SY31-0623-2

IBM 5280 Distributed Data System

IBM 5285 Programmable Data Station Maintenance Analysis Procedures

Preface

These Maintenance Analysis Procedures (MAPs) are to be used for servicing the IBM 5285 Programmable Data Station. Customer engineers using these MAPs are assumed to have completed the course on the IBM 5280 Distributed Data System.

It is suggested that you start your call with the *System Entry MAP*, which leads to a repair action.

Definition of terms and abbreviations that are not common, but are used in the MAPs, are in the *Glossary of Terms and Abbreviations* section of the *IBM 5285 Programmable Data Station Maintenance Information Manual*, SY31-0600.

There are several DANGER and CAUTION notices in the manual. You can use the blank lines below each notice to translate it into your own words. The locations of these notices are listed in the safety section.

Related Publications

Related information can be found in the following manuals:

- *IBM 5280 Operator's Guide*, GA21-9364
- *IBM 5285 Programmable Data Station Maintenance Information Manual*, SY31-0600
- *IBM 5280 Diskette Drive Maintenance Information Manual*, SY31-0602
- *IBM 5280 Message Manual*, GA21-9354

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This is a major revision of, and makes obsolete, SY31-0623-1. Because the changes and additions are extensive, this publication should be reviewed in its entirety. Changes are periodically made to the information herein; these changes will be reported in technical newsletters or in new editions of this publication.

Use this publication only for the purpose stated in the *Preface*.

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SUMMARY CHART

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NUMBER	MDI	MAP	EXER-CIZER	NAME	EC NUMBER
0001		X		SUMMARY CHART	840874
0002		X		DESCRIPTIONS	840874
0100		X		SYSTEM ENTRY	840874
0200		X		POWER ON CHECKOUT	840874
0210		X		POWER ON RESET	840874
0220		X		CONDITION CODE	840874
0300		X		ERROR CODES	840874
0500		X		BASE ENTRY	840874
0501	X			BASE AREA MENU	840874
0510	X			MAIN MPU TEST	840874
0511		X		MAIN MPU ATTENTION ERROR	840874
0520	X			MAIN STORAGE A TEST (AUTOMATIC)	840874
0530	X			MAIN STORAGE B TEST (MANUAL)	840874
0531		X		MAIN STORAGE ACCESS ERROR	840874
0532		X		MAIN STORAGE PARITY CHECK ERROR	840874
0600		X		ROS PATCH CARD	840874
0800		X		INTERMITTENT ERROR	840874
1000		X		DATA ENTRY ENTRY	840874
1001	X			DATA ENTRY AREA MENU	840874
1010		X		DATA ENTRY A-A1 DISPLAY	840874
1011		X		DATA ENTRY A-E1 DISPLAY	840874
1020		X		DATA ENTRY A-A1 KEYBOARD	840874
1021		X		DATA ENTRY A-E1 KEYBOARD	840874
1025		X		DATA ENTRY ERROR CODE	840874
1026		X		DATA ENTRY KEYLOCK	840874
1030		X		DATA ENTRY MAGNETIC STRIPE READER	840874
1040		X		DATA ENTRY ELAPSED TIME COUNTER	840874
1060	X			DATA ENTRY KEYBOARD/DISPLAY STORAGE	840874
1070	X			DATA ENTRY KEYBOARD ADAPTER TEST	840874
			X	D. E. KEYBOARD SCAN CODE TEST	840874
			X	D. E. MAGNETIC STRIPE READER TEST	840874
			X	D. E. ELAPSED TIME COUNTER TEST	840874
			X	D. E. DISPLAY EXERCISER TEST	840874

SUMMARY CHART

PAGE 2 OF 2

NUMBER	MDI	MAP	EXER-CIZER	NAME	EC NUMBER
2000		X		DISKETTE DRIVE ENTRY	840874
2001	X			DISKETTE AREA MENU	840874
2010		X		DISKETTE BASE SWAP	840874
2050	X			MAP SUPPORT EXERCISER	840874
2060	X			DRIVE FUNCTIONAL CHECK	840874
2210		X		DISKETTE CABLE SWAP	840874
2250		X		2 DRIVE, N/DDCC	840874
2260		X		2 DRIVE, DDCC	840874
2270		X		MINIMUM CONFIGURATION SYSTEM	840874
2280		X		INTERFACE/ LED	840874
2510	X			DISKETTE HEAD ALIGNMENT TEST	840874
			X	DISKETTE MEDIA ANALYZE (TMEDIA)	840874
3000		X		COMMUNICATION ENTRY	840874
3001	X			COMMUNICATIONS AREA MENU	840874
3010	X			COMMUNICATION SET UP	840874
3011		X		TRANSMIT/RECEIVE LEVEL CHECK	840874
3012		X		CBS TYPE COUPLER TEST	840874
3013		X		CDT TYPE COUPLER TEST	840874
3014		X		DIGITAL NETWORK WITH DDSA	840874
3015		X		OTHER COMMUNICATIONS ERRORS	840874
3016		X		W.T. LINE PLATE AUTO ANS	839661
3017		X		W.T. LINE PLATE MANUAL CALL	840874
3018		X		W.T. LINE PLATE MANUAL ANSWER	839661
3019		X		EIA OPEN/SHORT TEST	840874
7000		X		PRINTER ENTRY	840874
7001	X			PRINTER AREA MENU	840874
7010	X			PRINTER ADAPTER TEST	840874
			X	VERIFICATION TEST	840874
8000		X		POWER ENTRY	840874
8030		X		D. C. DISTRIBUTION	840874
9001	X			MAIN OPTION MENU	840874

DANGER AND CAUTION NOTICES

Throughout this manual, the word DANGER is used to inform the CE of an action that could cause a personal injury. The word CAUTION is used to inform the CE of an action that could damage the machine, or affect the running of a customer program.

If desired, translate these notices and write your own words on the blank lines provided on these pages.

Ensure that you understand and observe the safety precautions printed on the CE Safety Practices card that is used in the country where you work. A copy of the card that is used by customer engineers who work in the United States follows.

CE SAFETY PRACTICES

All Customer Engineers are expected to take every safety precaution possible and observe the following safety practices while maintaining IBM equipment:

1. You should not work alone under hazardous conditions or around equipment with dangerous voltage. Always advise your manager if you MUST work alone.
2. Remove all power, ac and dc, when removing or assembling major components, working in immediate areas of power supplies, performing mechanical inspection of power supplies, or installing changes in machine circuitry.
3. After turning off wall box power switch, lock it in the Off position or tag it with a "Do Not Operate" tag, Form 229-1266. Pull power supply cord whenever possible.
4. When it is absolutely necessary to work on equipment having exposed operating mechanical parts or exposed live electrical circuitry anywhere in the machine, observe the following precautions:
   a. Another person familiar with power off controls must be in immediate vicinity.
   b. Do not wear rings, wrist watches, chains, bracelets, or metal cuff links.
   c. Use only insulated pliers and screwdrivers.
   d. Keep one hand in pocket.
   e. When using test instruments, be certain that controls are set correctly and that insulated probes of proper capacity are used.
   f. Avoid contacting ground potential (metal floor strips, machine frames, etc.). Use suitable rubber mats, purchased locally if necessary.
5. Wear safety glasses when:
   a. Using a hammer to drive pins, riveting, staking, etc.
   b. Power or hand drilling, reaming, grinding, etc.
   c. Using spring hooks, attaching springs.
   d. Soldering, wire cutting, removing steel bands.
   e. Cleaning parts with solvents, sprays, cleaners, chemicals, etc.
   f. Performing any other work that may be hazardous to your eyes. REMEMBER–THEY ARE YOUR EYES.
6. Follow special safety instructions when performing specialized tasks, such as handling cathode ray tubes and extremely high voltages. These instructions are outlined in CEMs and the safety portion of the maintenance manuals.
7. Do not use solvents, chemicals, greases, or oils that have not been approved by IBM.
8. Avoid using tools or test equipment that have not been approved by IBM.
9. Replace worn or broken tools and test equipment.
10. Lift by standing or pushing up with stronger leg muscles–this takes strain off back muscles. Do not lift any equipment or parts weighing over 60 pounds.
11. After maintenance, restore all safety devices, such as guards, shields, signs, and grounding wires.
12. Each Customer Engineer is responsible to be certain that no action on his part renders products unsafe or exposes customer personnel to hazards.
13. Place removed machine covers in a safe out-of-the-way place where no one can trip over them.
14. Ensure that all machine covers are in place before returning machine to customer.
15. Always place CE tool kit away from walk areas where no one can trip over it; for example, under desk or table.
16. Avoid touching moving mechanical parts when lubricating, checking for play, etc.
17. When using stroboscope, do not touch ANYTHING–it may be moving.
18. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled above the elbow.
19. Ties must be tucked in shirt or have a tie clasp (preferably nonconductive) approximately 3 inches from end. Tie chains are not recommended.
20. Before starting equipment, make certain fellow CEs and customer personnel are not in a hazardous position.
21. Maintain good housekeeping in area of machine while performing and after completing maintenance.

Knowing safety rules is not enough.
An unsafe act will inevitably lead to an accident.
Use good judgment–eliminate unsafe acts.

ARTIFICIAL RESPIRATION

General Considerations

1. Start Immediately–Seconds Count
   Do not move victim unless absolutely necessary to remove from danger. Do not wait or look for help or stop to loosen clothing, warm the victim, or apply stimulants.
2. Check Mouth for Obstructions
   Remove foreign objects. Pull tongue forward.
3. Loosen Clothing–Keep Victim Warm
   Take care of these items after victim is breathing by himself or when help is available.
4. Remain in Position
   After victim revives, be ready to resume respiration if necessary.
5. Call a Doctor
   Have someone summon medical aid.
6. Don't Give Up
   Continue without interruption until victim is breathing without help or is certainly dead.

Rescue Breathing for Adults

1. Place victim on his back immediately.
2. Clear throat of water, food, or foreign matter.
3. Tilt head back to open air passage.
4. Lift jaw up to keep tongue out of air passage.
5. Pinch nostrils to prevent air leakage when you blow.
6. Blow until you see chest rise.
7. Remove your lips and allow lungs to empty.
8. Listen for snoring and gurglings–signs of throat obstruction.
9. Repeat mouth to mouth breathing 10-20 times a minute. Continue rescue breathing until victim breathes for himself.

Thumb and finger positions

Final mouth-to-mouth position

The following items are covered in the MAP introduction:

- MAP arrangement
- MAP flow
- MAP example
- How to use the MAPs
- Probing information when using the MAPs
- Normal conditions after power on

MAP Arrangement

MAPs contain procedures that let you follow symptoms, one step at a time, until you find the cause of the failure. Each MAP contains the following information:

- The purpose
- A list of conditions
- Step-by-step procedures to follow

When problems occur on the IBM 5280 Distributed Data System, use the System Entry MAPs. The system entry MAPs contain general questions that send you to one of the following MAPs:

- A power on checkout
- An intermittent failure
- An error code
- An operational symptom
- An area entry

The power on checkout MAP contains specific questions that enable you to isolate any hardware functions or microcode test problems that occur during a check of the basic system. You may be directed to a unit MAP to determine the failing FRU (field replaceable unit).

The intermittent failure MAP contains charts for operational symptom failures or error codes and a list of probable FRUs that could cause the failure.

The error code MAP contains specific questions that enable you to isolate hardware functions or microcode tests and direct you to another MAP or a failing FRU.

The operational symptom MAP contains symptom tables that will direct you to another MAP or a failing FRU.

