O check (PARITY CHECK) is working.

Note: This test should be run after the system has been powered off and powered on.

33.4.2 ROUTINE 1

Writes a pattern of 00 FF throughout the 16K of storage. It waits 20 milliseconds and reads the pattern written and a reverse pattern is then written. This routine runs alternate patterns 10 times. It also checks that the correct page register is selected.

33.4.3 ROUTINE 2

This routine takes about 4 minutes to run. It writes each pattern as determined by the address and reads it back. This pattern writes every bit and runs 256 times through storage.

33.4.4 ROUTINE 3

This routine writes several instructions throughout the 16K of storage. It then executes these instructions and verifies that 16K of instructions are executed correctly. This routine runs 10 times.

33.4.5 OPTION 2

The attribute test displays different patterns of attributes on the screen. It also verifies that the two CRT's are in SYNC.

Note: If a TRAP or LOOP occurs or if the screen blinks or disappears, replace the WORD PROCESSING CARD and CABLE or the CPU PLANAR BOARD. Go to MAP 1450, Entry Point A.

1

START MAP

PAGE 1 OF 10

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

1205	B	9	032
1210	B	9	032
1300	B	9	032
1400	A	1	001
1400	B	9	032
2001	A	1	001
2001	B	9	032
3001	A	1	001
3001	B	9	032
3004	B	9	032

EXIT POINTS

EXIT THIS MAP		TO	

PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT

2	002	1100	A
2	004	1200	A
8	031	1220	A
10	033	1225	A
5	014	1300	A
5	016	1300	A
3	006	1400	A
8	029	1501	A
6	020	1501	AA
8	030	2001	A
8	030	3001	A

001
(ENTRY POINT A)

BEFORE STARTING - RECORD ANY SYMPTOMS SUCH AS ERROR MESSAGES OR TRAP DISPLAYS. (SEE THE DIAGNOSTIC USER GUIDE 0001 FOR A DESCRIPTION OF ERROR LOG DISPLAY AND TRAP DATA DISPLAY)

1. REFER TO NOTE 1.
2. POWER OFF CPU AND I/O UNITS (ENSURE CUSTOMER IS NOT USING 'SHARED' I/O UNITS).
3. SET THE DISPLAY BRIGHTNESS CONTROL (ON FRONT OF PROCESSOR) IN THE CENTER OF ITS ADJUSTMENT RANGE.
4. POWER ON ALL ATTACHED I/O UNITS, THEN POWER ON THE CPU.
5. AFTER YOU POWER ON THE SYSTEM, LOOK AND LISTEN FOR THE (STEP 001 CONTINUES)

NOTE 1 - GENERAL RULES

1. TURN POWER OFF BEFORE REMOVING OR REPLACING PARTS.
2. BEFORE REPLACING ANY CABLE, SEE THE CABLE FIGURE IN THE SERVICE MANUAL AND CHECK THE CABLE FOR CONTINUITY OF THE LEADS OR SHORT CIRCUIT BETWEEN THE LEADS. REPAIR THE CABLE IF POSSIBLE.
3. AFTER A REPAIR HAS BEEN MADE, ENSURE THAT THE FOLLOWING RULES ARE OBSERVED:
 - (A) RECONNECT ANY CABLES OR PARTS THAT WERE DISCONNECTED (ENSURE THAT THE CABLES ARE TIED AND LAYING IN THEIR CORRECT POSITIONS. (SEE SM 1200 AND 1215)).

(STEP 001 CONTINUES)

2

START MAP

|
|
|
|

PAGE 3 OF 10

005

THE DISPLAY IS NOT NORMAL IF ANY OF THE FOLLOWING CONDITIONS OCCUR:

- (A) DISPLAY LINES NOT STRAIGHT, DISTORTED.
- (B) CHARACTERS NOT DISTINCT, OUT OF FOCUS.
- (C) CHARACTER WIDTH NOT CONSTANT FROM THE LEFT TO RIGHT SIDE OF THE SCREEN.
- (D) CHARACTER HEIGHT NOT CONSTANT FROM TOP TO BOTTOM OF THE DISPLAY.
- (E) RASTER IS DECREASED IN SIZE.
- (F) RASTER IS OUT OF SYNC.
- (G) DISPLAY CONTAINS WIDE HORIZONTAL BARS SIMILAR TO A TELEVISION SET WITH THE HORIZONTAL HOLD OUT OF ADJUSTMENT.
- (H) EXTRA OR MISSING DOTS IN THE CHARACTERS.
- (I) WRONG CHARACTERS DISPLAYED.
- (J) DISPLAY NOT ALIGNED CORRECTLY ON THE FACE OF THE CRT.

IS THE DISPLAY NORMAL?

Y N

|
| 006
| GO TO THE DISPLAY MAP
| GO TO MAP 1400, ENTRY POINT A.
|

007

IS A FLASHING CURSOR DISPLAYED ON THE SCREEN?

Y N

|
| 008
| 1. REPLACE THE CPU PLANAR BOARD
| (SEE SM 1230).
| 2. VERIFY REPAIR
|
|
|
|
|

18AUG81 PN6841656

EC994445 PEC987896

B
3

SYSTEM 23

MAP 1000-4

START MAP

PAGE 4 OF 10

009

IS THE CUSTOMER REPORTED SYMPTOM
'TRAP' ERRORS?

Y N

010

(ENTRY POINT C)

1. PLACE THE DIAGNOSTIC DISKETTE PN 6841645 IN DRIVE 1, 2, 3 OR 4 AND CLOSE THE LEVER.
2. IF DRIVES 3 OR 4 ARE BEING USED TO LOAD THE DIAGNOSTICS AND THEY ARE SHARED WITH ANOTHER PROCESSOR, POWER DOWN THE OTHER PROCESSOR.
3. PRESS AND HOLD 'CMD' AND PRESS 'TEST'. THEN PRESS AND HOLD 'CMD' AND PRESS 'ERROR RESET'.
4. WHEN THE MESSAGE 'SELECT DRIVE (1-4)' APPEARS AT THE TOP OF THE CRT, ENTER '1' OR '2' TO SELECT ONE OF THE INTERNAL DRIVES, '3' OR '4' TO SELECT ONE OF THE EXTERNAL DRIVES.
5. AFTER THE DRIVE IS SELECTED, ANSWER WITH A '0' (NO) RESPONSE FOR EACH MESSAGE THAT APPEARS AT THE TOP OF THE CRT UNTIL 'LOAD DCP?' APPEARS. THEN ENTER A '1' (YES) RESPONSE.

DOES THE DCP PROGRAM LOAD
CORRECTLY (DCP MENU DISPLAYED)

?

Y N

--NOTE-- IF, WHILE EXECUTING DISKETTE RESIDENT DIAGNOSTICS, THE PROGRAMS APPEAR TO 'HANG' OR 'BLOW UP' IN AN UNEXPECTED WAY, I/O FEATURE CARDS MAY BE CAUSING THE FAILURE. REMOVAL OF I/O FEATURE CARDS WILL ISOLATE THIS TYPE OF FAILURE (SEE SM 1205 AND 1230).

18AUG81 PN6841656

EC994445 PEC987896

8 7 5

C D E

MAP 1000-4

E
4

SYSTEM 23

MAP 1000-5

START MAP

PAGE 5 OF 10

011

IS THE MESSAGE 'ROUTINE 0D STATUS
XX' DISPLAYED?

-NOTE- IF DRIVE 3 OR 4 IS
SELECTED AND THESE DRIVES ARE
SHARED WITH ANOTHER PROCESSOR, IT
MAY TAKE UP TO 4 MINUTES FOR THE
'ROUTINE 0D STATUS XX' MESSAGE TO
BE DISPLAYED.

Y N

012

DOES A 'TRAP' OCCUR JUST AFTER
THE 'CMD' AND 'ERROR RESET'
KEYS ARE PRESSED?

Y N

013

ARE FEATURE CARDS OTHER THAN
DISKETTE PRESENT IN THE
SYSTEM (SEE SM 1205 AND
1230)?

Y N

014

GO TO KEYBOARD MAP
GO TO MAP 1300,
ENTRY POINT A.

015

1. POWER DOWN.
2. REMOVE ALL FEATURE CARDS
(EXCEPT DISKETTE).
3. POWER UP AND ATTEMPT TO
LOAD DCP.

DOES DCP LOAD OK?

Y N

016

GO TO KEYBOARD MAP
GO TO MAP 1300,
ENTRY POINT A.

18AUG81 PN6841656

EC994445 PEC987896

6 6 6
F G H

MAP 1000-5

START MAP

PAGE 6 OF 10

| | 017
| | RECONNECT FEATURE CARDS ONE
| | AT A TIME UNTIL THE FAILING
| | CARD IS IDENTIFIED (SEE SM
| | 1205 AND 1230).

| | 018
| CHECK TO SEE IF JUMPER 'C3' IS
| PRESENT ON THE CPU PLANAR BOARD
| (SEE SM 1230).

- | 1. IF THE JUMPER IS PRESENT,
| REMOVE IT AND RETURN TO STEP
| 001 OF THIS MAP.
|
| 2. IF THE JUMPER IS NOT
| PRESENT, REPLACE THE CPU
| PLANAR BOARD (SEE SM 1230).

| 019
| IS THE ROUTINE 0D STATUS 'FB'?
| Y N

| | 020
| |
| GO TO MAP 1501, ENTRY POINT AA.

| 021
| STATUS 'FB' INDICATES THAT THE
| DCP PROGRAM WAS NOT FOUND ON THE
| DISKETTE. ENSURE THAT A C.E.
| DISKETTE IS INSTALLED IN THE
| SELECTED DRIVE. IF A C.E.
| DISKETTE IS INSTALLED, REPLACE:

1. C.E. DISKETTE.
 2. DISKETTE ATTACHMENT CARD (SEE
SM 1511 AND 1205).
 3. CPU PLANAR BOARD (SEE SM
1230).
- GO TO PAGE 4, STEP 010,
ENTRY POINT C.

18AUG81 PN6841656

EC994445 PEC987896

D
4

SYSTEM 23

MAP 1000-7

START MAP

PAGE 7 OF 10

022

DO THE CUSTOMER REPORTED SYMPTOMS
POINT TO A SPECIFIC UNIT?

Y N

023

GO TO PAGE 9, STEP 032,
ENTRY POINT B.

024

IS THE REPORTED CUSTOMER SYMPTOM
A PRINTER PROBLEM?

Y N

025

IS THE REPORTED CUSTOMER
SYMPTOM A DISKETTE PROBLEM?

Y N

026

VERIFY CORRECT MACHINE
CONFIGURATION (RUN PID 0150
UNDER DCP OPTION 18). IF
CONFIGURATION IS WRONG, GO TO
MAP 1150. IF OK, SELECT AND
RUN THE PROGRAM FOR THE
SUSPECT UNIT.

(IF YOU ARE NOT POSITIVE
ABOUT WHICH ROUTINES TO RUN,
GO TO THE MAP ENTRY POINT
GIVEN FOR DIRECTIONS)

UNIT	PID	MAP	ENTRY POINT
PROCESSOR	1205	1205	A
CPU STORAGE	1210	1210	A
UPDATE STORAGE	1212	----	-
(SEE NOTE 2 BELOW)			
KEYBOARD	1300	1300	A
DISPLAY	1400	1400	A
PRINTER(5241)	2300	2001	A
PRINTER(5242)	2300	3001	A
COMMUNICATION	5000	----	-
FEATURES/RPQ'S (SEE NOTE 2)			

(STEP 026 CONTINUES)

18AUG81 PN6841656

EC994445 PEC987896

8 8
J K

MAP 1000-7

J K
7 7

SYSTEM 23

C
4

MAP 1000-8

START MAP

PAGE 8 OF 10

(STEP 026 CONTINUED)

NOTE 2: USE DCP OPTION '10'.
SEE DIAGNOSTIC USERS GUIDE
0001, FOR THE FEATURE/RPQ IN
QUESTION, TO DETERMINE THE
PID NUMBER AND MAP ENTRY
POINT FOR THE FEATURE/RPQ
DIAGNOSTIC PROGRAM.

WAS AN ERROR FOUND OR SHOWN
BY THE PROGRAM?

Y N

027

RETURN TO THE DCP BY
ENTERING 'ATTN-9' UNTIL THE
DCP MENU IS DISPLAYED.

GO TO PAGE 9,
STEP 032,
ENTRY POINT B.

028

GO TO THE MAP ASSOCIATED WITH
THE FAILING PROGRAM.
(SEE TABLE IN THE PRECEDING
STEP FOR ENTRY POINTS).

029

GO TO MAP 1501, ENTRY POINT A.

030

5241 PRINTER
GO TO MAP 2001, ENTRY POINT A.

5242 PRINTER
GO TO MAP 3001, ENTRY POINT A.

FOR OTHER PRINTER ATTACHED, GO TO
THE ENTRY MAP OF THAT PRINTER.

031

GO TO THE TRAP MAP.
GO TO MAP 1220, ENTRY POINT A.

18AUG81 PN6841656

EC994445 PEC987896

MAP 1000-8

START MAP

PAGE 9 OF 10

032

(ENTRY POINT B)

1. RUN ALL DIAGNOSTIC PROGRAMS IN THE SEQUENCE SHOWN BELOW. (SEE THE MAP ENTRY POINT GIVEN FOR THE SPECIFIC SEQUENCE OF ROUTINES TO BE RUN.)
2. IF AN ERROR IS FOUND DURING THE PROGRAM RUN, GO TO THE ASSOCIATED MAP SHOWN.

UNIT	PID	MAP	ENTRY POINT
KEYBOARD	1300	1300	A
CONFIGURATION DISPLAY (SEE NOTE 3 BELOW)	0150	1150	A
PROCESSOR	1205	1205	A
CPU STORAGE	1210	1210	A
UPDATE STORAGE (SEE NOTE 4)	1212	----	-
DISKETTE (ALL DRIVES) (RUN SECTIONS 1 AND 2 ONLY)	1505	1501	AA
DISKETTE (ALL DRIVES)	1510	1501	DD
DISKETTE (51TD) (RUN 1510 USING A 2D DISKETTE)	1510	1500	G
DISKETTE (DRIVE 3/4) (SEE NOTE 5)	1500	1501	AA
PRINTER (5241)	2300	2001	B
PRINTER (5242)	2300	3001	B
DISPLAY	1400	1400	A
COMMUNICATION FEATURES/RPQ'S (SEE NOTE 4)	5000	----	-

NOTE 3: TO RUN PID 0150
(CONFIGURATION DISPLAY)
DCP OPTION 18 MUST BE
SELECTED.

(STEP 032 CONTINUES)

18AUG81 PN6841656

EC994445 PEC987896

MAP 1000-9

START MAP

PAGE 10 OF 10

(STEP 032 CONTINUED)

NOTE 4: USE DCP OPTION '10'. SEE DIAGNOSTIC USERS GUIDE 0001, FOR THE FEATURE/RPQ IN QUESTION, TO DETERMINE THE PID NUMBER FOR THE FEATURE/RPQ DIAGNOSTIC PROGRAM.

NOTE 5: IF DRIVES #3 AND #4 ARE SHARED, POWER DOWN BOTH PROCESSORS ATTACHED TO THE SHARED DISKETTE FILE. INSERT THE DIAGNOSTIC DISKETTE IN DRIVE 3/4. POWER UP BOTH PROCESSORS, SELECT PID 1500 (ROS RESIDENT DISKETTE TEST) AND EXECUTE PID 1500 IN LOOP MODE ON BOTH PROCESSORS. SEE DIAGNOSTIC USER GUIDE 0001, FOR OPERATING INSTRUCTIONS.

WAS AN ERROR FOUND BY THE PROGRAM(S)?

Y N

|

| 033

| NO ERROR FOUND. FAILURE MAY BE
| INTERMITTENT. GO TO
| INTERMITTENT MAP.

| GO TO MAP 1225, ENTRY POINT A.

|

034

GO TO THE MAP ASSOCIATED WITH THE
FAILING PROGRAM.

18AUG81 PN6841656

EC994445 PEC987896

MAP 1000-10

INITIAL FAILURE

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

3	008	1200	B
1	003	1250	A
2	006	1250	A
4	023	1400	A
4	025	1400	A

001
(ENTRY POINT A)

DOES THE AUDIBLE ALARM SOUND
INSIDE OF 30 SECONDS AFTER
TURNING POWER ON?

Y N

- 002
1. REMOVE THE REAR COVER
(ACCESS PANEL) LOCATED AT
THE REAR OF THE CPU UNIT.
(SEE SM 1220).
 2. POWER ON.
 3. OBSERVE THE 'POWER GOOD' LED
LOCATED AT THE REAR OF THE
POWER SUPPLY. (IF LED IS
LIGHTED, +5, -5, +12, -12V
DC ARE ALL OK. DOES NOT
INCLUDE +24V DC.). (SEE SM
1240).

IS THE LED LIGHTED?

Y N

- 003
- GO TO POWER MAP
 - GO TO MAP 1250,
 - ENTRY POINT A.

COPYRIGHT IBM CORP 1981

14AUG81 PN6841651

EC994445 PEC987896

1 INITIAL FAILURE

| PAGE 2 OF 4

004

1. PUT THE CPU PLANAR BOARD IN THE SERVICE POSITION. (SEE SM 1230).

2. USING THE CE LOGIC PROBE, READ THE CE REGISTER TEST PINS ON THE CPU PLANAR BOARD. RECORD RESULTS. (SEE SM 1230 FOR LOCATIONS.) (SEE NOTE 1.)

NOTE 1
GENERAL LOGIC PROBE SET UP
(SEE SM 1230)

- A) TECHNOLOGY SWITCH = MULTI
- B) LATCH SWITCH = NONE
- C) GATE REF. SWITCH = GND
- D) POWER LEAD (BLACK) = GND
- E) POWER LEAD (RED) = +5V
- F) PROBE GROUND LEAD = GND
- G) TEST 'UP' LIGHT = +5V
- H) TEST 'DOWN' LIGHT = GND

ARE THE CE REGISTER TEST PINS EQUAL TO A HEX VALUE OF '01' TO '06'? (IF THE CE REGISTER TEST PINS HAVE 'PULSING' SIGNALS, ANSWER THE QUESTION 'NO'.)

Y N

| 005
| MEASURE THE DC VOLTAGES AT THE CPU PLANAR BOARD CONNECTOR P4 (SEE SM 1211 AND 1230 FOR LOCATIONS AND VOLTAGES).

| ARE ALL VOLTAGES CORRECT?

| Y N

| | 006
| | GO TO POWER MAP
| | GO TO MAP 1250,
| | ENTRY POINT A.

| 007
| 1. REPLACE CPU PLANAR BOARD (SEE SM 1230).

| 2. VERIFY REPAIR.
| -NOTE- IF PROBLEM REMAINS AFTER REPLACEMENT OF PLANAR BOARD, SEE NOTE 1, PAGE 2, MAP 1200.

14AUG81 PN6841651

EC994445 PEC987396

A C

SYSTEM 23

E

MAP 1100-3

1 2

INITIAL FAILURE

PAGE 3 OF 4

008

RECORD ERROR CODE AND GO TO THE POWER ON TEST MAP. GO TO MAP 1200, ENTRY POINT B.

009

ENSURE THAT THE OPERATOR 'BRIGHTNESS' CONTROL IS SET AT THE CENTER OF ITS ADJUSTMENT RANGE.

IS IT CORRECT?

Y N

010

ADJUST THE BRIGHTNESS CONTROL. DID THE ADJUSTMENT CORRECT THE PROBLEM?

Y N

011

GO TO STEP 013, ENTRY POINT B.

012

PROBLEM CORRECTED. VERIFY REPAIR.

013

(ENTRY POINT B)

IS THE CRT SIGNAL CABLE CONNECTED DIRECTLY INTO THE CPU PLANAR BOARD? (NO COMPOSITE VIDEO RPQ AND/OR WORD PROCESSING SUPPORT CARD PRESENT.) (SEE SM 1230 AND 1205).

Y N

4

D E

014

1. REMOVE THE CABLE CONNECTING THE COMPOSITE VIDEO RPQ AND/OR THE WORD PROCESSING SUPPORT CARD TO THE CPU PLANAR BOARD (SEE SM 1205, 1230 AND 1212).

2. REMOVE THE CRT SIGNAL CABLE CONNECTOR FROM THE COMPOSITE VIDEO RPQ CARD AND/OR THE WORD PROCESSING SUPPORT CARD AND CONNECT IT INTO THE CPU PLANAR BOARD CRT SIGNAL CABLE SOCKET (SEE SM 1205 AND 1230).

DOES THE CRT NOW WORK CORRECTLY?

Y N

015

GO TO PAGE 4, STEP 017, ENTRY POINT C.

016

1. REPLACE THE COMPOSITE VIDEO RPQ CARD (SEE SM 1205 AND 1230).

2. REPLACE THE WORD PROCESSING CARD OR CABLE (SEE SM 1205 AND 1230 FOR CARD AND 1212 FOR CABLE).

3. VERIFY REPAIR.

14AUG81 PN6841651

EC994445 PEC987896

MAP 1100-3

D SYSTEM 23
3 INITIAL FAILURE
PAGE 4 OF 4

F G H MAP 1100-4

017
(ENTRY POINT C)

USING THE CE LOGIC PROBE, PROBE
THE HORIZONTAL, VERTICAL, AND
VIDEO SIGNALS IN THE CRT SIGNAL
CABLE CONNECTOR AT THE CRT END,
PINS F, J AND K. (SEE SM 1411
FOR LOCATIONS).
(SEE NOTE 1 ON PAGE 2 OF THIS
MAP)

ARE ALL LINES PULSING?

Y N

018
DISCONNECT CRT SIGNAL CABLE AT
THE CRT END AND PROBE THE SAME
SIGNALS AT THE CRT END OF THE
CABLE.

ARE ALL LINES PULSING?

Y N

019
DISCONNECT THE CRT SIGNAL
CABLE FROM THE CPU PLANAR
BOARD AND PROBE THE SAME
SIGNALS ON THE CPU CRT SIGNAL
CABLE JACK (SEE SM 1212 FOR
LOCATIONS).

ARE ALL LINES PULSING?

Y N

020
1. REPLACE CPU PLANAR BOARD
(SEE SM 1230).

2. VERIFY REPAIR.

-NOTE- IF PROBLEM REMAINS
AFTER REPLACEMENT OF PLANAR
BOARD, SEE NOTE 1, PAGE 2,
MAP 1200.

	021

| | 1. REPAIR/REPLACE CRT SIGNAL
| | CABLE (SEE SM 1411)

| | 2. VERIFY REPAIR.

| | 022

| OBSERVE THE FILAMENT ON THE
| CRT.

| IS IT LIGHTED?

| Y N

| | 023

| | GO TO THE DISPLAY MAP.

| | GO TO MAP 1400,

| | ENTRY POINT A.

| | 024

| REPLACE CRT DISPLAY UNIT. (SEE
| SM 1430).

| 025

GO TO THE DISPLAY MAP.

GO TO MAP 1400, ENTRY POINT A.

14AUG81 PN6841651

EC994445 PEC987896

F G H

MAP 1100-4

CONFIGURATION DISPLAY

PAGE 1 OF 4

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1000	A	1	001
1210	A	1	001
2025	A	1	001
3025	A	1	001

EXIT POINTS

EXIT THIS MAP TO			
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	021	1501	EE
2	007	2001	D
2	007	3001	D

001
(ENTRY POINT A)

RUN PID 0150 TO DISPLAY MACHINE CONFIGURATION. CHECK THE MACHINE HISTORY AND VERIFY THAT THE CONFIGURATION DISPLAYED IS CORRECT.

IS THE CONFIGURATION CORRECT?

Y N

|
| 002
| IS THE STORAGE CONFIGURATION
| CORRECT?

| Y N

| | 003
| | CHECK THE SEATING OF THE
| | STORAGE CARDS (SEE SM 1230).

| | ARE THE CARDS SEATED
| | CORRECTLY?

| | Y N

| | 004
| | SEAT CARDS AND VERIFY
| | REPAIR.

| | | COPYRIGHT IBM CORP 1981

14AUG81 PN6841633

EC994445 PEC987896

4 2 2
A B C

F G H
2 2 2

SYSTEM 23

MAP 1150-3

CONFIGURATION

PAGE 3 OF 4

018

CORRECT JUMPERING AND VERIFY
REPAIR

019

REPLACE CPU PLANAR BOARD (SEE
SM 1230).

020

IS THE DISKETTE CONFIGURATION
CORRECT?

Y N

-NOTE- IF THE EXTERNAL DRIVES (3
AND 4) ARE SHARED WITH ANOTHER
PROCESSOR, CONFIGURATION RESULTS
ARE NOT RELIABLE IF THE OTHER
PROCESSOR IS USING THE EXTERNAL
DRIVES. IF THIS OCCURS, POWER
DOWN THE OTHER PROCESSOR AND RUN
PID 0150 AGAIN.

021

GO TO MAP 1501, ENTRY POINT EE.

022

IS THE '2ND PRINTER PORT'
INFORMATION CORRECT?

Y N

023

CHECK SEATING OF 2ND PRINTER
PORT ATTACHMENT CARD. IF OK,
REPLACE:

1. DISKETTE ATTACHMENT CARD
(SEE SM 1205 AND 1511).

2. CPU PLANAR BOARD (SEE SM
1230).

3. VERIFY REPAIR.

024

IS THE 'PRINTER ATTACHED TO 2ND
PRINTER PORT' INFORMATION
CORRECT?

Y N

14AUG81 PN6841633

EC994445 PEC987896

4 4
J K

MAP 1150-3

A J K
1 3 3

SYSTEM 23

MAP 1150-4

CONFIGURATION

PAGE 4 OF 4

025

GO TO PAGE 2, STEP 007,
ENTRY POINT C.

026

IS THE COMMUNICATIONS
ATTACHMENT INFORMATION CORRECT?

Y N

027

CHECK SEATING OF
COMMUNICATIONS ATTACHMENT
CARD. IF OK, REPLACE:

1. DISKETTE ATTACHMENT CARD
(SEE SM 1205 AND 1511).
2. CPU PLANAR BOARD (SEE SM
1230).
3. VERIFY REPAIR.

028

GO TO STEP 029,
ENTRY POINT B.

029

(ENTRY POINT B)

NO PROBLEM WITH THE
CONFIGURATION. RETURN TO THE MAP
THAT SENT YOU HERE.

14AUG81 PN6841633

EC994445 PEC987896

MAP 1150-4

POWER-ON RESET

PAGE 1 OF 13

ENTRY POINTS

```

-----
FROM | ENTER THIS MAP
-----+-----
MAP  | ENTRY PAGE  STEP
NUMBER| POINT NUMBER NUMBER
-----+-----
1000 |  A     1     001
1100 |  B     2     008
1201 |  B     2     008

```

001
(ENTRY POINT A)

IS THE CUSTOMER SYMPTOM 'SYSTEM WORKS OK BUT AUDIBLE ALARM DOES NOT SOUND'?

Y N

|
| 002
| (ENTRY POINT C)

| DOES THE DISPLAY SHOW THE
| POWER-ON DIAGNOSTIC ROUTINE
| RESULTS INDICATORS AT THE TOP
| OF THE DISPLAY? (IF THE TEST
| APPEARS TO BE 'LOOPING', ANSWER
| 'NO'.) (SEE DIAGNOSTIC USER
| GUIDE 0001, PID 1200, FOR
| DESCRIPTION OF POR RESULTS
| INDICATORS.)

| Y N

| | 003
| | FIRST TIME AT THIS STEP?

| | Y N

| | | 004
| | | REPLACE:
| | | 1. STORAGE CARD(S).
| | | 2. CPU PLANAR BOARD (SEE SM
| | | 1230).

-JAPAN ONLY- IF THE 'JAPAN'
COUNTRY SELECT JUMPER IS
INSTALLED (SEE SM 1230), A
NUMERIC '1' WILL BE DISPLAYED AS
A 'P' CHARACTER DURING THE POWER
ON ROUTINES IF A PRINTER IS NOT
ATTACHED TO THE SYSTEM.

B C
1 1

SYSTEM 23

MAP 1200-2

POWER-ON RESET

PAGE 2 OF 13

005

1. POWER OFF AND SEE NOTE----->
2. PLACE 'STOP ON ERROR' JUMPER ON THE CPU PLANAR BOARD (SEE SM 1230 FOR JUMPER LOCATIONS).
3. POWER ON THE CPU.
GO TO PAGE 1, STEP 002,
ENTRY POINT C.

IF EITHER JUMPER A1 (CE LOOP ON TEST) OR A4 (FACTORY TEST) ARE INSTALLED (SEE SM 1230), REMOVE THEM AND RETURN TO MAP 1000, ENTRY POINT A. IF JUMPERS ARE OK, CONTINUE WITH THE NEXT STEP.

006

IS A 'TRAP' MESSAGE DISPLAYED AT THE BOTTOM OF THE DISPLAY?

Y N

007

DID THE POWER ON RESET TEST HANG WITHOUT SHOWING AN ERROR INDICATOR?

Y N

008

(ENTRY POINT B)

COMPARE THE ERROR CODE WITH THOSE SHOWN IN TABLE A AND TAKE THE RECOMMENDED ACTION. IN CASE OF MORE THAN ONE ERROR, USE THE FIRST ERROR TO DETERMINE THE REPAIR ACTION.

NOTE 1: IF THE FAILURE IS STILL PRESENT AFTER REPLACING THE RECOMMENDED FRU, THE CPU BOARD OR ANOTHER FRU PLUGGED INTO THE CPU BOARD MAY BE CAUSING THE PROBLEM. CARD EXCHANGE IS THE RECOMMENDED PROCEDURE TO CORRECT THIS TYPE OF FAILURE. ALSO MEASURE THE DC VOLTAGES AT THE CPU PLANAR BOARD (P4). (SEE SM 1211, 1230, 1205). IF A VOLTAGE IS WRONG, GO TO MAP 1250. IF VOLTAGE IS ALL RIGHT, AND CARD REPLACEMENT HAS NOT SOLVED THE PROBLEM, GO TO MAP 1225 AND PERFORM CHECKS RECOMMENDED IN THAT MAP.

CAUTION

POWER DOWN BEFORE REMOVING/REPLACING CARDS OR CABLES.

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

1 1
3 2
D E

MAP 1200-2

POWER-ON RESET

PAGE 3 OF 13

(STEP 008 CONTINUED)

TABLE A

```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*      CODE      *      REPAIR ACTION      *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*      *      *
*      *      * FAILURE IN CPU INSTRUCTIONS, REGISTERS, FLAGS OR *
*      *      * DATA AND ADDRESS BUSES. CHECK TO ENSURE THAT +5 *
*      *      * VOLTS (+/- 10%) IS PRESENT ON CPU PLANAR BOARD *
*      *      * (SEE SM 1230). IF OK, REMOVE ALL CARDS (SM 1205 *
*      *      * AND 1230) AND CABLES (EXCEPT POWER) FROM THE CPU *
*      *      * PLANAR BOARD AND RUN THE TEST AGAIN. IF THE ERROR*
*      *      * CODE CHANGES, START REINSTALLING CARDS ONE AT A *
*      *      * TIME TO ISOLATE THE FAILING FRU. IF THE ERROR *
*      *      * CODE REMAINS THE SAME, REPLACE THE CPU PLANAR *
*      *      * BOARD (SEE SM 1230). IF PROBLEM NOT FIXED, SEE *
*      *      * NOTE 1, PAGE 2, THIS MAP. *
*      *      *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*      *      *
*      *      * CRC ERROR IN FIRST ROS MODULE. ISOLATE AS DE- *
*      *      * SCRIBED IN ERROR '01'. IF ERROR CODE DOES NOT *
*      *      * CHANGE, REPLACE CPU PLANAR BOARD (SEE SM 1230). *
*      *      * IF THE ERROR CODE CHANGES, RECONNECT CARDS UNTIL *
*      *      * FAILURE IS ISOLATED. IF PROBLEM NOT FIXED, SEE *
*      *      * NOTE 1, PAGE 2, THIS MAP. *
*      *      *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*      *      *
*      *      * RESERVED: IF THIS ERROR CODE IS FOUND IN THE *
*      *      * CE REGISTER TEST POINTS REPLACE CPU PLANAR BOARD *
*      *      * (SEE SM 1230). *
*      *      *
*      *      *
*      *      *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

(STEP 008 CONTINUES)

POWER-ON RESET

(STEP 008 CONTINUED)

```

*****
*           *
*           *
*           *
* 04        * FAILURE IN FIRST 16K BLOCK OF BASE STORAGE OR IN *
*           * STORAGE SUPPORT CIRCUITS ON CPU PLANAR BOARD. *
*           * EXCHANGE THE BASE STORAGE CARD. IF THE PROBLEM *
*           * IS NOT CORRECTED, THEN REPLACE THE CPU PLANAR *
*           * BOARD (SEE SM 1230). IF PROBLEM NOT FIXED, SEE *
*           * NOTE 1, PAGE 2, THIS MAP. *
*           *
*           *
*****
*           *
*           *
* 05        * CANNOT INITIALIZE AND SYNC. THE CRT AND DMA *
*           * CONTROLLERS. REPLACE: 1) CPU PLANAR BOARD (SEE *
*           * SM 1230), 2) STORAGE CARD CONTAINING THE FIRST *
*           * 16K OF READ/WRITE STORAGE (BASE STORAGE), 3) CRT *
*           * ASSEMBLY (SEE SM 1430). IF PROBLEM NOT FIXED, *
*           * SEE NOTE 1, PAGE 2, THIS MAP. *
*           *
*           *
*****
*           *
*           *
* 06 (LATCHES) * FAILURE IN CRT INTERFACE LINES (HORIZONTAL, *
* 07 (ON CRT)  * VERTICAL, OR VIDEO). DISCONNECT CRT CABLE AT THE *
*           * CPU END. RUN TEST AGAIN. IF TEST ENDS WITHOUT *
*           * ERROR (AN AUDIBLE ALARM AFTER APPROXIMATELY 30-45 *
*           * SECONDS INDICATES CORRECT ENDING), AFTER *
*           * REMOVING THE CRT CABLE, REPLACE: 1) CRT ASSEMBLY *
*           * (SEE SM 1430), 2) CRT CABLE. *
*           * IF TEST FAILS AT ERROR '06' IN THE CE LATCHES, *
*           * WITH THE CRT CABLE REMOVED, REPLACE THE CPU *
*           * PLANAR BOARD (SEE SM 1230). IF PROBLEM NOT *
*           * FIXED, SEE NOTE 1, PAGE 2, THIS MAP. *
*           *
*           *
*****
*           *
* 08        * FAILURE IN PAGE REGISTERS. REPLACE CPU PLANAR *
*           * BOARD (SEE SM 1230). IF PROBLEM NOT FIXED, *
*           * SEE NOTE 1, PAGE 2, THIS MAP. *
*           *
*           *
*****

```

(STEP 008 CONTINUES)

POWER-ON RESET

(STEP 008 CONTINUED)

```

*****
*
* 09 * CRC FAILURE IN ROS. REPLACE CPU PLANAR BOARD, *
* THROUGH * PATCH MODULE, OR CO-PLANAR (SEE CHART BELOW). IF *
* 19 * NOT REPAIRED, SEE NOTE 1, PAGE 2, THIS MAP. *
*
* ** TOP VIEW OF PLANAR SEEN FROM THE REAR ** *
*
* | ===== | ===== | <-- NOT FOUND ON | *
* | | 10 | | 11 | | <-- SOME EARLY | *
* | =3=40= | =3=60= | | <-- MACHINES | *
*
* | ===== | ===== | | *
* | | 19 | | 0D | | | *
* | =7=60= | =1=60= | | | *
*
* | ===== | ===== | *
* | =PATCH= | ===== | * PHYSICAL LOCATION *
* | | 18 | | 0C | | * OF ROS MODULES *
* | =7=40= | =1=40= | | * FOR EACH ERROR CODE *
* | ===== | ===== | *
* | | 17 | | 0B | | -KEY- *
* | =6=60= | =0=60= | | ===== *
* | ===== | ===== | | | XX | *
* | | 16 | | 0A | | =Y=ZZ= *
* | =6=40= | =0=40= | | XX=POD ERROR CODE *
* | ===== | ===== | | Y=ROS PAGE VALUE *
* | | 15 | | 09 | | ZZ=HIGH ORDER BYTE OF *
* | =5=60= | =0=20= | | FIRST ADDRESS IN *
* | ===== | ===== | | ROS MODULE. *
* | | 14 | | 02 | | --- (CABLE) --- *
* | =5=40= | =0=00= | | | 09 | | CO-PLANAR *
* | ===== | ===== | | =0=20= | | BOARD. *
* | | 13 | | | | ===== | | (FOUND ON *
* | =4=60= | | | | | SOME EARLY *
* | ===== | ===== | | | 10 | | MACHINES.) *
* | | 12 | | | | =3=40= | *
* | =4=40= | | | | | ===== *
* | ===== | ===== | | | 11 | | *
* | | 11 | | | | =3=60= | *
* | ===== | ===== | | | *
*****

```

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

POWER-ON RESET

(STEP 008 CONTINUED)