The area entry MAP contains specific questions that send you to one of the following:

- A stand-alone program
- A MDI test
- A unit MAP

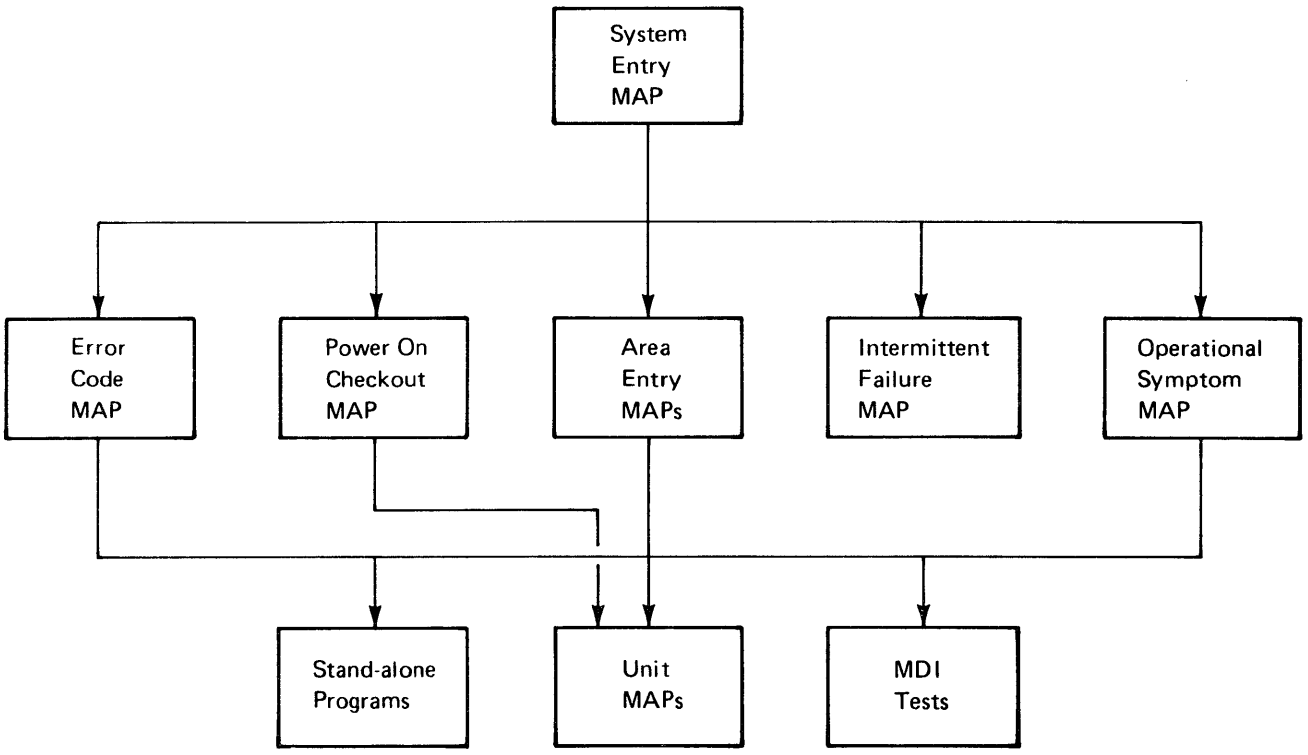
The stand-alone programs are tests used for diagnosis. After a repair action has been completed the stand-alone programs are used to verify the operation.

The MDI tests are diagnostic routines that prompt you through a diagnostic procedure to aid you in finding system failures and to isolate failing FRUs.

The unit MAPs contain detailed questions that enable you to identify the failing FRU.

MAP Flow

The following chart shows the normal path to follow to isolate a failure:



MAP Example

(A) → MAP 0100-1

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ENTRY POINTS ← (B) → **EXIT POINTS**

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
No entries in this table			

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	024	0200	A
3	021	0300	A
3	020	0400	A
3	025	0500	B
3	019	0532	A
3	014	0600	A
3	022	0800	A
3	016	0800	A
2	007	1000	A

001 ← (C)
(Entry Point A)

- Power On Checkout starts when the 'Power' switch is set to the On position (MIM 931).
- The keyboard speaker(s) should buzz near the start and again at the end of Power On Checkout.
- A buzz is a series of clicks (1 to 2 seconds).
- Power On Checkout terminates at the second buzz.
- If the second buzz is audible on at least one data station keyboard, Power On Checkout is OK.

(D) → The GLP extender cable (PN 453605) is used with the General Logic Probe in all MAPS, except where instructed to use short probe tips due to noise interference.

Is a Power On Checkout failure present or reported?
Y N

002 ← (C)
Is the machine problem intermittent? ← (E)
Y N ← (F)

003
- Error codes can be obtained from the System operator or from running 'TSYSEREP' (MIM 971). ← (G)

Is an error code present or reported?
Y N

3 3 3 2
A B C D ← (I)

(H) → EC 839661

(A) MAP number and page sequence number.

(B) These tables list all the Entry Points and Exit Points to and from this MAP.

(C) Step number.

(D) Statements that provide additional information about a step.

(E) Questions are to be answered either yes or no. Continue from your answer to the next question or instruction.

(F) Y = yes; N = no.

(G) Reference numbers refer to a location graphic, a maintenance procedure, a chart, or other pertinent information in the MIM.

(H) Engineering change number of the MAP.

(I) Off-page references identify the page and trace where a MAP leg continues.

D1 ← J

PAGE 2 OF 3

004
(Entry Point B)

Is an operational symptom present or reported?
Y N

005
(Entry Point C)

Is a diagnostic Sign-on screen or a valid data display screen format visible on any data station?
Y N

006
- Power off. ← K
- Remove the Magnetic Stripe Reader/Elapsed Time Counter card (A-D1) (MIM 501).
- Note: Answer no if card is not installed.
- Power on.

Is a diagnostic Sign-On screen or a valid data display screen format visible on any data station?
Y N

007
- Reinstall the MSR/ETC card.
Go To Map 1000, Entry Point A. ← L

008
- Defective MSR/ETC card (A-D1) (MIM 501). ← M

009
- The Parity Check indicator is a Full Screen, Reverse Image on all data stations.
- If data is present on any screen, at the time of the error, the data will be flashing.

Is a Parity Check the indicated error?
Y N

3E 3F G ← O

G

010
(Entry Point D)

- The following chart shows the areas of the machine.

Area Name
Base
Communications
Diskette
Display
Elapsed Time Counter (ETC)
Keyboard
Magnetic Stripe Reader (MSR)
Power Supply
Printer

Is the failing area known?
Y N

011
- Attempt to run 'TSYSEREP' (MIM 903) for error information.

Does EREP return usable information?
Y N

012
- Insert the diagnostic diskette and load 'DCP' using the customers configuration (MIM 951).

017
Go to Page 2, Step 010, Entry Point D. ← N

018
- Go to the Entry MAP for the failing area.

J Off-page references identify the page and trace where a MAP leg came from.

K Instructions establish conditions that help you answer the next question.

L Exit instructions indicate the next MAP and entry point that you should go to.

M Commands state the possible fixes for the failure. Follow the commands in the order in which they are presented.

N Exit instructions indicate the entry point in this MAP that you should go to.

O On-page references identify the trace on the same page where this MAP leg continues.

How to Use the MAPs

You should observe the following rules and procedures when using the MAPs or running MDI tests:

1. When any MDI tests are to be run, the MAP describes how to set up the machine in the correct condition to answer the MAP questions.

2. Before starting the error analysis, always observe and record any existing error symptoms.

3. The MAP might send you to the MIM for instructions on how to remove, check, adjust, or reinstall a FRU. After completing the action, return to the MAP for additional instructions.

4. If the failure symptoms do not remain constant, you should still attempt to use the MAPs and MDI tests to isolate the failure.

5. Unless you are instructed not to, always power off the system before you remove or install a fuse, cable, or card.

6. When a MAP indicates that a card or cable is bad, perform the following steps:
   a. Inspect the card and socket, then reseat the card and rerun the test that failed.
   b. Remove the card or cable, install a good one, and rerun the test that failed.

7. Probe all the lines indicated before answering the question that follows in the MAP or MDI test.

8. Names of all switches and indicators are shown in MAPs in the same way that they appear on the keyboard/display or operator panel.

9. Hexidecimal numbers are shown as hex AB23.

10. An X indicates a don't care position within the number. For example, the X in hex X54B represents any hexadecimal number.

11. After you diagnose and repair a failure, run the failing MAP or MDI test again to verify that the failure is corrected.

Probing Information When Using MAPs

When instructed by the MAPs, you should use the general logic probe II (part 453212) to measure signal levels. This probe is used for normal IBM 5280 Distributed Data System maintenance. The probe extender (part 453605) is used with the general logic probe in all MAPs except where you are instructed to use the short probe tips. Detailed information on using and maintaining the probe is found in the *IBM General Logic Probe II Manual*, SY27-0127, and in the *Diagnostic Aids* section (see 905) of the *IBM 5285 Programmable Data Station Maintenance Information Manual*,SY31-0600.

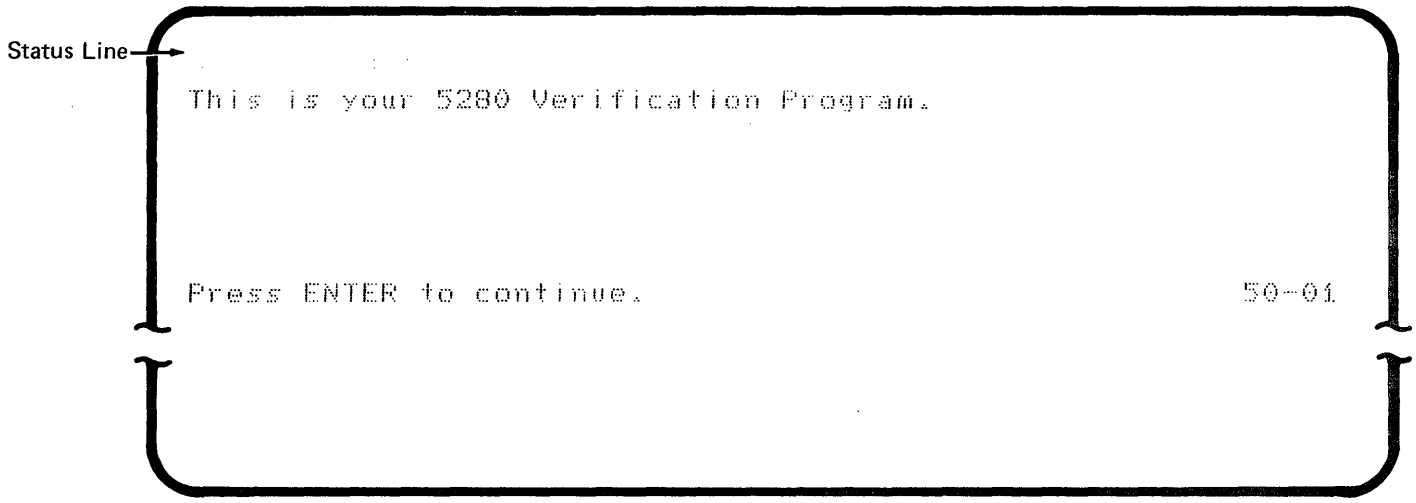
Normal Conditions After Power On

After you have powered on the system, the following display examples show the normal conditions of the display screen on the IBM 5285. All other attached data stations or dual data stations are blank.

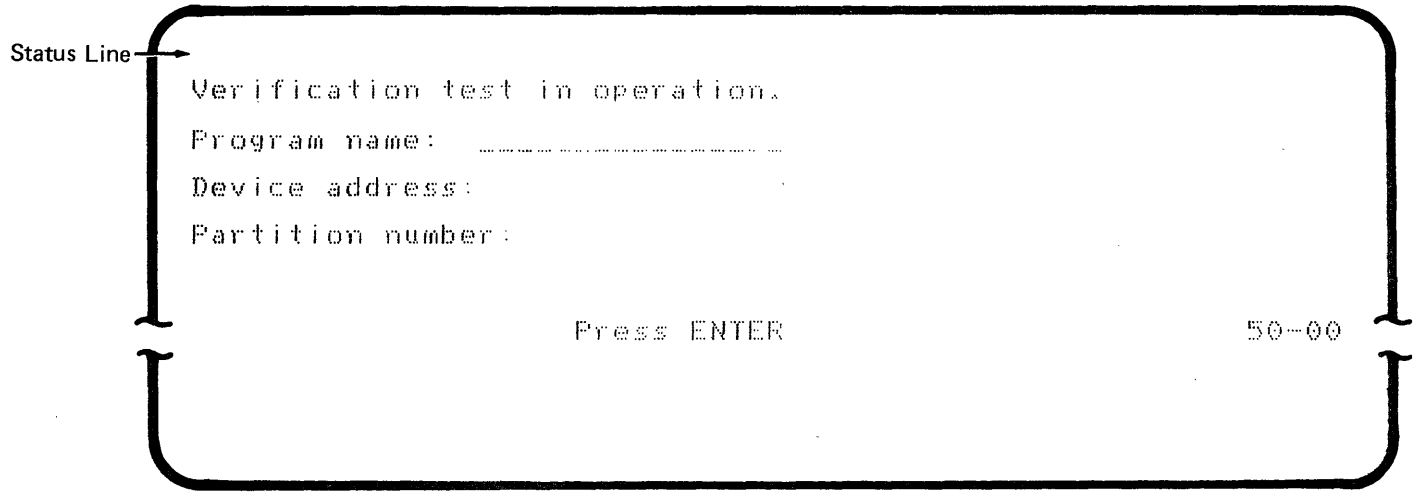
The selected program diskette must be inserted into a diskette drive and the diskette locking lever must be closed.

If the selected program diskette is inserted into an attached data station diskette drive, that data station must also be powered on.

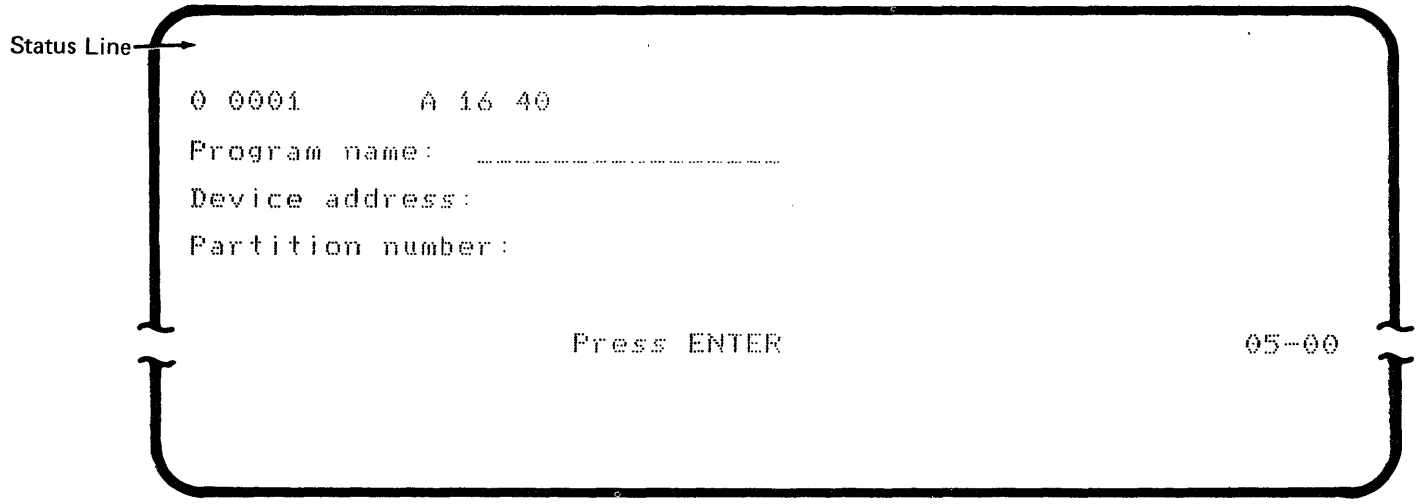
Display Example for a Diagnostic Diskette



Display Example for a Machine Verification Diskette



Display Example for a User IPL Program Diskette



NUMBER	DESCRIPTION
0100	SYSTEM ENTRY: This MAP is the start of call, and directs you to area, error code, or operational symptom MAPs or MDI's.
0200	POWER ON CHECKOUT: This MAP diagnoses the P.O.C. failure syndrome.
0210	POWER ON RESET: This MAP diagnoses loss of the system Power On Reset function.
0220	CONDITION CODE: The MAP directs you to other MAPs based on a condition code returned by microcode tests.
0300	ERROR CODE: This MAP directs you from a system error code to an entry or unit MAP.
0500	BASE ENTRY: This MAP directs you to a unit MAP for a problem in the base system.
0511	MAIN MPU ATTENTION ERROR: This MAP diagnoses the attention lines to and from the main microprocessor.
0531	MAIN STORAGE ACCESS: This MAP diagnoses the failure of a microprocessor to access main storage correctly.
0532	MAIN STORAGE PARITY CHECK ERROR: This MAP diagnoses the cause of a main storage parity check.
0600	ROS PATCH CARD: This MAP isolates the ROS Patch card from the microprocessor that it is connected to.
0800	INTERMITTENT ERROR: This MAP is a sequential replacement of FRUs in relation to an error code or operational conditions.

NUMBER	DESCRIPTION
1000	DATA ENTRY ENTRY: This MAP directs you to a unit MAP or MDI based on a data entry type of error condition.
1010	DATA ENTRY A-C1 DISPLAY: This MAP diagnoses display failures related to display #0 and/or common bus failures.
1011	DATA ENTRY A-E1 DISPLAY: This MAP diagnoses display failures related to displays #1/2.
1020	DATA ENTRY A-C1 KEYBOARD: This MAP diagnoses keybord failures related to keyboard #0 and/or common bus failures.
1021	DATA ENTRY A-E1 KEYBOARD: This MAP diagnoses failures related to keyboards #1/2.
1025	DATA ENTRY ERROR CODE: This MAP diagnoses failures related to Data Entry error codes 9119, 9120 or 9231 are generated by IPL of the Diagnostic Diskette.
1026	DATA ENTRY KEYLOCK: This MAP diagnoses failures with the keylock feature.
1030	DATA ENTRY MAGNETIC STRIPE READER: This MAP diagnoses failures related to MSR #0, 1, 2 or 3.
1040	DATA ENTRY ELAPSED TIME COUNTER: This MAP diagnoses failures related to Elapsed Time Counter feature.
2000	DISKETTE DRIVE ENTRY: This MAP directs you to a unit MAP based on error codes and condition codes.
2010	DISKETTE BASE SWAP: This MAP directs you to perform basic swapping and directs you to a specific problem area.
2210	DISKETTE CABLE SWAP: This MAP is used for cable problems.

NUMBER	DESCRIPTION
2250	2 DRIVE, N/DDCC: This MAP is for problem determination for two drives installed and the diskette drive control card is not failing.
2260	2 DRIVE, DDCC: This MAP is for problem determination for two drives installed and the diskette drive control card might be failing.
2270	MINIMUM CONFIGURATION SYSTEM: This MAP is for a minimum configuration system,1 drive only, connected to the system.
2280	INTERFACE/ LED: This MAP is for problem isolation with DRIVE IN USE led failures and interchange problems.
3000	COMMUNICATIONS ENTRY: This MAP checks the type of communications feature installed and directs you to the communications MDI's.
3011	TRANSMIT/RECEIVE LEVEL CHECK: This MAP checks the dB levels that are being transmitted and received for 3&LS.
3012	CBS TYPE COUPLER TEST: This MAP diagnoses the CBS coupler.
3013	CDT TYPE COUPLER TEST: This MAP diagnoses the CDT coupler.
3014	DIGITAL NETWORK WITH DDSA: This MAP is used to do a remote wrap for DDSA.
3015	OTHER COMMUNICATIONS ERRORS: This MAP diagnoses errors not detected by the MDI's.

NUMBER	DESCRIPTION
3016	W.T. LINE PLATE AUTO ANSWER: This MAP diagnoses the auto answer funciton of the W.T. line plate.
3017	W.T. LINE PLATE MANUAL CALL: This MAP diagnoses the manual call function of the W.T. line plate.
3018	W.T. LINE PLATE MANUAL ANSWER: This MAP diagnoses the manual answer function of the W.T. line plate.
3019	EIA OPEN/SHORT CIRCUIT TEST: This MAP is used to check for shorts or opens in the EIA cables.
7000	PRINTER ENTRY: Directs you to device MAPs or MDI's, based on a printer type errors.
8000	POWER ENTRY: This MAP diagnoses primary power and D.C. power problems.
8030	D. C. DISTRIBUTION: This MAP isolates D.C. distribution cable type of problems.

SYSTEM ENTRY MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0300	AD	2	004
1000	A	1	001
1010	A	1	001
1025	A	1	001
1030	A	1	001
3000	A	1	001
7000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	007	0200	A
5	036	0200	A
5	030	0300	A
3	015	0300	A
3	012	0300	A
5	038	0500	B
5	032	0532	A
5	028	0800	A
4	021	0800	A
5	031	0800	A
3	017	1000	A
3	020	1000	A
3	011	1000	B
4	025	1000	B
4	023	1025	A

001
(ENTRY POINT A)

- If the GLP extender cable (PN 453605) is used, the following must be observed.

1. The extender cable must not be used to probe any clock lines.
2. The extender cable must not lay across the logic board. Signals may be induced into the probe giving false indications.

- See MIM 905 for PROBE setup and test.

Did the System fail to IPL using the Customer's diskette?

Y N

002
(ENTRY POINT AA)

- See MIM 925 for EXAMPLES of Parity Check display indications.
- The Parity Check indicator is a Full Screen Reverse Image on ALL Data Stations.
- If data is present on any screen, at the time of the error, the data will be flashing.

Is a Parity Check the indicated error?
Y N

003
- Error codes can be obtained from the System operator or from running 'TSYSEREP' or 'TCOMEREP' (MIM 975).

Is an error code present or reported?
Y N

004
(ENTRY POINT AD)

Is the machine problem intermittent?
Y N

5 5 5
C D E F

005
- The 5280 System is divided into the following functional areas.

Area Name
Base (Main MPU and Main Storage)
Base (Feature Main MPU)
Keyboard/Display
Keylock
Magnetic Stripe Reader
Elapsed Time Counter
Diskette
Communications
Printer
Power Supply

NOTE: If you have been through this step before answer NO to this question.

Does the reported failure fit into one of these areas?
Y N

006
(ENTRY POINT B)

SYSTEM CHECKOUT PROCEDURE

- Power Off.
- Insert Diagnostic Diskette 1 in drive 4000 and close the locking lever.
- Power On.

Is the First Display Prompt (50-01) (MIM 941) visible on Data Station 0?
Y N

007
GO TO MAP 0200,
ENTRY POINT A.

EC840874 PEC839787

5 3
G H

008
- Press the 'x' key and then the 'ENTER' key.