```

*****
*           *
*           * CRC FAILURE IN ROS LOCATED ON I/O FEATURE CARDS. *
*           * (ASSIGNMENT OF ROS SPACE SPECIFIED BY THESE *
*           * NUMBERS IS NOT SPECIFIED AT THIS TIME.) IF ONE OF*
*           * THESE INDICATORS SHOWS AN ERROR, REMOVE ALL I/O *
*           * CARDS (SM 1205) AND RUN THE POWER ON TEST AGAIN. *
*           * IF AN ERROR IS STILL PRESENT, REPLACE THE CPU *
*           * PLANAR BOARD (SEE SM 1230). IF THE FAILURE *
*           * DISAPPEARS, PLUG FEATURE CARDS TO FIND THE *
*           * FAILING FRU. IF PROBLEM REMAINS, SEE NOTE 1, *
*           * PAGE 2, THIS MAP. *
*****
*           *
*           * CRC FAILURE IN ROS ON SECOND PRINTER ATTACHMENT *
*           * FEATURE. REPLACE FEATURE. IF PROBLEM REMAINS, *
*           * SEE NOTE 1, PAGE 2, THIS MAP. *
*****
*           *
*           * SEE REPAIR INFORMATION ASSOCIATED WITH CODES *
*           * AND * 1A THROUGH 26, LOCATED IN THIS MAP. *
*           * 28 *
*           * 29 *
*****

```

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

POWER-ON RESET

(STEP 008 CONTINUED)

* * FAILURE IN STORAGE. SEE THE FOLLOWING TABLE *
* * FOR FAILING FRU. (SEE SM 1230 FOR LOCATIONS). *
* * * * *

2A
THROUGH
30

STORAGE CONFIGURATION			
(32K X 1), (32K X 2)		(64K X 1)	
(64K + 32K), OR (64K X 2)			
TEST	BASE STORAGE	FEATURE STORAGE	BASE STORAGE
2A	X		X
2B		X	X
2C		X	X
2D	X		
2E	X		
2F		X	
30		X	

* * REPLACE FAILING STORAGE CARD. (ENSURE JUMPERS *
* * ARE CORRECT ON 64K CARD IF REPLACED.) IF PROBLEM *
* * NOT FIXED, REPLACE: 1) CPU PLANAR BOARD, 2) ANY *
* * OTHER STORAGE CARDS (IF PRESENT). THE FOLLOWING *
* * TABLE DESCRIBES VALID STORAGE CONFIGURATIONS: *
* * * * *

STORAGE SIZE-->	32K	64K	* 64K	** 96K	** 128K
BASE	32K	32K	64K	64K	64K
FEATURE	---	32K	---	32K	64K

* * 64K STORAGE CARD JUMPERS *
* * * (64K TOTAL) | ** (96K & 128K) *
* * JUMPERS #1 AND #3 | JUMPERS #2 AND #4 *
* * * * *

* * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
* * THIS MAP. *
* * * * *

(STEP 008 CONTINUES)

POWER-ON RESET

PAGE 8 OF 13

(STEP 008 CONTINUED)

```
*****
*                               *
*      31      * READ/WRITE STORAGE PAGE ACCESS FAILURE.      *
*                               * REPLACE: 1) CPU PLANAR BOARD (SEE SM 1230). *
*                               * 2) READ/WRITE STORAGE CARD(S). IF PROBLEM NOT *
*                               * FIXED, SEE NOTE 1, PAGE 2, THIS MAP. *
*                               *
*****
*                               *
*      32      * DMA PAGE REGISTER FAILURE. REPLACE CPU PLANAR *
*                               * BOARD (SEE SM 1230). IF PROBLEM NOT FIXED, *
*                               * SEE NOTE 1, PAGE 2, THIS MAP. *
*                               *
*****
```

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

POWER-ON RESET

(STEP 008 CONTINUED)

```

*****
*
* 33      * INTERRUPT CONTROLLER FAILURE. REPLACE CPU PLANAR *
*          * BOARD (SEE SM 1230).                               *
*          *
*          * IF THIS TEST FINDS A 'HOT' INTERRUPT, THE        *
*          * SYSTEM WILL STOP WITH THE LEVEL OF THE 'HOT'     *
*          * INTERRUPT DISPLAYED ON THE 4TH LINE FROM THE     *
*          * TOP OF THE SCREEN. USE THE FOLLOWING TABLE TO   *
*          * DETERMINE THE DEVICE CAUSING THE INTERRUPT:     *
*          *
*          * | LEVEL | DEVICE |
*          * -----|-----|
*          * |  0  | KEYBOARD |
*          * -----|-----|
*          * |  1  | PRINTER RECEIVE |
*          * -----|-----|
*          * |  2  | PRINTER TRANSMIT |
*          * -----|-----|
*          * |  3  | NOT ASSIGNED |
*          * -----|-----|
*          * |  4  | DISKETTE |
*          * -----|-----|
*          * |  5  | NOT ASSIGNED |
*          * -----|-----|
*          * |  6  | TP RECEIVE OR PRINTER 2 RECEIVE |
*          * -----|-----|
*          * |  7  | TP TRANSMIT OR PRINTER 2 TRANSMIT |
*          * -----|-----|
*          *
*          * IF THE DEVICE CAUSING THE INTERRUPT IS A PLUG-   *
*          * ABLE CARD, REMOVE THE CARD AND RUN THE TEST     *
*          * AGAIN. IF THE TEST STILL FAILS, REPLACE THE CPU  *
*          * PLANAR BOARD (SEE SM 1230). IF THE TEST RUNS    *
*          * WITHOUT ERROR, REPLACE THE FRU THAT WAS REMOVED. *
*          * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2,      *
*          * THIS MAP.                                       *
*
*****

```

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

POWER-ON RESET

(STEP 008 CONTINUED)

```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*           *
*   34      * TIMER INTERRUPT FAILURE. REPLACE THE CPU PLANAR *
*           * BOARD (SEE SM 1230). IF PROBLEM NOT FIXED, *
*           * SEE NOTE 1, PAGE 2, THIS MAP. *
*           *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
*           *
*           * WRONG KEYBOARD RESPONSE TO A RESET COMMAND. *
*           *
*   35      * 1.CRITICAL ERROR INDICATOR (BLINKING REVERSE *
*           * VIDEO). *
*           * REPLACE: 1) KEYBOARD ASSEMBLY (SEE SM 1330). *
*           * 2) KEYBOARD CABLE ASSEMBLY (SEE SM *
*           * 1320). *
*           * 3) CPU PLANAR BOARD (SEE SM 1230). *
*           *
*           * 2.NOT CRITICAL ERROR INDICATOR (REVERSE VIDEO). *
*           * A KEY INTERRUPT WAS SENSED AFTER THE CORRECT *
*           * RESPONSE TO A RESET (JAMMED DOWN KEY). THE SCAN *
*           * CODE SENSED ON THE 4TH LINE FROM THE TOP OF THE *
*           * CRT IS THE FAILING SCAN CODE. SEE SM 1310 AND *
*           * DETERMINE WHICH KEY IS FAILING. INSPECT THE KEY *
*           * FOR FOREIGN MATERIAL (PAPER CLIPS, ETC.) THAT *
*           * MIGHT BE CAUSING THE JAMMED CONDITION. IF NONE *
*           * ARE FOUND, REPLACE KEYBOARD (SEE SM 1330). *
*           * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
*           * THIS MAP. *
*           *
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

(STEP 008 CONTINUES)

POWER-ON RESET

PAGE 11 OF 13

(STEP 008 CONTINUED)

```

*          * TIMER 0 OR PRINTER ATTACHMENT WRAP FAILED.          *
*          * 1. POWER OFF PROCESSOR.                               *
*          * 2. PLACE THE ATTACHED PRINTER IN WRAP MODE (SEE     *
*          * STEP 1 OF MAP 2025 (5241) OR MAP 3025 (5242)).        *
*          * 3. POWER ON PROCESSOR.                               *
*          * IF TEST 36 FAILS, REPLACE THE CPU PLANAR BOARD      *
*          * (SEE SM 1230). IF TEST 36 RUNS WITHOUT ERROR,      *
*          * GO TO ENTRY POINT A OF MAP 2025 OR 3025.           *
36          * -NOTE- IF THIS TEST AND THE NEXT TEST (37) SHOW    *
*          * A 'FEATURE ABSENT' (UNDERLINE) RESULT AND A        *
*          * PRINTER IS PRESENT ON THE SYSTEM AND POWER IS     *
*          * ON, GO TO THE INDICATED MAP:                        *
*          *          PRINTER      MAP      ENTRY POINT          *
*          *          -----      ---      -----            *
*          *          5241         2001         D                 *
*          *          5242         3001         D                 *
*          * NOTE: FOR OTHER PRINTER ATTACHED, GO TO THE ENTRY*
*          * MAP OF THAT PRINTER. IF PROBLEM IS NOT IN        *
*          * PRINTER THEN REPLACE CPU PLANAR BOARD (SEE      *
*          * SM 1230).                                         *
*          * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2,        *
*          * THIS MAP.                                         *

```

```

*          * THE ATTACHED PRINTER DID NOT RESPOND CORRECTLY    *
*          * TO A DIAGNOSE COMMAND. GO TO THE PRINTER MAP TO    *
*          * ISOLATE THE PROBLEM. -NOTE- THIS ERROR IS         *
*          * NORMAL IF THE PRINTER IS ATTACHED THROUGH A        *
37          * SHARED PRINTER SWITCH AND THE PRINTER IS         *
*          * SWITCHED TO THE 'OTHER' PROCESSOR.                *
*          * ('ERROR RESET' KEY WILL BYPASS THIS ERROR.)       *
*          *          PRINTER      MAP      ENTRY POINT          *
*          *          -----      ---      -----            *
*          *          5241         2001         A                 *
*          *          5242         3001         A                 *
*          * NOTE: FOR OTHER PRINTER ATTACHED, GO TO THE ENTRY*
*          * MAP OF THAT PRINTER. IF PROBLEM IS NOT IN        *
*          * PRINTER THEN REPLACE CPU PLANAR BOARD (SEE      *
*          * SM 1230).                                         *
*          * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2,        *
*          * THIS MAP.                                         *

```

(STEP 008 CONTINUES)

18AUG81 PN6841652

EC994445 PEC987896

POWER-ON RESET

PAGE 12 OF 13

(STEP 008 CONTINUED)

```

*           *
*   38      * DISKETTE ATTACHMENT FAILURE.          *
*           * 1. POWER DOWN.                        *
*           * 2. REMOVE ALL I/O CARDS EXCEPT DISKETTE CARD. *
*           *   (SEE SM 1205).                       *
*           * 3. REMOVE DISKETTE ATTACHMENT CABLES FROM   *
*           *   DISKETTE CARD.                       *
*           * 4. POWER ON.                            *
*           * IF TEST '38' RUNS WITHOUT ERROR, PLUG     *
*           * I/O CARDS AND CABLES ONE AT A TIME UNTIL  *
*           * CARD OR CABLE CAUSING THE ERROR IS FOUND. *
*           * IF TEST '38' FAILS, REPLACE 1. DISKETTE   *
*           * ATTACHMENT CARD (SEE SM 1511 AND 1205). 2. CPU *
*           * PLANAR BOARD (SEE SM 1230).              *
*           *                                           *
*           * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
*           * THIS MAP.                                *

```

```

*           *
*   39      * +24 VOLTS FOR DISKETTE #1 AND #2 MISSING *
*           * OR OUT OF TOLERANCE.  PRESS             *
*           * <ERROR RESET> AND GO TO MAP 1500, ENTRY *
*           * POINT A.                                *
*           * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
*           * THIS MAP.                                *

```

```

*           *
* 3A THROUGH FE * FEATURE TEST. GO TO MAP 1201, ENTRY POINT A. *
*           *                                           *

```

009

IS AN 'FD' SHOWN AS THE LAST SEQUENCE INDICATOR?

Y N

010

REPLACE CPU PLANAR BOARD (SEE SM 1230).

18AUG81 PN6841652

EC994445 PEC987896

1 2 1

2 POWER-ON RESET

| |

| | | PAGE 13 OF 13

| | |

| | |

| | 011

| | SEE ERROR CODE 'FD' IN MAP
| | 1201.

| |

| 012

| IS AN ERROR SHOWN IN THE POWER
| ON TEST RESULTS DISPLAY
| (REVERSE VIDEO OR BLINKING
| REVERSE VIDEO BLOCK BEHIND ONE
| OR MORE TEST NUMBERS)?

| Y N

| |

| | 013

| | ADD 1 TO THE LAST POWER-ON
| | DIAGNOSTIC RESULT INDICATOR
| | SHOWN IN THE TOP SECTION OF
| | THE DISPLAY. THIS IS THE
| | 'ERROR CODE' TO BE USED IN
| | THE NEXT STEP.

| | GO TO PAGE 2, STEP 008,
| | ENTRY POINT B.

| |

| 014

| GO TO PAGE 2, STEP 008,
| ENTRY POINT B.

|

015

CHECK JUMPERS 'D' AND 'E' ON THE
CPU PLANAR BOARD (SEE SM 1230)
FOR CORRECT LOCATION. IF JUMPERS
ARE OK, REPLACE CPU PLANAR BOARD
(SEE SM 1230).

1

POWER-ON RESET

PAGE 1 OF 2

ENTRY POINT A

POWER-ON RESET (FEATURES)

```

*****
*   CODE   *                               REPAIR ACTION                               *
*****
*          * INTERNAL WRAP OF SECOND PRINTER ATTACHMENT FEATURE *
*          * CARD FAILED. *
*          * 1. REMOVE ALL I/O FEATURE CARDS FROM THE SYSTEM. (SEE *
*          * SM 1205 AND 1230). *
*          * 2. PLACE THE ATTACHED PRINTER IN 'WRAP' MODE (SEE *
*          * STEP 1 OF MAP 2025 (5241) OR MAP 3025 (5242)). *
*          * FOR OTHER PRINTERS ATTACHED, SEE NOTE 2 BELOW. *
*          * 3. RUN POWER ON TEST AGAIN. *
*          * IF TEST '3A' FAILS, REPLACE 2ND PRINTER ATTACHMENT *
*          * CARD. IF TEST '3A' RUNS WITHOUT ERROR, ISOLATE PROBLEM *
* 3A      * TO I/O FEATURE CARDS OR THE ATTACHED PRINTER. *
*          * IF THE PRINTER IS DETERMINED TO BE THE FAILING UNIT, *
*          * GO TO MAP 2025, ENTRY A FOR 5241 PRINTER OR MAP 3025 *
*          * ENTRY A FOR 5242 PRINTER. *
*          * -NOTE 1-IF THIS TEST AND THE NEXT TEST (3B) SHOW A *
*          * 'FEATURE ABSENT' (UNDERLINE) RESULT AND A *
*          * PRINTER IS PRESENT ON THE SYSTEM, GO TO THE *
*          * INDICATED MAP: *
*          *          PRINTER      MAP      ENTRY POINT *
*          *          -----      ---      ----- *
*          *          5241      2001      D *
*          *          5242      3001      D *
*          *          IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
*          *          MAP 1200. *
*          * -NOTE 2-FOR OTHER PRINTERS ATTACHED GO TO THE ENTRY MAP *
*          * OF THAT PRINTER. IF PROBLEM IS NOT IN PRINTER, *
*          * THEN REPLACE CPU PLANAR BOARD (SEE SM 1230). *
*****

```

POWER-ON RESET

```

*****
*
*
* 3B * THE ATTACHED PRINTER DID NOT RESPOND CORRECTLY *
* * TO A DIAGNOSE COMMAND. GO TO THE PRINTER MAP TO *
* * ISOLATE THE PROBLEM. -NOTE- THIS ERROR IS NORMAL *
* * IF THE PRINTER IS ATTACHED THROUGH A SHARED *
* * PRINTER SWITCH AND THE PRINTER IS SWITCHED TO *
* * THE 'OTHER' PROCESSOR. *
* * ('ERROR RESET' WILL BYPASS THIS ERROR.) *
* * PRINTER MAP ENTRY POINT *
* * ----- --- ----- *
* * 5241 2001 A *
* * 5242 3001 A *
* * IF PROBLEM NOT FIXED, SEE NOTE 1, PAGE 2, *
* * MAP 1200. *
* * -NOTE 1-FOR OTHER PRINTERS ATTACHED GO TO THE *
* * ENTRY MAP OF THAT PRINTER. IF PROBLEM IS *
* * NOT IN PRINTER, THEN REPLACE CPU PLANAR *
* * BOARD (SEE SM 1230). *
*****
*
* 3C THRU FC * REPLACE CPU PLANAR BOARD. IF THE PROBLEM *
* AND FE * IS NOT FIXED, SEE NOTE 1, PAGE 2, MAP 1200. *
* *
*****
*
* FD * SEQUENCE CODE 'FD' IS DISPLAYED AT THE START *
* * OF THE SYSTEM DISKETTE CONFIGURATION ROUTINE. *
* * IF SHARED EXTERNAL DISKETTES ARE ATTACHED TO THE *
* * SYSTEM AND CANNOT BE ACCESSED BECAUSE THE OTHER *
* * PROCESSOR IS USING THEM, THE SYSTEM WILL HANG *
* * UNTIL THE OTHER PROCESSOR RELEASES THEM. *
* * IF THE EXTERNAL DISKETTES ARE NOT SHARED OR *
* * THE OTHER PROCESSOR IS NOT USING THEM: *
* * 1. REPLACE DISKETTE ATTACHMENT CARD (SM 1205 AND *
* * 1511). *
* * 2. IF PROBLEM NOT FIXED AND EXTERNAL DRIVES ARE *
* * ATTACHED TO THE SYSTEM ASSUME THE EXTERNAL *
* * DRIVES TO BE THE 'FAILING DRIVES' AND GO *
* * TO MAP 1500, ENTRY POINT EE. *
* * --NOTE-- WHEN THIS ERROR CODE IS DISPLAYED, THE *
* * KEYBOARD IS ACTIVE AND PID 1500 (ROS RESIDENT *
* * DISKETTE DIAGNOSTICS) CAN BE SELECTED WITH THE *
* * CMD-TEST AND CMD-ERROR RESET KEY SEQUENCE. *
* * NOTE: 'CMD-ERROR RESET' KEY WILL BYPASS THIS *
* * ERROR. *
*****

```

18AUG81 PN6841638

EC994445 PEC987896

PROCESSOR

PAGE 1 OF 3

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

2	010	1000	B
2	009	1225	A
3	013	1300	A
3	014	1500	A

001
(ENTRY POINT A)

1. BEFORE STARTING, RECORD ANY ERROR MESSAGES OR 'TRAP' DISPLAYS.
2. VERIFY THAT ALL CABLES AND CARDS ARE SEATED AND TIGHT.

CAUTION

TO RESEAT OR EXCHANGE STORAGE CARDS, FIRST POWER OFF SYSTEM.

3. TO RUN PID 1205, SELECT DCP MENU OPTION '3'. (SEE DIAGNOSTIC USERS GUIDE 0001, PID 1205.)
4. VERIFY THAT PID 1205 LOADED, SIGNED ON (MESSAGE I-300), EXECUTED ROUTINE 1 AND DISPLAYED OPTIONS (MESSAGE I-301) OK.

DID PID 1205 LOAD AND DISPLAY OPTIONS LIST WITHOUT ERROR?

Y N
|
| 002
| GO TO PAGE 3, STEP 011,
| ENTRY POINT F.
|
|

COPYRIGHT IBM CORP 1981

14AUG81 PN6841712

EC994445 PEC869281

1 PROCESSOR

| PAGE 2 OF 3

003 SELECT OPTION '1' TO RUN AUTOMATIC ROUTINES.

DID ROUTINE 1 RUN OK?
Y N

| 004
| GO TO PAGE 3, STEP 015,
| ENTRY POINT G.

005 DID ROUTINES 2 AND 3 RUN OK?
Y N

| 006
| GO TO STEP 008,
| ENTRY POINT D.

007 NO FAILURE FOUND. SEE NOTE 1.
USE OPTION '9' AND 'ENTER' TO
RETURN TO DCP MAIN MENU.
RETURN TO MAP THAT SENT YOU HERE.

NOTE 1:

IF CPU PLANAR BOARD IS SUSPECTED
AND PROBLEM IS INTERMITTENT,
FIRST RUN ROUTINE 8 AND VERIFY
THAT THE TRAP INTERRUPT DISPLAY
DATA IS CORRECT. IF NOT CORRECT,
EXCHANGE PLANAR BOARD (SEE SM
1230). NEXT, SET LOOP MODE WITH
OPTION '0' AND THEN OPTION '1' TO
LOOP PROGRAM. RUN WITH COVERS
CLOSED UNTIL NORMAL OPERATING
TEMPERATURE IS REACHED. USE
'ATTN' AND 'E' TO END LOOPING.
GO TO MAP ENTRY POINT 'A', IF A
FAILURE IS SENSED.

008 (ENTRY POINT D)

EXCHANGE 'CPU PLANAR BOARD' (SEE
SM 1230).

(ENTRY POINT E)

VERIFY REPAIR.
IS PROBLEM CORRECTED?
Y N

| 009
| EXCHANGE AND TEST (SEE SM
| 1230):

- | 1) 'BASE STORAGE CARD'.
- | 2) 'CPU PLANAR BOARD'.

| IF NOT REPAIRED, SUSPECT POWER.
| GO TO MAP 1225, ENTRY POINT A.

010 RETURN SYSTEM TO NORMAL. INSTALL
ALL CARDS AND CABLES.

VERIFY SYSTEM.
GO TO MAP 1000, ENTRY POINT B.

14AUG81 PN6841712

EC994445 PEC869281

PROCESSOR

PAGE 3 OF 3

011
(ENTRY POINT F)

DID PID 1205 SIGN ON
WITH MESSAGE I-300?

Y N

|
| 012
| VERIFY CORRECT KEYBOARD ENTRY.
| VERIFY THAT A '3' DISPLAYED
| NEXT TO THE '?' WHEN THE '3'
| KEY WAS PRESSED (ON THE RIGHT
| END NUMERIC PAD) AND MOVED UP
| WHEN THE 'ENTER' KEY WAS
| PRESSED.

| WAS THE KEYBOARD ENTRY OK?

Y N

|
| 013
| KEYBOARD PROBLEM.
| SEE DIAGNOSTIC USERS GUIDE
| 0001, PID 1300.
| GO TO MAP 1300,
| ENTRY POINT A.

| 014
| 1. USE ANY ERROR MESSAGES OR
| 'TRAP' ERRORS AS A GUIDE TO
| THE PROBLEM. SEE DIAGNOSTIC
| USERS GUIDE 0001, PID 0001,
| FOR MESSAGE DEFINITIONS.
|
| 2. VERIFY CORRECT CE DISKETTE
| AND DRIVE NUMBER.
|
| 3. IF PROBLEM IS NOT CORRECTED,
| NEXT VERIFY DISKETTE
| ATTACHMENT WITH ROS PID
| 1500. (SEE DIAGNOSTIC USERS
| GUIDE 0001, PID 1500). IF
| ERROR,
| GO TO MAP 1500, ENTRY POINT A.

015
(ENTRY POINT G)

ERROR WITH 'FRU=' OR 'SEE MAP'?
Y N

|
| 016
| RESEAT / EXCHANGE 'BASE STORAGE
| CARD'.
| GO TO PAGE 2, STEP 008,
| ENTRY POINT E.

|
| 017
| EXCHANGE FRU OR GO TO MAP.
| GO TO PAGE 2, STEP 008,
| ENTRY POINT E.

14AUG81 PN6841712

EC994445 PEC869281

1

STORAGE

PAGE 1 OF 6

ENTRY POINTS

FROM ENTER THIS MAP			

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP TO			

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

6	036	1000	B
5	033	1150	A
6	035	1225	A
4	025	1300	A
4	026	1500	A

001
(ENTRY POINT A)

1. BEFORE STARTING, RECORD ANY ERROR MESSAGES OR 'TRAP' DISPLAYS.
2. CLEAN STORAGE CARD CONTACTS WHEN SWAPPING CARDS ONLY IF NECESSARY. USE CLEANER PART 619022.

CAUTION

TO RESEAT OR EXCHANGE STORAGE CARDS, POWER OFF SYSTEM FIRST.

3. TO RUN PID 1210, SELECT DCP MENU OPTION '4' (SEE DIAGNOSTIC USERS GUIDE 0001, PID 1210).
4. VERIFY PID 1210 LOADED AND SIGNED ON (MESSAGE I-400), EXECUTED ROUTINE 1 AND DISPLAYED OPTIONS (MESSAGE I-401).

DID PID 1210 LOAD AND DISPLAY MENU LIST WITHOUT ERROR MESSAGE?

Y N
| |
| |
| |
| |
| |
| |

COPYRIGHT IBM CORP 1981

14AUG81 PN6841713

EC994445 PEC869281

2 2
A B

2 STORAGE

PAGE 3 OF 6

015

- 1. NO FAILURE FOUND. SEE NOTE 1.
- 2. USE OPTION '9' AND 'ENTER' TO RETURN TO DCP MAIN MENU.
- 3. RETURN TO MAP THAT SENT YOU HERE.

NOTE 1:

- 1. IF STORAGE OR ROS IS SUSPECT AND PROBLEM IS INTERMITTENT, SET LOOP MODE WITH OPTION '0' AND THEN USE OPTION '1' TO LOOP PROGRAM.
- 2. RUN WITH COVERS CLOSED UNTIL SYSTEM REACHES OPERATING TEMPERATURE.
- 3. END LOOPING WITH 'ATTN' AND 'E'.
- 4. SWAP STORAGE CARDS WHEN POSSIBLE AND REPEAT DIAGNOSTICS.
- 5. CHECK JUMPERING ON 64K CARDS IF STORAGE CONFIGURATION IS CHANGED.
- 6. USE OPTION '8' FOR EXTENDED STORAGE EXERCISER.
- 7. GO TO MAP ENTRY POINT 'A' IF A FAILURE IS SENSED.

016

(ENTRY POINT B)

DID ROUTINE 4 STOP WITH 'PAGE=' '8' THROUGH 'F' IN MESSAGE I-440?
Y N

| 017

| MESSAGE E-441 WITH 'PAGE=' '0' THROUGH '7'?

| Y N

| | 018

| | GO TO STEP 020,
| | ENTRY POINT C.

| | 019

| GO TO PAGE 6, STEP 034,
| ENTRY POINT F.

020

(ENTRY POINT C)

- 1. POWER OFF SYSTEM.
- 2. EXCHANGE FAILING FRU, IF KNOWN, AND VERIFY REPAIR.
- 3. REMOVE ALL FEATURE CARDS PLUGGED INTO THE I/O BUS. IF THE 'MACHINE UPDATE CARD' IS REMOVED, ALSO REMOVE THE 'MACHINE UPDATE CARD INSTALLED' JUMPER (A3) FROM THE CPU PLANAR BOARD (SEE SM 1205 AND 1230). (DO NOT REMOVE THE DISKETTE CONTROLLER CARD OR STORAGE.)
- 4. POWER ON SYSTEM AND RUN PID 1210, ROUTINE 4 AND 5.

DID ROUTINE 4 AND 5 RUN WITHOUT ERROR?

Y N

| |
| |
| |
| |
| |

14AUG81 PN6841713

EC994445 PEC869281

4 4

E F

E F
3 3

SYSTEM 23

MAP 1210-4

STORAGE

PAGE 4 OF 6

| |
| |
| |
| |
| 021
| GO TO PAGE 6, STEP 034,
| ENTRY POINT F.

022

1. POWER OFF SYSTEM AND INSTALL A FEATURE CARD. IF THE 'MACHINE UPDATE CARD' IS INSTALLED, ALSO INSTALL THE 'MACHINE UPDATE CARD INSTALLED' JUMPER (A3) ON THE CPU PLANAR BOARD (SEE SM 1205 AND 1230).
2. POWER ON AND RUN PID 1210, ROUTINE 4 AND 5. REPEAT STEP 1 UNTIL FAILING CARD IS FOUND.
3. EXCHANGE FAILING FEATURE CARD.
4. INSTALL REMOVED CARDS AND JUMPERS.
5. RUN FLT FOR ALL FEATURES INSTALLED.

GO TO PAGE 6, STEP 034,
ENTRY POINT G.

023
(ENTRY POINT D)

DID PID 1210 SIGN ON
(MESSAGE I-400)?

Y N

| |
| 024
| VERIFY CORRECT KEYBOARD ENTRY.
|
| VERIFY THAT A '4' DISPLAYED
| NEXT TO THE '?' WHEN THE '4'
| KEY WAS PRESSED (ON THE RIGHT
| END NUMERIC PAD) AND THEN MOVED
| UP WHEN THE 'ENTER' KEY WAS
| PRESSED.

| WAS KEYBOARD ENTRY OK?

| Y N

| |
| 025
| KEYBOARD PROBLEM.
| GO TO MAP 1300,
| ENTRY POINT A.

| 026

1. VERIFY CORRECT CE DISKETTE AND DRIVE NUMBER.
2. USE ANY ERROR MESSAGES OR 'TRAP' ERRORS AS A GUIDE TO THE PROBLEM. (SEE DIAGNOSTIC USERS GUIDE 0001, PID 0001, FOR MESSAGE DEFINITIONS.)
3. IF PROBLEM NOT CORRECTED, NEXT VERIFY DISKETTE ATTACHMENT WITH ROS ROUTINES (SEE DIAGNOSTIC USERS GUIDE 0001, PID 1500).
4. IF ERROR THEN,
GO TO MAP 1500, ENTRY POINT A.

14AUG81 PN6841713

EC994445 PEC869281

5
G

MAP 1210-4

G SYSTEM 23
4 STORAGE
PAGE 5 OF 6

027
(ENTRY POINT E)

WAS MESSAGE E-417 (STORAGE
CONFIGURATION ERROR) DISPLAYED?

Y N

028
ERROR WITH 'FRU=' OR 'SEE MAP'?

Y N

029
DID ROUTINE 2 OR 3 STOP WITH
'ADDR=' OTHER THAN '00'?

Y N

030
RESEAT / EXCHANGE
'BASE STORAGE CARD'.
GO TO PAGE 6,
STEP 034,
ENTRY POINT G.

031
EXCHANGE FRU USING 'PAGE= #'.

'PAGE=' - - - FRU
- 0 - 'BASE STORAGE CARD'
- 1 - 'FEATURE STORAGE CARD'
(OR SINGLE 64K CARD)
- 2 - 'FEATURE STORAGE CARD'
(OR SINGLE 64K CARD)
- 3 - 'BASE STORAGE CARD'
- 4 - 'BASE STORAGE CARD'
- 5 - 'FEATURE STORAGE CARD'
- 6 - 'FEATURE STORAGE CARD'
- 7 - 'CPU PLANAR BOARD'
- 8-F - 'I/O CHANNEL STORAGE'

GO TO PAGE 6, STEP 034,
ENTRY POINT G.

H J MAP 1210-5

032
EXCHANGE FRU OR GO TO MAP.

GO TO PAGE 6, STEP 034,
ENTRY POINT G.

033
IF STORAGE CARDS WERE SWAPPED AS
A TEST AND 'STATUS=' '4' THEN
ENTER A '1' AND CONTINUE TEST, OR
CHECK STORAGE CARD LOCATIONS.

CORRECT STATUS CODES AND STORAGE
CARD CONFIGURATIONS ARE:

STATUS	BASE	FEATURE
- 0 -	64K	64K
- 4 -	32K	64K - NOT VALID
- 8 -	64K	32K
- A -	64K	- JUMPERED
- C -	32K	32K
- E -	32K	

ANY OTHER STATUS IS AN ERROR.

THE 'NOT VALID' CONFIGURATION CAN
BE TESTED BY PID 1210 BUT MUST BE
CHANGED FOR SYSTEM USE.

TO CHANGE FROM A TWO CARD
CONFIGURATION TO A SINGLE 64K
CARD THE STORAGE CARD JUMPERS
MUST BE CHANGED.

SUSPECT STORAGE CARD CONNECTORS.
RESEAT STORAGE CARDS AND REPEAT
TEST.

IF PROBLEM NOT CORRECTED THEN
GO TO MAP 1150, ENTRY POINT A.

14AUG81 PN6841713

EC994445 PEC869281

H J

MAP 1210-5

STORAGE

034

(ENTRY POINT F)

1. EXCHANGE 'CPU PLANAR BOARD'.
2. CHECK PLUGGABLE ROS MODULES (SEE SM 1230 AND 1231).

(ENTRY POINT G)

VERIFY REPAIR.

IS PROBLEM CORRECTED?

Y N

- |
- | 035
- | 1. EXCHANGE AND TEST (SEE SM 1230):
 - | A) 'FEATURE STORAGE CARD'.
 - | B) 'BASE STORAGE CARD'.
 - | C) 'CPU PLANAR BOARD'.
 - |
 - | 2. IF NOT REPAIRED, SUSPECT POWER.
 - | GO TO MAP 1225, ENTRY POINT A.
 - |

036

1. RETURN SYSTEM TO NORMAL. INSTALL ALL CARDS AND CABLES IN CORRECT POSITIONS.
2. CHECK THAT THE 64K STORAGE CARDS ARE JUMPERED CORRECTLY IF CHANGED FOR TESTS.

TWO CARDS		SINGLE 64K
	OR	
* X * X		X * X *
* X * X		X * X *
1 2 3 4		1 2 3 4

3. VERIFY SYSTEM.
- GO TO MAP 1000, ENTRY POINT B.

14AUG81 PN6841713

EC994445 PEC869281

UPDATE STORAGE

PAGE 1 OF 3

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

2	010	1225	A

001
(ENTRY POINT A)

1. LOAD PID 1212 USING OPTION 10 FROM THE DCP MENU. (SEE DIAGNOSTIC USER GUIDE 0001, PID 1212 FOR LOADING INSTRUCTIONS.)
2. SELECT OPTION 0 FROM PID 1212 MENU AND RUN THE STORAGE TEST. NOTE: THIS TEST RUNS FOR ABOUT 5 MINUTES.

DID STORAGE TEST COME TO A CORRECT COMPLETION?

Y N

|
| 002
| DID THE SCREEN GO BLANK AFTER
| TEST STARTED?

| Y N

| |
| | 003
| | DID AN ERROR HALT OCCUR?

| | Y N

| | |
| | | 004
| | | 1. REPLACE THE UPDATE
| | | STORAGE CARD (SEE SM
| | | 1205).

| | |
| | | 2. REPLACE THE CPU PLANAR
| | | BOARD (SEE SM 1230).

| | |
| | | 3. VERIFY REPAIR.

| | |
| | |
| | | COPYRIGHT IBM CORP 1981

14AUG81 PN6842276

EC994445 PEC987896

2 2 2
A B C

A B C
1 1 1

SYSTEM 23

UPDATE STORAGE

PAGE 2 OF 3

005

1. REPLACE THE UPDATE STORAGE CARD (SEE SM 1205).
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

006

1. REPLACE THE UPDATE STORAGE CARD (SEE SM 1205).
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

007

1. POWER OFF THE SYSTEM.
2. WAIT 30 SECONDS AND POWER ON THE SYSTEM.
3. LOAD PID 1212 AND SELECT OPTION 0. (SEE DIAGNOSTIC USERS GUIDE 0001, PID 1212, FOR LOADING INSTRUCTIONS.)
4. THIS STEP RUNS THE ROUTINE TO CHECK THE I/O CHECK (PARITY CHECK) CIRCUIT.

DID AN ERROR HALT OCCUR?

Y N

008

WAS THIS MAP ENTERED BECAUSE THE CUSTOMER HAD A TRAP 2000?

Y N

3

D E F

E F

MAP 1212-2

009

1. SELECT OPTION 1 PID 1212 (SEE DIAGNOSTIC USERS GUIDE 0001, PID 1212, FOR INSTRUCTIONS.)
2. LET THE STORAGE TEST LOOP AND IF NO ERRORS OCCUR FAILURE MAY BE INTERMITTENT.

DID AN ERROR HALT OCCUR OR DID THE SCREEN GO BLANK?

Y N

010

1. PROBLEM IS INTERMITTENT.
2. GO TO THE INTERMITTENT MAP GO TO MAP 1225, ENTRY POINT A.

011

1. REPLACE THE UPDATE STORAGE CARD (SEE SM 1205).
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

012

1. REPLACE THE UPDATE STORAGE CARD (SEE SM 1205).
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

14AUG81 PN6842276

EC994445 PEC987896

MAP 1212-2

D
2

SYSTEM 23

MAP 1212-3

UPDATE STORAGE

PAGE 3 OF 3

|
|
|
|
013

1. REPLACE THE UPDATE STORAGE CARD (SEE SM 1205).
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

14AUG81 PN6842276

EC994445 PEC987896

MAP 1212-3

1

TRAP DATA

PAGE 1 OF 6

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

3	010	1225	A
3	008	1250	A

001

(ENTRY POINT A)

TRAP DATA DISPLAY (-JAPAN ONLY- SEE NOTE ON NEXT PAGE)

'TRAP XXXX AB00 CCCC DDEE FFGG HHII JJJJ KKKK LLLL MMMM NNPP QQQRRRRR SSSS TTTT
UUUU VVVV WWWW YYYY ZZZZ 1111 2222 3333 4444 55566666 7777 8888 9999 aaaa ?????'

XXXX = TRAP CLASS BITS

'80XX' = POWER CHECK

'40XX' = WRITE TO ROS TRAP

'20XX' = I/O CHANNEL TRAP

'10XX' = STORAGE PARITY CHECK

'00XX' = SYSTEM PROGRAMMING ERROR TRAP

SEE TABLE 'X' AT THE END OF THIS MAP FOR CAUSES

A = PAGE IN USE AT THE TIME OF THE TRAP

B = HIGH ORDER ADDRESS BITS AT TIME OF TRAP

00 = ALWAYS 00

CCCC = DMA CHANNEL 0 ADDRESS (DISKETTE)

DD = INTERRUPT CONTROLLER INTERRUPT MASK

EE = PROCESSOR INTERRUPT MASK

FF = R/W STORAGE WRITE PAGE REGISTER

GG = R/W STORAGE READ PAGE REGISTER

HH = ROS PAGE REGISTER

II = DMA PAGE REGISTER

JJJJ = STACK POINTER VALUE LESS EIGHT AT TIME OF TRAP

KKKK = H/L REGISTER CONTENTS

LLLL = D/E REGISTER CONTENTS

MMMM = B/C REGISTER CONTENTS

NN = A REGISTER

PP = FLAGS

QQQQ = PROGRAM COUNTER AT TIME OF TRAP

RRRR THROUGH ????? = STACK CONTENTS (MAY NOT HAVE ANY MEANING)

(STEP 001 CONTINUES)

TRAP DATA

(STEP 001 CONTINUED)

-NOTE- ON SYSTEMS THAT HAVE THE 'JAPAN' COUNTRY SELECT JUMPER INSTALLED (SEE SM 1230) A '1' CHARACTER WILL BE SEEN AS A 'P' CHARACTER ON A TRAP DISPLAY.

SEE THE 'XXXX' VALUES IN THE DATA DISPLAY EXAMPLE GIVEN ABOVE. ARE THEY EQUAL TO '0000'?

Y N

|

| 002

| ARE THEY EQUAL TO '00XX'?

| ('XX' VALUES OTHER THAN '00')

| Y N

| |

| | 003

| | ARE THEY EQUAL TO '10XX'?

| | ('XX' = IGNORE)

| | Y N

| | |

| | | 004

| | | ARE THEY EQUAL TO '20XX'?

| | | ('XX' = IGNORE)

| | | Y N

| | | |

| | | | 005

| | | | ARE THEY EQUAL TO '40XX'?

| | | | ('XX' = IGNORE)

| | | | Y N

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

6 5 4 3 3 3
A B C D E F

14AUG81 PN6841653
EC994445 PEC987896

TRAP DATA

PAGE 3 OF 6

006

ARE THEY EQUAL TO '80XX'?

('XX' = IGNORE)

Y N

007

REPLACE:

1. CPU PLANAR BOARD (SEE SM 1230).

2. STORAGE CARDS.

3. POWER SUPPLY (SEE SM 1240).

4. VERIFY REPAIR.

008

TRAP 80XX - POWER CHECK.

GO TO POWER MAP

GO TO MAP 1250, ENTRY POINT A.

009

TRAP 40XX - WRITE TO ROS TRAP.

RUN THE POWER-ON RESET TEST (PID 1200), ROS RESIDENT DISKETTE TEST (PID 1500), AND ALL DISKETTE RESIDENT TESTS. IF NONE OF THESE TESTS SHOW AN ERROR, THE TRAP WAS CAUSED BY A PROGRAMMING ERROR. CALL FOR AID.

010

TRAP 20XX - I/O CHANNEL TRAP.

INSPECT THE ROS PAGE RESISTOR VALUES IN THE TRAP DATA DISPLAY (VALUE 'HH' IN THE EXAMPLE ON PAGE 1 OF THIS MAP).

1. IF 'HH'='F8', REPLACE WORD PROCESSING SUPPORT CARD (SEE SM 1230 AND 1205).

2. IF 'HH'='FF', REPLACE MACHINE UPDATE CARD (SEE SM 1205).

3. IF PROBLEM IS NOT FIXED, SEE MAP 1225, AND PERFORM THE RECOMMENDED CHECKS.

GO TO MAP 1225, ENTRY POINT A.

14AUG81 PN6841653

EC994445 PEC987896

2

TRAP DATA

|
|
|
|

PAGE 4 OF 6

011

TRAP 10XX - READ/WRITE STORAGE PARITY CHECK.

LOOK AT 'B' VALUE, IS IT C,D,E,F?

Y N

|

| 012

| REPLACE BASE STORAGE CARD.

|

013

OBSERVE THE CHARACTER REPRESENTED BY THE 'A' IN THE DATA DISPLAY EXAMPLE IN STEP 1. USE THE FOLLOWING CHART TO DETERMINE THE STORAGE CARD CAUSING THE ERROR. (SEE SM 1230.)

STORAGE CONFIGURATION			
(32K X 1), (32K X 2) (64K + 32K), OR (64K X 2)		(64K X 1)	
'A' VALUE	BASE STORAGE	FEATURE STORAGE	BASE STORAGE
0	X		X
1		X	X
2		X	X
3	X		
4	X		
5		X	
6		X	

1. REPLACE THE FAILING CARD.
2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
3. VERIFY REPAIR.

14AUG81 PN6841653

EC994445 PEC987896

TRAP DATA

PAGE 5 OF 6

014

TRAP 00XX - MICROCODE ERROR. SEE TABLE
'X' AT THE END OF THIS STEP FOR CAUSES.
CALL FOR AID IF NECESSARY.

TABLE 'X'	
00XX	REASON
0000	SYSTEM CALL ATTEMPTED THROUGH A TRANSFER VECTOR THAT HAS NOT BEEN INITIALIZED.
0001	SYSTEM STORAGE CONTROLLER ROUTINE SENSED AN ERROR IN ITS STORAGE POINTERS.
0002	DATA STORAGE CONTROLLER ROUTINE SENSED AN ATTEMPT TO FREE ITS PERMANENTLY ASSIGNED STORAGE.
0003	'BASIC' STORAGE CONTROLLER ROUTINE SENSED A WRONG DIRECTORY ENTRY.
0004	'BASIC' STORAGE CONTROLLER ROUTINE SENSED A WRONG FORWARD OR BACKWARD POINTER.
0005	'BASIC' STORAGE CONTROLLER ROUTINE SENSED A WRONG PROGRAM BLOCK OR REFERENCE.
0006	DATA CONTROL ROUTINE SENSED A WRONG VARIABLE ON ENTRY.
0007	DATA CONTROL ROUTINE SENSED A WRONG VARIABLE ON ENDING.

14AUG81 PN6841653

EC994445 PEC987896

A
2

SYSTEM 23

MAP 1220-6

TRAP DATA

PAGE 6 OF 6

015

DID THE TRAP '0000' OCCUR AFTER THE
POWER ON RESET TEST HAD ENDED? (AFTER
THE AUDIBLE ALARM THAT SIGNALS THE END
OF THE TEST.)

Y N

016

REPLACE CPU PLANAR BOARD (SEE SM
1230).

017

1. RUN POWER ON RESET TEST (PID 1200)
AND FORCE AN ERROR BY HOLDING DOWN
THE SPACE BAR ON THE KEYBOARD.
2. LOOK AT THE RESULTS INDICATORS FOR
THE ROS CRC CHECK TEST (09 THROUGH
29)

ARE RESULTS INDICATORS 09, 0A, 0B, 0C,
0D, 12, 13, 14, 15, 16, 17, 18, 19 AND
27* SHOWN AS 'PRESENT' (NOT
UNDERLINED)?

SEE NOTE AT RIGHT >>>----->

Y N

018

CHECK ALL PLUGGABLE ROS MODULES FOR
CORRECT SEATING OR BENT PINS. (SEE
MAP 1200, ERROR CODES 09 THROUGH 17
FOR MODULE LOCATIONS). IF NO
PROBLEMS ARE FOUND, REPLACE CPU
PLANAR BOARD (SEE SM 1230).

019

CALL FOR AID.

* INDICATOR 27 IS FOR THE ROS ON THE
SECOND PRINTER ATTACHMENT CARD. IF
SECOND PRINTER ATTACHMENT CARD IS
INSTALLED AND INDICATOR 27 IS
UNDERLINED, REPLACE SECOND PRINTER
ATTACHMENT CARD (SEE SM 1205 AND 1230).

14AUG81 PN6841653

EC994445 PEC987896

MAP 1220-6

INTERMITTENT ERROR

PAGE 1 OF 3

(ENTRY POINT A)

IF YOU ARE HAVING INTERMITTENT PROBLEMS WITH DISKETTES OR PRINTERS GO TO THE FOLLOWING MAPS:

DISKETTE MAP 1500, ENTRY POINT C

5241 PRINTER MAP 2022, ENTRY POINT A

5242 PRINTER MAP 3022, ENTRY POINT A

NOTE: FOR OTHER PRINTER ATTACHED, GO TO THE ENTRY MAP OF THAT PRINTER.

IF THE PROBLEM IS NOT REPAIRED, RETURN TO THIS MAP AND PERFORM THE FOLLOWING CHECKS:

1. A.C. INPUT POWER: ENSURE THAT THE A.C. INPUT POWER IS +/- 10% OF THE GIVEN VALUE SHOWN ON THE POWER SUPPLY OF EACH SYSTEM UNIT.

-GBGI SYSTEMS- ENSURE THAT THE A.C. TRANSFORMER IS JUMPERED CORRECTLY FOR THE CUSTOMER SUPPLY VOLTAGE (50 HZ - SEE SM 1260 AND 1210. 50 HZ SEE SM 1250 AND 1210).

2. GROUNDING: CHECK THAT ALL OUTLETS SUPPLYING POWER TO THE SYSTEM UNITS ARE CORRECTLY GROUNDED. (USE TOOL PN 9900453)
3. TIGHTEN ALL SCREW CONNECTIONS IN THE POWER SUPPLIES OF THE SYSTEM UNITS.
4. CHECK ALL D.C. VOLTAGES FOR TOO MUCH RIPPLE USING AN OSCILLOSCOPE.

THE MAXIMUM PERMISSIBLE AMOUNT OF RIPPLE IS 3% OF THE GIVEN VOLTAGE. EXAMPLE: FOR +5 VOLTS, MAXIMUM RIPPLE = $5 \times .03 = 150$ MILLIVOLTS (PEAK-TO-PEAK).

-NOTE- IF AN OSCILLOSCOPE IS NOT AVAILABLE, THE PROCEDURE GIVEN IN SM 1211 TO USE A C.E. METER MAY BE USED. THIS PROCEDURE WILL NOT GIVE EXACT VALUES OF PEAK-TO-PEAK RIPPLE BUT CAN SHOW IF IT IS NECESSARY TO OBTAIN AN OSCILLOSCOPE.

IF HIGH VALUES OF RIPPLE ARE FOUND, TIGHTEN ALL CAPACITOR MOUNTING SCREWS IN THE POWER SUPPLY BEING MEASURED. IF THIS DOES NOT CORRECT THE PROBLEM, REPLACE THE POWER SUPPLY. (SEE SM 1240, 1250 AND 1260).

5. AIR FLOW: ENSURE THAT ALL FANS ARE RUNNING AND THAT ALL AIR FLOW OPENINGS ARE FREE OF OBSTRUCTIONS. (SM 1200 AND 1210 MAY BE USEFUL IF FANS ARE NOT RUNNING IN THE CPU).

INTERMITTENT ERROR

PAGE 2 OF 3

6. MEASURE ALL D.C. VOLTAGES AT THE CPU PLANAR BOARD. (SEE SM 1211 AND 1230 FOR LOCATIONS AND TOLERANCES). IF ANY VOLTAGE IS NOT CORRECT, GO TO MAP 1250, ENTRY POINT A.
7. THE FOLLOWING ITEMS SHOULD BE CHECKED IF ELECTRICAL NOISE PROBLEMS ARE SUSPECTED:
 1. DISKETTE CARD CONNECTION TO BRACKET - TIGHTEN SECURELY.
 2. DISKETTE CARD BRACKET TO LOGIC DRAWER - TIGHTEN SECURELY.
 3. GROUND STRAP FROM KEYBOARD TO BASE - TIGHTEN SECURELY.
 4. MAKE SURE CABLES ARE LAYING IN THEIR CORRECT POSITIONS AS SHOWN IN SM 1215.
 5. GROUND CLAMP TO POWER SUPPLY FRAME - TIGHTEN VERY SECURELY (2 SCREWS).
8. LOOPING: ALTHOUGH THE DIAGNOSTIC PROGRAMS ARE MAINLY MEANT TO FIND SOLID ERRORS, THE LOOP OPTIONS IN MANY OF THE TEST ROUTINES MAY BE USEFUL IN FINDING INTERMITTENT ERRORS. SEE THE PROGRAM DIAGNOSTIC USER GUIDE FOR LOOPING INSTRUCTIONS.

PROGRAM MAP	PROGRAM TITLE	SECTION TESTED
-----	-----	-----
PID1200 1000	CPU POWER-ON TEST (ROS)	CPU PLANAR BOARD
PID1205 1205	CPU PROCESSOR FLT	CPU PLANAR BOARD
PID1210 1210	CPU STORAGE FLT	SYSTEM STORAGE
PID1300 1300	KEYBOARD FLT	KEYBOARD
PID1400 1400	DISPLAY FLT	DISPLAY
PID1500 1500	DISKETTE DIAG.(ROS)	DISKETTE DRIVES 1-4
PID1505 1500	DISKETTE FLT (PART 1)	ALL DISKETTE DRIVES
PID1510 1500	DISKETTE FLT (PART 2)	ALL DISKETTE DRIVES
PID2300 2001	PRINTER FLT	PRINTER (5241)
PID2300 3001	PRINTER FLT	PRINTER (5242)
PID5000 5000	T.P. FLT	ALL T.P. HARDWARE

9. ERROR LOG

THE ERROR LOG IS USED TO RECORD ERRORS THAT OCCUR DURING CUSTOMER OPERATION. THIS LOG OF ERROR DATA IS KEPT IN SYSTEM STORAGE AND ON THE CUSTOMER'S DISKETTE.

A REVIEW OF THIS HISTORY OF ERRORS MAY BE USED BY THE CE TO IDENTIFY WHICH SECTION OF THE SYSTEM HAS BEEN CAUSING THE INTERMITTENT ERRORS.

CE UTILITY PID 0120 IS USED TO DISPLAY (OR PRINT) THE ERROR LOG

14AUG81 PN6841716

EC994445 PEC987896

INTERMITTENT ERROR

PAGE 3 OF 3

HISTORY FROM THE CUSTOMER'S DISKETTE.

PROCEDURE TO DISPLAY/PRINT ERROR LOG DATA

1. LOAD THE DCP PROGRAM PID 0001.
2. SELECT DCP MENU OPTION '18' TO DISPLAY THE CE UTILITY MENU.
3. SELECT OPTION '24' FROM THE CE UTILITY MENU TO LOAD PID 0120 (ERROR LOG DISPLAY).

NOTE: THE USER MAY DECIDE TO PRINT THE ERROR LOG ON THE PRINTER BY PRESSING THE 'ATTN' AND 'COPY D' KEYS TO ENABLE THE ALTERNATE PRINT FUNCTION.

4. FOLLOW THE PID 0120 PROMPTING MESSAGES.
(SEE PID 0120 IN USER GUIDE 0001)
5. INTERPRETING ERROR LOG DATA:

(SEE PID 0120 IN USER GUIDE 0001, SECTION 19.5.4)

14AUG81 PN6841716

EC994445 PEC987896

1

POWER MAP

PAGE 1 OF 15

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1100	A	1	001
1200	A	1	001
1220	A	1	001
1225	A	1	001
1400	AC	15	124
1500	A	1	001
1530	A	1	001
1545	A	1	001
1545	AC	15	124
1555	A	1	001

001
(ENTRY POINT A)

DANGER

AC LINE VOLTAGE IS PRESENT IN THE POWER SUPPLY WHEN POWER OFF/ON SWITCH IS IN THE 'OFF' POSITION. ALWAYS PULL THE AC LINE CORD FROM THE CUSTOMER OUTLET WHEN WORKING IN THE PRIMARY POWER AREA.

SEE NOTES BEFORE CONTINUING.
>>>----->

1. BEFORE CONTINUING WITH THIS MAP, MOVE POWER CORD TO A KNOWN GOOD AC OUTLET. IF THE SYSTEM WORKS CORRECTLY, HAVE CUSTOMER REPAIR POWER TO THE ORIGINAL OUTLET. IF SYSTEM STILL FAILS, CONTINUE WITH THIS MAP.
2. NOTE: FOR GBGI SYSTEMS F6 = CB1 AND REPLACE F6 = RESET CB1.
3. REMOVE THE ACCESS PANEL AT THE REAR OF THE CPU UNIT (SEE SM (STEP 001 CONTINUES)

NOTES:

'TYPE 1' SUPPLY MAY BE IDENTIFIED BY NOT HAVING OUTSIDE COVERS WHEN THE SUPPLY IS IN THE SERVICE POSITION.

'TYPE 2' SUPPLIES HAVE SHEET METAL COVERS. (WHEN WORKING WITH TYPE 2 SUPPLIES SEE THE LABELS ON THE SUPPLY FOR FUSE LOCATIONS AND AC WIRING INFORMATION.)

*** GBGI SYSTEMS ***

UNUSUAL POWER SUPPLY/SYSTEM PROBLEMS MAY RESULT IF THE AC VOLTAGE SELECTION JUMPERS ON THE POWER SUPPLY TRANSFORMER DO NOT MATCH THE CUSTOMERS INPUT VOLTAGE ALWAYS CHECK THAT THESE JUMPERS ARE CORRECT BEFORE REPLACING THE POWER SUPPLY AND AFTER A NEW SUPPLY IS INSTALLED. (SEE SM 1250 AND 1260 FOR AC VOLTAGE SELECTION PROCEDURE.)

POWER MAP

(STEP 001 CONTINUED)

1220).

- 4. SEE SM 1210 AND SM 1211 FOR ALL OF THE FOLLOWING:
- 5. OBSERVE THE 'POWER GOOD' LED LOCATED AT THE REAR OF THE POWER SUPPLY. (IF THE LED IS LIGHTED, +5, -5, +12 AND -12V DC ARE ALL OK. DOES NOT INCLUDE +24V DC.)

IS POWER GOOD INDICATOR ON WHEN POWER SWITCH IS ON?

Y N

002

- 1. POWER OFF
- 2. PLACE THE POWER SUPPLY IN THE SERVICE POSITION (SEE SM 1240, 1250, 1260).
- 3. CHECK ALL FUSES (F1, F2, F3, F4, F5, F6) (SEE SM 1241, 1251, 1261).

ARE ALL FUSES GOOD?

Y N

003

- 1. REPLACE DAMAGED FUSES.
- 2. POWER ON.

IS POWER GOOD INDICATOR OFF?

Y N

004

- PROBLEM SOLVED.
- VERIFY REPAIR.

005

- 1. POWER OFF.
- 2. CHECK ALL FUSES AGAIN.

ARE ALL FUSES GOOD?

Y N

006

IS PRIMARY FUSE F6/CB1 GOOD?

Y N

007

- 1. POWER OFF.
- 2. DISCONNECT AC DISTRIBUTION CONNECTORS (P1,P2,P3,P5). (SEE SM 1210.)
- 3. REPLACE FUSE F6.
- 4. POWER ON.

IS FUSE F6/CB1 GOOD?

Y N

008

- 1. POWER OFF.
- 2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
- 3. VERIFY REPAIR.

009

PROBLEM IS NOT IN THE POWER SUPPLY.

IS DRIVE 1 PRESENT ON THE SYSTEM?

Y N

010

GO TO PAGE 4, STEP 021, ENTRY POINT E.

011

- 1. POWER OFF.
- 2. RECONNECT THE AC DISTRIBUTION CABLE AT CONNECTOR P1 (DRIVE 1).
- 3. POWER ON.

IS FUSE F6/CB1 GOOD?

Y N

14AUG81 PN6841657

EC994445 PEC987896

- 012
1. POWER OFF.
 2. RECONNECT REMAINING AC DISTRIBUTION CABLES.
 3. PROBLEM IS IN DRIVE 1. REPLACE FUSE F6.
 4. REMOVE DRIVE 1 FROM PROCESSING UNIT (SEE SM 1510).
 5. REMOVE AC LEADS FROM MOTOR START CAPACITOR (SEE SM 1551).
 6. USE CE METER TO DETERMINE IF MOTOR START CAPACITOR HAS A SHORT CIRCUIT.

DOES CAPACITOR HAVE A SHORT CIRCUIT?
Y N

- 013
1. REPLACE DRIVE MOTOR (SEE SM 1550).
 2. VERIFY REPAIR.

- 014
1. REPLACE CAPACITOR (SEE SM 1551).
 2. VERIFY REPAIR.

015
IS DRIVE 2 PRESENT ON THE SYSTEM?

Y N

016
GO TO PAGE 4, STEP 021,
ENTRY POINT E.

H

- 017
1. POWER OFF.
 2. RECONNECT THE AC DISTRIBUTION CABLE AT CONNECTOR P2 (DRIVE 2).
 3. POWER ON.

IS FUSE F6/CB1 GOOD?
Y N

- 018
1. POWER OFF.
 2. RECONNECT REMAINING AC DISTRIBUTION CABLES.
 3. PROBLEM IS IN DRIVE 2. REPLACE FUSE F6.
 4. REMOVE DRIVE 2 FROM PROCESSING UNIT (SEE SM 1510).
 5. REMOVE AC LEADS FROM MOTOR START CAPACITOR (SEE SM 1551).
 6. USE CE METER TO DETERMINE IF MOTOR START CAPACITOR HAS A SHORT CIRCUIT.

DOES CAPACITOR HAVE A SHORT CIRCUIT?
Y N

- 019
1. REPLACE DRIVE MOTOR (SEE SM 1550).
 2. VERIFY REPAIR.

- 020
1. REPLACE CAPACITOR (SEE SM 1551).
 2. VERIFY REPAIR.

14AUG81 PN6841657

EC994445 PEC987896

4
J

L SYSTEM 23
4
POWER MAP
PAGE 5 OF 15

034

1. POWER OFF.
2. PULL AC PLUG.
3. REMOVE COVER (BACK) FROM PROCESSOR.
4. REMOVE POWER SUPPLY FROM PROCESSOR (SEE SM 1240, 1250, 1260).
5. DISCONNECT THE AC DISTRIBUTION CABLES AT CONNECTORS P3 AND P5.
6. REMOVE THE AC DISTRIBUTION BOX COVER.(TYPE 1 SUPPLY)
7. CHECK FOR CONTINUITY FROM THE AC DISTRIBUTION CONNECTORS P3 AND P5 TO TB1 AS SHOWN ON SM 1210

ARE ALL CONTINUITY CHECKS GOOD?

Y N

|

| 035

- | 1. REPAIR BAD CABLE(S).
- | 2. RECONNECT THE AC DISTRIBUTION CABLES (P3 AND P5).
- | 3. INSTALL AC DISTRIBUTION BOX COVER.
- | 4. VERIFY REPAIR.

|

036

PROBLEM IS NOT IN THE POWER SUPPLY.

1. REPLACE THE FAN (SEE SM 1270).
2. RECONNECT THE AC DISTRIBUTION CABLES (P3 AND P5).
3. INSTALL AC DISTRIBUTION BOX COVER.
4. VERIFY REPAIR.

K MAP 1250-5
4

|

|

|

|

037

POWER OFF.

IS POWER GOOD INDICATOR OFF WHEN POWER SWITCH IS OFF?

Y N

|

| 038

| 'TYPE 2' SUPPLY - REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).

|

| 'TYPE 1' SUPPLY - PERFORM FOLLOWING STEPS:

|

- | 1. PULL AC PLUG.
- | 2. REMOVE POWER SUPPLY FROM BOX (SEE SM 1240, 1250, 1260).
- | 3. REPLACE POWER SWITCH (SEE SM 1245, 1255, 1265).
- | 4. VERIFY REPAIR.

|

039

1. REMOVE POWER SUPPLY FROM BOX (SEE SM 1240, 1250, 1260).
2. PULL AC PLUG.
3. REMOVE AC DISTRIBUTION BOX COVER.
4. CHECK FOR CORRECT LOCATIONS AND TIGHTEN ALL CONNECTIONS ON TB1 (SEE SM 1210).
5. REINSTALL AC DISTRIBUTION BOX COVER.
6. REINSTALL AC PLUG.
7. POWER ON.
8. MEASURE THE 'DC' VOLTAGES AT THE TEST POINTS ON THE SIDE OF THE POWER SUPPLY (SEE SM 1241, 1251, 1261).
9. SEE CHART A:

(STEP 039 CONTINUES)

14AUG81 PN6841657

EC994445 PEC987896

MAP 1250-5

(STEP 039 CONTINUED)

CHART A				
METER LEADS				
VOLTS	+	-	MIN.	MAX.
+24	+24	GND	+22.0	+26.4
+12	+12	GND	+11.0	+13.2
+ 5	+ 5	GND	+4.6	+5.5
-5	GND	-5	-4.6	-5.5
-12	GND	-12	-11.0	-13.2

'GND' MAY BE MARKED 'RTN'
 DO NOT MEASURE -5 V AT THE FUSE
 ON TYPE 2 SUPPLY (CHECK CONNECTOR
 ON THE SIDE OF THE SUPPLY.)
 IS ANY VOLTAGE OUT OF THE
 SPECIFIED RANGE?

Y N

040
 CHECK FOR TOO MUCH RIPPLE ON
 THE DC OUTPUT VOLTAGES USING AN
 OSCILLOSCOPE OR THE C.E. METER
 (SEE SM 1211).

-NOTE- THE PROCEDURE IN SM 1211
 TO CHECK RIPPLE USING A C.E.
 METER WILL NOT GIVE EXACT VALUES
 OF PEAK-TO-PEAK RIPPLE. IT
 SHOULD ONLY BE USED AS A QUICK
 CHECK TO DETERMINE IF ANY RIPPLE
 IS PRESENT. AN OSCILLOSCOPE
 SHOULD BE USED TO DETERMINE EXACT
 VALUES OF RIPPLE.

IS TOO MUCH RIPPLE PRESENT ON
 ANY DC VOLTAGE?

Y N

041
 MEASURE THE DC VOLTAGE AT THE
 POWER GOOD TERMINAL ON
 CONNECTOR P4 (SEE SM 1211).
 (METER LEADS: + = POWER GOOD,
 - = RETURN.)

IS POWER GOOD SIGNAL BETWEEN
 2.4V AND 5.5V DC WHEN POWER
 SWITCH IS ON?

Y N

14AUG81 PN6841657

EC994445 PEC987896

M N P Q
6 6 6 6

SYSTEM 23

R S

MAP 1250-7

POWER MAP

PAGE 7 OF 15

042

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
3. VERIFY REPAIR.

043

1. REMOVE THE DC CONNECTOR (P4) FROM THE CPU PLANAR BOARD.
2. MEASURE VOLTAGES AT THE CPU END OF THE CABLE (SEE SM 1211).

ARE THE VOLTAGES OK?

Y N

044

1. REPAIR FAILING CABLE.
2. VERIFY REPAIR.

045

1. REPLACE CPU PLANAR BOARD (SEE SM 1230).
2. VERIFY REPAIR.

046

1. POWER OFF.
2. TIGHTEN ALL CAPACITOR MOUNTING SCREWS. (TYPE 1 SUPPLY)
3. IF HIGH VALUES OF RIPPLE ARE STILL PRESENT, REPLACE POWER SUPPLY (SEE SM 1240, 1250 OR 1260).
4. VERIFY REPAIR.

047

IS THE +24V DC LEVEL THE ONLY ONE OUT OF THE SPECIFIED RANGE?

Y N

048

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
3. VERIFY REPAIR.

049

POWER OFF (SEE SM 1241, 1251, 1261).

IS DC OUTPUT FUSE F4 GOOD?

Y N

050

1. REPLACE FUSE F4
2. POWER ON.

IS FUSE F4 GOOD?

Y N

051

1. POWER OFF.
2. DISCONNECT THE +24V DC DISTRIBUTION CABLES (DRIVE 1 AND DRIVE 2). (SEE SM 1211 AND 1215).
3. REPLACE FUSE F4.
4. POWER ON.

IS THE REPLACED F4 GOOD?

Y N

052

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
3. VERIFY REPAIR.

14AUG81 PN6841657

EC994445 PEC987896

9 9 8
T U V

MAP 1250-7

R S

V
7

SYSTEM 23

W X Y

MAP 1250-8

POWER MAP

PAGE 8 OF 15

053

- 1. POWER OFF.
- 2. RECONNECT DRIVE 1 DC DISTRIBUTION CABLE.
- 3. POWER ON.

IS FUSE F4 GOOD?

Y N

054

- 1. POWER OFF. PROBLEM IS IN DRIVE 1.
- 2. REPLACE FUSE F4.
- 3. REMOVE DRIVE 1 FROM PROCESSING UNIT (SEE SM 1510).
- 4. DISCONNECT HEAD LOAD SOLENOID (SEE SM 1540).
- 5. POWER ON.

IS FUSE F4 GOOD?

Y N

055

- 1. POWER OFF.
- 2. CONNECT HEAD LOAD SOLENOID.
- 3. DISCONNECT STEPPER MOTOR (SEE SM 1560) (51TD SEE SM 1560).
- 4. REPLACE FUSE F4 (SEE SM 1241, 1251, 1261).
- 5. POWER ON.

IS FUSE F4 GOOD?

Y N

056

- 1. POWER OFF.
- 2. REPLACE DRIVE CONTROL CARD (SEE SM 1572).
- 3. REPLACE FUSE F4.
- 4. VERIFY REPAIR.

| | |

| | |

| | |

| | |

| | |

| | 057

- 1. POWER OFF.
- 2. REPLACE STEPPER MOTOR (SEE SM 1560).
- 3. VERIFY REPAIR.

| | 058

- 1. POWER OFF.
- 2. REPLACE HEAD LOAD SOLENOID (SEE SM 1540).
- 3. VERIFY REPAIR.

059

- 1. POWER OFF.
- 2. RECONNECT DRIVE 2 DC DISTRIBUTION CABLE.
- 3. POWER ON.

IS FUSE F4 GOOD?

Y N

060

- 1. POWER OFF. PROBLEM IS IN DRIVE 2.
- 2. REPLACE FUSE F4.
- 3. REMOVE DRIVE 2 FROM PROCESSING UNIT.
- 4. DISCONNECT HEAD LOAD SOLENOID (SEE SM 1540).
- 5. POWER ON.

IS FUSE F4 GOOD?

Y N

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

| | |

14AUG81 PN6841657

9 9 EC994445 PEC987896

9 A A

Z A B

MAP 1250-8

W X Y

|||
||| | PAGE 9 OF 15
||| |

- ||| | 061
- ||| | 1. POWER OFF.
- ||| | 2. CONNECT HEAD LOAD SOLENOID.
- ||| | 3. DISCONNECT STEPPER MOTOR (SEE SM 1560).
- ||| | 4. REPLACE FUSE F4 (SEE SM 1241, 1251, 1261).
- ||| | 5. POWER ON.

||| | IS FUSE F4 GOOD?
||| | Y N

- ||| | 062
- ||| | 1. POWER OFF.
- ||| | 2. REPLACE DRIVE CONTROL CARD (SEE SM 1572).
- ||| | 3. REPLACE FUSE F4.
- ||| | 4. VERIFY REPAIR.

- ||| | 063
- ||| | 1. POWER OFF.
- ||| | 2. REPLACE STEPPER MOTOR (SEE SM 1560).
- ||| | 3. VERIFY REPAIR.

- ||| | 064
- ||| | 1. POWER OFF.
- ||| | 2. REPLACE HEAD LOAD SOLENOID (SEE SM 1540).
- ||| | 3. VERIFY REPAIR.

||| | 065
||| | PROBLEM DISAPPEARED.
||| | VERIFY REPAIR.

||| | 066
||| | PROBLEM SOLVED.
||| | VERIFY REPAIR.

- ||| | 067
- ||| | 1. POWER OFF.
- ||| | 2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
- ||| | 3. VERIFY REPAIR.

- ||| | 068
- ||| | (ENTRY POINT B)
- ||| | 1. REMOVE AC PLUG FROM WALL OUTLET.
- ||| | 2. DISCONNECT LINE CORD FROM AC INPUT CONNECTOR J1 (SEE SM 1240, 1250, 1260).
- ||| | 3. TEST LINE CORD FOR CONTINUITY.

||| | IS CONTINUITY OK?
||| | Y N

- ||| | 069
- ||| | 1. REPLACE LINE CORD.
- ||| | 2. VERIFY REPAIR.

- ||| | 070
- ||| | 1. REMOVE POWER SUPPLY FROM PROCESSOR (SEE SM 1240, 1250, 1260).
- ||| | 2. TIGHTEN ALL DC CAPACITOR SCREWS (TYPE 1 SUPPLY) AND CHECK ALL TERMINALS FOR GOOD CONTACT.
- ||| | 3. RECONNECT LINE CORD AT CONNECTOR J1 AND PLUG IN.
- ||| | 4. POWER ON.

||| | IS POWER GOOD INDICATOR OFF?
||| | Y N

||| | 071
||| | PROBLEM SOLVED.
||| | VERIFY REPAIR.

- 072
1. POWER OFF.
 2. DISCONNECT DC DISTRIBUTION CABLES TO DRIVE 1 AND DRIVE 2 AT THE POWER SUPPLY (SEE SM 1211, 1215, 1241, 1251 AND 1261).
 3. DISCONNECT DC DISTRIBUTION CABLE P4 AT CPU PLANAR END.
 4. POWER ON.
 5. MEASURE THE DC VOLTAGES AT THE DC CONNECTOR P4 (SEE SM 1211).
 6. SEE CHART A

CHART A				
METER LEADS				
VOLTS	+	-	MIN.	MAX.
+24	+24	GND	+22.0	+26.4
+12	+12	GND	+11.0	+13.2
+ 5	+ 5	GND	+4.6	+5.5
- 5	GND	-5	-4.6	-5.5
-12	GND	-12	-11.0	-13.2

-NOTE- 'GND' MAY BE MARKED 'RTN'
ARE ANY OUTPUT VOLTAGES BELOW 1V
DC?

- Y N
- 073
1. POWER OFF.
 2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
 3. VERIFY REPAIR.

074
ARE ALL OUTPUTS BELOW 1V DC?
Y N

- 075
1. POWER OFF.
 2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
 3. VERIFY REPAIR.

A
D

1. POWER OFF.
2. PULL AC PLUG.
3. REMOVE SWITCH BOX COVER.
4. TEST FOR CONTINUITY ACROSS SWITCH IN ON POSITION. (S1-2 TO S1-3 AND S1-5 TO S1-6). (SEE SM 1245, 1255, 1265).

IS CONTINUITY OK?

Y N

077

'TYPE 2' SUPPLY - REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).

'TYPE 1' SUPPLY - PERFORM THE FOLLOWING STEPS.

1. REPLACE SWITCH (SEE SM 1245, 1255, 1265).
2. INSTALL SWITCH COVER.
3. VERIFY REPAIR.

- 078
1. DISCONNECT THE LINE CORD AT CONNECTOR J1.
 2. REMOVE AC DISTRIBUTION BOX COVER. (TYPE 1 SUPPLY)
 3. CHECK FOR CORRECT LOCATIONS AND TIGHTEN ALL CONNECTIONS ON TB1 (SEE SM 1210).

ARE ALL CONNECTIONS CORRECT AND TIGHT?

- Y N
- 079
1. CORRECT BAD CONNECTIONS.
 2. INSTALL SWITCH BOX COVER.
 3. INSTALL AC DISTRIBUTION BOX COVER.
 4. RECONNECT LINE CORD AT CONNECTOR J1.
 5. VERIFY REPAIR.

14AUG81 PN6841657
1
1 EC994445 PEC987896
A
E MAP 1250-10

|
|

080
'TYPE 2' SUPPLY - REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260)

'TYPE 1' SUPPLY - DO THE FOLLOWING STEPS.

CHECK CONTINUITY FROM J1 TO POWER SWITCH AND BACK TO TB1.
SEE CHART C.

CHART C
TB1-1 TO J1-6
TB1-1 TO S1-2
TB1-2 TO J1-N
TB1-2 TO S1-5
TB1-4 TO S1-3
TB1-5 TO S1-6

ARE ALL CONTINUITY CHECKS GOOD?
Y N

- | 081
1. REPAIR BAD CABLE(S).
 2. RECONNECT LINE CORD AT CONNECTOR J1.
 3. INSTALL SWITCH BOX COVER.
 4. INSTALL AC DISTRIBUTION BOX COVER.
 5. VERIFY REPAIR.

- 082
1. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
 2. RECONNECT LINE CORD AT CONNECTOR J1.
 3. VERIFY REPAIR.

083
(ENTRY POINT C)

1. POWER OFF.
2. REMOVE COVER (BACK) FROM PROCESSOR.
3. PLACE POWER SUPPLY IN SERVICE POSITION (SEE SM 1240, 1250, 1260).
4. DISCONNECT THE DC DISTRIBUTION CABLES (P4 AND, IF PRESENT, DRIVE 1 AND DRIVE 2). (SEE SM 1211, 1215, 1241, 1251, 1261.)
5. REPLACE DAMAGED FUSE.
6. POWER ON

IS REPLACED FUSE GOOD?

Y N

- | 084
1. POWER OFF.
 2. REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).
 3. RECONNECT THE DC DISTRIBUTION CABLES.
 4. VERIFY REPAIR.

- 085
1. POWER OFF. PROBLEM IS NOT IN THE POWER SUPPLY.
 2. DISCONNECT THE DC DISTRIBUTION CABLES (P4 AND, IF PRESENT, DRIVE 1 AND DRIVE 2). (SEE SM 1211 AND 1215).
 3. CHECK ALL DISTRIBUTION CABLES FOR CONTINUITY AND/OR SHORT.

ARE THE DC DISTRIBUTION CABLES OK?

Y N

- | 086
1. REPAIR BAD CABLES.
 2. INSTALL COVER (BACK).
 3. VERIFY REPAIR.

|
|
|

14AUG81 PN6841657

1

EC994445 PEC987896

2

A

F

A SYSTEM 23
F
1 POWER MAP
1
PAGE 12 OF 15

087
IS DRIVE 1 PRESENT ON THE SYSTEM?
Y N

088
GO TO PAGE 14, STEP 119,
ENTRY POINT D.

089
1. RECONNECT THE DC DISTRIBUTION
CABLE TO DRIVE 1.
2. POWER ON.

IS THE REPLACED FUSE STILL GOOD?
Y N

090
1. POWER OFF.
2. REPLACE DAMAGED FUSE.
3. RECONNECT REMAINING DC
DISTRIBUTION CABLES.
4. PROBLEM IS IN DRIVE 1.
REMOVE DRIVE 1 FROM
PROCESSING UNIT (SEE SM
1510).
5. (SEE SM 1241, 1251, 1261).

WAS DAMAGED FUSE F4? (+24V DC)
Y N

091
WAS DAMAGED FUSE F5? (+5V DC)
Y N

092
1. REPLACE DRIVE CONTROL
CARD (SEE SM 1572).
2. VERIFY REPAIR.

1
3
A A A
G H J

A A MAP 1250-12
H J

093
1. DISCONNECT LED CONNECTOR
(SEE SM 1570).
2. POWER ON.

IS FUSE F5 GOOD?
Y N

094
1. POWER OFF.
2. RECONNECT LED CONNECTOR.
3. DISCONNECT PTX CONNECTOR.
4. REPLACE FUSE F5.
5. POWER ON.

IS FUSE F5 GOOD?
Y N

095
1. POWER OFF.
2. REPLACE DRIVE CONTROL
CARD (SEE SM 1572).
3. REPLACE FUSE F5.
4. VERIFY REPAIR.

096
1. POWER OFF.
2. REPLACE PTX (SEE SM 1571).
3. VERIFY REPAIR.

097
1. REPLACE LED (SEE SM 1570).
2. VERIFY REPAIR.

098
1. DISCONNECT HEAD LOAD SOLENOID
CONNECTOR.
2. POWER ON.

IS FUSE F4 GOOD?
Y N

14AUG81 PN6841657
1 1
3 3 EC994445 PEC987896
A A
K L MAP 1250-12

A A A SYSTEM 23
G K L
1 1 1 POWER MAP
2 2 2
PAGE 13 OF 15

| | |
| | |
| | 099
| | 1. POWER OFF.
| | 2. RECONNECT HEAD LOAD
| | SOLENOID.
| | 3. DISCONNECT STEPPER MOTOR
| | CONNECTOR.
| | 4. REPLACE FUSE F4.
| | 5. POWER ON.

| | IS FUSE F4 GOOD?
| | Y N
| | |
| | | 100
| | | 1. POWER OFF.
| | | 2. REPLACE DRIVE CONTROL
| | | CARD (SEE SM 1572).
| | | 3. REPLACE FUSE F4.
| | | 4. VERIFY REPAIR.

| | |
| | 101
| | 1. POWER OFF.
| | 2. REPLACE STEPPER MOTOR (SEE
| | SM 1560).
| | 3. VERIFY REPAIR.

| | |
| | 102
| | 1. POWER OFF.
| | 2. REPLACE HEAD LOAD SOLENOID
| | (SEE SM 1540).
| | 3. VERIFY REPAIR.

| | |
103
IS DRIVE 2 PRESENT ON THE SYSTEM?
Y N

| | |
| | 104
| | GO TO PAGE 14, STEP 119,
| | ENTRY POINT D.