Is the Keyboard Information Prompt (50-02) (MIM 941) visible on Data Station 0?
Y N

009
Is Prompt 50-06 (MIM 941) visible on Data Station 0?
Y N

010
Is there a 9930 or 9231 error displayed on Data Station 0?
Y N

011
- This is a keyboard failure (no response),
GO TO MAP 1000,
ENTRY POINT B.

012
GO TO MAP 0300,
ENTRY POINT A.

013
- Use MIM 207 to determine the answer to the Prompt on the display.
- Enter the correct option and press the 'ENTER' key.

Are there any error codes displayed?
Y N

014
GO TO STEP 016,
ENTRY POINT C.

015
GO TO MAP 0300, ENTRY POINT A.

016
(ENTRY POINT C)

- Press the 'ENTER' key.

Is Prompt 50-03 (MIM 941) visible on Data Station 0?
Y N

017
GO TO MAP 1000, ENTRY POINT A.

018
- Select the 'CURRENT' definition and press the 'ENTER' key.

Is there a 9120 error displayed on Data Station 0?
Y N

019
- Press the 'SYS REQ' key.

Is the Load Prompt (MIM 941) displayed on Data Station 0?
Y N

020
GO TO MAP 1000,
ENTRY POINT A.

021
(ENTRY POINT D)

- Remove Diagnostic Diskette 1 from drive 4000 and insert Diagnostic Diskette 2.
- Load 'DCP' and run the following MDI's against all possible devices.

0510	MPU Test
0520	Auto. Main Mem. Test
2060	Funct. Disk. Drive Test
3010	Comm. Adapter Test
7010	Printer Adapter Test

- Go to the MAP indicated by the MDI.
- Replace the Fru called out by the MDI.
- If an error code is indicated:

GO TO MAP 0300, ENTRY POINT A.

- If no problems were encountered in this checkout procedure, ask the customer to demonstrate the failure.
- If MDI 2060 fails to complete successfully,

GO TO MAP 2000, ENTRY POINT A.

- - - - - OR - - - - -

GO TO MAP 0800, ENTRY POINT A.

022
- Power Off, wait at least 30 seconds, Power On.
- When the First Prompt (50-01) (MIM 941) is displayed on Data Station 0, press the 'x' key and then the 'ENTER' key.
- When the Keyboard Information Prompt (50-02) (MIM 941) is displayed, record the number of keyboards displayed on the screen.

Does the number of keyboards displayed on the screen match the number of keyboards installed in the system?

Y N

023
- This is a 9120 error,
GO TO MAP 1025, ENTRY POINT A.

024
- Press the 'ENTER' key.
- When Prompt (50-03) (MIM 941) is displayed, select the 'NO' option.
- Select the correct display size for each foreground partition as the prompts are displayed.
- Press the 'SYS REQ', '2' and 'z' keys on Data Station 0.

Is the Load Prompt displayed on Data Station 0?

Y N

025
- This is a display failure,
GO TO MAP 1000, ENTRY POINT B.

026
GO TO STEP 021,
ENTRY POINT D.

027
- Go to the Entry MAP for the failing area.

MAP Number	Entry Point	Area Name
0500	A	Base(Main MPU/ Main Storage)
0500	A	Base (Feature Main MPU)
1000	A	Keyboard/ Display
1026	A	Keylock
1030	A	MSR
1040	A	ETC
2000	A	Diskette
3000	A	Communications
7000	A	Printer
8000	A	Power Supply

028
GO TO MAP 0800, ENTRY POINT A.

029
Is the machine problem intermittent?
Y N

030
GO TO MAP 0300, ENTRY POINT A.

031
GO TO MAP 0800, ENTRY POINT A.

032
GO TO MAP 0532, ENTRY POINT A.

033
- Install the customer's 'IPL' diskette that caused the failure in Drive 4000 and close the locking lever.
- Power Off, wait at least 30 seconds, Power On.
- Check the display at Data Station 0.

Did Power On Checkout complete correctly?
Y N

034
Is ONLY ONE Display Indicator on (MIM 931)?
Y N

035
- Power Off.
- Insert Diagnostic Diskette 1 in drive 4000 and close the locking lever.
- Power On.

Is the First Display Prompt (50-01) (MIM 941) visible on Data Station 0?
Y N

036
GO TO MAP 0200, ENTRY POINT A.

037
- Suspect the customer's 'IPL' diskette.

038
GO TO MAP 0500, ENTRY POINT B.

039
GO TO PAGE 2, STEP 002, ENTRY POINT AA.

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POWER ON CHECKOUT MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0220	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	009	0210	A
3	018	0210	A
3	020	0210	A
7	038	0210	A
7	040	0210	A
6	027	0532	A
6	030	0600	A
7	042	1000	A
2	012	1000	A
7	041	1000	A
3	021	1000	A
7	043	1000	A
6	026	1010	A
2	007	1020	B
2	006	8000	A
2	011	8000	A
3	017	8000	A

001
(ENTRY POINT A)

- Ensure Diagnostic Diskette 1 is loaded in drive 4000.
- Ensure all Diskette locking levers are open.
- Power Off, wait at least 30 seconds, Power On.
- See MIM 931 for the Condition Code table diagram.

Is the Condition Code table displayed at Data Station 0?

Y N

NOTE: Before proceeding with this MAP, ensure All voltages are within tolerance and the RIPPLE check is OK (MIM 461, 463).

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6 2
A B

002
- Check location A-E5 for a card (MIM 501). If a card is installed, check MIM 402 and 811 to see which card you have installed.

Is the feature Main MPU card installed in location A-E5?
Y N

003
(ENTRY POINT AA)

- Power Off, wait at least 30 seconds, Power On.

Does the speaker sound at keyboard 0?
Y N

004
- Install a jumper at A-A1-TP06 '- Click A' (MIM 200).
- Momentarily ground the jumper to frame ground.

Does the speaker sound at keyboard 0?
Y N

005
(ENTRY POINT B)

- Check for +5 Vdc from the Data Station 0 keyboard logic card J03-2(+) to J02-1(-) (Data Station MIM 220).

Is +4.5 to +5.5 Vdc present?
Y N

006
GO TO MAP 8000, ENTRY POINT A.

007
GO TO MAP 1020, ENTRY POINT B.

008
- Install a jumper at A-C1-TP40 '- Test POR' (MIM 303).
- Probe A-A8B04 '+ POR' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: Pulse
Down light: Ignore

Are the lights correct?
Y N

009
GO TO MAP 0210, ENTRY POINT A.

010
- Check for +8.5 Vdc from A-C2B11 to A-C2D08 (MIM 501).

Is +7.7 to +9.3 Vdc present?
Y N

011
GO TO MAP 8000, ENTRY POINT A.

012
GO TO MAP 1000, ENTRY POINT A.

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013
(ENTRY POINT C)

- See MIM 931 for examples of 'Valid Display indicators'.
- The 'Valid Display indicators' (located at the right side of the screen) are in one vertical column of 12 positions with dashes (off condition) at one end and squares (on condition) at the opposite end.
- During Power On Checkout the Display indicators change from squares to dashes in sequence.

Are any of the 'Valid Display indicators' On?
Y N

014
- Load a different 'IPL' diskette and IPL.
- The Power On Checkout should terminate with a sign-on screen.

Does Power On Checkout terminate correctly?
Y N

4 4
H J K

015
- Install a jumper at A-C1-TP40 '- Test POR' (MIM 303).
- Probe A-C2B04 '- POR' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: Ignore
Down light: Pulse

Are the lights correct?
Y N

016
- Check for -5 Vdc from A-C1B06 to A-C1D08 (MIM 501).

Is -4.5 to -5.5 Vdc present?
Y N

017
GO TO MAP 8000, ENTRY POINT A.

018
GO TO MAP 0210, ENTRY POINT A.

019
- Probe A-A8B04 '+ POR' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: Pulse
Down light: Ignore

Are the lights correct?
Y N

020
GO TO MAP 0210, ENTRY POINT A.

021
GO TO MAP 1000, ENTRY POINT A.

POWER ON CHECKOUT

PAGE 4 OF 7

022
- The first diskette has a data problem.
- Replace or initialize the diskette again.

023
(ENTRY POINT D)

- See MIM 925 for EXAMPLES of Parity Check display indications.
- The Parity Check indicator is a Full Screen Reverse Image on All Data Stations.
- If data is present on any screen, at the time of the error, the data will be flashing.

Is a Parity Check the indicated error?
Y N

024

- Match the TOTAL number of 'Valid Display Indicators' that are 'On' at Data Station 0 to the numbers in the 'On' column below. See the display example to the right and MIM 931 for EXAMPLES of 'Valid Display Indicators' On.

ON	REPAIR OR GO TO ENTRY POINT (E.P.)
1	Main Storage Size error. GO TO MAP 0500, ENTRY POINT A.
2,3,4, 5,6	Condition Code error. GO TO MAP 0220, ENTRY POINT A.
7	Defective MPU card (A-A1 or A-C1). If a 'Ros Patch' cable is connected to the card, GO TO MAP 0600, ENTRY POINT A.
8	Main Storage error. GO TO MAP 0500, ENTRY POINT A.
9	Defective Main MPU card(A-C1). If a 'Ros Patch' cable is connected to the card, GO TO MAP 0600, ENTRY POINT A.
10	Main MPU error. GO TO MAP 0500, ENTRY POINT A.
11	Defective Feature Keyboard/ Display storage card (A-B7). - - - - - OR - - - - - GO TO MAP 1000, ENTRY POINT A.
12	Keyboard/Display MPU error. GO TO MAP 1000, ENTRY POINT A.

-
-
-
-
X
X
X
X
X
X
X
X

DISPLAY EXAMPLE

This Display Example shows '8' Display indicators 'On'.

025
- Probe A-C4D04 '- Parity Error' (MIM 501).

Up light: Off
Down light: On

Are the lights correct?
Y N

026
- Keyboard/Display storage is causing a Power On Checkout failure,

GO TO MAP 1010,
ENTRY POINT A.

027
GO TO MAP 0532, ENTRY POINT A.

028
- Power Off.
- Remove the feature Main MPU card and install the following jumpers;

A-C1 Jumpers 2,4,5 (MIM 303)
A-E7D09 to A-E7D10 KBD/Disp
A-E7B11 to A-E7B12 Printer
A-E7D12 to A-E7D13 Comm.

- Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

029
- Power Off.
- Remove the jumpers and reinstall the Feature Main MPU card.

GO TO PAGE 2, STEP 003,
ENTRY POINT AA.

030
- Defective feature Main MPU card (A-E5) (MIM 402).
- Remove the jumpers and replace the feature Main MPU card.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

031
- See MIM 931 for the Condition Code table diagram.

NOTE: DO NOT PRESS A KEY. If a key has been pressed Power Off, wait at least 30 seconds, Power On.

Is a Scan Code present on line 1?
Y N

032
- Close the Diskette locking lever on drive 4000.
- Listen for a sound from the speaker at keyboard 0.

Note: The sound might be delayed from 2 to 3 seconds.

Does the speaker sound?
Y N

033
- Install a jumper at A-A1-TP06 '- Click A' (MIM 200).
- Momentarily ground the jumper to frame ground.

Does the speaker sound at keyboard 0?
Y N

034
GO TO PAGE 2, STEP 005,
ENTRY POINT B.

035
GO TO PAGE 4, STEP 023,
ENTRY POINT D.

036
- Execute a 'SOFT IPL' from Data Station 0 with the following command key sequence.