A
M

A MAP 1250-13
M

	105
	1. POWER OFF.
	2. RECONNECT THE DC DISTRIBUTION
	CABLE TO DRIVE 2.
	3. POWER ON.

| | IS THE REPLACED FUSE GOOD?
| | Y N
| | |
| | | 106
| | | 1. POWER OFF.
| | | 2. REPLACE DAMAGED FUSE.
| | | 3. RECONNECT REMAINING DC
| | | DISTRIBUTION CABLES.
| | | 4. PROBLEM IS IN DRIVE 2.
| | | REMOVE DRIVE 2 FROM
| | | PROCESSING UNIT (SEE SM
| | | 1510).
| | | 5. (SEE SM 1241, 1251, 1261).
| | | 6. REINSTALL COVER (BACK) ON
| | | POWER SUPPLY.

| | WAS DAMAGED FUSE F4?
| | Y N

| | |
| | | 107
| | | WAS DAMAGED FUSE F5?
| | | Y N
| | | |
| | | | 108
| | | | 1. REPLACE DRIVE CONTROL
| | | | CARD (SEE SM 1572).
| | | | 2. VERIFY REPAIR.

| | |
| | | 109
| | | 1. DISCONNECT LED CONNECTOR
| | | (SEE SM 1570).
| | | 2. POWER ON.

| | |
| | | IS FUSE F5 GOOD?
| | | Y N

| | |
| | | 14AUG81 PN6841657
| | | 1 1 1 1
| | | 4 4 4 4 EC994445 PEC987896
| | | A A A A
| | | N P Q R MAP 1250-13

A A A SYSTEM 23
P Q R POWER MAP
1 1 1
3 3 3 PAGE 14 OF 15

| | |
| | |
| | 110
| | 1. POWER OFF.
| | 2. RECONNECT LED CONNECTOR.
| | 3. DISCONNECT PTX CONNECTOR.
| | 4. REPLACE FUSE F5.
| | 5. POWER ON.

| | IS FUSE F5 GOOD?

| | Y N

| | | 111
| | | 1. POWER OFF.
| | | 2. REPLACE DRIVE CONTROL
| | | CARD (SEE SM 1572).
| | | 3. REPLACE FUSE F5.
| | | 4. VERIFY REPAIR.

| | | 112
| | | 1. POWER OFF.
| | | 2. REPLACE PTX (SEE SM 1571).
| | | 3. VERIFY REPAIR.

| | 113
| | 1. REPLACE LED (SEE SM 1570).
| | 2. VERIFY REPAIR.

114
1. DISCONNECT HEAD LOAD SOLENOID
CONNECTOR (SEE SM 1540).
2. POWER ON.

IS FUSE F4 GOOD?

Y N

| | 115
| | 1. POWER OFF.
| | 2. RECONNECT HEAD LOAD
| | SOLENOID.
| | 3. DISCONNECT STEPPER MOTOR
| | CONNECTOR (SEE SM 1560).
| | 4. REPLACE FUSE F4.
| | 5. POWER ON.

| | IS FUSE F4 GOOD?

| | Y N

A A A
S T U

A A A A MAP 1250-14
N S T U

1
3 | | |
| | |
| | |
| | | 116

| | | 1. POWER OFF.
| | | 2. REPLACE DRIVE CONTROL
| | | CARD (SEE SM 1572).
| | | 3. REPLACE FUSE F4.
| | | 4. VERIFY REPAIR.

| | | 117

| | | 1. POWER OFF.
| | | 2. REPLACE STEPPER MOTOR (SEE
| | | SM 1560).
| | | 3. VERIFY REPAIR.

| | | 118

| | | 1. POWER OFF.
| | | 2. REPLACE HEAD LOAD SOLENOID
| | | (SEE SM 1540).
| | | 3. VERIFY REPAIR.

119

(ENTRY POINT D)

1. POWER OFF.
2. RECONNECT P4.
3. REMOVE ALL CARDS FROM CPU
PLANAR BOARD (SEE SM 1205 AND
1230).
4. POWER ON.

IS THE REPLACED FUSE GOOD?

Y N

| | 120
| | 1. POWER OFF.
| | 2. REPLACE DAMAGED FUSE.
| | 3. REPLACE CPU PLANAR BOARD
| | (SEE SM 1230).
| | 4. INSERT ALL CARDS BACK INTO
| | PLANAR BOARD (SEE SM 1205).
| | 5. VERIFY REPAIR.

14AUG81 PN6841657

5 EC994445 PEC987896

A
V

MAP 1250-14

|
|
121

1. POWER OFF.
2. INSERT ONE CARD INTO CPU PLANAR BOARD.
3. POWER ON.

IS THE REPLACED FUSE GOOD?

Y N

|
| 122

1. POWER OFF.
2. THE LAST CARD INSERTED INTO CPU PLANAR BOARD IS BAD. REPLACE THIS CARD.
3. REPLACE THE DAMAGED FUSE.
4. INSERT ALL REMAINING ATTACHMENT CARDS (SEE SM 1205).
5. VERIFY REPAIR.

|
123

1. REPEAT THE LAST STEP UNTIL BAD ATTACHMENT CARD IS INSERTED AND FUSE BLOWS.
2. REPLACE LAST CARD INSERTED.
3. REPLACE DAMAGED FUSE.
4. INSERT ALL REMAINING CARDS.
5. VERIFY REPAIR.

124

(ENTRY POINT AC)

(AC MISSING FROM DISKETTES OR CRT)

DANGER

AC LINE VOLTAGE IS PRESENT IN THE POWER SUPPLY WHEN THE POWER ON/OFF SWITCH IS IN THE 'OFF' POSITION. ALWAYS PULL THE AC LINE CORD FROM THE POWER SUPPLY WHEN WORKING IN THE AC POWER AREA.

1. PLACE POWER SUPPLY IN THE SERVICE POSITION (SEE SM 1240, 1250, 1260).
2. -TYPE 2 SUPPLY- REMOVE TOP COVER.
3. CHECK FOR LOOSE CONNECTIONS ON TB1 WHERE AC DISTRIBUTION CABLES ARE CONNECTED.

ARE CONNECTIONS OK?

Y N

|
| 125

1. CORRECT PROBLEM IF BAD CONNECTIONS ARE FOUND.

|
126

REPLACE POWER SUPPLY (SEE SM 1240, 1250, 1260).

14AUG81 PN6841657

EC994445 PEC987896

1

KEYBOARD MAP

PAGE 1 OF 2

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1000	A	1	001
1205	A	1	001
1210	A	1	001

EXIT POINTS

EXIT THIS MAP TO			
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	009	1000	B

001
(ENTRY POINT A)

IS IT POSSIBLE TO LOAD PID 1300?

Y N

|
| 002
| ONE OF THE KEYS THAT MUST BE
| USED TO LOAD DCP OR PID 1300 IS
| FAILING.

- | 1. REPLACE KEYBOARD (SEE SM 1330).
- | 2. VERIFY REPAIR.

003
IF YOU DO NOT KNOW EXACTLY WHICH KEY IS FAILING, ANSWER THE NEXT QUESTION 'NO'.

IS THERE A SINGLE KEY FAILING?

Y N

|
| 004
| LOAD DIAGNOSTIC PID 1300 AND
| SELECT OPTION #1 (TEST COMPLETE
| KEYBOARD). FOLLOW THE
| DIRECTIONS GIVEN ON THE SCREEN.

| DID PID 1300 IDENTIFY A
| PROBLEM?

| Y N

COPYRIGHT IBM CORP 1981

14AUG81 PN6841654

EC994445 PEC869281

2 2 2
A B C

A B C SYSTEM 23
1 1 1

KEYBOARD MAP

PAGE 2 OF 2

005
TEST EVERY KEY USING OPTION
#0 OF PID 1300.
GO TO STEP 007,
ENTRY POINT B.
006
GO TO STEP 011,
ENTRY POINT C.
007
(ENTRY POINT B)

LOAD PID 1300 AND SELECT OPTION
#0 (TEST SINGLE KEY). SEE SM
1310 AND TEST THE SUSPECT KEY FOR
CORRECT SCAN CODE AND FUNCTION.

IS THE FAILING KEY IDENTIFIED?
Y N

008
INSPECT THE KEYBOARD AND ENSURE
THAT ALL KEY TOPS ARE IN THE
CORRECT POSITIONS (SEE SM 1340
FOR KEYBOARD ARRANGEMENTS).

ARE ANY KEYS IN THE WRONG
POSITIONS?
Y N

009
KEYBOARD IS OK. RETURN TO
START MAP.
GO TO MAP 1000,
ENTRY POINT B.

D E MAP 1300-2

010
REPLACE KEYBOARD (SEE SM 1330).

CAUTION

DO NOT ATTEMPT TO REMOVE AND
REPLACE KEY TOPS. IF THE
KEYBOARD BECOMES CONTAMINATED,
INTERMITTENT FAILURES MAY
OCCUR.

011
(ENTRY POINT C)

BEFORE REPLACING THE KEYBOARD,
INSPECT THE AREA AROUND THE
FAILING KEY FOR FOREIGN MATERIAL
(PAPER CLIPS, ETC.). IF ANY IS
FOUND, REMOVE THEM AND TEST THE
KEY. IF NO FOREIGN MATERIAL IS
FOUND, REPLACE THE KEYBOARD (SEE
SM 1330).

CAUTION

DO NOT ATTEMPT TO DISASSEMBLE THE
KEYBOARD. IT CONTAINS NO FIELD
REPAIRABLE PARTS.

14AUG81 PN6841654

EC994445 PEC869281

D E

MAP 1300-2

DISPLAY MAP

PAGE 1 OF 6

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

1000	A	1	001
1100	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT

5	031	1000	A
2	009	1000	B
4	026	1225	A
5	035	1250	AC

001
(ENTRY POINT A)

--GBGI ONLY-- SEE NOTE 1.

NOTE 1:

ON GBGI SYSTEMS, UNUSUAL CRT PROBLEMS CAN RESULT IF THE POWER SUPPLY TRANSFORMER IS NOT JUMPERED TO MATCH THE CUSTOMERS INPUT VOLTAGE. CHECK THESE JUMPERS (SEE SM 1210) AND CORRECT IF NECESSARY BEFORE REPLACING THE CRT ASSEMBLY.

IS A COMPOSITE VIDEO RPQ CARD AND/OR WORD PROCESSING SUPPORT CARD PRESENT ON THE SYSTEM (SEE SM 1205 AND 1230)?

Y N

|
| 002
| (ENTRY POINT D)

| IS THE PROBLEM 'NO DISPLAY'?

| Y N

| | 003
| | IS THE PROBLEM EXTRA OR
| | MISSING DOTS IN CHARACTER
| | BLOCKS?

| | Y N

COPYRIGHT IBM CORP 1981

14AUG81 PN6841655

EC994445 PEC987896

6 5 5 2
A B C D

G K L M
2 2 2 2

SYSTEM 23

DISPLAY MAP

PAGE 3 OF 6

015

REPLACE CPU PLANAR BOARD
(SEE SM 1230).

016

CHECK JUMPERS 'D' AND 'E'
(SEE SM 1230).

1. IF JUMPERS ARE IN THE
WRONG POSITION, CORRECT
JUMPER POSITION AND TEST
AGAIN.

2. IF JUMPERS ARE OK, REPLACE
CPU PLANAR BOARD (SEE SM
1230).

017

CALL FOR AID.

018

1. LOAD PID 0150 (CONFIGURATION
DISPLAY) AND DISPLAY THE
COUNTRY SELECT OPTION.

2. IF CHARACTER SET IS WRONG,
CHECK THE COUNTRY SELECT
JUMPERS (SEE SM 1230 FOR
LOCATIONS).

3. IF JUMPERS ARE CORRECT,
REPLACE THE CPU PLANAR BOARD
(SEE SM 1230).

F
2

MAP 1400-3

019

USING THE CE LOGIC PROBE, PROBE
THE HORIZONTAL, VERTICAL, AND
VIDEO SIGNALS IN THE CRT SIGNAL
CABLE CONNECTOR AT THE CRT END,
PINS F, J, AND K. (SEE SM 1411
FOR LOCATIONS).
(SEE NOTE BELOW.)

NOTE 1

GENERAL LOGIC PROBE SET UP
(SEE SM 1230)

A) TECHNOLOGY SWITCH = MULTI
B) LATCH SWITCH = NONE
C) GATE REF. SWITCH = GND
D) POWER LEAD (BLACK) = GND
E) POWER LEAD (RED) = +5V
F) PROBE GROUND LEAD = GND
G) TEST 'UP' LIGHT = +5V
H) TEST 'DOWN' LIGHT = GND

ARE ALL LINES PULSING?

Y N

020

DISCONNECT CRT SIGNAL CABLE AT
THE CRT END AND PROBE THE SAME
SIGNALS AT THE CRT END OF THE
CABLE.

ARE ALL LINES PULSING?

Y N

021

1. REMOVE CRT SIGNAL CABLE
FROM THE CPU PLANAR BOARD.
2. PROBE THE SAME SIGNALS AT
THE CPU CRT PLANAR BOARD
CONNECTOR PINS (SEE SM
1212 FOR LOCATIONS).

ARE ALL LINES PULSING?

Y N

14AUG81 PN6841655

EC994445 PEC987896

4 4 4 4

N P Q R

MAP 1400-3

N P Q R SYSTEM 23
3 3 3 3

MAP 1400-4

DISPLAY MAP

PAGE 4 OF 6

022

1. REPLACE CPU PLANAR BOARD
(SEE SM 1230).
2. VERIFY REPAIR.

023

1. REPAIR/REPLACE CRT SIGNAL
CABLE (SEE SM 1411).
2. VERIFY REPAIR.

024

REPLACE CRT DISPLAY UNIT
ASSEMBLY (SEE SM 1430).

025

1. PERFORM CRT ADJUSTMENTS (SEE
SM 1440).

NOTE: IF THE DISPLAY IS DISTORTED
TO THE POINT THAT IT CANNOT BE
READ, IGNORE THE INSTRUCTION IN
SM 1440 TO LOAD PID 1400, ROUTINE
0. USE ANY CHARACTERS THAT ARE
DISPLAYED AND THE PROCEDURES IN
SM 1440 TO OBTAIN A READABLE
DISPLAY. AT THAT POINT, LOAD PID
1400, ROUTINE 0 AND PERFORM
ADJUSTMENTS IN SM 1440.

2. IF ADJUSTMENTS DO NOT CORRECT
PROBLEM, REPLACE THE CRT
DISPLAY UNIT ASSEMBLY (SEE SM
1430).

IS THE PROBLEM FIXED?

Y N

026

PROBLEM MAY BE RIPPLE ON THE
D.C. VOLTAGES.
SEE MAP 1225 FOR RIPPLE CHECK
PROCEDURES.

GO TO MAP 1225, ENTRY POINT A.

--50 HZ ONLY-- BEFORE PERFORMING
ADJUSTMENTS ENSURE THE '50 HZ'
JUMPER IS PRESENT ON THE CPU
PLANAR BOARD. (SEE SM 1230).

14AUG81 PN6841655

EC994445 PE087896

5
S

MAP 1400-4

A T SYSTEM 23

V

MAP 1400-6

1 5

DISPLAY MAP

PAGE 6 OF 6

040

PERFORM THE ADJUSTMENTS THAT AFFECT BRIGHTNESS (SEE SM 1440).

DID THE ADJUSTMENTS CORRECT THE PROBLEM?

Y N

041

REPLACE CRT DISPLAY UNIT (SEE SM 1430).

042

PROBLEM SOLVED.

VERIFY REPAIR.

043

1. REMOVE THE CABLE CONNECTING THE COMPOSITE VIDEO RPQ CARD OR THE WORD PROCESSING CARD TO THE SYSTEM (SEE SM 1205, 1230 AND 1212 (MODEL 4XX)).
2. REMOVE THE CRT SIGNAL CABLE FROM THE COMPOSITE VIDEO RPQ CARD OR THE WORD PROCESSING SUPPORT CARD AND CONNECT IT DIRECTLY INTO THE CPU PLANAR BOARD (SEE SM 1205, 1230 AND 1212 (MODEL 4XX)).

DOES THE CRT NOW WORK CORRECTLY?

Y N

044

GO TO PAGE 1, STEP 002, ENTRY POINT D.

045

1. REPLACE COMPOSITE VIDEO RPQ CARD.
2. REPLACE THE WORD PROCESSING SUPPORT CARD (SEE SM 1205 AND 1230).
3. REPLACE THE CABLE FROM THE FEATURE/RPQ CARD TO THE CPU PLANAR BOARD (SEE SM 1205, 1230 AND 1212 (MODEL 4XX)).

14AUG81 PN6841655

EC994445 PEC987896

MAP 1400-6

V

WORD PROCESSING

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

2	011	1225	A

001
(ENTRY POINT A)

- LOAD PID 1450 FROM DCP MENU OPTION 10 (SEE THE USER GUIDE 0001, PID 1450 FOR LOADING INSTRUCTIONS).

IS THE PROBLEM AN ATTRIBUTE PROBLEM, (NO BLINKING, HIGHLIGHT, REVERSE VIDEO OR UNDERLINE)?

Y N

|
| 002
| (ENTRY POINT B)

- SELECT OPTION 0 FROM PID 1450 MENU AND RUN THE STORAGE TEST.

| NOTE: THIS TEST RUNS FOR ABOUT 5 MINUTES.

| DID STORAGE TEST COME TO A GOOD END?

| Y N

| | 003
| | DID THE SCREEN GO BLANK AFTER TEST STARTED?

| | Y N

COPYRIGHT IBM CORP 1981

14AUG81 PN6842277

EC994445 PEC987896

3 2 2 2
A B C D

C D SYSTEM 23
1 1
WP SUPPORT
PAGE 2 OF 4

004
WAS AN ERROR MESSAGE DISPLAYED?
Y N

- 005
1. REPLACE THE WORD PROCESSING SUPPORT CARD (SEE SM 1205 AND 1230).
 2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).
 3. VERIFY REPAIR.

006

1. REPLACE THE WORD PROCESSING SUPPORT CARD (SEE SM 1205 AND 1230).

2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).

3. VERIFY REPAIR.

007

1. REPLACE THE WORD PROCESSING SUPPORT CARD (SEE SM 1205 AND 1230).

2. REPLACE THE CPU PLANAR BOARD (SEE SM 1230).

3. VERIFY REPAIR.

B MAP 1450-2
1

008
1. POWER OFF THE SYSTEM.

2. WAIT 30 SECONDS AND POWER ON THE SYSTEM.

3. LOAD PID 1450 AND SELECT OPTION 0 (SEE USER GUIDE 0001, PID 1450 FOR LOADING INSTRUCTIONS).

4. THIS STEP RUNS THE ROUTINE TO CHECK THE I/O CHECK (PARITY CHECK) CIRCUIT.

WAS AN ERROR MESSAGE DISPLAYED?
Y N

009
WAS THIS MAP ENTERED BECAUSE THE CUSTOMER HAD A TRAP 2000?
Y N

010

1. SELECT OPTION 1 PID 1450 (SEE USER GUIDE 0001, PID 1450 FOR INSTRUCTIONS).

2. LET THE STORAGE TEST LOOP AND IF NO ERRORS OCCUR FAILURE MAY BE INTERMITTENT.

WAS AN ERROR MESSAGE DISPLAYED OR DID THE SCREEN GO BLANK?
Y N

011

1. PROBLEM IS INTERMITTENT.

2. GO TO THE INTERMITTENT MAP
GO TO MAP 1225,
ENTRY POINT A.

14AUG81 PN6842277
EC994445 PEC987896

3 3 3
E F G

MAP 1450-2

A E F G
1 2 2 2

SYSTEM 23

WP SUPPORT

PAGE 3 OF 4

012

1. REPLACE THE WORD
PROCESSING SUPPORT CARD
(SEE SM 1205 AND 1230).

2. REPLACE THE CPU PLANAR
BOARD (SEE SM 1230).

3. VERIFY REPAIR.

013

1. REPLACE THE WORD
PROCESSING SUPPORT CARD
(SEE SM 1205 AND 1230).

2. REPLACE THE CPU PLANAR
BOARD (SEE SM 1230).

3. VERIFY REPAIR.

014

1. REPLACE THE WORD PROCESSING
SUPPORT CARD (SEE SM 1205
AND 1230).

2. REPLACE THE CPU PLANAR BOARD
(SEE SM 1230).

3. VERIFY REPAIR.

015

1. SELECT OPTION 2 ATTRIBUTE
TEST.

WAS AN ERROR MESSAGE DISPLAYED?

Y N

016

DID THE SCREEN GO BLANK OR IS
IT FLASHING?

Y N

4 4

H J K

K

MAP 1450-3

017

IS THE SCREEN NORMAL (SEE USER
GUIDE 0001, PID 1450)?

Y N

018

1. CHECK THAT THE HIGHLIGHT
JUMPER IS INSTALLED (SEE SM
1205 AND 1230).

2. REPLACE THE WORD PROCESSING
SUPPORT CARD (SEE SM 1205
AND 1230).

3. REPLACE THE WORD PROCESSING
SUPPORT CABLE TO THE CPU
BOARD (SEE SM 1212).

4. REPLACE THE CPU PLANAR BOARD
(SEE SM 1230).

5. VERIFY REPAIR.

019

IS THE PROBLEM MOVING ATTRIBUTES?

Y N

020

1. TERMINATE ROUTINE BY
PRESSING 'ATTN E'.

2. LOAD AND SELECT OPTION 0,
(STORAGE TEST, SEE USER
GUIDE 0001, PID 1450 FOR
LOADING INSTRUCTIONS).

3. GO TO ENTRY B
GO TO PAGE 1, STEP 002,
ENTRY POINT B.

14AUG81 PN6842277

EC994445 PEC987896

4

L

MAP 1450-3

WP SUPPORT

PAGE 4 OF 4

021

1. REPLACE THE WORD
PROCESSING SUPPORT CARD
(SEE SM 1205 AND 1230).

2. REPLACE THE WORD
PROCESSING SUPPORT CABLE
TO THE CPU BOARD (SEE SM
1212).

3. REPLACE THE CPU PLANAR
BOARD (SEE SM 1230).

4. VERIFY REPAIR.

022

1. REPLACE THE WORD PROCESSING
SUPPORT CARD (SEE SM 1205
AND 1230).

2. REPLACE THE WORD PROCESSING
SUPPORT CABLE TO THE CPU
BOARD (SEE SM 1212).

3. REPLACE THE CPU PLANAR BOARD
(SEE SM 1230).

4. VERIFY REPAIR.

023

1. REPLACE THE WORD PROCESSING
SUPPORT CARD (SEE SM 1205 AND
1230).

2. REPLACE THE WORD PROCESSING
SUPPORT CABLE TO THE CPU BOARD
(SEE SM 1212).

3. REPLACE THE CPU PLANAR BOARD
(SEE SM 1230).

4. VERIFY REPAIR.

14AUG81 PN6842277

EC994445 PEC987896

DISKETTE STRATEGY

PAGE 1 OF 32

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

1000	G	13	128
1200	A	2	001
1201	EE	5	034
1205	A	2	001
1210	A	2	001
1225	C	17	170
1501	A	2	001
1501	F	10	096
1501	G	13	128
1501	T	26	247
1501	U	7	067
1502	A	2	001
1530	B	6	048

EXIT POINTS

EXIT THIS MAP		TO	

PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT

3	010	1250	A
8	074	1250	A
32	321	1250	A
6	046	1502	A
17	168	1502	A
28	268	1502	A
4	022	1502	D
11	102	1502	D
12	124	1502	D
13	138	1502	D
18	178	1502	D
19	191	1502	D
21	212	1502	D
28	274	1502	D
5	038	1530	A
6	040	1530	A
9	092	1530	A
9	094	1540	A
13	126	1540	A
14	142	1540	H
14	144	1545	A
16	164	1545	A
16	166	1545	A
17	169	1545	A
8	071	1560	A
32	321	1560	A

DISKETTE STRATEGY

001
(ENTRY POINT A)

*** NOTE ***

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE PROCESSOR, USE
SM R4904 FOR REMOVAL/REPLACEMENT
OF THE DISKETTE ATTACHMENT CARD.

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE 5246 DISKETTE
UNIT, USE SM R4908 FOR
REMOVAL/REPLACEMENT OF THE
MULTIPLEXER CARD.

SEE NOTE 1 ON THE RIGHT ----->

WHEN A FRU DOES NOT REPAIR THE
PROBLEM, REPLACE THE FRU WITH THE
ORIGINAL.

DID POWER-ON TEST RUN OK?

Y N

|
| 002

| ERROR 38?

| Y N

| |
| | 003

| | (ENTRY POINT J)

| |
| | (ERROR 39)

| |
| |

| | IS DRIVE 1 INSTALLED ON
| | SYSTEM?

| | Y N

NOTE 1:

1. REFERENCE TO SM 15XX AND 12XX INDICATES INTERNAL DRIVES 1 OR 2, SM 45XX IS FOR EXTERNAL DRIVES 3 OR 4. SM R49XX IS FOR THE REMOTE PROCESSOR/5246 RPQ EXTENDED FEATURE.
2. IT MAY BE NECESSARY TO PUT THE DISKETTE DRIVES IN THE SERVICE POSITION (SEE SM 1510 AND 1220 OR SM 4510 AND 4505).
3. DAMAGE TO THE DISKETTE MAY OCCUR IF NOT REMOVED BEFORE POWERING DOWN.
4. THIS MAP CHART NEEDS THE CE DISKETTE TO BE A TYPE 1 DISKETTE.
5. IT TAKES APPROXIMATELY 4 MINUTES FOR A 'COULD NOT SECURE' (ENDING STATUS 32) TO SHOW ON THE SCREEN. LET THIS TIME PASS WHEN IT APPEARS THAT ONE OR BOTH PROCESSORS ARE HUNG.

14AUG81 PN6841632

EC994445 PEC987896

5 3 3 3
A B C D

C D SYSTEM 23
 2 2
 DISKETTE STRATEGY
 PAGE 3 OF 32
 004
 CHECK JUMPER FOR 'NO INTERNAL
 DISKETTES INSTALLED ON SYSTEM'
 (SEE SM 1230).
 IS JUMPER INSTALLED?
 Y N
 005
 1. INSTALL JUMPER (SEE SM
 1230).
 2. VERIFY REPAIR.
 006
 REPLACE PLANAR BOARD (SEE SM
 1230).
 007
 (NO +24V TO DISKETTE ATTACHMENT
 FROM DRIVE 1.)
 ON DRIVE 1 AT THE DISKETTE
 ATTACHMENT CARD, CHECK PIN B03
 FOR +24V DC ON CABLE BETWEEN
 DISKETTE DRIVE CONTROL CARD AND
 DISKETTE ATTACHMENT CARD (SEE SM
 1505).
 IS +24V DC VOLTAGE PRESENT?
 Y N
 008
 1. POWER OFF.
 2. CHECK CABLE FROM DRIVE 1 TO
 DISKETTE ATTACHMENT CARD FOR
 CONTINUITY OF +24V
 DISTRIBUTION (SEE SM 1211 &
 1505).
 IS CABLE OK?
 Y N

B E F G MAP 1500-3
 2
 009
 1. REPAIR/REPLACE CABLE
 (SEE SM 1211 AND 1215 OR
 1505 AND 1511).
 2. VERIFY REPAIR.
 010
 GO TO MAP 1250,
 ENTRY POINT A.
 011
 1. POWER OFF.
 2. REPLACE DISKETTE ATTACHMENT
 CARD (SEE SM 1205 AND 1511).
 3. POWER ON.
 ERROR 39?
 Y N
 012
 PROBLEM IS REPAIRED.
 013
 1. POWER OFF.
 2. REINSTALL ORIGINAL DISKETTE
 ATTACHMENT CARD.
 3. REPLACE CPU PLANAR BOARD
 (SEE SM 1230).
 4. VERIFY REPAIR.
 014
 1. REMOVE ALL FEATURE I/O CARDS
 EXCEPT DISKETTE ATTACHMENT
 (SEE SM 1205 AND 1230).
 2. IF EXTERNAL DRIVES ARE
 INSTALLED, REMOVE CABLE FROM
 THE DISKETTE ATTACHMENT CARD
 TO THE MULTIPLEXER CARD AT THE
 DISKETTE ATTACHMENT CARD (SEE
 SM 1212). (IF EXTENDED RPQ
 FEATURE IS INSTALLED, REMOVE
 CABLE FROM EXTENDED FEATURE
 CARD AND REMOVE EXTENDED
 FEATURE CARD. SEE SM R4904).
 (STEP 014 CONTINUES)
 14AUG81 PN6841632
 EC994445 PEC987896

DISKETTE STRATEGY

PAGE 4 OF 32

(STEP 014 CONTINUED)

3. RUN POWER ON DIAGNOSTICS AGAIN.

ERROR 38?

Y N

015 REINSTALL FEATURE I/O CARDS ONE AT A TIME. RUN POWER ON DIAGNOSTICS AFTER EACH FEATURE CARD IS REINSTALLED, UNTIL ERROR 38 OCCURS AGAIN. THE LAST I/O FEATURE CARD INSTALLED THAT CAUSED ERROR 38 TO OCCUR AGAIN IS BAD. REPLACE IT.

DID AN I/O FEATURE CARD CAUSE AN ERROR 38?

Y N

016 IS DRIVE 3 AND 4 INSTALLED?

Y N

017 REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

018 1. REINSTALL CABLE FROM THE DISKETTE MULTIPLEXER CARD TO THE DISKETTE ATTACHMENT CARD. (IF THE EXTENDED RPQ FEATURE IS INSTALLED, REINSTALL CABLE AT EXTENDED FEATURE CARD (SEE SM R4904). 2. DISCONNECT CABLE AT THE MULTIPLEXER CARD END. (SEE SM 4506 AND 4501).

ERROR 38?

Y N

Vertical column of pipe characters |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | 019

| | | REPLACE MULTIPLEXER CARD (SEE SM 4578).

| | | |

| | | 020

| | | IF EXTENDED RPQ FEATURE INSTALLED (SEE SM R4902), IS AN ERROR 38 ON THE REMOTE PROCESSOR?

| | | Y N

| | | |

| | | 021

| | | 1. POWER OFF. 2. CHECK CABLE BETWEEN DISKETTE ATTACHMENT CARD AND THE MULTIPLEXER CARD FOR CONTINUITY OR SHORT CIRCUITS (SEE SM 4505).

| | | 3. REPAIR/REPLACE AS NECESSARY. (SEE SM 4579).

| | | |

| | | 022

| | | |

| | | GO TO MAP 1502, ENTRY POINT D.

| | | |

| | | 023

| | | 1. CONNECT ANY CABLES THAT MAY HAVE BEEN REMOVED. 2. VERIFY REPAIR.

| | | |

| | | 024

| | | 1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511). 2. REINSTALL ANY I/O FEATURE CARDS THAT WERE REMOVED (SEE SM 1205 AND 1230). 3. REINSTALL ANY CABLES THAT WERE REMOVED BEFORE.

IS PROBLEM FIXED?

Y N

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

14AUG81 PN6841632

EC994445 PEC987896

DISKETTE STRATEGY

PAGE 5 OF 32

025
 1. REPLACE CPU PLANAR BOARD
 (SEE SM 1230).
 2. REINSTALL ORIGINAL
 DISKETTE ATTACHMENT CARD
 (SEE SM 1205 AND 1511).
 3. VERIFY REPAIR.

026
 VERIFY REPAIR.

027
 IS SHARED EXTERNAL DRIVES FEATURE
 PRESENT ON THE SYSTEM?

Y N

028
 GO TO STEP 034,
 ENTRY POINT EE.

029
 FAILURE ONLY WHEN RUNNING
 DIAGNOSTIC IN SHARED MODE?

Y N

030
 GO TO STEP 034,
 ENTRY POINT EE.

031
 REPLACE THE MULTIPLEXER CARD (SEE
 SM 4578).

IS PROBLEM FIXED?

Y N

032
 GO TO STEP 034,
 ENTRY POINT EE.

033
 VERIFY REPAIR

034
 (ENTRY POINT EE)

1. POWER OFF.
2. POWER ON.
3. RUN ROS RESIDENT DISKETTE
 TEST, PID 1500 (SEE DIAGNOSTIC
 USER'S GUIDE 0001 TO OPTION
 ROS RESIDENT DIAGNOSTICS).
4. SELECT FAILING DISKETTE DRIVE.
5. SELECT 'DISKETTE DIAGNOSTIC
 WITHOUT LOOP' OPTION TO RUN
 TEST ON FAILING DISKETTE
 DRIVE.

TEST RUN OK?

Y N

035
 IS ENDING STATUS '31'?

Y N

036
 IS THE FAILING DRIVE DRIVE 1
 OR DRIVE 2?

Y N

037
 IS ENDING STATUS '32'?

Y N

038
 PID 1500 DISKETTE
 FAILURE.
 GO TO MAP 1530,
 ENTRY POINT A.

039

GO TO PAGE 26,
 STEP 247,
 ENTRY POINT T.

14AUG81 PN6841632

EC994445 PEC987896

Q R
5 5

SYSTEM 23
DISKETTE STRATEGY

PAGE 6 OF 32

040
PID 1500 DISKETTE FAILURE.
GO TO MAP 1530, ENTRY POINT A.

041
IS EXTENDED RPQ FEATURE INSTALLED
(SEE SM R4902)?

Y N

042
GO TO PAGE 29, STEP 276,
ENTRY POINT BB.

043
IS ERROR '31' ON REMOTE
PROCESSOR?

Y N

044
GO TO PAGE 29, STEP 276,
ENTRY POINT BB.

045
DOES LOCAL PROCESSOR FAIL?

Y N

046
GO TO MAP 1502, ENTRY POINT A.

047

GO TO PAGE 29, STEP 276,
ENTRY POINT BB.

P
5

MAP 1500-6

048
(ENTRY POINT B)

(NOTE: IF SHARED EXTERNAL DRIVES
IS INSTALLED, POWER OFF, THEN
POWER ON BOTH PROCESSORS. IF
FAILING DRIVE IS EXTERNAL AND
SHARED, LOAD DCP FROM SUSPECTED
FAILING PROCESSOR).
LOAD DCP PROGRAM ON FAILING
DISKETTE DRIVE.

DID DCP LOAD OK?

Y N

049
IS ENDING STATUS '32'?

Y N

050
REPLACE CE DISKETTE.
VERIFY

051

GO TO PAGE 26, STEP 247,
ENTRY POINT T.

052
WHEN DCP MENU IS DISPLAYED ENTER
OPTION '0' TO LOAD PID 1505
DISKETTE FLT (PART 1).

DID PID 1505 LOAD OK?

Y N

053
ENDING STATUS '32'?

Y N

054
REPLACE CE DISKETTE.
VERIFY

14AUG81 PN6841632

EC994445 PEC987896

7 7
S T

MAP 1500-6

S T
6 6

SYSTEM 23

DISKETTE STRATEGY

PAGE 7 OF 32

055

GO TO PAGE 26, STEP 247,
ENTRY POINT T.

056

1. SELECT OPTION 2.
2. RUN PID 1505 WITHOUT LOOP ON FAILING DRIVE, UNTIL CONFIGURATION RECORD IS DISPLAYED. (NOTE: WAIT A MAXIMUM OF 4 MINUTES FOR CONFIGURATION.)

DID CONFIGURATION RECORD DISPLAY WITHOUT ENDING STATUS '032'?

Y N

057

GO TO PAGE 26, STEP 247,
ENTRY POINT T.

058

IS THE CONFIGURATION RECORD CORRECT?

Y N

059

IS EXTERNAL DRIVES FEATURE INSTALLED?

Y N

060

GO TO STEP 067,
ENTRY POINT U.

061

DOES THE CONFIGURATION RECORD INDICATE THAT EXTERNAL DRIVE POWER IS OFF?

Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

9
U V W

V W

MAP 1500-7

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

8
X

062

IS ENDING STATUS 032?

Y N

063

GO TO STEP 067,
ENTRY POINT U.

064

GO TO PAGE 26, STEP 247,
ENTRY POINT T.

065

CHECK THAT EXTERNAL DRIVES ARE POWERED ON.

IS THE EXTERNAL DRIVE ON/OFF SWITCH IN THE ON POSITION, AND THE LINE PLUG CONNECTED TO THE WALL OUTLET?

Y N

066

POWER EXTERNAL DRIVE ON AND VERIFY.

067

(ENTRY POINT U)

IS INTERNAL +24 VOLTS OK (SEE CONFIGURATION DISPLAY)?

Y N

068

GO TO PAGE 2, STEP 003,
ENTRY POINT J.

14AUG81 PN6841632

EC994445 PEC987896

MAP 1500-7

U Y
7 8

SYSTEM 23

DISKETTE STRATEGY

PAGE 9 OF 32

081
IS DRIVE 2 ATTACHED?
Y N

082
REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND 1511).

083
CHECK CABLE PIN 18 TO DRIVE 2
FOR OPEN (SEE SM 1505).

IS CABLE OK?
Y N

084
REPAIR/REPLACE CABLE (SEE SM
1215, 1505 AND 1511).

085
REPLACE
1. DISKETTE DRIVE CONTROL CARD
(SEE SM 1572).
2. DISKETTE ATTACHMENT CARD
(SEE SM 1205 AND 1511).

086
IS SHARED EXTERNAL DRIVES FEATURE
INSTALLED?
Y N

087
(ENTRY POINT V)

WAS ENTRY TO THIS MAP BECAUSE
OF A FAILURE WHEN RUNNING
DIAGNOSTICS IN SHARED MODE?
Y N

2 2 |
2 2 |
A A A
A B C

A
C

MAP 1500-9

088
RUN SELECTED TEST TO THE END OR
UNTIL AN ERROR (OPTION 2 ONLY).
(NOTE: IF SHARED EXTERNAL DRIVES
FEATURE IS INSTALLED, RUN
SELECTED TEST TO END ON SUSPECTED
FAILING PROCESSOR).

TEST RUN OK?