1. Press the 'Command' key.
2. Press and hold the 'Numeric Shift' key.
3. Press the 'G' key.

Is the First Display Prompt (50-01) (MIM 941) visible on Data Station 0?
Y N

037
- Check location A-E5 for a card (MIM 501). If a card is installed, check MIM 402 and &11 to see which card you have installed.

Is the feature Main MPU card installed in location A-E5?
Y N

038
GO TO MAP 0210,
ENTRY POINT A.

039
- Power Off.
- Remove the feature Main MPU card and install the following jumpers;

A-C1 Jumpers 2,4,5 (MIM 303)
A-E7D09 to A-E7D10 KBD/DISP
A-E7B11 to A-E7B12 Printer
A-E7D12 to A-E7D13 Comm.

- Power On.
- Execute a 'SOFT IPL' from Data Station 0 with the following command key sequence.

1. Press the 'Command' key.
2. Press and hold the 'Numeric Shift' key.
3. Press the 'G' key.

Is the First Display Prompt (50-01) (MIM 941) visible on Data Station 0?
Y N

040
GO TO MAP 0210,
ENTRY POINT A.

041
GO TO MAP 1000,
ENTRY POINT A.

042
GO TO MAP 1000, ENTRY POINT A.

043
GO TO MAP 1000, ENTRY POINT A.

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POWER ON RESET MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	010	0600	A
3	012	0600	A
2	006	0600	A
3	019	0600	A
4	021	0600	A
4	025	0600	A
4	027	0600	A
5	030	0600	A
2	007	0600	A
2	004	8000	A

001
(ENTRY POINT A)

- Install a jumper at A-C1-TP40 '- Test POR' (MIM 303).
- Probe A-C2B04 '- POR' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

NOTE: Ensure the probe power leads are correctly connected to the power supply regulator card (MIM 905).

Up light: Ignore
Down light: Pulse

Are the lights correct?
Y N

002
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

003
- Check for +5 Vdc from A-C1D03 and A-C3D03 to ground (MIM 501).

Is +4.5 to +5.5 Vdc present at both pins?
Y N

004
GO TO MAP 8000,
ENTRY POINT A.

005
(ENTRY POINT C)

- Install a jumper at A-A4B04 '- POR CMND' (MIM 501).
- Probe A-C4B04 '- POR CMND' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: Ignore
Down light: Pulse

Are the lights correct?
Y N

006
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

007
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

008
- Power Off.
- Use the C.E. voltmeter set to the RX1 scale.
- Check for a ground at A-C2B04 '- POR' (MIM 501).

Does the meter have a 5 ohm or less reading?
Y N

009
- Power On.
- Probe A-C4B04 '- POR CMND' (MIM 501).

Up light: Off
Down light: On

Are the lights correct?
Y N

010
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

011
- Power Off.
- Use the C.E. voltmeter set to the RX1 scale.
- Check for a ground at A-C4B04 '- POR CMND' (MIM 501).

Does the meter have a 5 ohm or less reading?
Y N

012
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

013
- Use MIM 531 for '- POR CMND'.
- Remove the cards in the net, one at a time, until the meter reading is 100 ohms or more.
- If all cards have been removed, and the meter reading is still zero ohms, check the logic board for a ground.

014
- Leave the C.E. voltmeter connected.
- Disconnect A-A1-P01 (if installed) from the card (MIM 219).

Does the meter have a 5 ohm or less reading?
Y N

015
- Use MIM 219 '- POR' to find the grounded line.

016
- Use MIM 531 for '- POR'.
- Remove the cards in the net, one at a time, until the meter reading is 100 ohms or more.
- If all cards have been removed, and the meter reading is still zero ohms, check the logic board for a ground.

017
- Probe A-A8B04 '+ POR' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: Pulse
Down light: Ignore

Are the lights correct?
Y N

018
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

019
- The logic board is open '+ POR' (MIM 531).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

POWER ON RESET

PAGE 4 OF 5

020
- Power Off.
- Use the C.E. voltmeter set to the RX1 scale.
- Check for a ground at A-A8B04 '+ POR' (MIM 501).

Does the meter have a 5 ohm or less reading?
Y N

021
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

022
- Use MIM 531 for '+ POR'.
- Remove the cards in the net, one at a time, until the meter reading is 100 ohms or more.
- If all cards have been removed, and the meter reading is still zero ohms, check the logic board for a ground.

023
- Probe A-A4B02 '100 Hz' (MIM 501).

Up light: On
Down light: On

Are the lights correct?
Y N

024
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

025
- The logic board is open '100 Hz' (MIM 531).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

026
- Power off.
- Use the C.E. voltmeter set to the RX1 scale.
- Check for a ground at A-A4B02 '100 Hz' (MIM 501).

Does the meter have a 5 ohm or less reading?
Y N

027
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

POWER ON RESET

PAGE 5 OF 5

028
- Use MIM 531 for '100 Hz'.
- Remove all cards in the net, one at a time, until the meter reading is 100 ohms or more.
- If all cards have been removed and the meter reading is still zero ohms, check the logic board for a ground.

029
Did Power On Checkout fail on 'SOFT IPL'?
Y N

030
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

031
GO TO PAGE 2, STEP 005,
ENTRY POINT C.

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CONDITION CODE MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0200	A
2	005	0600	A
2	007	0600	A
2	008	0600	A
2	015	1000	A
2	012	2000	A
2	013	3000	A
2	014	7000	A

001
(ENTRY POINT A)

- Power Off, open All diskette locking levers, Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

002
- Power Off.
- Remove the following Feature MPU card(s) (if installed) (MIM 501).

Feature	Location
Printer	A-D5
Communications	A-E5

- Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

003
Is the same failure present?
Y N

004
GO TO MAP 0200,
ENTRY POINT A.

005
- Defective Diskette/Main MPU card (A-C1) (MIM 303) or Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

006
- Power Off.
- Reinstall ONE Feature MPU card.
- Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

007
- The Feature MPU card you reinstalled is defective.

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

008
- The Feature MPU card you did not reinstall is defective.

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

009
- See MIM 931 for the Condition Code table diagram.

NOTE: DO NOT PRESS A KEY. If a key has been pressed Power Off, wait at least 30 seconds, Power On.

Is a Scan Code present on line 1?
Y N

010
Are you diagnosing a Printer feature error?
Y N

011
Are you diagnosing a Communications feature error?
Y N

012
GO TO MAP 2000,
ENTRY POINT A.

013
GO TO MAP 3000,
ENTRY POINT A.

014
GO TO MAP 7000, ENTRY POINT A.

015
GO TO MAP 1000, ENTRY POINT A.

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ERROR CODE MAP

PAGE 1 OF 2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
1025	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	002	0100	AD
2	009	0100	AD
2	016	0100	AD
2	017	0600	A
2	014	1000	A
2	012	2000	A
2	011	3000	A
2	013	7000	A

001
(ENTRY POINT A)

- The valid error codes on this system have a four digit number.

Is a 4 digit error code present or reported?
Y N

002
- The number you have is not an error code.
GO TO MAP 0100, ENTRY POINT AD.

003
Is the first digit equal to a 0?
Y N

004
Is the first digit equal to a 1?
Y N

005
Is the first digit equal to a 2?
Y N

D 1 BASE MAP

ERROR CODE

PAGE 2 OF 2

006
Is the first digit equal to a 3?
Y N

007
Is the first digit equal to a 4 or 5?
Y N

008
Is the error code a 9119, 9120, 9231, or 9930?
Y N

009
- The other 9XXX error codes are programming related.
- Use the Operator's Guide and Message Manual to diagnose the error.
- If a machine error is still indicated,
GO TO MAP 0100,
ENTRY POINT AD.

010

Error Code	Map Entry Point (E.P.)
9 1 1 9	1025,A
9 1 2 0	1025,A
9 2 3 1	1025,A
9 9 3 0	0500,A

011
- The 4XXX and 5XXX error codes are Communications feature errors,
GO TO MAP 3000, ENTRY POINT A.

012
- The 3XXX error codes are Diskette errors,
GO TO MAP 2000, ENTRY POINT A.

A B C 1 1 1 MAP 0300-2

013
- The 2XXX error codes are Printer feature errors,
GO TO MAP 7000,
ENTRY POINT A.

014
- The 1XXX error codes are Keyboard/Display errors,
GO TO MAP 1000, ENTRY POINT A.

015
Is the second digit equal to a 7?
Y N

016
- The other 0XXX error codes are Main microprocessor errors,
GO TO MAP 0100, ENTRY POINT AD.

017
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

- - - - - OR - - - - -

- Defective Feature MPU card that you are trying to access (MIM 501).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

BASE ENTRY MAP

PAGE 1 OF 3

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	B	2	013
0200	A	1	001
0300	A	1	001

EXIT POINTS

EXIT THIS MAP PAGE NUMBER	STEP NUMBER	TO MAP NUMBER	ENTRY POINT
2	012	0511	A
3	017	0531	A
3	018	0531	B
3	021	0600	A
2	014	0600	A

001
(ENTRY POINT A)

- Check location A-E5 for a card (MIM 501). If a card is installed, check MIM 402 and 811 to see which card you have installed.

Is the feature Main MPU card installed in location A-E5?
Y N

002
(ENTRY POINT AA)

- Ensure the 'IPL' diskette that caused the error is loaded in drive 4000.
- Power Off, wait at least 30 seconds, Power On.
- See MIM 931 for a description of Power On Checkout.

Does Power On Checkout fail with only EIGHT Display Indicators On?
Y N

NOTE: Before proceeding with this MAP, ensure All voltages are within tolerance and the RIPPLE check is OK (MIM 461, 463).

BASE ENTRY

PAGE 2 OF 3

003
Does Power On Checkout fail with only ONE Display Indicator on?
Y N

004
Does Power On Checkout fail with only TEN Display Indicators on?
Y N

005
- IPL Diagnostic Diskette 1.
- Load 'DCP' (MIM 951).

Is the main option menu displayed on the screen?
Y N

006
- The MDI and step number should be displayed in the status line.

Is MDI 0510 step 002 displayed?
Y N

007
- Use Display/Alter to isolate further (MIM 991).

008
- Perform the indicated repair.

009
Are you diagnosing a Main MPU error?
Y N

010
- Run the Main Storage A test (MDI 0520) to diagnose the error (MIM 961).

011
- Run the Main MPU test (MDI 0510) in loop mode to check for an intermittent (MIM 951, 961).

012
GO TO MAP 0511, ENTRY POINT A.

013
(ENTRY POINT B)

- Probe A-C7B02 '- Feature Storage Select' (MIM 501).

Up light: On
Down light: On

Are the lights correct?
Y N

014
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

015
- Probe;
A-C6D13 '- SAR BIT 0'
A-C6B02 '- SAR GRP BIT 7'
(MIM 501).

Up light: Off
Down light: On

Are the lights correct for either line?
Y N

016
- Load 'DCP' (MIM 951) and run Main Storage A test (MDI 0520).

BASE ENTRY

PAGE 3 OF 3

017
GO TO MAP 0531,
ENTRY POINT A.

018
- The Base 32K of Main Storage failed.
- Use the Main Storage Access MAP to diagnose a grounded address, data or control line.

GO TO MAP 0531, ENTRY POINT B.

019
- Power Off.
- Remove the feature Main MPU card and install the following jumpers;

  A-C1 Jumpers 2,4,5 (MIM 303)
  A-E7D09 to A-E7D10 KBD/Disp
  A-E7B11 to A-E7B12 Printer
  A-E7D12 to A-E7D13 Comm.

- Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

020
- Power Off.
- Remove the jumpers and reinstall the Feature Main MPU card.
- Power On.

GO TO PAGE 1, STEP 002,
ENTRY POINT AA.

021
- Defective feature Main MPU card (A-E5) (MIM 402).
- Remove the jumpers and replace the Feature Main MPU card.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

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MAIN MPU ATTN ERROR MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0500	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	003	0600	A
3	009	0600	A
3	010	0600	A
3	012	0600	A
3	014	0600	A
2	007	0600	A
4	015	0600	A

001
(ENTRY POINT A)

- Probe All attention lines in the chart.

Line Name	Probe Point (MIM 501)
-ATTN From COMM	A-C4B07
-ATTN From 2 TP	A-C4B08
-ATTN From Printer	A-C4B09
-ATTN From KBD/Disp	A-C4D06
-ATTN From Diskette	A-C4D07
-ATTN From 1 TP	A-C4D09
-ATTN To KBD/Disp	A-C4D13

Up Light: Off
Down Light: On

Are the lights correct for ANY line?
Y N

002
- Install terminating resistor (PN:4177566) (5.1K) from A-C4D03 to A-C4D13 (MIM 501).
- Install a jumper at A-C1-TP40 '- Test POR' (MIM 303).
- Probe A-C4D13 '- ATTN to KBD/Disp' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up Light: On
Down Light: Pulse

Are the lights correct?
Y N

003
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

004
- Check location A-E5 for a card (MIM 501). If a card is installed, check MIM 402 and &11 to see which card you have installed.

Is the feature Main MPU card installed in location A-E5?
Y N

005
- Ensure that the jumper from A-E7D09 to A-E7D10 is installed.

GO TO PAGE 3, STEP 008,
ENTRY POINT AA.

006
- Install terminating resistor (PN:4177566) (5.1K) from A-E7D03 to A-E7D09 (MIM 501).
- Probe A-E7D09 '- Attn to KBD/Disp' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.

Up light: On
Down light: Pulses

Are the lights correct?
Y N

007
- The Logic board is open '- Attn to KBD/Disp' (MIM 531).

- - - - - OR - - - - -

- Defective Feature Main MPU card (A-E5) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

008
(ENTRY POINT AA)

- Install terminating resistor (PN:4177566) (5.1K) from A-A4D03 to A-A4D06 (MIM 501).
- Probe A-A4D06 '- ATTN from KBD/Disp' (MIM 501).
- Observe the lights as you momentarily ground the jumper to frame ground.
- NOTE: The pulse may be delayed 3 to 4 seconds.

Up Light: On
Down Light: Pulse

Are the lights correct?
Y N

009
- The logic board is open '- ATTN to KBD/Disp' (MIM 531).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

010
(ENTRY POINT B)

- The logic board is open '- ATTN from KBD/Disp' (MIM 531).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

011
(ENTRY POINT C)

- Power Off.
- Check the Attention line(s), that match the probe light condition, for a ground.
- Use the CE voltmeter set to the RX1 scale.
- Connect the C.E. voltmeter to the probe point for the failing Attention line(s).

Does the meter have a 5 ohm or less reading?
Y N

012
- Defective MPU card for the attention line(s) that match the probe condition (MIM 501).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

013
- Remove the Diskette/Main MPU card (A-C1) (MIM 501).
- Check the Attention line(s), that match the probe light condition, for a ground.

Does the meter have a 5 ohm or less reading for ANY line?
Y N

014
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

MAIN MPU ATTN ERROR

PAGE 4 OF 4

015

- Defective MPU card for the attention line(s) that is grounded (MIM 501).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

MAIN STORAGE ACCESS MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0500	A	1	001
0500	B	1	002

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0600	A
2	006	0600	A
2	007	0600	A

001
(ENTRY POINT A)

- Insure the 'IPL' diskette that caused the error is loaded in drive 4000.
- Power Off, wait at least 30 seconds, Power On.
- See MIM 931 for a description of Power On checkout.

Does Power On Checkout fail with only ONE Display Indicator On?
Y N

002
(ENTRY POINT B)

- If installed, the Feature Main Storage card is located at A-B5 (MIM 501).

Is a Feature Main Storage card installed?
Y N

003
(ENTRY POINT C)

- If installed, the Feature MPU card(s) is located at:

Feature	Location (MIM 501)
Printer	A-D5
Communications	A-E5

Is a Feature MPU card(s) installed?
Y N

004
- Defective Diskette/Main MPU card (A-C1) (MIM 303) or Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

005
- Power Off.
- Remove all Feature MPU cards installed.
- Power On.

Does Power On Checkout complete correctly?
Y N

006
- Defective Diskette/Main MPU card (A-C1) (MIM 303) or Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

007
- Reinstall the Feature MPU card(s), one at a time, until Power On Checkout fails.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

008
- Power Off.
- Remove the Feature Main Storage card.
- Power On.

Does Power On Checkout complete correctly?
Y N

009
GO TO STEP 003,
ENTRY POINT C.

010
- Defective Feature Main Storage card (A-B5) (MIM 403).

011
GO TO PAGE 1, STEP 002,
ENTRY POINT B.

PARITY CHECK MAP

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0200	A	1	001
1025	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	010	0600	A
3	014	0600	A
3	015	0600	A
4	020	0600	A
3	017	0600	A
4	025	0800	A

001
(ENTRY POINT A)

- Power Off.
- Ensure Diagnostic Diskette 1 is loaded in drive 4000.
- Close the locking lever.
- Power On.

Is the first Display Prompt (50-01) (MIM 941) visible on Data Station 0?
Y N

002
- Check location A-E5 for a card (MIM 501). If a card is intsalled, check MIM 402 and 811 to see which card you have installed.

Is the feature Main MPU card installed in location A-E5?
Y N

003
(ENTRY POINT AA)

Is the feature Main Storage card installed in location A-B5?
Y N

004
GO TO STEP 008,
ENTRY POINT AB.

005
- Probe;
A-B5-TP01 '+feature parity check' (MIM 403).

Up light: On
Down light: Off

NOTE: Answer 'No' if no TP on the card.

Are the lights correct?
Y N

006
- Power Off.
- Remove the Feature Main Storage card (A-B5) (MIM 501).
- Power On.

Does Power On Checkout fail with a Parity Check?
Y N

007
- Defective Feature Main Storage card (A-B5) (MIM 403).

3
D E

008
(ENTRY POINT AB)

- Probe All control lines in the chart.

Line Name	Probe Point (MIM 501)
- Valid Address	A-C4D02
- Parity Error	A-C4D04
+ WT/-RD	A-C5D04
- T Comp	A-C5D05
- Stor Request Dot	A-C5D06
- Parity Bit	A-C5D09
- Feat Stor Select	A-C7B02

Up light: Off
Down light: On

Are the lights correct for any line?
Y N

009
- Probe Both lines in the chart.

Line Name	Probe Point (MIM 501)
- SAR Bit 0 Dot	A-C6D13
+ Device Select 4	A-C7B11

Up light: Off
Down light: On

Are the lights correct for both lines?
Y N

EC840874 PEC839787

3 3 3
F G H

010
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

011
GO TO STEP 012,
ENTRY POINT B.

012
(ENTRY POINT B)

- Power Off.
- Check the control line(s) that match the probe light condition for a ground.
- Use the C.E. Voltmeter set to the RX1 range.
- Connect the C.E. voltmeter to the probe point for the failing control line(s).

Does the meter have a 5 ohm or less reading?
Y N

013
- Power Off.
- Remove the following feature MPU card(s) (if installed) (MIM 501).

Feature	Location
Printer	A-D5
Communications	A-E5

- Power On.

Does Power On Checkout fail with a Parity Check?
Y N

014
- Install the feature MPU card(s), one at a time, until the error ocurrs.
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

015
- Defective Diskette/Main MPU card (A-C1) (MIM 303) or the Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

016
- Use MIM 531 for the failing line net.
- Remove all cards in the net, one at a time, until the meter reading is 100 ohms or more.
- If all cards have been removed, and the meter reading is still zero, check the logic board for a ground.

017
- Defective Feature Main Storage card (A-B5) (MIM 403).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

018
- Power Off.
- Remove the feature Main MPU card and install the following jumpers;

  A-C1 Jumpers 2,4,5 (MIM 303)
  A-E7D09 to A-E7D10 KBD/Disp
  A-E7B11 to A-E7B12 Printer
  A-E7D12 to A-E7D13 Comm.

- Power On.

Is the Condition Code table displayed on Data Station 0?
Y N

019
- Power Off.
- Remove the jumpers and reinstall the Feature Main MPU card.
- Power On.

GO TO PAGE 2, STEP 003, ENTRY POINT AA.

020
- Defective feature Main MPU card (A-E5) (MIM 402).
- Remove the jumpers and replace the Feature Main MPU card.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

021
- Run Main Storage A test (MDI 0520) (MIM 961).

Does the test complete successfully?
Y N

022
(ENTRY POINT C)

- Defective Feature Main Storage card (A-B5) (MIM 403).

023
Is the size tested equal to the total size of Main storage?
Y N

024
- Run Main Storage B test (MDI 0530) (MIM 961) for the total size.

025
GO TO MAP 0800, ENTRY POINT A.

ROS PATCH CARD MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	1	001
0210	A	1	001
0220	A	1	001
0500	A	1	001
0511	A	1	001
0531	A	1	001
0532	A	1	001
1000	A	1	001
1010	A	1	001
1011	A	1	001
1020	A	1	001
1021	A	1	001
1025	A	1	001
1026	A	1	001
1030	A	1	001
1040	A	1	001
3011	A	1	001
3012	A	1	001
3013	A	1	001
3015	A	1	001
3019	A	1	001
7000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	8000	A

001
(ENTRY POINT A)

- See the Theory Section for a description of the 'Ros Patch' card and it's purpose.
- You should use this MAP if the other MAPs instructed you to replace a microprocessor card.
- This MAP will help you in the isolation of 'Ros Patch' card errors from microprocessor card errors.
- 'Ros Patch' card errors are caused by failing hardware or a

(Step 001 continues)

(Step 001 continued)
wrong level of card installed for the specific Ros level on an MPU card.

NOTE: Each MPU on the Diskette/Main MPU card must be checked seperatly.

- Power Off.
- Disconnect the 'Ros Patch' card cable from the MPU card.
- Install the MPU 'Ros' jumper (PN. 1794401) on the MPU card (MIM 200, 303, 402, 731, 801).
- Power On.

Does the same error condition occur?
Y N

002
- Check for +5 Vdc from J02-03 to J02-01 at the 'Ros Patch' card (MIM 455, 563).

Is +4.5 to +5.5 Vdc present?
Y N

003
- Check for +5 Vdc from J2-10 to J2-03 at the power supply (MIM 451,455).

Is +4.5 to +5.5 Vdc present?
Y N

004
GO TO MAP 8000,
ENTRY POINT A.

005
- Check the D.C. distribution cable for an open (MIM 455).

006
- See MIM 565 for label definition on the cards.
- Ensure that the 'Ros Patch' card label is at the correct level for the MPU Ros level that it is correcting (MIM 200, 303, 402, 731, 801).

Is the 'Ros Patch' card label at the correct level?
Y N

007
- Order the correct level of 'Ros Patch' card for the MPU card Ros level.

008
- Replace the 'Ros Patch' card with the same or higher level of card for the MPU card Ros level.

- - - - - OR - - - - -

- Defective 'Ros Patch' cable.

009
- See MIM 565 for label definition on the cards.
- Replace the MPU card with one that has the same or higher level of Ros.

NOTE: The new MPU card might not need a 'Ros Patch' card.

INTERMITTENT ERROR MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0532	A	1	001
3015	A	1	001

001
(ENTRY POINT A)

- This chart assigns numbers to each Field Field Replaceable Unit (FRU) used in this map.

NUMBER	FIELD REPLACEABLE UNIT (FRU)
0 1	DISKETTE DRIVE (MIM 301)
0 2	DISKETTE DRV CNTRL CARD (DISK MIM 377)
0 3	READ/WRITE HEAD (DISKETTE MIM 341)
0 4	STEPPER MOTOR (DISKETTE MIM 357)
0 5	A C MOTOR (DISKETTE MIM 351)
0 6	COMMUNICATIONS MPU CARD (MIM 811)
0 7	LINE ADAPTER CARD (MIM 8XX)
0 8	D/S DRV/REV CARD (MIM 211)
0 9	DISPLAY UNIT (MIM 181)
1 0	OPERATOR PANEL (MIM 071)
1 1	KEYBOARD SPEAKER (MIM 101)
1 2	KEY MODULE (MIM 121)
1 3	DISKETTE
1 4	DISKETTE/MAIN MPU CARD (MIM 303)
1 5	VFO CARD (MIM 501)
1 6	FEAT KBD/DISP STORAGE CARD (MIM 207)
1 7	MSR/ETC CARD (MIM 751)
1 8	MSR UNIT (MIM 78X)
1 9	KEYBOARD LOGIC OR PAD CARD (MIM 127)
2 0	VERTICAL ADJUSTMENT (MIM 163)
2 1	KEYBOARD ADAPTER CARD (MIM 205)
2 2	D/S ADAPTER CARD (MIM 201, 203)
2 3	ROS PATCH CARD (MIM 451)
2 4	USE THE PRINTER MAPS

(Step 001 continues)

(Step 001 continued)

NUMBER	FIELD REPLACEABLE UNIT (FRU)
2 5	FEATURE MAIN STORAGE CARD (MIM 403)
2 6	PRINTER ATTACHMENT MPU CARD (MIM 73)
2 7	KEYBOARD/DISPLAY MPU CARD (MIM 200)
2 8	FILE IN USE LED (MIM 079)
2 9	HORIZONTAL ADJUSTMENT (MIM 165)
3 0	VIDEO/BRIGHTNESS ADJ (MIM 161,171)
3 1	FEATURE MAIN MPU CARD (MIM 402)
3 2	MAIN MPU (SEE CHART #14 OR #31)

NOTES: Before proceeding in this MAP;
1. Ensure All voltages are within tolerance and the RIPPLE check is OK (MIM 461, 463).
2. Check all capacitor mounting screws on the power supply P.C. board assembly(s) (MIM 451).

- Error codes can be obtained from the System operator or from running 'TSYSEREP' or 'TCOMEREP' (MIM 971).

Is an error code present or reported?
Y N

002
Do you have a Display, Keyboard, Elapsed Time Counter (ETC) or Magnetic Stripe Reader (MSR) operational symptom?
Y N

003

DISKETTE / FEATURE / MISCELLANEOUS OPERATIONAL SYMPTOMS	REPAIR SEQUENCE 01	02	03	04
1. 'SOFT IPL' fails	27	32	23	
2. System stops during 'IPL'	32	27	23	
3. Printer problems	26	32	23	
4. Communications problems	06	07	32	23
5. Diskette ready problems	01	02	05	14
6. Diskette seek errors	04	02	14	23
7. Diskette read errors	03	02	15	14
8. Diskette write errors	03	02	14	13
9. 'File in use' LED problems	28	14		
10. Single drive destroys data	03	02	14	23
11. Diskette interchange errors	03	13		
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

004

DISPLAY / KEYBOARD / ETC / MSR OPERATIONAL SYMPTOMS	REPAIR SEQUENCE 01	02	03	04
1. Single screen dark	09	08	22	27
2. All screens dark	09	27	22	08
3. Characters missing in the corners	09			
4. Display out of focus	09			
5. Only one vertical line displayed	09			
6. Only one horizontal line displayed	09			
7. No contrast control	10			
8. Horizontal centering problem	29	09		
9. Vertical centering problem	09			
10. No brightness control	10	30	09	
11. Video problems	30	09		
12. Vertical size, hold, or linearity problems	20	09		
13. Single key failure	12	19		
14. Multiple key failure	19			
15. Keyboard speaker failure	11	08	19	22
16. No keyboard response	19	08	22	21
17. Elapsed time counter failure	17	27		
18. Magnetic stripe reader failure	17	18	27	
19. No valid sign-on or data (display is stable)	27	32	22	25
20. Full screen reverse image	25	14	16	27

005

ERROR CODES	REPAIR SEQUENCE 01	02	03	04
0 X X X	32	23	NOTE	
1 1 1 0	16	27	22	
1 2 0 0	16	27	22	
1 2 0 1	16	27	22	
1 2 0 4	17	27		
1 X X X	19	22	27	
2 X X X	26	14	24	
3 2 0 1	02	03	14	
3 2 5 1	01	08	05	13
3 2 6 1	02	03	14	
3 2 X X	14	13	08	01
3 3 0 1	13	03		

ERROR CODES	REPAIR SEQUENCE 01	02	03	04
3 3 0 2	03	02	14	
3 3 0 4	04	02	14	
3 3 0 7	13	02	19	14
3 3 X X	13			
3 5 X X	13			
4 X X X	06	07	32	
5 X X X	06	07	32	
9 1 1 9	16	27	22	
9 1 2 0	27	22	16	
9 2 3 1	16	27	22	
9 9 3 0	25			
9 X X X	32	27	23	

NOTE: If the Diskette/Main MPU card does not fix the problem, the feature MPU card that you are trying to access might be failing.

This page is intentionally left blank.

ENTRY MAP

PAGE 1 OF 7

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	B	2	004
0200	A	1	001
0220	A	1	001
0300	A	1	001
1025	C	5	039

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	003	0100	A
3	008	0100	A
6	050	0100	A
4	029	0600	A
3	021	1010	A
3	019	1010	A
7	063	1010	A
3	018	1011	A
3	015	1020	A
3	014	1020	A
7	061	1020	A
3	013	1021	A
6	054	1025	A
5	038	1025	A
5	035	1025	A
3	022	1026	A
3	010	1030	A
3	009	1040	A

001
(ENTRY POINT A)

- The Keyboard/Display MPU controls the keyboard and display units attached to the 5285 system. In addition, it services the magnetic stripe readers and the interval timer.
- The partition to which the keyboard display is attached is normally displayed as the first byte of the status line.
- Each Keyboard/Display unit and magnetic stripe reader must be attached to a foreground partition in main storage. The interval timer may be serviced from any partition.
- The Keyboard/Display microprocessor handles from 1 to 4 Keyboard/Displays, from 1 to 4 magnetic stripe readers, and one interval timer.

- DCP can only handle 3 foreground partitions. See error code 9999, MIM 951.

(Step 001 continues)

(Step 001 continued)

- - - - - - - - - - - - - - - - - - NOTES - - - - - - - - - - - - - - - - - -

1.

KEYBOARD DISPLAY NUMBER	DISPLAY NUMBER	MAGNETIC STRIPE READER NUMBER (MSR)	FOREGROUND PARTITION NUMBER
0	0	0	0
1(ADS)	1 (ADS)	1	1
2(ADS)	2 (ADS)	2	2

2. ADS=Auxiliary Data Station.
3. Foreground partition number 0 supports the console Keyboard/Display/MSR. The console is controlled by the Keyboard/Display MPU card A-A1 (MIM 501).
4. If there is a 5281 Data Station attached to the system it is supported by foreground partition number 1. The Remote Data Station is controlled by the Data Station Adapter Card (A-E1) (MIM 501).
5. If there is a 5282 Data Station attached to the system, it is supported by foreground partition numbers 1 and 2. The Remote Data Station is controlled by the Dual Data Station Adapter Card A-E1 (MIM 501).

Did you start this call at the
System Entry MAP's?
Y N

002
Did you start this call from a
remote Data Station MAP?
Y N

003
GO TO MAP 0100,
ENTRY POINT A.

004
(ENTRY POINT B)

Is this a Display failure?
Y N

005
Is this a Keyboard failure?
Y N

006
Is this a Magnetic Stripe Reader failure?
Y N

007
Is this an Elapsed Time Counter failure?
Y N

008
GO TO MAP 0100,
ENTRY POINT A.

009
GO TO MAP 1040,
ENTRY POINT A.

010
GO TO MAP 1030, ENTRY POINT A.

011
Are all the keyboards failing?
Y N

012
Is keyboard number 0 failing?
Y N

013
GO TO MAP 1021,
ENTRY POINT A.

014
GO TO MAP 1020, ENTRY POINT A.

015
GO TO MAP 1020, ENTRY POINT A.

016
Are all the displays failing?
Y N

017
Is display number 0 failing?
Y N

018
GO TO MAP 1011,
ENTRY POINT A.

019
GO TO MAP 1010,
ENTRY POINT A.

020
Is the Keylock feature installed?
Y N

021
GO TO MAP 1010,
ENTRY POINT A.

022
GO TO MAP 1026, ENTRY POINT A.

023
Did you enter this MAP as a result of a Power On Checkout failure?
Y N

024
(ENTRY POINT D)

- Power off.
- Ensure that all Diskette locking levers are open.
- Ensure that all 5281/5282 Data Station power switches are in the ON position.
- Power on.
- Wait at least 30 seconds.

Is the condition code table displayed on Data Station 0 (MIM 931)?
Y N

025
- This is a Keyboard failure. Go to Step 004, Entry Point B, for further isolation.

026
Is there a keyboard scan code displayed in line 1 of the condi on code table (MIM 931)?
Y N

027
- Insert the Diagnostic Diskette 1 in drive 4000 and close the locking lever.

Is the First Display Prompt (50-01) (MIM 941) displayed correctly on Data Station 0?
Y N

028
- Power off.
- Remove the Data Station Adapter card (A-E1) (MIM 501).
- Power on.

Is the First Display Prompt (50-01) (MIM 941) displayed correctly on Data Station 0?
Y N

029
- Defective Keyboard/Display Storage card (A-B7) (MIM 207).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card
GO TO MAP 0600,
ENTRY POINT A.

030
- Defective Data Station Adapter card (A-E1) (MIM 501).

031
- Press the 'X' key and then the ENTER key.

Is the Keyboard Information Prompt (50-02) (MIM 941) visible on Data Station 0?
Y N

032

Is Prompt (50-06) (MIM 941) visible on Data Station 0?
Y N

033
Is there a 9930 or 9231 error displayed on Data Station 0?
Y N

034
- This is a Keyboard failure (no response). Go to Step 004, Entry Point B, for further isolation.

035
GO TO MAP 1025, ENTRY POINT A.

036
- To determine the answer to the Prompt on the display, go to MIM 207.
- Enter the correct option and press the ENTER key.

Are there any error codes displayed?
Y N

037
GO TO STEP 039, ENTRY POINT C.

038
GO TO MAP 1025, ENTRY POINT A.

039
(ENTRY POINT C)

Is Prompt (50-03) (MIM 941) visible on Data Station 0?
Y N

040
- Press the ENTER key.

Is Prompt (50-03) (MIM 941) visible on Data Station 0?
Y N

041
- This is a display failure. Go to Step 004, Entry Point B, for further isolation.

042
GO TO STEP 039, ENTRY POINT C.

043
- Select the current definition and press the ENTER key.