Y N

089
IS ENDING STATUS '31' OR
'E-031'?
Y N

090
IS ERROR ROUTINE 07 ERROR
'E-0FE'?
Y N

091
IS ERROR ROUTINE 09 ERROR
'E-029'?
Y N

092
GO TO MAP 1530,
ENTRY POINT A.

093
REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND
1511).

094
(TRACK READ FAILURE)
GO TO MAP 1540,
ENTRY POINT A.

095
GO TO PAGE 29, STEP 276,
ENTRY POINT BB.

14AUG81 PN6841632

1
0
A
D

EC994445 PEC987896

MAP 1500-9

096
(ENTRY POINT F)

NOTE 2:

- SEE NOTE 2 ----->
1. RETURN TO THE DCP.
 2. ENTER DCP MENU OPTION '8' TO LOAD PID 1510 WITHOUT LOOP.
 3. SELECT FAILING DRIVE TO RUN TEST.
 4. READ TYPE DISKETTE MESSAGE AND VERIFY THAT THE TYPE OF DISKETTE SENSED IS EQUAL WITH DISKETTE INSERTED.

IF ENTRY TO THIS MAP WAS BECAUSE OF AN ERROR IN THE FORMAT ROUTINE (PID 1510), RUN PID 1510 AGAIN, AFTER FILE IS REPAIRED, TO WRITE OVER TRACK 76.

TYPE OF DISKETTE THE SAME?

Y N

| 097
| (ENTRY POINT L)

| IS EXTENDED RPQ FEATURE
| INSTALLED (SEE SM R4902)?

| Y N

| 098

| GO TO PAGE 11, STEP 103,
| ENTRY POINT GG.

| 099

| IS AN EXTERNAL DRIVE FAILING ON
| THE REMOTE PROCESSOR?

| Y N

| 100

| GO TO PAGE 11, STEP 103,
| ENTRY POINT GG.

| 101

| DOES THE LOCAL PROCESSOR FAIL?

| Y N

| |
| |
| |
| |
| |
| |
| |

1 1 1
2 1 1
A A A
E F G

14AUG81 PN6841632

EC994445 PEC987896

A A SYSTEM 23
 F G
 1 1 DISKETTE STRATEGY
 0 0
 PAGE 11 OF 32
 | |
 | |
 | 102
 | GO TO MAP 1502, ENTRY POINT D.
 |
 103
 (ENTRY POINT GG)
 DIAGNOSE PROBLEM USING THE LOCAL
 PROCESSOR
 IS DRIVE 1 OR DRIVE 2 FAILING TO
 INDICATE THE CORRECT DISKETTE
 TYPE?
 Y N
 |
 | 104
 | GO TO PAGE 24, STEP 234,
 | ENTRY POINT H.
 |
 105
 (INTERNAL DRIVES)
 DOES SYSTEM HAVE ONLY ONE
 INTERNAL DISKETTE DRIVE (DRIVE
 1)?
 Y N
 |
 | 106
 | 1. MOVE DISKETTE TO OTHER
 | INTERNAL DRIVE.
 | 2. POWER OFF.
 | 3. POWER ON.
 | 4. RUN PID 1510 ON THIS DRIVE.
 |
 | TYPE OF DISKETTE THE SAME?
 | Y N
 | |
 | | 107
 | | 1. REPLACE DISKETTE
 | | ATTACHMENT CARD (SEE SM
 | | 1205 AND 1511).
 | | 2. VERIFY REPAIR.
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 1 |
 2 |
 A A
 H J

A MAP 1500-11
 J
 |
 |
 |
 108
 IS DRIVE 1 THE FAILING DRIVE?
 Y N
 |
 | 109
 | 1. POWER DOWN.
 | 2. MOVE DRIVE 2 CABLE AT
 | ATTACHMENT CARD TO DRIVE 1
 | POSITION (SEE SM 1511).
 | 3. POWER UP.
 | 4. INSTALL DISKETTE IN DRIVE 2.
 | SELECT DRIVE 1.
 | 5. RUN PID 1510 AGAIN.
 |
 | IS THE FAILURE THE SAME AS THE
 | ORIGINAL FAILURE?
 | Y N
 | |
 | | 110
 | | 1. REPLACE DISKETTE
 | | ATTACHMENT CARD (SEE SM
 | | 1205 AND 1511).
 | | 2. RETURN CABLES TO ORIGINAL
 | | POSITION.
 | | 3. VERIFY REPAIR.
 | |
 | | 111
 | | RETURN CABLES TO ORIGINAL
 | | POSITION.
 | GO TO PAGE 23, STEP 229,
 | ENTRY POINT D.
 |
 112
 1. POWER DOWN.
 2. MOVE DRIVE 1 CABLE AT THE
 ATTACHMENT CARD TO DRIVE 2
 POSITION (SEE SM 1511).
 3. POWER UP.
 4. INSTALL DISKETTE IN DRIVE 1.
 SELECT DRIVE 2.
 5. RUN PID 1510 AGAIN.
 IS THE FAILURE THE SAME AS THE
 ORIGINAL FAILURE?
 Y N
 | |
 | |
 | |
 | |
 14AUG81 PN6841632
 1 1
 2 2 EC994445 PEC987896
 A A
 K L MAP 1500-11

A A A SYSTEM 23
H K L
1 1 1 DISKETTE STRATEGY
1 1 1
PAGE 12 OF 32

| | |
| | |
| | 113
| | 1. REPLACE DISKETTE
| | ATTACHMENT CARD (SEE SM
| | 1205 AND 1511).
| | 2. RETURN CABLES TO ORIGINAL
| | POSITION.
| | 3. VERIFY REPAIR.
| |
| 114
| RETURN CABLES TO ORIGINAL
| POSITION.
| GO TO PAGE 23, STEP 229,
| ENTRY POINT D.

115
1. POWER DOWN.
2. MOVE CABLE TO OTHER PORT ON
THE DISKETTE ATTACHMENT CARD
(SEE SM 1511).
3. POWER UP.
4. SELECT DRIVE 2.
5. RUN PID 1510.

DID THE SAME FAILURE OCCUR?
Y N

| 116
| 1. REPLACE THE DISKETTE
| ATTACHMENT CARD (SEE SM 1205
| AND 1511).
| 2. VERIFY REPAIR.

117
1. REPLACE DRIVE CONTROL CARD
(SEE SM 1572).
2. CHECK DISKETTE ATTACHMENT
CABLE FOR CONTINUITY OR SHORT
CIRCUITS (SEE SM 1505, 1511).
3. REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND 1511).
4. VERIFY REPAIR.

A MAP 1500-12
E
1
0

|
|
118
RUN TEST TO THE END OR UNTIL AN
ERROR.

TEST RUN OK?
Y N

| 119
| IS EXTENDED RPQ FEATURE
| INSTALLED (SEE SM R4902)?
| Y N

| 120
| GO TO STEP 125,
| ENTRY POINT HH.

| 121
| IS AN EXTERNAL DRIVE FAILING ON
| THE REMOTE PROCESSOR?
| Y N

| 122
| GO TO STEP 125,
| ENTRY POINT HH.

| 123
| DOES THE LOCAL PROCESSOR FAIL?
| Y N

| 124
| GO TO MAP 1502,
| ENTRY POINT D.

| 125
| (ENTRY POINT HH)
| DIAGNOSE PROBLEM USING THE
| LOCAL PROCESSOR

| IS ENDING STATUS 'E-031'?
| Y N

14AUG81 PN6841632
1 1 1
3 3 3 EC994445 PEC987896
A A A
M N P MAP 1500-12

| |
| |
| 152
| CHECK THE CABLE FROM THE
| DISKETTE ATTACHMENT CARD TO THE
| MULTIPLEXER CARD FOR CONTINUITY
| OR A SHORT CIRCUIT ON '+SELECT
| HEAD 1' (SEE SM 4505).

| |
| |
| 157
| PROBE '+SELECT HEAD 1' AT THE
| MULTIPLEXER CARD AT THE CABLE
| THAT CONNECTS TO THE DISKETTE
| ATTACHMENT CARD (SEE SM 4505).

| DOES '+SELECT HEAD 1' HAVE A
| SHORT CIRCUIT OR OPEN?

| DID '+SELECT HEAD 1' PULSE?
Y N

| Y N

- | |
| | 153
| | 1. REPLACE THE DISKETTE
| | ATTACHMENT CARD (SEE SM
| | 1205 AND 1511).
| | 2. REPLACE THE MULTIPLEXER
| | CARD (SEE SM 4578).

- | | 158
| 1. CHECK CABLE BETWEEN THE
| DISKETTE ATTACHMENT CARD AND
| THE MULTIPLEXER CARD FOR
| OPEN OR SHORT CIRCUIT ON
| '+SELECT HEAD 1' LINE (SEE
| SM 4505).
| 2. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4579).
| 3. REPLACE THE MULTIPLEXER CARD
| (SEE SM 4578).

| 154
| REPAIR/REPLACE CABLE AS
| NECESSARY (SEE SM 4505 AND
| 4579).

| 159
| PROBE '+SELECT HEAD 1' AT THE
| MULTIPLEXER CARD ON THE CABLE
| THAT CONNECTS TO THE FAILING
| DISKETTE DRIVE (SEE SM 4507).

| 155
| IS DISKETTE DRIVE 3/4 FAILING?
Y N

| DID '+SELECT HEAD 1' PULSE?
Y N

- | | 156
| 1. CHECK CABLE BETWEEN THE
| DISKETTE DRIVE CONTROL CARD
| AND THE DISKETTE ATTACHMENT
| CARD FOR OPEN OR SHORT
| CIRCUIT ON '+SELECT HEAD 1'
| LINE.
| 2. REPAIR/REPLACE AS NECESSARY
| (SEE SM 1205, 1505, 1511).
| 3. REPLACE DISKETTE DRIVE
| CONTROL CARD (SEE SM 1572).

- | | 160
| 1. CHECK CABLE BETWEEN THE
| MULTIPLEXER CARD AND THE
| FAILING DISKETTE DRIVE
| CONTROL CARD FOR OPEN OR
| SHORT CIRCUIT ON '+SELECT
| HEAD 1' LINE. (SEE SM
| 4507).
| 2. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4511).
| 3. REPLACE THE MULTIPLEXER CARD
| (SEE SM 4578).
| 4. REPLACE THE DISKETTE DRIVE
| CONTROL CARD (SEE SM 4572).

14AUG81 PN6841632

EC994445 PEC987896

A A B SYSTEM 23
R T A
1 1 1 DISKETTE STRATEGY
3 3 5
 PAGE 16 OF 32

MAP 1500-16

| | |
| | |
| | 161
| | 1. CHECK CABLE BETWEEN THE
| | FAILING DISKETTE DRIVE
| | CONTROL CARD AND THE
| | MULTIPLEXER CARD FOR OPEN
| | OR SHORT CIRCUIT ON
| | '+SELECT HEAD 1' LINE.
| | (SEE SM 4507).
| | 2. REPAIR/REPLACE AS
| | NECESSARY (SEE SM 4511).
| | 3. REPLACE DISKETTE DRIVE
| | CONTROL CARD (SEE SM
| | 4572).

| 162
|
| GO TO PAGE 17, STEP 170,
| ENTRY POINT C.

163
IS EXTENDED RPQ FEATURE INSTALLED
(SEE SM R4902)?
Y N

| 164
|
| GO TO MAP 1545, ENTRY POINT A.

165
IS DRIVE 3 OR 4 FAILING FROM THE
REMOTE PROCESSOR?
Y N

| 166
| (DRIVE 1 OR 2 OR LOCAL DRIVE 3
| OR 4 FAILING)
|
| GO TO MAP 1545, ENTRY POINT A.

167
DOES FAILING DRIVE FAIL FROM THE
LOCAL PROCESSOR?
Y N

| |
| |
| |
| |
| |

1 1
7 7
B B
B C

14AUG81 PN6841632

EC994445 PEC987896

MAP 1500-16

| | |
| | |
| | 168
| | (DRIVE 3 OR 4 REMOTE FAILURE)
| |
| | GO TO MAP 1502,
| | ENTRY POINT A.
| |
| | 169
| | (DIAGNOSE FROM LOCAL PROCESSOR)
| |
| | GO TO MAP 1545, ENTRY POINT A.
| |
170

- (ENTRY POINT C)
1. INSERT THE CE DISKETTE IN DRIVE BEING TESTED.
 2. LOAD DCP PROGRAM.
 3. WHEN DCP MENU IS DISPLAYED ENTER OPTION '0' TO LOAD PID 1505 DISKETTE FLT (PART 1).
 4. SELECT OPTION 2 DISKETTE DRIVE TEST.
 5. BYPASS ERROR STOPS.
 6. SELECT LOOP ONE ROUTINE.
 7. LOOP ON ROUTINE 0A.
 8. SELECT DISKETTE DRIVE. (SEE NOTE 3).

NOTE: WAIT UNTIL DIAGNOSTICS SEQUENCE TO ROUTINE 0A).

9. PROBE AT THE DISKETTE DRIVE CONTROL CARD. (SEE SM 1505 OR 4508 CABLE PIN LOCATIONS).
'+ INNER TRACKS'
'+ SWITCH FILTER'

(NOTE: +SWITCH FILTER IS NOT USED ON A 31SD DRIVE.)

NOTE 3:

ENTRY POINT C, OF THIS MAP, IS TO ENSURE THAT ALL DISKETTE DRIVES HAVE THE FOLLOWING SIGNALS.

1. +INNER TRACKS
2. +SWITCH FILTER
3. NO PULSES ON WRITE DATA WHILE SEEKING AND READING

IF NO DISKETTE DRIVE IS SUSPECTED, RUN ON ALL DISKETTE DRIVES THAT ARE ATTACHED.

BOTH LINES PULSING?

Y N
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

2 1
0 8
B B
D E

14AUG81 PN6841632

EC994445 PEC987896

MAP 1500-17

B B SYSTEM 23
F G
1 1 DISKETTE STRATEGY
8 8
PAGE 19 OF 32

| |
| |
| 182
| CHECK THE CABLE BETWEEN THE
| DISKETTE DRIVE ATTACHMENT CARD
| AND THE DISKETTE DRIVE CONTROL
| CARD FOR CONTINUITY/SHORT
| CIRCUIT ON THE SIGNAL LINE OR
| LINES THAT WAS MISSING PULSES
| (SEE SM 1505).

| IS THE CABLE OK?
| Y N

| | 183
| REPAIR/REPLACE CABLE AS
| NECESSARY (SEE SM 1205, 1505
| AND 1511).

| 184
| 1. REPLACE THE DISKETTE
| ATTACHMENT CARD (SEE SM 1205
| AND 1511).
| 2. REPLACE THE DISKETTE DRIVE
| CONTROL CARD (SEE SM 1572).

185
DRIVES 1 OR 2 MISSING PULSE?
Y N

| 186
| IS EXTENDED RPQ FEATURE
| INSTALLED (SEE SM R4902)?
| Y N

| | 187
| |
| GO TO STEP 192,
| ENTRY POINT LL.

| 188
| IS AN EXTERNAL DRIVE FAILING ON
| THE REMOTE PROCESSOR?

| Y N
2 | |
0
B B B
J K L

B B MAP 1500-19
K L

| |
| |
| |
| |
| 189

| GO TO STEP 192,
| ENTRY POINT LL.

190
DOES THE LOCAL PROCESSOR FAIL?
Y N

| 191

| GO TO MAP 1502, ENTRY POINT D.

| 192
(ENTRY POINT LL)

DIAGNOSE PROBLEM USING THE LOCAL
PROCESSOR

1. POWER DOWN.
2. CHECK CABLE FROM DISKETTE
ATTACHMENT CARD TO MULTIPLEXER
CARD FOR CONTINUITY/SHORT
CIRCUITS ON SIGNAL LINE
MISSING PULSE. (SEE SM 4505).
REPAIR/REPLACE AS NECESSARY
(SEE SM 4511).
3. CHECK CABLE FROM MULTIPLEXER
CARD TO DISKETTE DRIVE CONTROL
CARD FOR CONTINUITY/SHORT
CIRCUITS ON SIGNAL LINE
MISSING PULSE. (SEE SM 4507).
REPAIR/REPLACE AS NECESSARY
(SEE SM 4579).

ARE CABLES OK?

Y N

| 193
| REPAIR/REPLACE AS NECESSARY.
| 1. SEE SM 4579 FOR CABLE FROM
| DISKETTE ATTACHMENT CARD TO
| MULTIPLEXER CARD.
| 2. SEE SM 4511 FOR CABLE FROM
| MULTIPLEXER CARD TO DRIVE
| CONTROL CARD.

2
0
B
M
14AUG81 PN6841632
EC994445 PEC987896
MAP 1500-19

B B B SYSTEM 23
D J M
1 1 1 DISKETTE STRATEGY
7 9 9

PAGE 20 OF 32

| | |
| | |
| | 194

| | 1. REPLACE THE MULTIPLEXER
| | CARD (SEE SM 4578).
| | 2. REPLACE THE DISKETTE DRIVE
| | CONTROL CARD (SEE SM
| | 4572).

| |
| | 195

| 1. CHECK CABLE FROM DISKETTE
| ATTACHMENT CARD TO DISKETTE
| DRIVE CONTROL CARD FOR
| CONTINUITY/SHORT CIRCUITS ON
| THE SIGNAL LINE MISSING
| PULSE. (SEE SM 1505 CABLE
| PIN LOCATIONS).
| REPAIR/REPLACE AS NECESSARY
| (SEE SM 1215 AND 1511).
| 2. REPLACE DISKETTE DRIVE
| CONTROL CARD (SEE SM 1572).

|
196
PROBE '+WRITE DATA' AT THE CABLE
POSITION ON THE DISKETTE
ATTACHMENT CARD FOR THE SELECTED
DISKETTE DRIVE. OBSERVE PROBE
FOR A MINIMUM OF 5 SECONDS.
(NOTE: FOR DRIVES 3 AND 4 PROBE
AT THE CABLE END THAT CONNECTS TO
THE MULTIPLEXER CARD) (SEE SM
1505 OR 4505).

LINE NOT PULSING?

Y N

|
| 197

| REPLACE DISKETTE ATTACHMENT
| CARD (SEE SM 1205 AND 1511).

|
198
HAVE ALL ATTACHED DISKETTE DRIVES
BEEN TESTED?

Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |

B B
N P

B B MAP 1500-20
N P

| |
| |
| |
| |
| 199

|
| GO TO PAGE 17, STEP 170,
| ENTRY POINT C.

|
200
(ENTRY POINT M)

(THIS SECTION WILL CHECK THAT
HEAD LOAD CIRCUITS ARE WORKING
CORRECTLY.)

1. RETURN TO DCP.
2. SELECT PID 1505.
3. SELECT OPTION 4 (WRITE TRACK
THREE AND 76 STRESS PATTERN).
4. BYPASS ERROR STOP.
5. LOOP TEST.
6. SELECT DISKETTE DRIVE BEING
TESTED.
7. OBSERVE DISKETTE DRIVE HEAD
ACCESS ASSEMBLY WHILE SENDING
A RECAL COMMAND. (SEE MENU ON
CRT).

DO THE HEADS LOAD AND UNLOAD?

Y N

|
| 201
| PROBE 'HEAD ENGAGE' AT THE
| DISKETTE DRIVE CONTROL CARD
| WHILE SENDING A RECAL COMMAND.
| (SEE SM 1502 (31SD), 1503
| (51TD) OR 4508).

|
| MISSING 'HEAD ENGAGE' PULSE?

| Y N

| |
| | 202
| | 1. REPLACE THE DISKETTE DRIVE
| | CONTROL CARD (SEE SM 1572
| | OR 4572).
| | 2. REPLACE HEAD LOAD SOLENOID
| | (SEE SM 1542 OR 4542).

| |
| |
| |
| |
| |

2 2 14AUG81 PN6841632

2 1 EC994445 PEC987896

B B
Q R MAP 1500-20

B SYSTEM 23
R
2 DISKETTE STRATEGY
0
PAGE 21 OF 32

203
POWER DOWN.

IS DRIVE 3 OR 4 FAILING?

Y N

204
CHECK CABLE BETWEEN THE
DISKETTE ATTACHMENT CARD AND
DISKETTE DRIVE CONTROL CARD FOR
CONTINUITY/SHORT CIRCUITS ON
'HEAD ENGAGE' LINE (SEE SM
1505).

IS CABLE OK?

Y N

205
REPAIR/REPLACE AS NECESSARY.
(SEE SM 1215, 1505 AND 1511).

206
REPLACE IN THE FOLLOWING ORDER
UNTIL PROBLEM IS CORRECTED:
1. DISKETTE ATTACHMENT CARD
(SEE SM 1205 AND 1511).
2. DISKETTE DRIVE CONTROL CARD
(SEE SM 1572).
3. HEAD LOAD SOLENOID (SEE SM
1542).

207
IS EXTENDED RPQ FEATURE INSTALLED
(SEE SM R4902)?

Y N

208

GO TO STEP 213,
ENTRY POINT MM.

B
S

B MAP 1500-21
S

209
IS AN EXTERNAL DRIVE FAILING TO
LOAD AND UNLOAD HEADS ON THE
REMOTE PROCESSOR?

Y N

210
GO TO STEP 213,
ENTRY POINT MM.

211
DOES THE LOCAL PROCESSOR FAIL TO
LOAD AND UNLOAD HEADS?

Y N

212
GO TO MAP 1502, ENTRY POINT D.

213
(ENTRY POINT MM)

DIAGNOSE PROBLEM USING THE LOCAL
PROCESSOR

1. CHECK CABLE BETWEEN THE
DISKETTE ATTACHMENT CARD AND
THE MULTIPLEXER CARD FOR
CONTINUITY/SHORT CIRCUITS ON
'HEAD ENGAGE' LINE (SEE SM
4505).
2. CHECK CABLE BETWEEN THE
MULTIPLEXER CARD AND THE
DISKETTE DRIVE CONTROL CARD
FOR CONTINUITY/SHORT CIRCUITS
ON 'HEAD ENGAGE' LINE (SEE SM
4507 FOR LOCATIONS).

ARE CABLES OK?

Y N

||
||
||
||
||
||
||

14AUG81 PN6841632

2 2

EC994445 PEC987896

B B

T U

MAP 1500-21

B B B SYSTEM 23
Q T U
2 2 2 DISKETTE STRATEGY
0 1 1

PAGE 22 OF 32

| | |
| | |
| | 214
| | REPAIR/REPLACE AS NECESSARY.
| | 1. SEE SM 4579 FOR CABLE FROM
| | DISKETTE ATTACHMENT CARD
| | TO MULTIPLEXER CARD.
| | 2. SEE SM 4511 FOR CABLE FROM
| | MULTIPLEXER CARD TO DRIVE
| | CONTROL CARD.

| | 215
| | REPLACE IN THE FOLLOWING ORDER
| | UNTIL PROBLEM IS CORRECTED:
| | 1. DISKETTE ATTACHMENT CARD
| | (SEE SM 1205 AND 1511).
| | 2. MULTIPLEXER CARD (SEE SM
| | 4578).
| | 3. DISKETTE DRIVE CONTROL CARD
| | (SEE SM 4572).
| | 4. HEAD LOAD SOLENOID (SEE SM
| | 4542).

| 216
| HAVE ALL ATTACHED DISKETTE DRIVES
| BEEN TESTED?
| Y N

| | 217
| | GO TO PAGE 20, STEP 200,
| | ENTRY POINT M.

| 218
| ARE THERE 31SD DRIVES ATTACHED TO
| THE SYSTEM?
| Y N

| | 219
| | PROBLEM MAY BE THE CUSTOMER'S
| | DISKETTE. PID 0110 AND PID
| | 0120 CAN BE USED TO ISOLATE
| | THESE PROBLEMS. SEE DIAGNOSTIC
| | USER GUIDE 0001 FOR INFORMATION
| | ON USING THESE PROGRAMS.

A A B MAP 1500-22
A B V
9 9

	220
	CHECK ALL DISKETTE DRIVE
	ERASE COILS FOR CONTINUITY BY
	REMOVING READ/WRITE HEAD
	CONNECTOR ON THE CONTROL CARD
	(HEAD 0 ERASE TO HEAD 0 ERASE
	COMMON). (SEE SM 1502).
	(NOTE: PERFORM THIS CHECK
	ONLY ON 31SD DRIVES.)

| | ARE ERASE COILS OK?
| | Y N

| | 221
| | REPAIR OR REPLACE HEAD
| | CARRIAGE ASSEMBLY WITH OPEN
| | ERASE COIL (SEE SM 1530).

| | 222
| | PROBLEM MAY BE THE CUSTOMER'S
| | DISKETTE. PID 0110 AND PID
| | 0120 CAN BE USED TO ISOLATE
| | THESE PROBLEMS. SEE
| | DIAGNOSTIC USER GUIDE 0001
| | FOR INFORMATION ON USING
| | THESE PROGRAMS.

| | 223
| | GO TO PAGE 26, STEP 247,
| | ENTRY POINT T.

| 224
| CHECK CONFIGURATION FOR OTHER
| PROCESSOR.

1. LOAD DCP ON OTHER PROCESSOR.
2. WHEN DCP MENU IS DISPLAYED,
ENTER OPTION '0' TO LOAD PID
1505 DISKETTE FLT (PART 1).
3. SELECT OPTION 2.
4. RUN PID 1505 WITHOUT LOOP ON
ANY CONNECTED DRIVE UNTIL THE
CONFIGURATION RECORD IS
DISPLAYED.

(NOTE: WAIT MAXIMUM 4 MINUTES FOR
(STEP 224 CONTINUES)

14AUG81 PN6841632

EC994445 PEC987896

B
V

MAP 1500-22

DISKETTE STRATEGY

PAGE 23 OF 32

(STEP 224 CONTINUED)
CONFIGURATION.

CONFIGURATION RECORD DISPLAYS
WITHOUT ENDING STATUS '032'?

Y N

|

| 225

|

| GO TO PAGE 26, STEP 247,

| ENTRY POINT T.

|

226

IS CONFIGURATION OK?

Y N

|

| 227

|

| GO TO PAGE 7, STEP 067,

| ENTRY POINT U.

|

228

GO TO PAGE 9, STEP 087,

ENTRY POINT V.

229

(ENTRY POINT D)

1. POWER DOWN.
2. RETURN CABLES TO ORIGINAL POSITION IF NOT IN ORIGINAL POSITION.
3. EXCHANGE DRIVE CONTROL CARD ON FAILING DRIVE. VERIFY THAT DISKETTE IS IN FAILING DRIVE. (SEE SM 1572 OR 4572).
4. POWER UP.
5. RUN TEST (PID 1510) ON FAILING DRIVE AGAIN.

DID THE SAME FAILURE OCCUR?

Y N

|

| 230

|

| VERIFY REPAIR.

|

231

DID AN EXTERNAL DRIVE FAIL (DRIVE 3 OR 4)?

Y N

|

| 232

1. CHECK CABLE FROM DISKETTE DRIVE CONTROL CARD TO DISKETTE ATTACHMENT CARD FOR CONTINUITY ON 'SENSE LINE' B05 (SEE SM 1505).
2. REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505 AND 1511).
3. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
4. VERIFY REPAIR.

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

14AUG81 PN6841632

EC994445 PEC987896

B
W
2
3

|
|

233

1. CHECK CABLE FROM DISKETTE DRIVE CONTROL CARD TO MULTIPLEXER CARD FOR CONTINUITY ON SENSE LINE B05. (SEE SM 4507).
2. REPAIR/REPLACE AS NECESSARY (SEE SM 4511).
3. CHECK CABLE FROM MULTIPLEXER CARD TO DISKETTE ATTACHMENT CARD FOR CONTINUITY ON 'DISKETTE SENSE' LINE (SEE SM 4505).
4. REPAIR/REPLACE AS NECESSARY (SEE SM 4579).
5. REPLACE MULTIPLEXER CARD (SEE SM 4578).
6. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
7. VERIFY REPAIR.

234

(ENTRY POINT H)
(EXTERNAL DRIVES)

DOES SYSTEM HAVE ONLY ONE EXTERNAL DISKETTE DRIVE (DRIVE 3)?

Y N

|

| 235

- | 1. MOVE DISKETTE TO OTHER EXTERNAL DRIVE.
- | 2. POWER OFF.
- | 3. POWER ON.
- | 4. RUN PID 1510 ON OTHER DRIVE UNTIL DISKETTE TYPE IS DISPLAYED.
- | 5. READ CAUTION MESSAGE AND VERIFY THAT THE TYPE OF DISKETTE SENSED IS EQUAL WITH DISKETTE INSERTED.

|

| TYPE OF DISKETTE THE SAME?

| Y N

|

| 236

- | 1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
- | 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
- | 3. REPAIR/REPLACE CABLE FROM THE MULTIPLEXER CARD TO THE DISKETTE ATTACHMENT CARD (SEE SM 4505, 4579).

|

| 237

| IS DRIVE 3 THE FAILING DRIVE?

| Y N

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

14AUG81 PN6841632

2 2 2

5 5 5

B B B

X Y Z

EC994445 PEC987896

B B SYSTEM 23
Y Z
2 2 DISKETTE STRATEGY
4 4
PAGE 25 OF 32

| |
| |
| 238
| 1. POWER DOWN.
| 2. MOVE DRIVE 4 CABLE AT
| MULTIPLEXER CARD TO DRIVE 3
| POSITION (SEE SM 4506 AND
| 4501).
| 3. POWER UP.
| 4. INSTALL DISKETTE IN DRIVE
| FOUR. SELECT DRIVE 3.
| 5. RUN PID 1510 AGAIN.

| IS THE FAILURE THE SAME AS THE
| ORIGINAL FAILURE?

| Y N

| |
| | 239
| | 1. REPLACE MULTIPLEXER CARD
| | (SEE SM 4578).
| | 2. RETURN CABLES TO ORIGINAL
| | POSITION.
| | 3. VERIFY REPAIR.

| |
| 240
| RETURN CABLES TO ORIGINAL
| POSITION.
| GO TO PAGE 23, STEP 229,
| ENTRY POINT D.

| 241

1. POWER DOWN.
2. MOVE DRIVE 3 CABLE AT THE
MULTIPLEXER CARD TO DRIVE 4
POSITION (SEE SM 4506 AND
4501).
3. POWER UP.
4. INSTALL DISKETTE IN DRIVE 3.
SELECT DRIVE 4.
5. RUN PID 1510 AGAIN.

IS THE FAILURE THE SAME AS THE
ORIGINAL FAILURE?

Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |

C C
A B

B C C MAP 1500-25
X A B
2
4 | |

| |
| |
| |
| | 242
| | 1. REPLACE MULTIPLEXER CARD
| | (SEE SM 4578).
| | 2. RETURN CABLES TO ORIGINAL
| | POSITION.
| | 3. VERIFY REPAIR.

| |
| 243
| RETURN CABLES TO ORIGINAL
| POSITION.
| GO TO PAGE 23, STEP 229,
| ENTRY POINT D.

| 244
1. POWER DOWN.
2. MOVE CABLE FROM DRIVE 3 TO
DRIVE 4 CONNECTOR AT THE
MULTIPLEXER CARD.
3. POWER UP.
4. SELECT DRIVE 4.
5. RUN PID 1510 UNTIL DISKETTE
TYPE IS DISPLAYED.

IS TYPE OF DISKETTE THE SAME?

Y N

| |
| 245
| 1. REPLACE DRIVE CONTROL CARD
| (SEE SM 4572).
| 2. CHECK CABLE BETWEEN DISKETTE
| DRIVE CONTROL CARD AND
| MULTIPLEXER CARD FOR
| CONTINUITY OR SHORT CIRCUITS
| (SEE SM 4507).
| 3. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4511).
| 4. CHECK CABLE BETWEEN
| MULTIPLEXER CARD AND
| DISKETTE ATTACHMENT CARD FOR
| CONTINUITY OR SHORT CIRCUITS
| (SEE SM 4505).
| 5. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4579).
| 6. REPLACE MULTIPLEXER CARD
| (SEE SM 4578).
| 7. REPLACE DISKETTE ATTACHMENT
| (STEP 245 CONTINUES)

|
| 14AUG81 PN6841632
2
6 EC994445 PEC987896
C
C MAP 1500-25

C
C
2
5

SYSTEM 23
DISKETTE STRATEGY
PAGE 26 OF 32

MAP 1500-26

|
| (STEP 245 CONTINUED)
| CARD (SEE SM 1205 AND 1511).
|

246

1. REPLACE THE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
2. REPLACE MULTIPLEXER CARD (SEE SM 4578).

247
(ENTRY POINT T)

ERROR 32?

Y N

|
| 248

1. REPLACE MULTIPLEXER CARD (SEE SM 4578).
2. VERIFY REPAIR.

249

IS SHARED EXTERNAL DRIVES FEATURE INSTALLED?

Y N

|
| 250

MOVE CABLE TO OTHER PORT ON THE MULTIPLEXER CARD.

| SAME FAILURE?

| Y N

|
| 251

REPLACE MULTIPLEXER CARD (SM 4578).

|
| 252

1. CHECK CABLE BETWEEN THE MULTIPLEXER CARD AND THE DISKETTE ATTACHMENT CARD FOR CONTINUITY/SHORT CIRCUITS (SEE SM 4505).
2. REPAIR/REPLACE IF NECESSARY (SEE SM 4579).
3. REPLACE MULTIPLEXER CARD (SM 4578).
4. REPLACE DISKETTE ATTACHMENT CARD (SM 1205 AND 1511).

253

BOTH PROCESSORS FAIL?

Y N

|
|
|
|
|

14AUG81 PN6841632

2 2

8 7

C C

D E

EC994445 PEC987896

MAP 1500-26

254 IS REMOTE RPQ PROCESSOR
INSTALLED?

Y N

255
NOTE WHICH EXTERNAL PORT THE
FAILING PROCESSOR IS CONNECTED
TO.

1. POWER DOWN.
2. SWAP PORTS AT THE
MULTIPLEXER CARD.
3. POWER UP.
4. RUN DIAGNOSTIC AGAIN.

DOES SAME PROCESSOR FAIL ON
OTHER PORT?

Y N

256
ERROR 32 ON OTHER PROCESSOR?

Y N

257
ERROR DISAPPEARED.

1. RETURN CABLES TO
ORIGINAL POSITIONS.
2. VERIFY.
3. IF ERROR RETURNS,
REPLACE MULTIPLEXER CARD
(SEE SM 4578).

258
REPLACE MULTIPLEXER CARD (SEE
SM 4578).

- 259
1. REMOVE CABLE OF WORKING
PROCESSOR AT MULTIPLEXER CARD.
 2. POWER DOWN, THEN POWER UP THE
PROCESSOR AND THE 5246.
 3. RUN DIAGNOSTICS AGAIN.

SAME FAILURE?

Y N

260
CHECK CABLE OF WORKING
PROCESSOR FOR OPEN/SHORTS (SEE
SM 4505).

IS CABLE OK?

Y N

261
REPAIR/REPLACE CABLE (SEE SM
4579).

262
REPLACE DISKETTE ATTACHMENT
CARD OF WORKING PROCESSOR (SEE
SM 1205 AND 1511).

263
CHECK CABLE FROM DISKETTE
ATTACHMENT CARD TO MULTIPLEXER
CARD FOR OPEN/SHORTS (SEE SM
4505).

IS CABLE OK?

Y N

264
REPAIR/REPLACE CABLE (SEE SM
4579).

265
REPLACE DISKETTE ATTACHMENT CARD
OF FAILING PROCESSOR (SEE SM 1205
AND 1511).

14AUG81 PN6841632

EC994445 PEC987896

C SYSTEM 23
F DISKETTE STRATEGY
2
7
PAGE 28 OF 32

266
IS REMOTE PROCESSOR FAILING?
Y N

- 267
1. REMOVE CABLE GOING TO REMOTE PROCESSOR AT THE MULTIPLEXER CARD.
 2. POWER OFF THE PROCESSOR AND THE 5246.
 3. POWER ON THE LOCAL PROCESSOR.
 4. RUN LOCAL PROCESSOR AGAIN.

SAME FAILURE?

Y N

268

GO TO MAP 1502,
ENTRY POINT A.

269

1. CHECK CABLE FROM LOCAL PROCESSOR TO MULTIPLEXER CARD FOR OPEN/SHORTS (SEE SM 4505).
REPAIR/REPLACE CABLE (SEE SM 4579).
2. REPLACE DISKETTE ATTACHMENT CARD IN LOCAL PROCESSOR (SEE SM 1205 AND 1511).
3. REPLACE MULTIPLEXER CARD (SEE SM 4578 OR R4908).

C C MAP 1500-28
D H
2
6

- 270
1. REMOVE CABLE AT THE MULTIPLEXER CARD GOING TO THE LOCAL PROCESSOR.
 2. POWER OFF, THEN ON, BOTH THE REMOTE PROCESSOR AND THE EXTERNAL DRIVES.
 3. RUN FAILING DIAGNOSTICS.

SAME FAILURE?

Y N

271

CHECK CABLE FROM LOCAL PROCESSOR TO MULTIPLEXER CARD FOR OPEN/SHORTS (SEE SM 4505).

IS CABLE OK?

Y N

272

REPAIR/REPLACE CABLE (SEE SM 4579).

273

1. REPLACE DISKETTE ATTACHMENT CARD ON LOCAL PROCESSOR (SEE SM 1205 AND 1511).
2. REPLACE MULTIPLEXER CARD (SEE SM 4578 OR R4908).

274

GO TO MAP 1502, ENTRY POINT D.

275

1. REPLACE MULTIPLEXER CARD (SEE SM 4578).
2. VERIFY REPAIR.

14AUG81 PN6841632

EC994445 PEC987896

MAP 1500-28

C
H

DISKETTE STRATEGY

PAGE 29 OF 32

276
(ENTRY POINT BB)

THIS SECTION OF THE MAP CHART IS TO BE USED SPECIFICALLY FOR ENDING STATUS '031', 'DRIVE WAS NOT READY'.

THIS ERROR INDICATES THAT AT SOME PERIOD OF TIME THE MICROPROCESSOR ON THE ATTACHMENT CARD READ THAT THE SELECTED DISKETTE DRIVE WENT FROM 'READY' TO 'NOT READY', AND THEN BECAME READY. THIS ERROR IS INTERMITTENT.

THE MICROPROCESSOR CHECKS THE INDEX PULSE OF THE DISKETTE DRIVES ATTACHED. THIS STATUS IS REPORTED IF, FOR A PERIOD OF TIME, INDEX PULSES ARE MISSING. OBSERVE THE FAILING DRIVE FOR VISIBLE REASONS FOR MISSING INDEX, SUCH AS DRIVE MOTOR STOPPING, DRIVE BELT SLIPPING ON SPINDLE PULLEY, DISKETTE NOT TURNING INTERMITTENTLY.

IS THERE A VISIBLE REASON FOR MISSING INDEX PULSE?

Y N

|
| 277
| (ENTRY POINT CC)

| DOES PROCESSOR HAVE ONLY ONE DRIVE?

| Y N

| | 278
| | DOES PROCESSOR HAVE BOTH INTERNAL AND EXTERNAL DRIVES?

| | Y N

| | |

| | |

| | |

| | |

3 3 3 |

1 0 0

C C C C

J K L M

279
ARE DRIVES 1 AND 2 INSTALLED?

Y N

| 280
| ARE EXTERNAL DRIVES SHARED WITH ANOTHER PROCESSOR?

| Y N

| | 281
| | BOTH DRIVES GIVE ENDING STATUS '031'?

| | Y N

| | | 282

| | | GO TO PAGE 31, STEP 307, ENTRY POINT P.

| | 283

| | GO TO PAGE 31, STEP 306, ENTRY POINT S.

| 284
| DO BOTH PROCESSORS REPORT ENDING STATUS '031'?

| Y N

| | 285

| | GO TO PAGE 31, STEP 306, ENTRY POINT S.

| 286

| GO TO PAGE 31, STEP 307, ENTRY POINT P.

287
BOTH DRIVES REPORT ENDING STATUS '031'?

Y N

| |

| |

| |

| |

14AUG81 PN6841632

3 3

0 0

C C

N P

EC994445 PEC987896

C C C SYSTEM 23
V W X
3 3 3 DISKETTE STRATEGY
1 1 1
PAGE 32 OF 32

C MAP 1500-32
Y

| | |
| | |
| | 310
| |
| | GO TO PAGE 29, STEP 277,
| | ENTRY POINT CC.

|
|
|
|
|
318
1. POWER OFF.
2. CHECK AC CONNECTOR TO DRIVE
MOTOR FOR LOOSE CONNECTIONS
(SEE SM 1200 OR 4574).

| 311
| CHECK DRIVE PULLEY AND SPINDLE
| ASSEMBLY FOR BINDS OR THAT
| DRIVE PULLEY AND SPINDLE ARE
| STRONGLY ATTACHED TO EACH
| OTHER.

IS THE AC CONNECTOR OK?
Y N
|
| 319
| REPAIR/REPLACE (SEE SM 1200 OR
| 4574).

| IS PULLEY ASSEMBLY OK?
| Y N
| |
| | 312
| | REPLACE COMPLETE DISKETTE
| | DRIVE ASSEMBLY (1510 OR
| | 4510).

|
320
1. POWER UP.
2. MEASURE AC VOLTAGE TO FAILING
DISKETTE DRIVE MOTOR (SEE SM
1210 OR 4574).

| 313
| CHECK HEAD LOAD ADJUSTMENTS
| (SEE SM 1540 OR 4540).

IS VOLTAGE OK?
Y N
|
| 321
| FOR DRIVE 3 AND 4
| GO TO MAP 1560, ENTRY POINT A.

| IS HEAD LOAD ADJUSTMENT OK?
| Y N
| |
| | 314
| | ADJUST AND VERIFY (SEE SM
| | 1540 AND 1542 OR SM 4540 AND
| | 4542).

| -----
| FOR DRIVE 1 AND 2
| GO TO MAP 1250, ENTRY POINT A.

| 315
| REPLACE COLLET ASSEMBLY (SEE SM
| 1521 OR 4521).

322
1. REPLACE MOTOR START CAPACITOR
(SEE SM 1551 OR 4551).
2. REPLACE AC DRIVE MOTOR (SEE SM
1550 OR 4550).

316
DID MOTOR PULLEY STOP TURNING?
Y N

| 317
| REPLACE DRIVE BELT (SEE SM 1552
| OR 4552).

14AUG81 PN6841632

EC994445 PEC987896

C
Y MAP 1500-32

DISKETTE ENTRY

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP	ENTRY	PAGE	STEP
NUMBER	POINT	NUMBER	NUMBER

1000	A	1	001
1000	AA	2	004
1000	DD	4	035
1150	EE	2	014

EXIT POINTS

EXIT THIS MAP		TO	

PAGE	STEP	MAP	ENTRY
NUMBER	NUMBER	NUMBER	POINT

2	005	1500	A
2	007	1500	A
2	009	1500	A
4	036	1500	F
4	038	1500	F
4	040	1500	F
3	029	1500	G
4	032	1500	G
4	033	1500	T
4	034	1500	T
2	015	1500	U
3	018	1500	U
3	020	1500	U
2	010	1502	A
3	019	1502	A
4	041	1502	A

001
 (ENTRY POINT A)
 WAS FAILING DRIVE IDENTIFIED BY
 THE CUSTOMER?

Y N
 |
 | 002
 |
 | GO TO PAGE 2, STEP 011,
 | ENTRY POINT BB.
 |

003
 ATTEMPT TO LOAD DCP ON THE
 'FAILING' DRIVE.

DOES DCP LOAD OK?

Y N
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 | |
 | |

COPYRIGHT IBM CORP 1981

14AUG81 PN6842271

EC994445 PEC987896

C D E F SYSTEM 23
 2 2 2 2

DISKETTE ENTRY

 PAGE 3 OF 4

018
 (DIAGNOSE DISKETTE DRIVE
 OTHER THAN THE EXTENDED
 DRIVE)
 GO TO MAP 1500,
 ENTRY POINT U.

019
 (EXTENDED RPQ FEATURE
 PROBLEM)
 GO TO MAP 1502,
 ENTRY POINT A.

020
 GO TO MAP 1500, ENTRY POINT U.

021
 WHEN MESSAGE A-003 APPEARS,
 SELECT THE DRIVE THAT DCP WAS
 LOADED FROM.

(ENTRY POINT CC)

CONTINUE WITH THE RUNNING OF
 SECTION 2, PID 1505.

DID PID 1505 RUN WITHOUT ERRORS?
 Y N

022
 GO TO PAGE 2, STEP 004,
 ENTRY POINT AA.

023
 RUN PID 1510

(NOTE: RESPOND WITH DRIVE NUMBER
 IF DCP MESSAGE A-0020 'ENTER
 DRIVE NUMBER (X)' IS DISPLAYED.)

DID PID 1510 LOAD OK?
 Y N

G H

MAP 1501-3

024
 REPLACE CE DISKETTE.

025
 RUN PID 1510 ON FAILING
 (SUSPECTED) DRIVE.

WAS AN ERROR FOUND BY PID 1510?
 Y N

026
 HAVE ALL DRIVES ON SYSTEM BEEN
 TESTED?
 Y N

027
 1. RESTART SECTION 2 OF PID
 1505.
 2. WHEN MESSAGE A-003
 APPEARS, MOVE THE
 DIAGNOSTIC DISKETTE TO A
 DRIVE THAT HAS NOT BEEN
 TESTED AND ENTER THE DRIVE
 NUMBER.
 GO TO STEP 021,
 ENTRY POINT CC.

028
 ARE EXTERNAL DISKETTES PRESENT
 AND ATTACHED TO ANOTHER
 PROCESSOR?
 Y N

029
 GO TO MAP 1500,
 ENTRY POINT G.

14AUG81 PN6842271

EC994445 PEC987896

4 4
 J K

MAP 1501-3

K SYSTEM 23
 3
 DISKETTE ENTRY
 |
 | PAGE 4 OF 4
 |
 |
 030
 1. POWER DOWN BOTH PROCESSORS.
 2. INSERT THE DIAGNOSTIC DISKETTE
 IN DRIVE 3.
 3. POWER UP BOTH PROCESSORS.
 4. SELECT PID 1500 (ROS RESIDENT
 DISKETTE TEST).
 5. SELECT DRIVE 3 FROM BOTH
 PROCESSORS.
 6. EXECUTE PID 1500 IN 'LOOP'
 MODE (LET PID 1500 LOOP AT
 LEAST 4 TIMES.)
 DOES ROS RESIDENT DISKETTE DRIVE
 TEST (PID 1500) SHOW AN ERROR
 FROM EITHER PROCESSOR OR DOES
 EITHER PROCESSOR FAIL TO COMPLETE
 ROUTINES 07 THROUGH 0A?
 Y N
 |
 | 031
 | REPEAT THE PROCEDURE IN THE
 | LAST STEP FOR DISKETTE DRIVE 4,
 | IF PRESENT.
 |
 | DOES PID 1500 SHOW AN ERROR
 | FROM EITHER PROCESSOR?
 | Y N
 | |
 | | 032
 | |
 | | GO TO MAP 1500,
 | | ENTRY POINT G.
 | |
 | 033
 |
 | GO TO MAP 1500, ENTRY POINT T.
 |
 034
 GO TO MAP 1500, ENTRY POINT T.

J MAP 1501-4
 3
 |
 |
 |
 |
 035
 (ENTRY POINT DD)
 IS EXTENDED RPQ FEATURE INSTALLED
 (SEE SM R4902)?
 Y N
 |
 | 036
 |
 | GO TO MAP 1500, ENTRY POINT F.
 |
 037
 IS AN EXTERNAL DRIVE FAILING ON
 THE REMOTE PROCESSOR?
 Y N
 |
 | 038
 |
 | GO TO MAP 1500, ENTRY POINT F.
 |
 039
 POWER OFF REMOTE PROCESSOR.
 DOES LOCAL PROCESSOR RUN OK ON
 EXTERNAL DRIVES?
 Y N
 |
 | 040
 | (DIAGNOSE DISKETTE DRIVE OTHER
 | THAN THE EXTENDED DRIVE)
 | GO TO MAP 1500, ENTRY POINT F.
 |
 041
 (EXTENDED RPQ FEATURE PROBLEM)
 GO TO MAP 1502, ENTRY POINT A.

EXTENDED RPQ FEATURE

PAGE 1 OF 4

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1500	A	1	001
1500	D	3	013
1501	A	1	001

EXIT POINTS

EXIT THIS MAP TO			
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	008	1500	A
2	012	1500	A

001
(ENTRY POINT A)

VERIFY THAT ALL CABLE CONNECTORS FROM PROCESSOR TO EXTERNAL DRIVES ARE CONNECTED:

1. CABLE AT MULTIPLEXER CARD CONNECTED TO EXTENDED PORT 2 (SEE SM R4902).
2. EXTENDED CABLE WHERE IT CONNECTS TO CABLE GOING TO MULTIPLEXER CARD (SEE SM R4902)
3. EXTENDED CABLE WHERE IT CONNECTS TO THE EXTENDED FEATURE CARD AT THE REMOTE PROCESSOR (SEE SM R4902).
4. CABLE FROM DISKETTE ATTACHMENT CARD TO THE EXTENDED FEATURE CARD IN THE REMOTE PROCESSOR (SEE SM R4902).
5. JUMPER BLOCK ASSEMBLY ON EXTENDED FEATURE CARD IS CONNECTED (SM R4900).

ARE CABLES CONNECTED?

Y N
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

COPYRIGHT IBM CORP 1981

14AUG81 PN6842272

EC994445 PEC987896

2 2
A B

A B SYSTEM 23
1 1
EXTENDED RPQ FEATURE

PAGE 2 OF 4

002
CONNECT CABLES AND RUN TEST
THAT FAILED AGAIN.

IS PROCESSOR RUNNING OK NOW?
Y N

003
GO TO STEP 005,
ENTRY POINT B.

004
VERIFY REPAIR.

005
(ENTRY POINT B)

DOES REMOTE PROCESSOR HAVE
INTERNAL DISKETTE DRIVE(S)?

Y N

006
GO TO STEP 009,
ENTRY POINT C.

007
RUN THE FAILING DIAGNOSTIC ON
DRIVE 1, ON REMOTE PROCESSOR.

TEST RUNS OK?

Y N

008
(DIAGNOSE FAILURE ON INTERNAL
DISKETTE DRIVE)
GO TO MAP 1500, ENTRY POINT A.

C MAP 1502-2

009
(ENTRY POINT C)

1. POWER OFF EXTERNAL DRIVES.
2. REMOVE CABLE CONNECTED TO
EXTENDED PORT 2, (CABLE THAT
CONNECTS TO THE REMOTE
PROCESSOR) AT THE MULTIPLEXER
CARD (SEE SM R4900, R4902).
3. MOVE CABLE CONNECTED TO PORT 1
TO NORMAL PORT 2 CONNECTOR
(SEE SM R4900).
4. POWER ON EXTERNAL DRIVES.
5. RUN FAILING DIAGNOSTIC AGAIN
USING LOCAL PROCESSOR.

TEST RUN OK?

Y N

- 010
1. POWER DOWN.
 2. REPLACE MULTIPLEXER CARD
(SEE SM R4908).
 3. POWER UP.
 4. RUN FAILING DIAGNOSTIC AGAIN
USING PROCESSOR ON NORMAL
PORT 2.

SAME FAILURE?

Y N

- 011
1. REINSTALL ALL CABLES TO
THEIR NORMAL POSITIONS
(SEE SM R4902).
 2. VERIFY REPAIR.

012
(DIAGNOSE FAILURE WITH LOCAL
PROCESSOR CONNECTED TO NORMAL
PORT 2)
GO TO MAP 1500, ENTRY POINT A.

14AUG81 PN6842272

EC994445 PEC987896

3

D

MAP 1502-2

C

G
3

SYSTEM 23

MAP 1502-4

EXTENDED RPQ FEATURE

PAGE 4 OF 4

019

1. REPLACE EXTENDED FEATURE CARD (SEE SM R4900, R4904).
2. REPLACE MULTIPLEXER CARD (SEE SM R4908).
3. REPLACE DISKETTE ATTACHMENT CARD (SEE SM R4900, R4904).
4. REPLACE CPU PLANAR BOARD (SEE SM 1230).

14AUG81 PN6842272

EC994445 PEC987896

MAP 1502-4

PID 1500/1505 FAIL

PAGE 1 OF 15

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1500	A	1	001

EXIT POINTS

EXIT THIS MAP TO			
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	019	1250	A
9	073	1250	A
4	026	1250	A
8	068	1500	B
8	065	1540	A
13	095	1540	A
6	046	1545	A
8	067	1555	A
12	090	1555	A
13	092	1555	A
9	073	1560	A
13	097	1560	A

001
(ENTRY POINT A)

*** NOTE ***

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE PROCESSOR, USE
SM R4904 FOR REMOVAL/REPLACEMENT
OF THE DISKETTE ATTACHMENT CARD.

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE 5246 DISKETTE
UNIT, USE SM R4908 FOR
REMOVAL/REPLACEMENT OF THE
MULTIPLEXER CARD.

(STEP 001 CONTINUES)

PID 1500/1505 FAIL

PAGE 2 OF 15

(STEP 001 CONTINUED)

SEE NOTE 1. >>>>----->

1. CHECK FOR LOOSE OR BROKEN BELT AND CHECK CABLES FOR CORRECT SEATING. LOOK FOR LOOSE OR DAMAGED PARTS.
2. REPAIR/REPLACE AS NEEDED.
3. ENSURE THAT THE DISKETTE DRIVE PULLEY IS TURNING IN THE RIGHT DIRECTION (COUNTERCLOCKWISE WHEN SEEN FROM THE CONTROL CARD SIDE). IF ROTATION IS IN THE WRONG DIRECTION, REPLACE:
 - A. MOTOR START CAPACITOR (SEE SM 1551 OR 4551).
 - B. DISKETTE DRIVE MOTOR (SEE SM 1550 OR 4550).
4. IF NONE OF THESE PROBLEMS ARE FOUND, ANSWER THE FOLLOWING STEP:

NOTE 1:

REFERENCE TO SM 12XX OR 15XX INDICATES INTERNAL DRIVES 1 OR 2, SM 45XX IS FOR EXTERNAL DRIVES 3 OR 4.

DID ROUTINES 0 THROUGH 4 OF PID 1500 OR 1505 RUN OK?

Y N

| 002
| IS ENDING STATUS '10' MISSING
| +24V?

| Y N

| | 003
| | 1. REPLACE DISKETTE
| | ATTACHMENT CARD. (SEE SM
| | 1205 AND 1511).
| | 2. RUN PID 1500 AGAIN.

| | IS FAILURE THE SAME?

| | Y N

| | | 004
| | | VERIFY.

14AUG81 PN6841634

EC994445 PEC987896

4 3 3
A B C

B C
2 2

SYSTEM 23
PID 1500/1505 FAIL
PAGE 3 OF 15

005
1. REMOVE ALL FEATURE I/O CARDS
EXCEPT DISKETTE ATTACHMENT
CARD (SEE SM 1230).
2. RUN FAILING PID AGAIN.

IS FAILURE THE SAME?
Y N

006
REINSTALL FEATURE I/O CARDS,
ONE AT A TIME, UNTIL ERROR
OCCURS. THE LAST I/O CARD
INSTALLED THAT CAUSED ERROR
TO OCCUR AGAIN IS BAD.
REPLACE IT.

DID I/O CARD CAUSE AN ERROR?
Y N

007
REPLACE CPU PLANAR BOARD
(SEE SM 1230).

008
VERIFY REPAIR.

009
REPLACE CPU PLANAR BOARD (SEE
SM 1230).

010
IS DRIVE 1 ATTACHED?
Y N

011
IS DRIVE 3 ATTACHED?
Y N

012
NOT A VALID CONFIGURATION OF
DISKETTES.

D E

D E

MAP 1530-3

013
CHECK JUMPER FOR 'NO INTERNAL
DISKETTES INSTALLED ON
SYSTEM' (SEE SM 1230).

IS JUMPER INSTALLED?
Y N

014
1. INSTALL JUMPER (SEE SM
1230).
2. VERIFY REPAIR.

015
REPLACE CPU PLANAR BOARD (SEE
SM 1230).

016
(MISSING +24V TO THE DISKETTE
ATTACHMENT CARD.)

CHECK +24V AT THE DISKETTE
ATTACHMENT CARD (SM 1505).

IS VOLTAGE PRESENT?
Y N

017
CHECK FOR OPEN/SHORT CIRCUIT IN
THE CABLE FROM DRIVE 1 AND THE
POWER SUPPLY TO THE DISKETTE
ATTACHMENT CARD (SEE SM 1505).

IS CABLE OK?
Y N

018
REPAIR/REPLACE AS NECESSARY
(SEE SM 1215, 1505 AND 1511).

019
GO TO MAP 1250, ENTRY POINT A.

14AUG81 PN6841634

EC994445 PEC987896

4
F

MAP 1530-3

A F
2 3

SYSTEM 23

PID 1500/1505 FAIL

PAGE 4 OF 15

020
REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND 1511).

021
(ROUTINE 05 THROUGH 0A FAILURE)

IS FAILING DRIVE INTERNAL DRIVE 1
OR DRIVE 2?

Y N

022
(DRIVE 3 OR 4 FAILURE)
GO TO PAGE 13, STEP 096,
ENTRY POINT C.

023
CHECK THE DC VOLTAGES AT FAILING
DISKETTE DRIVE CONTROL CARD (SEE
SM 1502 (31SD), 1503 (51TD)).

ARE THE VOLTAGES OK?

Y N

024
CHECK FOR OPEN/SHORT CIRCUIT IN
THE CABLE FROM FAILING DRIVE
AND THE POWER SUPPLY TO THE
DISKETTE ATTACHMENT CARD (SEE
SM 1505).

IS CABLE OK?

Y N

025
REPAIR/REPLACE AS NECESSARY
(SEE SM 1215, 1505 AND 1511).

026
GO TO MAP 1250, ENTRY POINT A.

G

G

MAP 1530-4

027
(DRIVE 1 OR 2 FAILURE)

DOES SYSTEM HAVE ONLY ONE
INTERNAL DISKETTE DRIVE?

Y N

028
(TWO INTERNAL DISKETTE DRIVES)

1. MOVE DISKETTE TO THE OTHER
INTERNAL DRIVE.
2. POWER OFF.
3. POWER ON.
4. RUN PID 1500 (ROS RESIDENT
DISKETTE TEST) ON OTHER
DRIVE.

DID PID 1500 RUN OK?

Y N

029
(BOTH INTERNAL DISKETTE
DRIVES FAIL)

1. POWER DOWN.
2. REPLACE DISKETTE
ATTACHMENT CARD. (SEE SM
1205 AND 1511).
3. POWER UP.
4. VERIFY REPAIR.

IS PROBLEM FIXED

Y N

030
REPLACE CPU PLANAR BOARD
(SEE SM 1230).

IS PROBLEM FIXED?

Y N

031
REPLACE CE DISKETTE.

14AUG81 PN6841634

EC994445 PEC987896

6 5 5 5

H J K L

MAP 1530-4

J K L
4 4 4

SYSTEM 23

PID 1500/1505 FAIL

PAGE 5 OF 15

032

VERIFY REPAIR.

033

VERIFY REPAIR.

034

IS DRIVE 1 THE FAILING DRIVE?

Y N

035

(DRIVE 2 IS FAILING)

1. POWER DOWN.

2. MOVE DRIVE 2 CABLE AT
DISKETTE ATTACHMENT CARD TO
DRIVE ONE POSITION (SEE SM
1511).

3. POWER UP.

4. INSTALL DISKETTE IN DRIVE
TWO.

5. SELECT DRIVE 1. RUN PID
1500 AGAIN (ROS RESIDENT
DISKETTE TEST).

IS THE FAILURE THE SAME AS THE
ORIGINAL FAILURE?

Y N

036

(DRIVE 2 OK IN DRIVE 1
POSITION)

1. REPLACE DISKETTE
ATTACHMENT CARD (SEE SM
1205 AND 1511).

2. RETURN CABLES TO ORIGINAL
POSITION.

3. VERIFY REPAIR.

M N

MAP 1530-5

037

(DRIVE 2 FAILED IN DRIVE 1
POSITION)

1. POWER DOWN.

2. RETURN CABLES TO ORIGINAL
POSITION.

3. POWER UP.

4. RUN FAILING DIAGNOSTIC
AGAIN.

GO TO PAGE 6, STEP 043,
ENTRY POINT B.

038

(DRIVE 1 IS FAILING)

1. POWER DOWN.

2. MOVE DRIVE 1 CABLE AT THE
DISKETTE ATTACHMENT CARD TO
DRIVE TWO POSITION.

3. POWER UP.

4. INSTALL DISKETTE IN DRIVE 1.
SELECT DRIVE 2.

5. RUN PID 1500 AGAIN (ROS
RESIDENT DISKETTE TEST).

IS THE FAILURE THE SAME AS THE
ORIGINAL FAILURE?

Y N

039

(DRIVE 1 OK IN DRIVE 2
POSITION)

1. REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND 1511).

2. RETURN CABLES TO ORIGINAL
POSITION.

3. VERIFY REPAIR.

14AUG81 PN6841634

EC994445 PEC987896

6
P

MAP 1530-5

M N

T SYSTEM 23
6 PID 1500/1505 FAIL
|
| PAGE 7 OF 15
|
|

049
(SPEED FAILURE.)

1. POWER DOWN.
2. CHECK SPINDLE PULLEY FOR FREE MOVEMENT. (REPLACE DISKETTE DRIVE ASSEMBLY IF SPINDLE PULLEY HAS BINDS (SEE SM 1510; 4510).
3. CHECK COLLET/SPRING FOR CORRECT OPERATION. (SEE SM 1520 AND 1521 OR 4520 AND 4521).

(ROTATIONAL SPEED ERROR).

STATUS #16 OR #17

1. CHECK MOTOR PULLEY SET SCREW FOR TIGHTNESS.
2. REPLACE DRIVE MOTOR (SEE SM 1550 OR 4550).

(MISSING INDEX OR '1C' OR TIMING ERROR).

STATUS #18 OR #19

1. POWER DOWN THE SYSTEM.
2. CHECK WITH A C.E. OHM METER TO SEE IF THE '+ INDEX' LINE AT THE DISKETTE DRIVE HAS A SHORT CIRCUIT TO GROUND. (A READING OF LESS THAN 90 OHMS IS NEAR A SHORT CIRCUIT). (SEE SM 1502 (31SD), 1503 (51TD) OR 4508 FOR TEST POINT LOCATION.)

DOES THE METER READ MORE THAN 90 OHMS (-METER LEAD TO GROUND, +METER LEAD ON +INDEX)?

Y N
| |
| |
| |
| |
| |
| |
| |
| |
| |

U V

U V MAP 1530-7

| |
| |
| |
| |
| |
| 050
| (INDEX SHORT PROBLEM)

| ISOLATE THE SHORT CIRCUIT (LOW READING) AND REPAIR/REPLACE:

1. SIGNAL CABLE TO DISKETTE DRIVE CONTROL CARD (SEE SM 1215, 1505, 1511 OR 4507, 4511).
2. DISKETTE DRIVE CONTROL CARD. (SEE SM 1572 OR 4572).
3. DISKETTE ATTACHMENT CARD. (SEE SM 1205 AND 1511).
4. PTX ASSEMBLY (SEE SM 1571 OR 4571).
5. DRIVE 3 AND 4 ONLY, MULTIPLEXER CARD AND SIGNAL CABLE FROM THE DISKETTE ATTACHMENT CARD TO THE MULTIPLEXER CARD (SEE SM 4578 AND 4579).

|
051

1. PERFORM THE LED OUTPUT SERVICE CHECK. (SEE SM 1570 OR 4570 FOR THE LED OUTPUT SERVICE CHECK.)
2. REMOVE OR REPLACE THE LED ASSEMBLY IF NEEDED.

IS THE LED VOLTAGE CORRECT?

Y N

- | |
| 052
| 1. REPLACE LED ASSEMBLY. (SEE SM 1570 OR 4570).
| 2. VERIFY REPAIR.

| ANY MORE ERRORS?

| Y N

| |
| | 053
| | PROBLEM IS CORRECTED.

| |
| |
| | 14AUG81 PN6841634

| |
| | EC994445 PEC987896

8 8

W X

MAP 1530-7

S W X
6 7 7

SYSTEM 23

Y Z

MAP 1530-8

PID 1500/1505 FAIL

PAGE 8 OF 15

054

REPLACE DISKETTE DRIVE
CONTROL CARD AND VERIFY
REPAIR (SEE SM 1572 OR 4572),

055

PERFORM THE PTX OUTPUT SERVICE
CHECK. (SEE SM 1571 OR 4571
FOR THE PTX OUTPUT SERVICE
CHECK.)

IS OUTPUT OK FOR DISKETTE BEING
USED?

Y N

056

REPLACE DISKETTE DRIVE
CONTROL CARD (SEE SM 1572 OR
4572).

ANY MORE ERRORS?

Y N

057

PROBLEM IS CORRECTED.

058

REPLACE PTX ASSEMBLY (SEE SM
1571 OR 4571).

059

1. REPLACE PTX ASSEMBLY (SEE SM
1571 OR 4571).
2. REPLACE COLLET/SPRING
ASSEMBLY (SEE SM 1521 OR
4521).
3. REPLACE LED ASSEMBLY (SEE SM
1570 OR 4570).
4. REPLACE CPU PLANAR BOARD
(SEE SM 1230).

060

ROUTINE 7 RUN OK?

Y N

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

| |

061

IS ENDING STATUS '02' CURRENT
ENABLED?

Y N

062

GO TO PAGE 12, STEP 089,
ENTRY POINT F.

063

GO TO PAGE 9, STEP 070,
ENTRY POINT Y.

064

ROUTINE 9 RUN OK?

Y N

065

READ ERROR.

GO TO MAP 1540, ENTRY POINT A.

066

ROUTINE 0A RUN OK?

Y N

067

SEEK FAILURE.

GO TO MAP 1555, ENTRY POINT A.

068

ROS RESIDENT DISKETTE TEST PID
1500 OR PID 1505 OPTION 2
DISKETTE DIAGNOSTIC RAN OK.

GO TO MAP 1500, ENTRY POINT B.

14AUG81 PN6841634

EC994445 PEC987896

Y Z

MAP 1530-8

R
6

SYSTEM 23

MAP 1530-9

PID 1500/1505 FAIL

PAGE 9 OF 15

069

1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
2. REPLACE CPU PLANAR BOARD. (SEE SM 1230).
3. IF EXTERNAL DISKETTE (DRIVE 3,4) REPLACE MULTIPLEXER CARD (SEE SM 4578).

070

(ENTRY POINT Y)

CHECK FOR +5/-5V ON SIGNAL CABLE FOR SELECTED DRIVE (SEE SM 1505 OR SM 4507).

ARE VOLTAGES OK?

Y N

| 071

| (DRIVES 1-4 VOLTAGE CHECK).

| 1. POWER DOWN.

| 2. CHECK CONTINUITY OF DISKETTE DC DISTRIBUTION CABLE. (SEE SM 1211 1505 OR 4507).

| IS CABLE OK?

| Y N

| | 072

| | REPLACE/REPAIR CABLE (SEE SM 1215, 1211, 1501 AND 1511 OR 4507 AND 4511).

| 073

| (DRIVE 3 AND 4)

| GO TO MAP 1560, ENTRY POINT A.

| (DRIVE 1 AND 2)

| GO TO MAP 1250, ENTRY POINT A.

074

REPLACE THE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

SAME FAILURE?

Y N

| 075

| VERIFY REPAIR.

14AUG81 PN6841634

1

EC994445 PEC987896

0

A

MAP 1530-9

A

A SYSTEM 23
A
9 PID 1500/1505 FAIL

PAGE 10 OF 15

076
IS DRIVE 1 AND/OR DRIVE 2 THE ONLY DRIVES ON THE SYSTEM?
Y N

077
IS DRIVE 1 OR 2 THE FAILING DRIVE?
Y N

078
(DRIVE 3 OR 4 VOLTAGE DISTRIBUTION CHECK)
CHECK FOR +5V/-5V AT THE MULTIPLEXER CARD (SEE SM 4507).

IS VOLTAGE OK?
Y N

079
1. REPLACE/REPAIR CABLE BETWEEN THE MULTIPLEXER CARD AND DISKETTE DRIVE 3 (SEE SM 4511 AND 4500).
2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
3. VERIFY REPAIR.

080
(CHECK IF BOTH EXTERNAL DRIVES ARE FAILING)

INSTALL DISKETTE IN OTHER EXTERNAL DRIVE THREE OR FOUR, RUN PID 1500 (ROS RESIDENT DISKETTE TEST) ON OTHER DRIVE.

SAME FAILURE?
Y N

1 1 1 1
1
A A A A
B C D E

A A A MAP 1530-10
C D E

081

1. REPAIR/REPLACE CABLE FROM DISKETTE DRIVE CONTROL CARD TO MULTIPLEXER CARD (SEE SM 4511, 4500).
2. REPLACE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).
3. REPLACE MULTIPLEXER CARD (SEE SM 4578).

- 082
1. REPAIR/REPLACE CABLE FROM DISKETTE ATTACHMENT CARD TO THE MULTIPLEXER CARD (SEE SM 4505 AND 4579).
 2. REPLACE THE MULTIPLEXER CARD (SEE SM 4578).

083
(CHECK TO FIND OUT IF THE EXTERNAL DISKETTE IS CAUSING THE PROBLEM)

1. POWER DOWN.
2. DISCONNECT CABLE TO THE MULTIPLEXER CARD AT THE DISKETTE ATTACHMENT CARD (SEE SM 4504).
3. POWER ON.
4. RUN PID 1500 (ROS RESIDENT DISKETTE TEST) ON THE FAILING DISKETTE DRIVE (DRIVE ONE OR DRIVE TWO).

SAME FAILURE?
Y N

1 1
1 1
A A
F G

14AUG81 PN6841634

EC994445 PEC987896

MAP 1530-10

A A SYSTEM 23
F G
1 1 PID 1500/1505 FAIL
0 0
PAGE 11 OF 15

A MAP 1530-11
B
1
0

| |
| |
| 084
| 1. POWER OFF.
| 2. RECONNECT CABLE AT THE
| DISKETTE ATTACHMENT CARD TO
| THE MULTIPLEXER CARD.
| 3. DISCONNECT THE CABLE FROM
| THE DISKETTE ATTACHMENT CARD
| AT THE MULTIPLEXER END (SEE
| SM 4506 AND 4501).
| 4. RUN PID 1500 (ROS RESIDENT
| DISKETTE TEST) AGAIN.

| |
| |
| 088
| (ENTRY POINT G)
1. REPLACE DISKETTE DRIVE CONTROL
CARD (SEE SM 1572).
2. CHECK DISKETTE ATTACHMENT
CABLE FOR OPENS/SHORT CIRCUITS
FOR DRIVE 1 OR 2 (SEE SM 1505
CABLE PIN LOCATIONS).
3. REPAIR/REPLACE AS NECESSARY
(SEE SM 1215, 1511).
4. REPLACE CPU PLANAR BOARD IF
ALL SYSTEM DISKETTE DRIVES
FAIL (SEE SM 1230).

| SAME FAILURE?

| Y N

| |
| | 085
| | 1. REPLACE THE MULTIPLEXER
| | CARD (SEE SM 4578).
| | 2. REINSTALL CABLE TO
| | MULTIPLEXER CARD (SEE SM
| | 4506 AND 4501).

| |
| 086
| 1. CHECK CABLE FROM THE
| DISKETTE ATTACHMENT CARD TO
| THE MULTIPLEXER CARD FOR
| CONTINUITY/SHORT CIRCUITS
| (SEE SM 4505).
| 2. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4579).

| 087
REINSTALL CABLE TO DISKETTE
ATTACHMENT CARD (SEE SM 4504).
GO TO STEP 088,
ENTRY POINT G.

14AUG81 PN6841634

EC994445 PEC987896

MAP 1530-11

PID 1500/1505 FAIL

PAGE 12 OF 15

089

(ENTRY POINT F)

(DETERMINE READ OR SEEK FAILURE)

1. SELECT MAP CHART SUPPORT OPTION FROM PID 1500 (ROS RESIDENT DISKETTE TEST) (SEE DIAGNOSTIC USER GUIDE 0001, PID 1500.)

2. SEE TABLE 1 AND SELECT OPTION 0, THEN SELECT OPTION 7.

DOES CARRIAGE MOVE SMOOTHLY WITH NO ERRATIC MOVEMENT?

Y N

|
 | 090
 | SEEK FAILURE
 | GO TO MAP 1555, ENTRY POINT A.
 |

091
 AFTER OPTION 7 CAUSES DRIVE TO SEEK, USE THE TIMING PIN TO CHECK THAT THE TIMING HOLE LINES UP WITH THE CASTING (VERIFY HEAD CARRIAGE ASSEMBLY MECHANICALLY AT TRACK 40).

SEE SM 1530 OR 4530, SERVICE CHECK ADJUSTMENT FIGURE, IF YOU ARE NOT POSITIVE THAT THE PIN IS INSERTED FULLY.

1. POWER DOWN.
2. WITH PIN INSERTED, ATTEMPT TO MOVE HEAD CARRIAGE ASSEMBLY.

(STEP 091 CONTINUES)

TABLE 1

ENTER KEY(S)	ACTION TAKEN
-----	-----
0	RECAL
1 (AND) +FIELD	SEEK IN 1 TRACK
1 (AND) -FIELD	SEEK OUT 1 TRACK
4 (AND) +FIELD	SEEK IN 4 TRACKS
4 (AND) -FIELD	SEEK OUT 4 TRACKS
7	HEAD ALIGN (TRACK 40,39,40)
9	END, GO TO POWER- ON DIAGNOSTICS

NOTE: COMMAND WILL BE REJECTED IF AN ATTEMPT TO SEEK PAST TRACK '0' OR TRACK '76'.

14AUG81 PN6841634

EC994445 PEC987896

PID 1500/1505 FAIL

PAGE 13 OF 15

(STEP 091 CONTINUED)

IS STEPPER MOTOR PULLEY LOCKED IN PLACE?

Y N

| 092

| GO TO MAP 1555, ENTRY POINT A.

093

CHECK FOR MOVEMENT OF HEAD ASSEMBLY WITH ALIGNMENT PIN INSTALLED.

IS HEAD ASSEMBLY TIGHT?

Y N

| 094

| (HEAD CARRIAGE ASSEMBLY TO PULLEY PROBLEM)

- | 1. CHECK DRIVE BAND SCREWS FOR TIGHTNESS (SEE SM 1562 OR 4562). ADJUST AS NECESSARY.
- | 2. ALIGN HEAD CARRIAGE ASSEMBLY. (SEE SM 1530 OR 4530).

095

READ FAILURE REMOVE ALIGNMENT PIN IF INSERTED GO TO MAP 1540, ENTRY POINT A.

096

(ENTRY POINT C)

CHECK DC VOLTAGES AT THE DRIVE CONTROL CARD OF EITHER DRIVE 3 OR DRIVE 4 (SEE SM 4508).

ARE VOLTAGES OK?

Y N

| 097

| GO TO MAP 1560, ENTRY POINT A.

098

DOES SYSTEM HAVE ONLY ONE EXTERNAL DISKETTE DRIVE (DRIVE 3)?

Y N

| 099

- | 1. MOVE DISKETTE TO THE OTHER EXTERNAL DRIVE.
- | 2. POWER OFF CPU.
- | 3. POWER ON CPU.
- | 4. RUN PID 1500 (ROS RESIDENT DISKETTE TEST WITHOUT LOOP) ON OTHER EXTERNAL DRIVE.

| DID PID 1500 RUN OK?

| Y N

| | 100

- | | 1. POWER DOWN.
- | | 2. REPLACE DISKETTE ATTACHMENT CARD. (SEE SM 1205 AND 1511).
- | | 3. POWER UP.
- | | 4. VERIFY REPAIR.

| | IS PROBLEM FIXED?

| | Y N

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

14AUG81 PN6841634

1 1 1 1

5 4 4 4

A A A A

H J K L

EC994445 PEC987896

A A A SYSTEM 23
J K L
1 1 1 PID 1500/1505 FAIL
3 3 3
PAGE 14 OF 15

- | | |
| | |
| | 101
| | 1. POWER OFF.
| | 2. REPAIR/REPLACE CABLE
| | BETWEEN THE DISKETTE
| | ATTACHMENT CARD AND THE
| | MULTIPLEXER CARD (SEE SM
| | 4505 AND 4579).
| | 3. REPLACE MULTIPLEXER CARD
| | (SEE SM 4578).
| | 4. REPLACE CE DISKETTE.
| | 5. REPLACE CPU PLANAR BOARD
| | (SEE SM 1230).
| | 6. VERIFY REPAIR.

| |
| 102
| VERIFY REPAIR.

| 103
| IS DRIVE 3 THE FAILING DRIVE?

| Y N

- | | 104
| | 1. POWER DOWN.
| | 2. MOVE DRIVE 4 CABLE AT
| | MULTIPLEXER CARD TO DRIVE 3
| | POSITION (SEE SM 4506 AND
| | 4501).
| | 3. POWER UP.
| | 4. INSTALL DISKETTE IN DRIVE
| | FOUR.
| | 5. SELECT DRIVE 3. RUN PID
| | 1500 AGAIN (ROS RESIDENT
| | DISKETTE TEST WITHOUT LOOP).

| | IS THE FAILURE THE SAME AS THE
| | ORIGINAL FAILURE?

| | Y N

A A A
M N P

A A A MAP 1530-14
M N P

- | | |
| | |
| | |
| | |
| | 105
| | 1. REPLACE MULTIPLEXER CARD
| | (SEE SM 4578).
| | 2. REPLACE DISKETTE
| | ATTACHMENT CARD (SEE SM
| | 1205 AND 1511).
| | 3. RETURN CABLES TO ORIGINAL
| | POSITION.
| | 4. CHECK CABLE BETWEEN
| | MULTIPLEXER CARD AND THE
| | DISKETTE ATTACHMENT CARD
| | FOR OPEN OR SHORT CIRCUIT
| | (SEE SM 4505).
| | 5. REPAIR/REPLACE AS
| | NECESSARY (SEE SM 4579).
| | 6. VERIFY REPAIR.

| | 106
| | GO TO PAGE 6, STEP 043,
| | ENTRY POINT B.

- | | 107
| | 1. POWER DOWN.
| | 2. MOVE DRIVE 3 CABLE AT THE
| | MULTIPLEXER CARD TO DRIVE 4
| | POSITION (SEE SM 4506 AND
| | 4501).
| | 3. POWER UP.
| | 4. INSTALL DISKETTE IN DRIVE 3.
| | SELECT DRIVE 4.
| | 5. RUN PID 1500 ROS RESIDENT
| | DISKETTE TEST AGAIN.

| | IS THE FAILURE THE SAME AS THE
| | ORIGINAL FAILURE?

| | Y N

1 1 14AUG81 PN6841634
5 5 EC994445 PEC987896
A A
Q R MAP 1530-14

1

.

READ/WRITE FAILURE

PAGE 1 OF 12

ENTRY POINTS

```

-----
FROM | ENTER THIS MAP
-----+-----
MAP | ENTRY PAGE STEP
NUMBER | POINT NUMBER NUMBER
-----+-----
1500 | A 1 001
1500 | H 5 026
1530 | A 1 001

```

001
(ENTRY POINT A)

*** NOTE ***

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE PROCESSOR, USE
SM R4904 FOR REMOVAL/REPLACEMENT
OF THE DISKETTE ATTACHMENT CARD.

IF EXTENDED RPQ FEATURE IS
INSTALLED ON THE 5246 DISKETTE
UNIT, USE SM R4908 FOR
REMOVAL/REPLACEMENT OF THE
MULTIPLEXER CARD.

(REFERENCE TO SM 12XX OR 15XX
INDICATES INTERNAL DRIVES 1 OR 2,
SM 45XX IS FOR EXTERNAL DRIVES 3
OR 4.

SEE NOTE 1 FOR 2D DISKETTE
FAILURES.

IS ENDING STATUS E00B, E00C ERASE
FAILURE?

Y N
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

COPYRIGHT IBM CORP 1981

14AUG81 PN6841636

EC994445 PEC987896

8 2
A B

B
1

SYSTEM 23

MAP 1540-2

READ/WRITE FAILURE

PAGE 2 OF 12

002

NOTE: TURN POWER ON IF POWER IS OFF.

WHILE INSPECTING DRIVE, TOUCH JUMPER BETWEEN TEST POINT TPA08 (51TD) OR TPHLD (31SD) (HEAD LOAD) AND GROUND ON DRIVE CONTROL CARD (SEE SM 1502 (31SD), 1503 (51TD) OR 4508).

*****CAUTION*****

ON A 51TD DRIVE THE HEADS CAN BE DAMAGED IF THE HEADS ARE LOADED AND NO DISKETTE IS IN THE DRIVE.

DOES THE HEAD LOAD BAIL MOVE?

Y N

003

CHECK FOR CORRECT PATH OF BAIL ACTUATOR CABLE (SEE SM 1542; 4542).

IS PATH CORRECT AND IS CABLE NOT BROKEN?

Y N

004

1. REPLACE OR VERIFY CORRECT CABLE PATH (SEE SM 1542 OR 4542).
2. PERFORM SOLENOID BAIL SERVICE CHECK (SEE SM 1540 OR 4540).

005

REMOVE BAIL (SEE SM 1541 OR 4541).

IS THE BAIL RETURN SPRING IN PLACE AND NOT BROKEN?

Y N

14AUG81 PH6841636

EC994445 PEC987896

4 3 3
C D E

MAP 1540-2

D E
2 2

SYSTEM 23

MAP 1540-3

READ/WRITE FAILURE

| |
| |
| |
| |

PAGE 3 OF 12

| 006

| REPLACE BAIL RETURN SPRING (SEE
| SM 1541; 4541).

|
007

1. POWER DOWN.
2. CHECK HEAD LOAD SOLENOID
RESISTANCE (SEE SM 1502
(31SD), 1503 (51TD) OR 4508).
3. RESISTANCE SHOULD MEASURE AS
INDICATED IN TABLE AT RIGHT.

	MINIMUM	MAXIMUM
	-----	-----
31SD	140 OHMS	400 OHMS
51TD	113 OHMS	250 OHMS

IS SOLENOID RESISTANCE INSIDE
LIMITS?

Y N

|
| 008

| REPAIR OR REPLACE AS NEEDED
| (SEE SM 1542 OR 4542).

|
| NOTE:

| IF HEAD LOAD SOLENOID
| RESISTANCE WAS BELOW MINIMUM
| PERMITTED, DAMAGE TO THE
| DISKETTE DRIVE CONTROL CARD MAY
| HAVE OCCURRED. IF PROBLEM IS
| STILL PRESENT AFTER HEAD LOAD
| SOLENOID IS REPAIRED/REPLACED,
| REPLACE THE DISKETTE DRIVE
| CONTROL CARD (SEE SM 1572 OR
| 4572).

|
009

1. OPERATE BAIL WITH YOUR HANDS.
2. CHECK TO SEE THAT SOLENOID AND
BAIL ARE FREE OF BINDS.
3. CHECK TO SEE THAT BAIL RETURN
SPRING RETURNS BAIL TO ITS
STOP.

IS BAIL FREE OF BINDS?

Y N
| |
| |
| |
| |
| |
| |
| |
| |

14AUG81 PN6841636
EC994445 PEC987896

4 4
F G

MAP 1540-3

C F G
2 3 3

SYSTEM 23

READ/WRITE FAILURE

PAGE 4 OF 12

010

REPAIR/REPLACE THE BINDING
PART (SEE SM 1540, 1541 AND
1542 OR 4540, 4541 AND 4542).

011

CHECK IDLER PULLEY BRACKET
SCREW (SEE SM 1542 OR 4542).

IS IT TIGHT?

Y N

012

1. TIGHTEN BRACKET SCREW.
2. PERFORM HEAD LOAD SOLENOID
BAIL SERVICE CHECK (SEE SM
1540 OR 4540).
3. ADJUST HEAD LOAD SOLENOID
(SEE SM 1540 OR 4540).

013

REPLACE THE DISKETTE DRIVE
CONTROL CARD (SEE SM 1572 OR
4572).

014

DRIVE CONTROL CARD ALREADY
EXCHANGED?

Y N

015

1. POWER DOWN.
2. EXCHANGE DISKETTE DRIVE
CONTROL CARD (SEE SM 1572 OR
4572).
3. RUN FAILING DIAGNOSTIC
AGAIN.

SAME FAILURE?

Y N

016

1. REPLACE DISKETTE DRIVE
CONTROL CARD (SEE SM 1572
OR 4572).
2. VERIFY REPAIR

H J

H J

MAP 1540-4

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

017

GO TO STEP 018,
ENTRY POINT B.

018

(ENTRY POINT B)

CHECK IDLER PULLEY BRACKET SCREW
(SEE SM 1542 OR 4542).

IS IT TIGHT?

Y N

019

1. TIGHTEN BRACKET SCREW.
2. PERFORM HEAD LOAD SOLENOID
BAIL SERVICE CHECK (SEE SM
1540 OR 4540).
3. ADJUST HEAD LOAD SOLENOID
(SEE SM 1540 OR 4540).

020

PERFORM A HEAD LOAD SOLENOID
SERVICE CHECK (SEE SM 1540 OR
4540).

IS SERVICE CHECK OK?

Y N

021

ADJUST OR REPLACE AS NEEDED.
(SEE SM 1542 OR 4542).

022

CHECK ADJUSTMENT OF HEAD/CARRIAGE
ASSEMBLY (SEE SM 1530 OR 4530).

IS ADJUSTMENT CORRECT?

Y N

023

ALIGN HEAD/CARRIAGE ASSEMBLY
(SEE SM 1530 OR 4530).

14AUG81 PN6841636

EC994445 PEC987896

5

K

MAP 1540-4

K SYSTEM 23
 4
 READ/WRITE FAILURE
 PAGE 5 OF 12
 024
 (ENTRY POINT D)
 1. REPLACE CE DISKETTE.
 2. RUN FAILING DIAGNOSTIC AGAIN.
 IS FAILURE THE SAME?
 Y N
 025
 VERIFY REPAIR.
 026
 (ENTRY POINT H)
 REMOVE ANY JUMPERS IF INSTALLED EARLIER.
 WAS ENTRY TO THIS MAP FROM MAP 1500?
 Y N
 027
 IS FAILING DRIVE DRIVE 1 OR DRIVE 2?
 Y N
 028
 GO TO PAGE 10, STEP 086,
 ENTRY POINT F.
 029
 GO TO PAGE 7, STEP 048,
 ENTRY POINT C.
 030
 IS ENDING STATUS E00B, E00C ERASE FAILURE?
 Y N
 8
 L M

M MAP 1540-5
 IS INTERNAL DRIVE (DRIVE 1 OR 2) FAILING?
 Y N
 031
 032
 GO TO PAGE 8, STEP 068,
 ENTRY POINT E.
 033
 DOES SYSTEM HAVE ONLY ONE DISKETTE DRIVE?
 Y N
 034
 1. MOVE DISKETTE TO THE OTHER INTERNAL DRIVE.
 2. POWER OFF.
 3. POWER ON.
 4. RUN FAILING DIAGNOSTIC ON OTHER DRIVE.
 DID FAILING DIAGNOSTIC NOW RUN OK?
 Y N
 035
 1. REPLACE DISKETTE ATTACHMENT CARD. (SEE SM 1205 AND 1511).
 2. VERIFY REPAIR.
 036
 IS DRIVE 1 THE FAILING DRIVE?
 Y N
 14AUG81 PN6841636
 EC994445 PEC987896
 8 6 6
 N P Q
 MAP 1540-5

Q SYSTEM 23
5 READ/WRITE FAILURE
|
| PAGE 6 OF 12
|
|

- 037
1. POWER DOWN.
2. MOVE DRIVE 2 CABLE AT DISKETTE ATTACHMENT CARD TO DRIVE 1 POSITION (SEE SM 1511).
3. POWER UP.
4. INSTALL DISKETTE IN DRIVE 2.
5. SELECT DRIVE 1. RUN FAILING DIAGNOSTIC AGAIN.

IS THE FAILURE THE SAME AS THE ORIGINAL FAILURE
Y N
|

- | 038
| 1. POWER DOWN.
| 2. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
| 3. RETURN DISKETTE AND CABLES TO ORIGINAL POSITION.
| 4. POWER UP.
| 5. VERIFY REPAIR.
|

- 039
1. RETURN DISKETTE CABLES TO ORIGINAL POSITION.
2. CHECK CABLE FOR CONTINUITY OR SHORT CIRCUITS (SEE SM 1505). REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505, 1511).
3. REPLACE DISKETTE ATTACHMENT CARD IF NOT ALREADY EXCHANGED. (SEE SM 1205 AND 1511).

IS PROBLEM FIXED?
Y N
|

| 040
| IS FAILING DRIVE A 51TD DRIVE?
| Y N

R S T

P R S T MAP 1540-6
5

- | | | 041
| | | REPLACE HEAD LOAD PRESSURE PAD (SEE SM 1531).
| | |
| | | IS PROBLEM FIXED?
| | | Y N
| | |
| | | 042
| | | REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 1530).
| | |
| | | 043
| | | VERIFY REPAIR.
| | |

- | | | 044
| | | REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 1530).
| | |
| | | 045
| | | VERIFY REPAIR.
|

- 046
1. POWER DOWN.
2. MOVE DRIVE 1 CABLE, AT DISKETTE ATTACHMENT CARD, TO DRIVE 2 POSITION (SEE SM 1511).
3. POWER UP.
4. INSTALL DISKETTE IN DRIVE 1.
5. SELECT DRIVE 2. RUN FAILING DIAGNOSTIC AGAIN.

IS THE FAILURE THE SAME AS THE ORIGINAL FAILURE?
Y N
|

- | 047
| 1. POWER DOWN.
| 2. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1511).
| 3. RETURN DISKETTE AND CABLES TO ORIGINAL POSITION.
| 4. POWER UP.
| 5. VERIFY REPAIR.
|

| 14AUG81 PN6841636
| EC994445 PEC987896
|

7
U

MAP 1540-6

U
6

SYSTEM 23

READ/WRITE FAILURE

PAGE 7 OF 12

048
(ENTRY POINT C)

ONE INTERNAL DISKETTE DRIVE?

Y N

049

1. RETURN DISKETTE CABLES TO ORIGINAL POSITION IF NOT IN ORIGINAL POSITION.
2. CHECK CABLE FOR CONTINUITY OR SHORT CIRCUITS (SEE SM 1505).
3. REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505, 1511).

IS PROBLEM FIXED?

Y N

050

IS FAILING DRIVE A 51TD DRIVE?

Y N

051

REPLACE HEAD LOAD PRESSURE PAD (SEE SM 1531).

IS PROBLEM FIXED?

Y N

052

REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 1530).

053

VERIFY REPAIR.

054

REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 1530).

055

VERIFY REPAIR.

V

MAP 1540-7

056

1. RETURN DISKETTE CABLES TO ORIGINAL POSITION IF NOT IN ORIGINAL POSITION.
2. CHECK CABLE FOR CONTINUITY OR SHORT CIRCUITS (SEE SM 1505).
3. REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505, 1511).
4. REPLACE DISKETTE ATTACHMENT CARD IF NOT ALREADY EXCHANGED (SEE SM 1205 AND 1511).

IS PROBLEM FIXED?

Y N

057

IS FAILING DRIVE A 51TD DRIVE?

Y N

058

REPLACE HEAD LOAD PRESSURE PAD (SEE SM 1531).

IS PROBLEM FIXED?

Y N

059

REPLACE HEAD CARRIAGE ASSEMBLY. (SEE SM 1530).

060

VERIFY REPAIR.

061

REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 1530).

062

VERIFY REPAIR

14AUG81 PN6841636

EC994445 PEC987896

V

MAP 1540-7

A L N
1 5 5

SYSTEM 23

MAP 1540-8

READ/WRITE FAILURE

PAGE 8 OF 12

063

1. POWER DOWN.
2. MOVE CABLE TO OTHER CONNECTOR ON THE DISKETTE ATTACHMENT CARD.
3. POWER UP.
4. SELECT DRIVE 2.
5. RUN FAILING DIAGNOSTIC ON DRIVE.

DID THE SAME FAILURE OCCUR?

Y N

064

1. REPLACE THE DISKETTE ATTACHMENT CARD. (SEE SM 1205 AND 1511).
2. VERIFY REPAIR.

065

GO TO PAGE 7, STEP 048,
ENTRY POINT C.

066

GO TO PAGE 11, STEP 093,
ENTRY POINT G.

067

GO TO PAGE 11, STEP 093,
ENTRY POINT G.

068

(ENTRY POINT E)

(EXTERNAL DRIVES)

DOES SYSTEM HAVE ONLY ONE
EXTERNAL DISKETTE DRIVE (DRIVE
3)?

Y N

069

1. MOVE DISKETTE TO OTHER EXTERNAL DRIVE.
2. POWER OFF.
3. POWER ON.
4. RUN FAILING DIAGNOSTIC ON OTHER DRIVE.

DID FAILING DIAGNOSTIC NOW RUN
OK?

Y N

070

1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
2. RUN FAILING TEST AGAIN.

IS FAILURE SAME AS ORIGINAL
FAILURE?

Y N

071

VERIFY REPAIR.

072

1. REPLACE MULTIPLEXER CARD (SEE SM 4578).
2. CHECK THE CABLE BETWEEN THE MULTIPLEXER CARD AND THE DISKETTE ATTACHMENT CARD FOR OPENS OR SHORT CIRCUITS (SEE SM 4505).
3. REPAIR/REPLACE AS NECESSARY (SEE SM 4579).

14AUG81 PN6841636

1 EC994445 PEC987896

0 9

W X

MAP 1540-8

X
8

SYSTEM 23
READ/WRITE FAILURE
PAGE 9 OF 12

073
IS DRIVE 3 THE FAILING DRIVE?
Y N

- 074
1. POWER DOWN.
 2. MOVE DRIVE FOUR CABLE AT MULTIPLEXER CARD TO DRIVE THREE POSITION (SEE SM 4506 AND 4501).
 3. POWER UP.
 4. INSTALL DISKETTE IN DRIVE FOUR.
 5. SELECT DRIVE THREE. RUN FAILING DIAGNOSTIC AGAIN.

IS THE FAILURE THE SAME AS THE ORIGINAL FAILURE?
Y N

- 075
1. POWER DOWN.
 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
 3. RETURN CABLES AND DISKETTE TO ORIGINAL POSITION.
 4. POWER UP AND RUN FAILING TEST AGAIN.

IS PROBLEM CORRECTED?
Y N

- 076
1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

077
VERIFY REPAIR.

078
GO TO PAGE 10, STEP 086,
ENTRY POINT F.

Y

MAP 1540-9

- 079
1. POWER DOWN.
 2. MOVE DRIVE THREE CABLE AT THE MULTIPLEXER CARD TO DRIVE FOUR POSITION.
 3. POWER UP.
 4. INSTALL DISKETTE IN DRIVE THREE.
 5. SELECT DRIVE FOUR. RUN FAILING DIAGNOSTIC AGAIN.

IS THE FAILURE THE SAME AS THE ORIGINAL FAILURE?

Y N

- 080
1. POWER DOWN.
 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
 3. RETURN CABLES TO ORIGINAL POSITION.

IS PROBLEM CORRECTED?
Y N

- 081
1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

082
VERIFY REPAIR.

083
GO TO PAGE 10, STEP 086,
ENTRY POINT F.

14AUG81 PN6841636

EC994445 PEC987896

MAP 1540-9

Y

W SYSTEM 23
8 READ/WRITE FAILURE

PAGE 10 OF 12

- 084
1. POWER DOWN.
 2. MOVE CABLE TO OTHER CONNECTOR ON THE DISKETTE MULTIPLEXER CARD (SEE SM 4506 AND 4501).
 3. POWER UP.
 4. SELECT DRIVE 4.
 5. RUN FAILING DIAGNOSTIC ON DRIVE.

DID THE SAME FAILURE OCCUR?

Y N

- 085
1. REPLACE THE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).

086
(ENTRY POINT F)

ONE EXTERNAL DRIVE?

Y N

- 087
1. RETURN DISKETTE CABLES TO ORIGINAL POSITION IF NOT IN ORIGINAL POSITION.
 2. CHECK CABLE BETWEEN DISKETTE DRIVE CONTROL CARD AND MULTIPLEXER CARD FOR CONTINUITY AND SHORT CIRCUITS (SEE SM 4507).
 3. REPAIR/REPLACE AS NECESSARY (SEE SM 4511).

IS PROBLEM FIXED?

Y N

- 088
1. REPLACE HEAD CARRIAGE ASSEMBLY (SEE SM 4530).

A
Z A

Z A MAP 1540-10
A

- 089
| VERIFY REPAIR.

- 090
1. RETURN DISKETTE CABLES TO ORIGINAL POSITION IF NOT IN ORIGINAL POSITION.
 2. CHECK CABLE BETWEEN DISKETTE DRIVE CONTROL CARD AND MULTIPLEXER CARD FOR CONTINUITY AND SHORT CIRCUITS (SEE SM 4507).
 3. REPAIR/REPLACE AS NECESSARY (SEE SM 4511).
 4. CHECK CABLE BETWEEN MULTIPLEXER CARD AND DISKETTE ATTACHMENT CARD FOR CONTINUITY AND SHORT CIRCUITS (SEE SM 4505).
 5. REPAIR/REPLACE AS NECESSARY (SEE SM 4579).
 6. REPLACE MULTIPLEXER CARD IF NOT ALREADY REPLACED. (SEE SM 4578).
 7. REPLACE DISKETTE ATTACHMENT CARD IF NOT ALREADY REPLACED. (SEE SM 1205 AND 1511).

IS PROBLEM FIXED?

Y N

- 091
| REPLACE HEAD CARRIAGE ASSEMBLY
| (SEE SM 4530).

092
VERIFY REPAIR.

14AUG81 PN6841636

EC994445 PEC987896

MAP 1540-10

READ/WRITE FAILURE

PAGE 11 OF 12

093
(ENTRY POINT G)

(ERASE COIL OR ERASE CIRCUIT FAILURE).

IS FAILING DRIVE A 51TD DRIVE?
Y N

094
(ENTRY POINT BB)

- 1. RUN PID 1510 WITH BYPASS ERROR STOPS, AND LOOP MODE ON FAILING DISKETTE DRIVE.
- 2. PROBE 'WRITE/ERASE ENABLE' AT THE DISKETTE DRIVE CONTROL CARD (SEE SM 1502 (31SD), 1503 (51TD)).

IS LINE PULSING?
Y N

095
PROBE 'ERASE GATE' AT THE DISKETTE DRIVE CONTROL CARD (SEE SM 1502 (31SD), 1503 (51TD)).

IS LINE PULSING?
Y N

- 096
- 1. CHECK CABLE BETWEEN DISKETTE ATTACHMENT CARD AND DRIVE CONTROL CARD FOR OPEN ON 'ERASE GATE'. (SEE SM 1505). REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505, 1511).
- 2. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

097
REPLACE THE DISKETTE DRIVE CONTROL CARD (SEE SM 1572).

- 098
- 1. CHECK CABLE BETWEEN DISKETTE ATTACHMENT CARD AND DRIVE CONTROL CARD FOR OPEN ON 'CURRENT ENABLE' (SEE SM 1502 (31SD), 1503 (51TD)). REPAIR/REPLACE AS NECESSARY (SEE SM 1215, 1505, 1511).
- 2. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

099
CHECK ERASE COIL ON FAILING HEAD FOR OPEN (SEE SM 1502 (31SD), 1503 (51TD) OR 4508).

IS THE ERASE COIL OK?
Y N

100
REPLACE READ/WRITE HEAD CARRIAGE ASSEMBLY (SEE SM 1530 OR 4530).

101
IS DRIVE 3 OR 4 THE FAILING DRIVE?
Y N

102
GO TO STEP 094, ENTRY POINT BB.

A SYSTEM 23
E
1 READ/WRITE FAILURE
1
PAGE 12 OF 12

103

1. RUN PID 1510 WITH BYPASS ERROR STOP AND LOOP MODE ON FAILING DISKETTE DRIVE.
2. PROBE 'WRITE/ERASE ENABLED' AT THE DISKETTE DRIVE CONTROL CARD (SEE SM 4508).

IS LINE PULSING?

Y N

104

PROBE 'ERASE GATE' AT THE DISKETTE DRIVE CONTROL CARD (SEE SM 4508).

IS LINE PULSING?

Y N

105

1. CHECK CABLE BETWEEN DRIVE CONTROL CARD AND MULTIPLEXER CARD FOR OPEN/SHORT CIRCUIT ON 'ERASE GATE' (SEE SM 4507).
2. REPAIR/REPLACE IF NECESSARY (SEE SM 4511).
3. CHECK CABLE BETWEEN MULTIPLEXER CARD AND DISKETTE ATTACHMENT CARD FOR OPEN/SHORT CIRCUIT ON 'ERASE GATE' (SEE SM 4505).
4. REPAIR/REPLACE IF NECESSARY (SEE SM 4579).
5. REPLACE MULTIPLEXER CARD. (SEE SM 4578).
6. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

106

REPLACE THE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).

A
F

MAP 1540-12

A
F

107

1. CHECK CABLE BETWEEN DRIVE CONTROL CARD AND MULTIPLEXER CARD ON 'WRITE ERASE ENABLED' LINE FOR OPEN OR SHORT CIRCUITS (SEE SM 4507).
2. REPAIR/REPLACE IF NECESSARY (SEE SM 4511).
3. CHECK CABLE BETWEEN MULTIPLEXER CARD AND DISKETTE ATTACHMENT CARD ON 'WRITE ERASE ENABLED' LINE FOR OPEN/SHORT CIRCUITS (SEE SM 4505).
4. REPAIR/REPLACE IF NECESSARY (SEE SM 4579).
5. REPLACE MULTIPLEXER CARD (SEE SM 4578).
6. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).

14AUG81 PN6841636

EC994445 PEC987896

MAP 1540-12

NOT READY MAP

PAGE 1 OF 9

ENTRY POINTS

FROM ENTER THIS MAP			
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1500	A	1	001
1530	A	1	001

EXIT POINTS

EXIT THIS MAP TO			
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	010	1250	A
4	021	1250	AC
3	007	1560	A
4	020	1560	A

001
(ENTRY POINT A)

*** NOTE ***

IF EXTENDED RPQ FEATURE IS INSTALLED ON THE PROCESSOR, USE SM R4904 FOR REMOVAL/REPLACEMENT OF THE DISKETTE ATTACHMENT CARD.

IF EXTENDED RPQ FEATURE IS INSTALLED ON THE 5246 DISKETTE UNIT, USE SM R4908 FOR REMOVAL/REPLACEMENT OF THE MULTIPLEXER CARD.

SEE NOTE 1 FOR 2D DISKETTE FAILURES. >>>----->

SEE NOTE 2.

USE THIS MAP WHEN A DRIVE WILL NOT BECOME READY OR IF THE DRIVE IS HAVING A PROBLEM MAINTAINING ITS READY STATUS.

VISUALLY CHECK FAILING DISKETTE DRIVE.

REFERENCE TO SM 12XX OR 15XX (STEP 001 CONTINUES)

NOTE 1:

ENTRY TO THIS MAP MAY BE BECAUSE OF A FAILURE IN PID 1510, WITH A 2D DISKETTE INSTALLED IN A 51TD DISKETTE DRIVE. IF THIS IS THE CONDITION, WHEN INSTRUCTED TO RUN FAILING DIAGNOSTIC AGAIN, AFTER A POWER ON, PERFORM THE FOLLOWING:

LOAD THE FAILING DIAGNOSTIC FROM A WORKING DISKETTE DRIVE, AND SELECT THE FAILING DRIVE, OR INSTALL THE CE DISKETTE IN THE (STEP 001 CONTINUES)

NOT READY MAP

PAGE 2 OF 9

(STEP 001 CONTINUED)
INDICATES INTERNAL DRIVES 1 OR 2,
SM 45XX IS FOR EXTERNAL DRIVES 3
OR 4.

(STEP 001 CONTINUED)
FAILING DISKETTE DRIVE. AFTER
PID 1510 IS LOADED, REMOVE THE CE
DISKETTE, AND INSTALL THE 2D
DISKETTE.

NOTE 2

A KNOWN GOOD DISKETTE MUST BE
CORRECTLY INSERTED.

IS THE SPINDLE PULLEY TURNING?

Y N

|

| 002

|

| GO TO PAGE 3, STEP 014,

| ENTRY POINT B.

|

003

CHECK '+24V DC', '+5V DC' AND
'-5V DC' INPUT VOLTAGE AT THE
DISKETTE DRIVE CONTROL CARD.
(SEE SM 1502 (31SD), 1503 (51TD)
OR 4508 FOR TEST PIN LOCATIONS
AND SM 1211 OR 4573 FOR POWER
SPECIFICATIONS).

ARE THE LINES INSIDE TOLERANCE?

Y N

|

| 004

| IS DRIVE 1 OR 2 THE FAILING
| DRIVE?

| Y N

| |

| | 005

| | 1. POWER DOWN.
| | 2. CHECK THE CONTINUITY OF
| | THE CABLE THAT SUPPLIES DC
| | POWER (SEE SM 4507).

| |

| | IS CABLE OK?

| | Y N

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

3 3 3 3

A B C D

14AUG81 PN6841637

EC994445 PEC869281

A B C D
2 2 2 2

SYSTEM 23

NOT READY MAP

PAGE 3 OF 9

006

REPAIR/REPLACE CABLE
ASSEMBLY (SEE SM 4507 AND
4511).

007

GO TO MAP 1560,
ENTRY POINT A.

008

1. POWER DOWN.
2. CHECK THE CONTINUITY OF THE
CABLE THAT SUPPLIES DC POWER
(SEE SM 1211).

IS CABLE OK?

Y N

009

REPAIR/REPLACE CABLE ASSEMBLY
(SEE SM 1215, 1505, 1511).

010

GO TO MAP 1250, ENTRY POINT A.

011

CHECK TO SEE THAT THE DISKETTE IS
INSERTED CORRECTLY.

IS THE DISKETTE INSERTED
CORRECTLY INTO THE DRIVE AND IS
THE LATCH CLOSED?

Y N

012

RUN TEST AGAIN WITH DISKETTE
CORRECTLY INSERTED.

E

MAP 1545-3

013

JUMPER 'HEAD LOAD' TEST POINT TO
GROUND ON THE DISKETTE DRIVE
CONTROL CARD. (SEE SM 1502
(31SD), 1503 (51TD) OR 4508 FOR
TEST POINT LOCATION.) THE
SOLENOID WILL BECOME ACTIVATED
CAUSING THE BAIL TO LOAD THE
HEAD(S), AND PUT MAXIMUM LOAD ON
THE DRIVE PARTS.
(NOTE: REMOVE JUMPER WHEN DRIVE
IS REPAIRED)

CAUTION: ON A 51TD DRIVE THE
HEADS CAN BE DAMAGED IF THE HEADS
ARE LOADED AND THERE IS NO
DISKETTE IN THE DRIVE.

IS THE SPINDLE PULLEY TURNING?

Y N

014

(ENTRY POINT B)

IS THE BELT INSTALLED?

Y N

015

INSTALL OR REPLACE THE BELT.
(SEE SM 1552 OR 4552.)

016

KEEP THE HEAD(S) LOADED, IF
LOADED EARLIER.

IS THE AC MOTOR PULLEY TURNING?

Y N

017

IS THE AC MOTOR SHAFT
TURNING?

Y N

14AUG81 PN6841637

EC994445 PEC869281

5 5 5 4

F G H J

MAP 1545-3

E

J
3

SYSTEM 23

NOT READY MAP

PAGE 4 OF 9

018

1. POWER DOWN.
2. DISCONNECT AC PLUG ON FAILING DRIVE (SEE SM 1200 OR 4574.
3. POWER UP.
4. MEASURE THE AC VOLTAGE AT THE AC MOTOR CONNECTOR (SEE SM 1210 OR 4574 FOR POWER SPECIFICATIONS.)

IS THE AC VOLTAGE CORRECT AT THE AC MOTOR CONNECTOR?

Y N

| 019

| DRIVE 1 OR 2 FAILING?

| Y N

| | 020

| | GO TO MAP 1560,
| | ENTRY POINT A.

| 021

| GO TO MAP 1250, ENTRY POINT AC.

022

1. POWER OFF.
2. RECONNECT AC PLUG.
3. REMOVE THE BELT (SEE SM 1552 OR 4552).
4. LET THE AC MOTOR COOL 5 MINUTES.
5. POWER ON.

DOES THE AC MOTOR START?

Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

K L

K L

MAP 1545-4

| |
| |
| |
| |
| |

| 023

| REPLACE THE AC MOTOR STARTING CAPACITOR. (SEE SM 1551 OR 4551 FOR CAPACITOR REMOVAL AND REPLACEMENT PROCEDURE.)

| DOES THE AC MOTOR START?

| Y N

| | 024

| | REPLACE THE AC MOTOR. (SEE SM 1550 OR 4550 FOR AC DRIVE MOTOR REMOVAL AND REPLACEMENT PROCEDURE.

| 025

| PROBLEM IS CORRECTED.
| REPLACE BELT AND VERIFY REPAIR. (SEE SM 1552 OR 4552).

026

1. CLOSE THE LATCH TO ENGAGE THE COLLET.
2. CHECK THE SPINDLE PULLEY ASSEMBLY FOR BINDS.

IS THE SPINDLE PULLEY FREE FROM BINDS?

Y N

| 027

| OPEN THE LATCH TO DISENGAGE THE COLLET AND CHECK FOR BINDS AND NOISE.

| IS THE SPINDLE PULLEY FREE FROM BINDS AND NOISE?

| Y N

| | 028

| | REPLACE THE COMPLETE DRIVE ASSEMBLY. (SEE SM 1510 OR 4510).

| | 14AUG81 PN6841637

| | EC994445 PEC869281

5 5

M N

MAP 1545-4

G H M N
3 3 4 4

SYSTEM 23

NOT READY MAP

PAGE 5 OF 9

029

REPLACE THE COLLET ASSEMBLY
(SEE SM 1521 OR 4521).

030

1. POWER OFF.
2. REMOVE ANY JUMPERS
INSTALLED EARLIER.
3. REPLACE THE AC MOTOR
STARTING CAPACITOR. (SEE
SM 1551 OR 4551 FOR
CAPACITOR REMOVAL AND
REPLACEMENT PROCEDURE).
4. REPLACE THE AC DRIVE MOTOR
(SEE SM 1550 OR 4550).

031

THE AC MOTOR PULLEY IS LOOSE.
ADJUST AND TIGHTEN. (SEE THE
REPLACEMENT CHAPTER OF SM 1550
OR 4550.)

032

1. POWER DOWN.
2. REMOVE THE BELT (SEE SM 1552
OR 4552).
3. POWER ON.
4. CLOSE THE LATCH TO ENGAGE THE
COLLET AND CHECK THE SPINDLE
PULLEY ASSEMBLY FOR BINDS.

IS THE SPINDLE PULLEY FREE OF
BINDS AND NOISE?

Y N

033

OPEN THE LATCH TO DISENGAGE THE
COLLET AND CHECK THE SPINDLE
PULLEY FOR NOISE AND BINDS.

IS SPINDLE PULLEY FREE OF BINDS
AND NOISE?

Y N

P Q R

F P Q R
3

MAP 1545-5

034

REPLACE THE COMPLETE
DISKETTE DRIVE ASSEMBLY.
(SEE SM 1510 OR 4510).

035

1. REPLACE THE COLLET
ASSEMBLY (SEE SM 1521 OR
4521.)
2. REINSTALL THE BELT.

036

1. INSTALL NEW DRIVE BELT (SEE
SM 1552 OR 4552).
2. REPLACE THE COLLET ASSEMBLY.
(SEE SM 1521 OR 4521).

037

IS THE COLLET TURNING?

Y N

038

1. REMOVE JUMPER TO TEST POINT
'HEAD LOAD'.
2. OPEN THE LATCH. REMOVE
DISKETTE.

IS THE SPINDLE PART OF THE
SPINDLE PULLEY ASSEMBLY
TURNING?

Y N

039

REPLACE THE COMPLETE DISKETTE
DRIVE ASSEMBLY (SEE SM 1510
OR 4510).

040

1. POWER DOWN.
2. REPLACE COLLET ASSEMBLY (SEE
SM 1521 OR 4521).

14AUG81 PN6841637

EC994445 PEC869281

6
S

MAP 1545-5

S
5

SYSTEM 23

V W

MAP 1545-6

NOT READY MAP

PAGE 6 OF 9

041

1. REMOVE ANY JUMPERS INSTALLED EARLIER.
2. PROBE '+INDEX' TEST POINT WITH A KNOWN GOOD DISKETTE INSERTED AT THE FAILING DISKETTE DRIVE. (SEE SM 1502 (31SD), 1503 (51TD) OR 4508 FOR TEST POINT LOCATIONS.)

(NOTE: USE SAME TYPE OF DISKETTE THAT FAILED.)

IS THE '+INDEX' LINE PULSING?

Y N

042

1. POWER DOWN THE SYSTEM.
2. CHECK WITH A C.E. OHM METER TO SEE IF THE '+ INDEX' LINE AT THE DISKETTE DRIVE HAS A SHORT CIRCUIT TO GROUND (A READING OF LESS THAN 90 OHMS IS NEARLY A SHORT CIRCUIT). (SEE SM 1502 (31SD), 1503 (51TD) OR 4508 FOR TEST POINT LOCATION.)

DOES THE METER READ MORE THAN 90 OHMS. (-LEAD TO GROUND, +METER LEAD ON +INDEX)?

Y N

043

DISCONNECT THE DISKETTE ATTACHMENT CABLE CONNECTOR AT THE DISKETTE DRIVE CONTROL CARD (SEE SM 1502 (31SD), 1503 (51TD) OR 4508).

DOES THE METER READ MORE THAN 90 OHMS?

Y N

8 7

T U V W

044

DISCONNECT THE PTX ASSEMBLY (SEE SM 1571 OR 4571).

DOES THE METER READ MORE THAN 90 OHMS?

Y N

045

REPLACE THE DISKETTE DRIVE CONTROL CARD (SEE SM 1572 OR 4572).

046

REPLACE THE PTX ASSEMBLY (SEE SM 1571 OR 4571).

047

IS DRIVE 1 OR 2 THE FAILING DRIVE?

Y N

048

(TO DETERMINE A SHORT CIRCUIT IN DRIVE 3 OR 4).

1. RECONNECT THE CABLE CONNECTOR AT THE DISKETTE DRIVE CONTROL CARD.
2. DISCONNECT THE CONNECTOR AT THE MULTIPLEXER CARD (SEE SM 4506 AND 4501).

DOES THE METER READ MORE THAN 90 OHMS?

Y N

049

REPAIR/REPLACE THE CABLE BETWEEN THE DISKETTE DRIVE CONTROL CARD AND THE MULTIPLEXER CARD (SEE SM 4507 AND 4511).

7 7

X Y

14AUG81 PN6841637

EC994445 PEC869281

MAP 1545-6

A
C
8

SYSTEM 23
NOT READY MAP

MAP 1545-9

PAGE 9 OF 9

073

1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
2. REPLACE DRIVE CONTROL CARD (SEE SM 1572).

074

(ENTRY POINT C)

DRIVE 3 OR 4 FAILING

PROBE +INDEX AT THE CABLE FROM DISKETTE DRIVE CONTROL CARD TO THE MULTIPLEXER CARD AT THE MULTIPLEXER CARD (SEE SM 4507).

IS LINE PULSING?

Y N

|

| 075

- | 1. REPAIR OR REPLACE CABLE FROM THE DISKETTE DRIVE CONTROL CARD TO THE MULTIPLEXER CARD (SEE SM 4507 AND 4511).
- | 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
- | 3. REPLACE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).

|

076

PROBE +INDEX AT THE DISKETTE ATTACHMENT CARD AT THE EXTERNAL DRIVE CONNECTOR (SEE SM 4508).

IS LINE PULSING?

Y N

|

| 077

- | 1. REPAIR OR REPLACE CABLE FROM MULTIPLEXER CARD TO THE DISKETTE ATTACHMENT CARD. (SEE SM 4505 AND 4579).
- | 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).

|

078

1. REPLACE DISKETTE ATTACHMENT CARD (SEE SM 12105 AND 1511).
2. REPLACE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).

14AUG81 PN6841637

EC994445 PEC869281

MAP 1545-9

1

SEEK ERROR MAP

PAGE 1 OF 7

ENTRY POINTS

FROM	ENTER THIS MAP		

MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

1530	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	

PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT

2	005	1250	A
2	006	1560	A

001
(ENTRY POINT A)

* * * NOTE * * *

IF EXTENDED RPQ FEATURE IS INSTALLED ON THE PROCESSOR, USE SM R4904 FOR REMOVAL/REPLACEMENT OF THE DISKETTE ATTACHMENT CARD.

IF EXTENDED RPQ FEATURE IS INSTALLED ON THE 5246 DISKETTE UNIT, USE SM R4908 FOR REMOVAL/REPLACEMENT OF THE MULTIPLEXER CARD.

REFERENCE TO SM 12XX OR 15XX INDICATES INTERNAL DRIVES 1 OR 2, SM 45XX IS FOR EXTERNAL DRIVES 3 OR 4.

CHECK '+24V DC', '+5V DC', AND '-5V DC' INPUT VOLTAGES AT THE DISKETTE DRIVE CONTROL CARD. (SEE SM 1502 (31SD), 1503 (51TD) OR 4508 FOR TEST PIN LOCATIONS AND SM 1211 OR 4573 FOR POWER SPECIFICATIONS.)

ARE THE LINES INSIDE TOLERANCE?

Y N
| |
| |
| |
| |
| |
| |
| |

COPYRIGHT IBM CORP 1981

TABLE 1

ENTER KEY(S)	ACTION TAKEN
-----	-----
0	RECAL
1 (AND) +FIELD	SEEK IN 1 TRACK
1 (AND) -FIELD	SEEK OUT 1 TRACK
4 (AND) +FIELD	SEEK IN 4 TRACK
4 (AND) -FIELD	SEEK OUT 4 TRACKS
7	HEAD ALIGN (TRACK 40,39,40)
9	END, GO TO POWER- ON DIAGNOSTICS

NOTE: COMMAND WILL BE REJECTED IF AN ATTEMPT TO SEEK PAST TRACK '0' OR TRACK '76'.

2 2
A B

14AUG81 PN6841639
EC994445 PEC869281

A B
1 1

SYSTEM 23

SEEK ERROR MAP

PAGE 2 OF 7

002

1. POWER DOWN.
2. CHECK CONTINUITY OF THE CABLE THAT SUPPLIES DC POWER (SEE SM 1211 AND 1505 OR 4507).

IS CABLE GOOD?

Y N

003

REPAIR/REPLACE CABLE (SEE SM 1215 AND 1511 OR 4507 AND 4511).

004

DRIVE 3 OR DRIVE 4 PROBLEM?

Y N

005

GO TO MAP 1250, ENTRY POINT A.

006

GO TO MAP 1560, ENTRY POINT A.

007

1. REMOVE TIMING PIN IF NOT ALREADY REMOVED.
2. SELECT MAP CHART SUPPORT OPTION FROM PID 1500. SEE DIAGNOSTIC USER GUIDE 0001.
3. ISSUE A RECAL.
4. PROBE 'ACCESS 0' AND 'ACCESS 1' AT DISKETTE DRIVE CONTROL CARD TEST POINTS WHILE DOING A RECAL BY PRESSING THE '0' KEY. (USE TABLE 1, THIS MAP, FOR REFERENCE). (SEE SM 1502 (31SD), 1503 (51TD) OR 4508).

BOTH LINES HAVE PULSES?

Y N

5

C D

D

MAP 1555-2

008

IS DRIVE 1 OR 2 FAILING?

Y N

009

1. POWER OFF PROCESSOR.
2. POWER ON PROCESSOR.
3. LEAVE THE EXTERNAL DISKETTE UNIT POWERED UP.
4. AFTER POWER ON TEST IS COMPLETED, PERFORM THE NEXT CHECK.
5. PROBE 'ACCESS 0' AND 'ACCESS 1' AT THE DISKETTE ATTACHMENT CARD (SEE SM 4504 FOR CABLE LOCATIONS).

ARE BOTH LINES AT A SOLID 'UP' LEVEL?

Y N

010

REPLACE DISKETTE ATTACHMENT CARD (SEE SM 1205, 1511).

011

1. SELECT MAP CHART SUPPORT OPTION FROM PID 1500. SEE DIAGNOSTIC USER GUIDE 0001.
2. PROBE 'ACCESS 0' AND 'ACCESS 1' AT THE DISKETTE ATTACHMENT CARD (SEE SM 4504 FOR CABLE LOCATIONS).

BOTH LINES PULSE?

Y N

14AUG81 PN6841639

EC994445 PEC869281

4 3 3

E F G

MAP 1555-2

F G
2 2

SYSTEM 23

SEEK ERROR MAP

PAGE 3 OF 7

012

- 1. POWER DOWN.
- 2. CHECK THE CABLE FROM THE DISKETTE ATTACHMENT CARD TO THE MULTIPLEXER CARD FOR CONTINUITY/SHORT CIRCUITS ON THE LINE THAT IS MISSING PULSES (SEE SM 4505).

IS THE CABLE OK?

Y N

013

- REPAIR/REPLACE CABLE AS NECESSARY. (SEE SM 4505 AND 4579).

014

- 1. REPLACE THE DISKETTE ATTACHMENT CARD (SEE SM 1205 AND 1511).
- 2. REPLACE THE MULTIPLEXER CARD (SEE SM 4578).

015

PROBE 'ACCESS 0' AND 'ACCESS 1' AT THE MULTIPLEXER CARD WHERE THE CABLE FROM THE DISKETTE ATTACHMENT CARD CONNECTS (SEE SM 4505).

BOTH LINES PULSE?

Y N

016

- 1. REPAIR/REPLACE CABLE BETWEEN MULTIPLEXER CARD AND THE DISKETTE ATTACHMENT CARD (SEE SM 4505 AND 4579).
- 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).

H

MAP 1555-3

017

PROBE 'ACCESS 0' AND 'ACCESS 1' AT THE MULTIPLEXER CARD, WHERE THE CABLE FROM THE FAILING DISKETTE DRIVE CONNECTS (SEE SM 4507), WHILE MOVING ACCESS FOUR TRACKS IN (USE TABLE 1, THIS MAP FOR REFERENCE).

BOTH LINES PULSE?

Y N

018

- 1. CHECK CABLE FROM THE MULTIPLEXER CARD TO THE FAILING DISKETTE DRIVE CONTROL CARD FOR OPENS/SHORT CIRCUITS.
- 2. REPAIR/REPLACE AS NECESSARY (SEE SM 4507 AND 4511).
- 3. REPLACE THE MULTIPLEXER CARD (SEE SM 4578).
- 4. REPLACE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).

019

- 1. CHECK CABLE FROM THE MULTIPLEXER CARD TO THE FAILING DISKETTE DRIVE CONTROL CARD FOR OPENS/SHORT CIRCUITS.
- 2. REPAIR/REPLACE AS NECESSARY (SEE SM 4507 AND 4511).
- 3. REPLACE DISKETTE DRIVE CONTROL CARD (SEE SM 4572).

14AUG81 PN6841639

EC994445 PEC869281

H

MAP 1555-3

E
2

SYSTEM 23

MAP 1555-4

SEEK ERROR MAP

PAGE 4 OF 7

020

PROBE 'ACCESS 0' AND 'ACCESS 1'
AT THE DISKETTE ATTACHMENT CARD
END OF CABLE WHILE DOING A RECAL
BY PRESSING THE '0' KEY (SEE
TABLE 1, THIS MAP, FOR
REFERENCE). (SEE SM 1505
ATTACHMENT CABLE PIN LOCATIONS).

BOTH LINES HAVE PULSES?

Y N

021

CHECK THE CABLE FROM THE
DISKETTE ATTACHMENT CARD TO THE
DISKETTE DRIVE CONTROL CARD FOR
CONTINUITY/SHORT CIRCUITS ON
THE LINE THAT IS MISSING PULSES
(SEE SM 1505).

IS THE CABLE OK?

Y N

022

REPAIR/REPLACE AS NECESSARY
(SEE SM 1215 AND 1511).

023

1. REPLACE DISKETTE ATTACHMENT
CARD (SEE SM 1205 AND 1511).
2. REPLACE DISKETTE DRIVE
CONTROL CARD (SEE SM 1572).

024

REPAIR/REPLACE THE DISKETTE
ATTACHMENT CABLE BETWEEN THE
DISKETTE ATTACHMENT CARD AND
FAILING DRIVE. (SEE SM 1215,
1505 AND 1511).

14AUG81 PN6841639

EC994445 PEC869281

MAP 1555-4

M SYSTEM 23
6
SEEK ERROR MAP
PAGE 7 OF 7

037
CHECK THE STEPPER MOTOR DRIVE
BAND TO SEE THAT IT IS NOT
DAMAGED.

IS THE STEPPER MOTOR DRIVE BAND
FREE OF DAMAGE?

Y N

038
REPLACE THE STEPPER MOTOR DRIVE
BAND. (SEE SM 1562 OR 4562 FOR
DRIVE BAND REMOVAL AND
REPLACEMENT PROCEDURE.)

039
CHECK TO SEE IF THERE IS A GAP
BETWEEN THE STEPPER MOTOR PULLEY
AND THE CASTING. (SEE SM 1561 OR
4561 FOR FIGURE OF WHERE TO
OBSERVE GAP.)

IS THERE A GAP?

Y N

040
1. ADJUST THE PULLEY SO THAT
THERE IS A GAP AND ALSO SO
THAT THE DRIVE BAND TRACKS
CORRECTLY. (SEE SM 1561 AND
1562 OR 4561 AND 4562.)
2. PERFORM HEAD ALIGNMENT (SEE
SM 1530 OR 4530).

041
CHECK TO SEE THAT THE HEAD
CARRIAGE MOVES FREELY, TO BOTH
LIMITS OF THE CARRIAGE MOVEMENT,
WHEN MOVED BY HAND.

DOES THE HEAD CARRIAGE MOVE
FREELY?

Y N

|
|
|
|
|
|
|
|
|
|

N P MAP 1555-7

|
|
|
|
|

042
1. ISOLATE THE BINDING PART.
2. CLEAN/REPLACE AS NECESSARY
(SEE SM 1530 OR 4530).

043
1. POWER ON.
2. ALIGN HEAD CARRIAGE ASSEMBLY
(SEE SM 1530 OR 4530).
3. RUN FAILING DIAGNOSTIC AGAIN.

SAME TYPE OF FAILURE OCCUR?

Y N

044
VERIFY REPAIR.

045
REPLACE STEPPER MOTOR (SEE SM
1560 OR 4560).

14AUG81 PN6841639

EC994445 PEC869281

N P

MAP 1555-7



1 1

5246 POWER MAP

PAGE 2 OF 17

006

- 1. POWER OFF.
- 2. REMOVE POWER PLUG FROM CUSTOMER WALL OUTLET.
- 3. CHECK THE AC LINE CORD FOR CONTINUITY.

IS AC LINE CORD OK?

Y N

007

- REPLACE LINE CORD.

008

- 1. REPLACE POWER SUPPLY (SEE SM 4576).
- 2. VERIFY REPAIR.

009

- 1. POWER OFF.
- 2. DISCONNECT AC DISTRIBUTION CABLE AT FAN AND DRIVE 3 AND DRIVE 4 IF INSTALLED. (SEE SM 4574).
- 3. RESET CB1.
- 4. POWER ON.

IS CB1 OK?

Y N

010

- 1. POWER OFF
- 2. REPLACE POWER SUPPLY (SEE SM 4576).
- 3. VERIFY REPAIR

011

- 1. POWER OFF.
- 2. CONNECT AC CABLE TO FAN. (SEE SM 4574).
- 3. POWER ON.

IS CB1 TRIPPED?

Y N

Vertical separator lines

3

E F

Vertical separator lines

012

- 1. POWER OFF.
- 2. CONNECT AC CABLE TO DRIVE THREE. (SEE SM 4574).
- 3. POWER ON.

IS CB1 TRIPPED?

Y N

013

- IS DRIVE 4 INSTALLED?

Y N

014

- NO FAILURE FOUND.

015

- 1. POWER OFF.
- 2. CONNECT AC CABLE TO DRIVE FOUR. (SEE SM 4574).
- 3. POWER ON.

IS CB1 TRIPPED?

Y N

016

- NO FAILURE FOUND

017

(DRIVE 4 MOTOR PROBLEM)

REPLACE:

- 1. MOTOR START CAPACITOR. (SEE SM 4551).
- 2. AC DRIVE MOTOR. (SEE SM 4550).

018

(DRIVE 3 MOTOR PROBLEM)

REPLACE:

- 1. MOTOR START CAPACITOR. (SEE SM 4551).
- 2. AC DRIVE MOTOR. (SEE SM 4550).

14AUG81 PN6842270

EC994445 PEC987896

A B E SYSTEM 23
1 1 2
5246 POWER MAP
PAGE 3 OF 17

019
REPLACE FAN (SEE SM 4577).
020
1. POWER OFF.
2. DISCONNECT CONNECTOR (P5)
THAT SUPPLIES AC VOLTAGE TO
THE FAN MOTOR (SEE SM 4574).
3. POWER ON.
4. CHECK AC VOLTAGE (J5) TO FAN
(SEE SM 4574).

IS AC VOLTAGE OK?
Y N

021
1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE
SM 4576).
3. VERIFY REPAIR.

022
REPLACE FAN. (SEE SM 4577).

023
ARE DISKETTE DRIVE PULLEY(S)
TURNING?
Y N

024
TWO EXTERNAL DISKETTE DRIVES?
Y N

025
GO TO STEP 028,
ENTRY POINT BB.

026
IS EITHER DRIVE MOTOR TURNING
(IF DRIVE 4 IS INSTALLED, BOTH
DRIVE PULLEYS MUST BE TURNING
TO ANSWER YES)?
Y N

G H J

G H J MAP 1560-3

027
1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE
SM 4576).
3. VERIFY REPAIR.

028
(ENTRY POINT BB)
CHECK THE AC VOLTAGE AT DRIVE
MOTOR OF FAILING DRIVE (SEE SM
4574).

IS VOLTAGE OK?
Y N

029
1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE
SM 4576).
3. VERIFY REPAIR.

030
REPLACE:
1. MOTOR START CAPACITOR. (SEE
SM 4551).
2. AC DRIVE MOTOR. (SEE SM
4550).

031
MEASURE THE DC VOLTAGES AT THE
DISKETTE DRIVE 3 CONTROL CARD
(SEE SM 4508).

IS VOLTAGE OK?
Y N

032
(DRIVE 3 VOLTAGE NO GOOD)
CHECK FUSES. (SEE SM 4581).

ARE FUSES OK?
Y N

14AUG81 PN6842270
EC994445 PEC987896

4 4 4
K L M

MAP 1560-3

K L M
3 3 3

SYSTEM 23

5246 POWER MAP

PAGE 4 OF 17

033

GO TO PAGE 10, STEP 095,
ENTRY POINT C.

034

DOES THE POWER SUPPLY HAVE AN
OVERVOLTAGE LED (OVERVOLTAGE
LED IS LOCATED ABOVE FUSE
PANEL)?

Y N

035

GO TO PAGE 6, STEP 054,
ENTRY POINT KK.

036

IS OVERVOLTAGE LED LIGHTED?

Y N

037

GO TO PAGE 6, STEP 054,
ENTRY POINT KK.

038

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE SM 4576).
3. VERIFY REPAIR.

039

IS DRIVE 4 INSTALLED?

Y N

040

GO TO PAGE 5, STEP 049,
ENTRY POINT DD.

N

MAP 1560-4

041

MEASURE DC VOLTAGES AT THE
DISKETTE 4 CONTROL CARD (SEE SM
4508).

IS VOLTAGE OK?

Y N

042

(ENTRY POINT F)

1. POWER OFF.
2. CHECK VOLTAGE AT THE J3/P3
AND J4/P4 CONNECTOR THAT
SUPPLIES THE DC VOLTAGE TO
THE CONTROL CARD, WHERE THE
VOLTAGE WAS NOT OK (SEE SM
4573).

IS VOLTAGE OK?

Y N

043

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE
SM 4576).
3. VERIFY REPAIR.

044

(ENTRY POINT GG)

1. POWER OFF.
2. CHECK CABLE FROM DISKETTE
DRIVE CONTROL CARD TO
MULTIPLEXER CARD FOR
OPENS/SHORT CIRCUITS ON
LINES SUPPLYING VOLTAGE FROM
P3 OR P4 TO CONTROL CARD
(SEE SM 4507).

IS CABLE OK?

Y N

14AUG81 PN6842270

EC994445 PEC987896

5 5 5

P Q R

MAP 1560-4

N

P Q R
4 4 4

SYSTEM 23

5246 POWER MAP

PAGE 5 OF 17

045

1. REPAIR/REPLACE CABLE (SEE SM 4511).
2. VERIFY REPAIR.

046

1. REPLACE DRIVE CONTROL CARD (SEE SM 4572).
2. MEASURE VOLTAGE AT DRIVE CONTROL CARD.

IS VOLTAGE OK?

Y N

047

1. POWER OFF.
2. REPLACE POWER SUPPLY (SEE SM 4576).
3. VERIFY REPAIR.

048

VERIFY REPAIR.

049

(ENTRY POINT DD)

(DRIVE 3 OR 4 PROBLEM)

MEASURE DC VOLTAGE AT THE MULTIPLEXER CARD. (SEE SM 4507).

IS VOLTAGE OK?

Y N

S T

MAP 1560-5

050

1. POWER OFF.
2. CHECK CABLE FROM DISKETTE DRIVE CONTROL CARD TO MULTIPLEXER CARD FOR OPENS/SHORT CIRCUITS ON LINE SUPPLYING VOLTAGE FROM P3 OR P4 TO THE MULTIPLEXER CARD (SEE SM 4507).

IS CABLE OK?

Y N

051

1. REPAIR/REPLACE CABLE (4511).
2. VERIFY REPAIR.

052

1. REPLACE MULTIPLEXER CARD (SEE SM 4578).
2. VERIFY REPAIR.

053

NO PROBLEM FOUND.

14AUG81 PN6842270

EC994445 PEC987896

S T

MAP 1560-5

054
(ENTRY POINT KK)

IS DRIVE 4 INSTALLED?

Y N

| 055

| GO TO STEP 057,
| ENTRY POINT CC.

056

CHECK DC VOLTAGES AT DISKETTE
DRIVE 4 CONTROL CARD. (SEE SM
4508).

ARE VOLTAGES OK?

Y N

| 057

| (ENTRY POINT CC)

- | 1. POWER OFF.
- | 2. DISCONNECT J3/P3 AND J4/P4
| (IF DRIVE 4 INSTALLED)
| CONNECTOR (SEE SM 4573).
- | 3. POWER ON.
- | 4. MEASURE VOLTAGES AT J3 AND
| J4 (SEE SM 4573).

ARE THE VOLTAGES OK?

Y N

| 058

- | 1. POWER OFF.
- | 2. REPLACE POWER SUPPLY (SEE
| SM 4576).
- | 3. VERIFY REPAIR.

| 059

| WITH DRIVE CABLES CONNECTED,
| WAS THE +24V DC LEVEL THE ONLY
| ONE OUT OF THE SPECIFIED RANGE?

Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

9 7
U V W

060

- 1. RECONNECT J3/P3 PLUG.
- 2. MEASURE VOLTAGE AT J3/P3.

IS VOLTAGE OK?

Y N

| 061

| IS DRIVE 4 INSTALLED?

Y N

| | 062

- | | 1. REPLACE POWER SUPPLY (SEE
| | SM 4576).
- | | 2. VERIFY REPAIR.

| 063

- | 1. DISCONNECT J3/P3 PLUG.
- | 2. CONNECT J4/P4 PLUG.
- | 3. MEASURE VOLTAGE AT J4/P4.

IS VOLTAGE OK?

Y N

| | 064

- | | 1. POWER OFF.
- | | 2. REPLACE POWER SUPPLY (SEE
| | SM 4576).
- | | 3. VERIFY REPAIR.

| 065

| GO TO PAGE 4, STEP 044,
| ENTRY POINT GG.

066

IS DRIVE 4 INSTALLED?

Y N

| 067

| PROBLEM DISAPPEARED.

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

7
X

14AUG81 PN6842270

EC994445 PEC987896

5246 POWER MAP

PAGE 7 OF 17

068

- 1. CONNECT J4/P4 PLUG.
- 2. MEASURE VOLTAGE AT J4/P4.

IS VOLTAGE OK?

Y N

069

GO TO PAGE 4, STEP 044,
ENTRY POINT GG.

070

PROBLEM DISAPPEARED.

071

- 1. POWER OFF.
- 2. CONNECT J3/P3 DC POWER DISTRIBUTION TO DISKETTE DRIVE THREE (SEE SM 4573).
- 3. POWER ON.
- 4. MEASURE THE +24V DC VOLTAGE ON DISKETTE DRIVE CONTROL CARD AT DISKETTE DRIVE 3 (SEE SM 4508).

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

072

(DRIVE 3 POWER PROBLEM).

- 1. POWER OFF.
- 2. PUT DRIVE 3 IN THE SERVICE POSITION. (SEE SM 4510).
- 3. DISCONNECT HEAD LOAD SOLENOID. (SEE SM 4508).
- 4. POWER ON.
- 5. MEASURE THE +24V DC VOLTAGE AT DISKETTE DRIVE THREE (SEE SM 4508).

(STEP 072 CONTINUES)

(STEP 072 CONTINUED)

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

073

- 1. POWER OFF.
- 2. CONNECT HEAD LOAD SOLENOID.
- 3. DISCONNECT STEPPER MOTOR (SEE SM 4508)
- 4. POWER ON.
- 5. MEASURE THE +24V DC VOLTAGE AT DISKETTE DRIVE THREE (SEE SM 4508).

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

074

- 1. POWER OFF.
- 2. REPLACE DISKETTE DRIVE CONTROL CARD. (SEE SM 4572).
- 3. POWER ON.
- 4. MEASURE +24V DC VOLTAGE.

IS VOLTAGE OK?

Y N

075

- 1. POWER OFF.
- 2. REPLACE MULTIPLEXER CARD (SEE SM 4578).
- 3. POWER ON.
- 4. MEASURE +24V DC VOLTAGE.

IS VOLTAGE OK?

Y N

076

- 1. POWER OFF.
- 2. REPLACE POWER SUPPLY (SEE SM 4576).
- 3. VERIFY REPAIR.

14AUG81 PN6842270

8 8 8 EC994445 PEC987896

8 A A A
Z A B C

Y Z A A A SYSTEM 23
7 7 A B C
7 7 7 5246 POWER MAP

PAGE 8 OF 17

077
VERIFY REPAIR.

078
VERIFY REPAIR.

079
1. POWER OFF.
2. REPLACE STEPPER MOTOR (SEE SM 4560).
3. VERIFY REPAIR.

080
1. POWER OFF.
2. REPLACE HEAD LOAD SOLENOID. (SEE SM 4542).
3. VERIFY REPAIR.

081
IS DISKETTE DRIVE 4 INSTALLED?
Y N

082
PROBLEM DISAPPEARED.
1. RETURN MACHINE TO NORMAL OPERATING POSITION (SEE SM 4576 AND 4510).
2. VERIFY REPAIR.

083
1. POWER OFF.
2. RECONNECT DRIVE 4 DC DISTRIBUTION J4/P4 CABLE. (SEE SM 4573).
3. POWER ON.
4. MEASURE THE +24V DC VOLTAGE AT DRIVE FOUR CONTROL CARD (SEE SM 4508).

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

9
A A
D E

MAP 1560-8

A
E

084
(PROBLEM IS IN DRIVE 4.)

1. POWER OFF.
2. PLACE DRIVE 4 IN THE SERVICE POSITION (SEE SM 4510).
3. DISCONNECT HEAD LOAD SOLENOID. (SEE SM 4508).
4. POWER ON.
5. MEASURE THE +24V DC VOLTAGE AT DRIVE FOUR CONTROL CARD (SEE SM 4508).

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

085
1. POWER OFF.
2. CONNECT HEAD LOAD SOLENOID.
3. DISCONNECT STEPPER MOTOR. (SEE SM 4508)
4. POWER ON.
5. MEASURE THE +24V DC VOLTAGE AT DRIVE FOUR CONTROL CARD (SEE SM 4508).

IS THE +24V DC VOLTAGE INSIDE THE SPECIFIED RANGE?

Y N

086
1. POWER OFF.
2. REPLACE DISKETTE DRIVE CONTROL CARD. (SEE SM 4572).
3. POWER ON.
4. MEASURE +24V DC VOLTAGE.

IS VOLTAGE OK?

Y N

14AUG81 PN6842270

9 9 9 9 EC994445 PEC987896
A A A A
F G H J MAP 1560-8

A A A A A SYSTEM 23
D F G H J
8 8 8 8 8 5246 POWER MAP

U MAP 1560-9
6

| | | | | PAGE 9 OF 17

|
|
|
|
094

- | | | | | 087
| | | | | 1. POWER OFF.
| | | | | 2. REPLACE MULTIPLEXER
| | | | | CARD (SEE SM 4578).
| | | | | 3. POWER ON.
| | | | | 4. MEASURE +24V DC
| | | | | VOLTAGE.

GO TO PAGE 4, STEP 042,
ENTRY POINT F.

| | | | | IS VOLTAGE OK?
| | | | | Y N

- | | | | | 088
| | | | | 1. POWER OFF.
| | | | | 2. REPLACE POWER SUPPLY
| | | | | (SEE SM 4576).
| | | | | 3. VERIFY REPAIR.

| | | | | 089
| | | | | VERIFY REPAIR.

| | | | | 090
| | | | | VERIFY REPAIR.

- | | | | | 091
| | | | | 1. POWER OFF.
| | | | | 2. REPLACE STEPPER MOTOR (SEE
| | | | | SM 4560).
| | | | | 3. VERIFY REPAIR.

- | | | | | 092
| | | | | 1. POWER OFF.
| | | | | 2. REPLACE HEAD LOAD SOLENOID
| | | | | (SEE SM 4542).
| | | | | 3. VERIFY REPAIR.

|
093
PROBLEM DISAPPEARED.

1. RETURN MACHINE TO NORMAL
OPERATING POSITION (SEE SM
4576 AND 4510).
2. VERIFY REPAIR.

14AUG81 PN6842270

EC994445 PEC987896

MAP 1560-9

A A A SYSTEM 23
N P Q
1 1 1 5246 POWER MAP
0 0 0
PAGE 11 OF 17

| | |
| | |
| | | 103
| | | 1. POWER OFF.
| | | 2. REPLACE FUSE F3 (SEE SM
| | | 4581).
| | | 3. REPLACE MULTIPLEXER CARD
| | | (SEE SM 4578).

| | | IS FUSE OK?

| | | Y N

| | | | 104
| | | | 1. POWER OFF.
| | | | 2. REPLACE POWER SUPPLY
| | | | (SEE SM 4576).
| | | | 3. VERIFY REPAIR.

| | | 105
| | | VERIFY REPAIR.

| | | 106
| | | VERIFY REPAIR.

| | | 107
| | | 1. POWER OFF.
| | | 2. REPLACE FUSE F2, (+5V DC).
| | | (SEE SM 4581).
| | | 3. DISCONNECT LED CONNECTOR (SEE
| | | SM 4508).
| | | 4. POWER ON.

| | | IS FUSE F2 GOOD?

| | | Y N

| | | | 108
| | | | 1. POWER OFF.
| | | | 2. RECONNECT LED CONNECTOR (SEE
| | | | SM 4508).
| | | | 3. DISCONNECT PTX CONNECTOR
| | | | (SEE SM 4508).
| | | | 4. REPLACE FUSE F2 (SEE SM
| | | | 4581).
| | | | 5. POWER ON.

| | | IS FUSE F2 GOOD?

| | | Y N

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

| | | |

A MAP 1560-11
T

| | |
| | |
| | | 109
| | | 1. POWER OFF.
| | | 2. REPLACE DISKETTE DRIVE CONTROL
| | | CARD (SEE SM 4572).
| | | 3. REPLACE FUSE F2 (SEE SM 4581).
| | | 4. POWER ON.

| | | IS FUSE OK?

| | | Y N

| | | | 110
| | | | 1. POWER OFF.
| | | | 2. REPLACE FUSE F2 (SEE SM
| | | | 4581).
| | | | 3. REPLACE MULTIPLEXER CARD
| | | | (SEE SM 4578).

| | | IS FUSE OK?

| | | Y N

| | | | 111
| | | | 1. POWER OFF.
| | | | 2. REPLACE POWER SUPPLY (SEE
| | | | SM 4576).
| | | | 3. VERIFY REPAIR.

| | | IS FUSE OK?

| | | Y N

| | | | 112
| | | | IS EXTENDED RPQ FEATURE
| | | | INSTALLED (SEE SM R4902)?

| | | | Y N

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

| | | | |

14AUG81 PN6842270

EC994445 PEC987896

MAP 1560-11

A A SYSTEM 23
X Y
1 1 5246 POWER MAP
1 1
PAGE 12 OF 17

| |
| |

- | 113
| 1. CHECK CABLE BETWEEN DISKETTE
| ATTACHMENT CARD AND
| MULTIPLEXER CARD FOR
| OPEN/SHORT CIRCUIT (SEE SM
| 4505). (IF SHARED FEATURE
| CHECK BOTH CABLES).
| 2. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4579).
| 3. REPLACE DAMAGED FUSE F2 (SEE
| SM 4581).
| 4. VERIFY REPAIR.

| 114
CHECK THE LOCAL PROCESSOR CABLE
FROM THE MULTIPLEXER CARD TO THE
DISKETTE ATTACHMENT CARD (SEE SM
4505).

IS CABLE OK?
Y N

| |
| 115

- | 1. REPAIR/REPLACE AS NECESSARY
| (SEE SM 4579).
| 2. REPLACE DAMAGED FUSE F2 (SEE
| SM 4581).
| 3. VERIFY REPAIR.

| 116
CHECK EXTENDED CABLE FOR SHORT
CIRCUIT (BOTH ENDS OF CABLE MUST
BE DISCONNECTED. SEE SM R4906).
DO NOT SEPARATE CABLE BETWEEN
EXTENDED FEATURE CARD AND
MULTIPLEXER CARD.

IS CABLE OK?
Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

A B
Z A

A B MAP 1560-12
Z A

| |
| |
| |
| |

- | 117
| 1. ISOLATE THE SHORT CIRCUIT.
| IT MAY BE IN THE SHORT CABLE
| OR IN THE LONG EXTENDED
| CABLE. (TO ISOLATE SHORT
| CIRCUIT, DISCONNECT EXTENDED
| CABLE AND SHORT CABLE AT THE
| SHORT CABLE CONNECTOR. SEE
| SM R4902).
| 2. REPAIR AS NECESSARY (SEE SM
| R4906).
| 3. REINSTALL ALL CABLES TO
| THEIR NORMAL POSITIONS (SEE
| SM R4902).
| 4. REPLACE DAMAGED FUSE F2 (SEE
| SM 4581).
| 5. VERIFY REPAIR.

| 118

- | 1. MOVE CABLE, AT MULTIPLEXER
| CARD, FROM EXTENDED PORT 2 TO
| THE TEST BLOCK (SEE SM R4900).
| 2. DISCONNECT CABLE (IF NOT
| ALREADY DISCONNECTED) THAT IS
| CONNECTED TO THE REMOTE
| PROCESSOR AT THE EXTENDED
| FEATURE CARD (SEE SM R4904).
| 3. CHECK CABLE AT EXTENDED
| FEATURE CONNECTOR (THE END
| THAT USUALLY CONNECTS TO THE
| EXTENDED FEATURE CARD) FOR
| CONTINUITY (SEE SM R4906).

IS CABLE CONTINUITY OK?
Y N

| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

1 1 14AUG81 PN6842270
3 3 EC994445 PEC987896
B B
B C MAP 1560-12

A A A A B B SYSTEM 23
S U V W B C
1 1 1 1 1 1 5246 POWER MAP
1 1 1 1 2 2

PAGE 13 OF 17

119
1. ISOLATE THE OPEN.
IT MAY BE IN THE
SHORT CABLE OR IN
THE LONG PART OF THE
EXTENDED CABLE (SEE
SM R4906).
2. REPAIR AS NECESSARY
(SEE SM R4906).
3. REINSTALL ALL CABLES
TO THEIR NORMAL
POSITIONS (SEE SM
R4902).
4. REPLACE DAMAGED FUSE
F2 (SEE SM 4581).
5. VERIFY REPAIR.

120
CALL FOR AID.

121
VERIFY REPAIR.

122
VERIFY REPAIR.

123
VERIFY REPAIR.

124
1. POWER OFF.
2. REPLACE PTX ASSEMBLY (SEE SM
4571).
3. VERIFY REPAIR.

A A MAP 1560-13
M R
1 1
0 1

125
1. REPLACE LED ASSEMBLY (SEE SM
4570).
2. VERIFY REPAIR.

126
(+24V DC PROBLEM ON DRIVE 3)
1. DISCONNECT HEAD LOAD SOLENOID
CONNECTOR (SEE SM 4508).
2. POWER ON.

IS FUSE F1 GOOD?
Y N
127
1. POWER OFF.
2. RECONNECT HEAD LOAD SOLENOID
(SEE SM 4508).
3. DISCONNECT STEPPER MOTOR
CONNECTOR (SEE SM 4508).
4. REPLACE FUSE F1 (SEE SM
4581).
5. POWER ON.

IS FUSE F1 GOOD?
Y N
128
1. POWER OFF.
2. RECONNECT STEPPER MOTOR
CONNECTOR (SEE SM 4508).
3. REPLACE DISKETTE DRIVE
CONTROL CARD (SEE SM
4572).
4. REPLACE FUSE F1 (SEE SM
4581).
5. POWER ON.

IS FUSE OK?
Y N
14AUG81 PN6842270
1 1 1 1
4 4 4 4 EC994445 PEC987896
B B B B
D E F G MAP 1560-13

B B SYSTEM 23
L M
1 1 5246 POWER MAP
4 4
PAGE 15 OF 17

- | |
| |
| 142
| 1. POWER OFF.
| 2. REPLACE FUSE F3, (-5V DC).
| (SEE SM 4581).
| 3. REPLACE DRIVE CONTROL CARD
| (SEE SM 4572).
| 4. POWER ON.

| IS FUSE OK?

| Y N

- | |
| | 143
| | 1. POWER OFF.
| | 2. REPLACE FUSE F3 (SEE SM
| | 4581).
| | 3. REPLACE MULTIPLEXER CARD
| | (SEE SM 4578).

| IS FUSE OK?

| Y N

- | |
| | 144
| | 1. POWER OFF.
| | 2. REPLACE POWER SUPPLY
| | (SEE SM 4576).
| | 3. VERIFY REPAIR.

| 145
| VERIFY REPAIR.

| 146
| VERIFY REPAIR.

- 147
1. POWER OFF.
2. REPLACE FUSE F2, (+5V DC).
(SEE SM 4581).
3. DISCONNECT LED CONNECTOR (SEE
SM 4508).
4. POWER ON.

IS FUSE F2 GOOD?

Y N

| |

| |

| |

| |

| |

| |

| |

1 |

6 |

B B

N P

B MAP 1560-15
P

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

- 148
1. POWER OFF.
2. RECONNECT LED CONNECTOR (SEE
SM 4508).
3. DISCONNECT PTX CONNECTOR (SEE
SM 4508).
4. REPLACE FUSE F2 (SEE SM 4581).
5. POWER ON.

IS FUSE F2 GOOD?

Y N

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

- 149
1. POWER OFF.
2. RECONNECT PTX CONNECTOR (SEE
SM 4508).
3. REPLACE DISKETTE DRIVE
CONTROL CARD (SEE SM 4572).
4. REPLACE FUSE F2 (SEE SM
4581).
5. POWER ON.

IS FUSE OK?

Y N

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

- 150
1. POWER OFF.
2. REPLACE FUSE F2 (SEE SM
4581).
3. REPLACE MULTIPLEXER CARD
(SEE SM 4578).

IS FUSE OK?

Y N

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

|

- 151
1. POWER OFF.
2. REPLACE POWER SUPPLY
(SEE SM 4576).
3. VERIFY REPAIR.

IS FUSE OK?

Y N

|

|

|

|

|

|

|

|

|

|

|

|

|

|

- 152
VERIFY REPAIR.

153
VERIFY REPAIR.

14AUG81 PN6842270

EC994445 PEC987896

MAP 1560-15

B B
J R
1 1
4 6

SYSTEM 23

MAP 1560-17

5246 POWER MAP

PAGE 17 OF 17

| |
| |
| 164

- | 1. POWER OFF.
- | 2. REPLACE HEAD LOAD SOLENOID
| (SEE SM 4542).
- | 3. VERIFY REPAIR.

|
165

PROBLEM DISAPPEARED.

14AUG81 PN6842270

EC994445 PEC987896

MAP 1560-17