Is there a 9120 error displayed on Data Station 0?
Y N

044
- Press the SYS REQ key.

Is the Load Prompt (MIM 941) displayed on Data Station 0?
Y N

045
- This is a display failure, go to MAP 1000, Entry Point B, for further isolation.

046
- Press the SYS REQ key on all other keyboards.

Do all Data Station have a Load Prompt displayed on their screens?
Y N

047
- This is a display failure, go to MAP 1000, Entry Point B, for further isolation.

048
- Power off.
- 'IPL', using Diagnostic Diskette 1, from Data Station 0 (MIM 941).
- Do not use the current definition.
- Select a single partition.
- Select 'DCP' (MIM 951).
- Select and run MDI 1060 (MIM 961).

Was the failure found by MDI 1060?
Y N

049
- Select and run MDI 1070 (MIM 961).

Was the failure found by MDI 1070?
Y N

050
GO TO MAP 0100,
ENTRY POINT A.

051
End of call.

052
End of call.

053
- Power off.
- Wait approximately 30 seconds.
- When the First Prompt (50-01) (MIM 941) is displayed on Data Station 0, press the 'X' key and then the ENTER key.
- When the Keyboard Information Prompt (50-02) (MIM 941) is displayed, record the number of keyboards displayed on the screen.

Does the number of keyboards displayed on the screen match the number of keyboards installed on the system?
Y N

054
- This is a 9120 error.
GO TO MAP 1025, ENTRY POINT A.

055
- Press the ENTER key.
- Prompt (50-03) (MIM 941) will be displayed.
- Select the 'No' option.
- Select the correct display size for each foreground partition as the prompts are displayed.
- Press the SYS REQ, 2, and z keys on Data Station 0.

Is the Load Prompt displayed on Data Station 0?
Y N

056
- This is a display failure.
GO TO PAGE 2, STEP 004,
ENTRY POINT B.

057
GO TO PAGE 4, STEP 024,
ENTRY POINT D.

058
- See MIM 931 to determine which keyboard may be causing the scan code to be displayed.
- Power off.
- Disconnect the keyboard associated with the displayed scan code from the system.
- Power on.
- Wait at least 30 seconds for the condition code table to be displayed on Data Station 0.

Is the scan code still displayed in line 1 of the condition code table (MIM 931)?
Y N

059
Was the scan code displayed generated by keyboard 0 (MIM 931)?
Y N

060
- Suspect a single key failure (repeating characters).
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

061
- Suspect a single key failure (repeating characters).

GO TO MAP 1020, ENTRY POINT A.

062
- There is a Keyboad Service Request bit active.

GO TO PAGE 2, STEP 004,
ENTRY POINT B.

063
GO TO MAP 1010, ENTRY POINT A.

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A-A1 DISPLAY MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	2	001
1000	A	2	001
1026	A	2	001
8000	A	2	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
9	036	0100	A
6	011	0600	A
6	017	0600	A
7	023	0600	A
9	040	0600	A
12	058	0600	A
12	060	0600	A
13	069	0600	A
15	086	0600	A
16	092	0600	A
16	097	0600	A
18	107	0600	A
18	109	0600	A
17	103	0600	A
7	026	0600	A
11	055	0600	A
13	072	0600	A
15	089	0600	A
16	095	0600	A
7	020	0600	A
17	101	0600	A
12	061	0600	A
11	056	0600	A
18	110	0600	A
5	008	0600	A
12	063	0600	A
14	081	0600	A
9	035	0600	A
9	034	0600	A
14	080	0600	A
8	027	0600	A
5	007	8000	A
8	033	8000	A
10	043	8000	A
14	078	8000	A

001
(ENTRY POINT A)

- Data station cover removal procedure is in MIM 031.
- The display controlled by the Keyboard/Display MPU card is attached to partition 0 in main storage.

- - - - - - - - - - - - - - - - NOTES - - - - - - - - - - - - - - - -

1. If there is no video, IPL the Diagnostic Diskette to attempt to display the sign-on screen (MIM 941).
2. The Display is checked first so that it may be used as an indicator in the MAP's.
3. The probe must be correctly grounded to ensure correct operation (MIM 905).

DISPLAY		
SYMPTOM	COMMENTS	REPAIR ACTION
DARK DISPLAY	NO DISPLAY	1. ENSURE THAT THE DISPLAY FUSE IS GOOD (MIM 141). 2. ENSURE THAT THE +5 VDC, -5 VDC AND +8.5 VDC ARE PRESENT AT THE A-A1 CARD LOCATION (MIM 531). 3. SEE MIM 461 AND 463 FOR LEVEL AND RIPPLE CHECKS. 4. IF ANY VOLTAGE IS MISSING OR OUT OF TOLERANCE, GO TO POWER MAP 8000, ENTRY POINT A. 5. IF ALL DISPLAYS FAIL AND THE KEYLOCK FEATURE IS INSTALLED, GO TO MAP 1026, ENTRY POINT A. 6. IF THE REPAIR ACTIONS ABOVE DO NOT CORRECT THE FAILURE, GO TO MAP 1010, STEP 002.

(Step 001 continues)

(Step 001 continued)

DISPLAY		
SYMPTOM	COMMENTS	REPAIR ACTION
OUT OF FOCUS	DISPLAY IS STABLE. ENSURE THAT THE BRIGHTNESS CONTROL IS NOT FULLY CLOCKWISE.	REPLACE THE DISPLAY ASSEMBLY (MIM 181).
CHARACTERS MISSING ONLY IN THE CORNERS		MIM 160
DISPLAY CHANGES SIZE	DISPLAY IS STABLE	REPLACE THE DISPLAY ASSEMBLY (MIM 181).
ONLY A HORIZONTAL LINE IS DISPLAYED	LINE MAY BE SOLID OR BROKEN	REPLACE THE DISPLAY ASSEMBLY (MIM 181).
ONLY A VERTICAL LINE IS DISPLAYED	LINE MAY BE SOLID OR BROKEN	REPLACE THE DISPLAY ASSEMBLY (MIM 181).
NO CONTRAST CONTROL	CANNOT ADJUST INTENSITY OF HIGHLIGHTED FIELDS.	MAP 1010 , ENTRY POINT B.
DISPLAY IS HORIZONTALLY OFF CENTER	DISPLAY IS EITHER TOO MUCH TO THE LEFT OR RIGHT SIDE OR SHIFTING BACK AND FORTH.	1. SEE MIM 165 FOR THE HORIZONTAL ADJUSTMENT. 2. IF THE ADJUSTMENT CANNOT BE MADE, REPLACE THE DISPLAY UNIT (MIM 181).

(Step 001 continues)

(Step 001 continued)

DISPLAY		
SYMPTOM	COMMENTS	REPAIR ACTION
BRIGHTNESS, OR VIDEO PROBLEMS	1. TOO MUCH OR TOO LITTLE BRIGHTNESS. 2. RASTER DISPLAYED. 3. LITTLE OR NO CHANGE IN BRIGHTNESS WHILE CHANGING THE BRIGHTNESS CONTROL.	1. SEE VIDEO ADJUSTMENT (MIM 161, 171). 2. SEE BRIGHTNESS LIMITER ADJUSTMENT (MIM 161, 171). 3. IF THE ADJUSTMENT CANNOT BE MADE, GO TO MAP 1010, STEP 6.
VERTICAL SIZE LINEARITY OR HOLD PROBLEMS	1. VERTICAL SIZE TOO LARGE OR TOO SMALL. 2. VERTICAL LINEARITY BAD. 3. SCREEN ROLLS OR HAS MULTIPLE VERTICAL DISPLAYS	1. SEE VERTICAL ADJUSTMENT (MIM 163) 2. IF THE ADJUSTMENT CANNOT BE MADE, GO TO MAP 1010, STEP 5.

Did you find the indication in the symptom index?

Y N

002

Did you enter this MAP as a result of a Power On Checkout failure?

Y N

003
- Turn the control panel Brightness Control clockwise until video appears, or fully clockwise if no video.

Is the Display completely dark (no raster)?
Y N

004
Is the Display stable (synchronized)?
Y N

005
- This checks for a vertical sync problem.

Is the complete Display moving up or down?
Y N

006
- Power problems can appear as display problems such as distortion, flashing, etc.
- Measure all voltages supplied to the A-A1 card.
- See MIM 463 for the ripple voltage check.

Are the voltages correct?
Y N

007
GO TO MAP 8000, ENTRY POINT A.

008
- Suspect a defective ground to the Brightness Control terminal 1 (MIM 217).

- - - - - OR - - - - -

- Defective Display (MIM 181).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

009
- Probe the display connector P20-009, '- Vertical Drive' (MIM 200, 217).

Up light: On
Down light: On

Are the lights correct?
Y N

010
- Power off.
- Disconnect A-A1-P01 (MIM 217).
- Power on.
- Probe A-A1-TP-13, '- Vertical Drive' (MIM 200, 217).

Up light: On
Down light: On

Are the lights correct?
Y N

EC840874 PEC839787

011
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

012
- Use MIM 217 to trace the '-Vertical Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Display Unit (MIM 181).

013
- Defective Display Unit (MIM 181).

014
(ENTRY POINT B)

- The Contrast Control is only used to change the intensity of highlighted fields.

Is there a problem with the Contrast Control?
Y N

015
(ENTRY POINT C)

- Probe A-A1B04, '18 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

016
- For the line probed in the previous step,

Up light: Off
Down light: On

Are the lights correct?
Y N

017
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

018
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-A1B04, '18 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

019
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

A-A1 DISPLAY

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020
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

021
- Probe A-A3B05, '1 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

022
- For the line probed in the previous step,

Up light: Off
Down light: On

Are the lights correct?
Y N

023
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

024
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-A3B05, '1 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

025
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

026
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

027

- - - - - SUSPECT A - - - - -

- Defective Keyboard/Display Storage card (A-B7) (MIM 207).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

028

- Load 'CRTTEST' on the failing data station (MIM 933).
- Select TU03.
- Adjust the Brightness Control so that normal characters are just visible on the screen.
- Turn the Contrast Control from maximum counterclockwise to maximum clockwise.

Is there a visual change only in the highlighted area of the pattern?

Y N

029

- Measure the voltage at A-A1-TP-11 (Contrast Control) to A-A1-TP18 (Ground) (MIM 200, 217).
- The voltage should change from 0 to + 5 Vdc as the Contrast Control is turned clockwise.

Is the voltage correct?

Y N

030

- Power off.
- Disconnect A-A1-P01 (MIM 200, 217).
- Remove the +5 Vdc lead from the Contrast Control terminal 3 (MIM 217).
- Set the CE meter to the RX1 scale.
- Measure the resistance from A-A1-P01-13 to frame ground.
- The meter should change from approximately 0 to 350 ohms as the Contrast Control is turned from maximum counterclockwise to maximum clockwise.

Is the meter reading correct?

Y N

031

- Use MIM 217 to trace the 'Contrast Control' line for opens or grounds.

- - - - - OR - - - - -

- Defective Contrast Control (MIM 077, 217).

032

- Power on.
- Measure the voltage from the +5 Vdc lead, removed from terminal 3 of the Contrast Control, to frame ground.

Is the voltage +4.5 to +5.5 Vdc present?

Y N

033

GO TO MAP 8000, ENTRY POINT A.

034
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

035
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

036
GO TO MAP 0100, ENTRY POINT A.

037
Is the Display CRT filament on?
Y N

038
- Probe the display connector P20-006 (MIM 217).

Up light: On
Down light: On

Are the lights correct?
Y N

039
- Power off.
- Disconnect A-A1-P01 (MIM 217).
- Power on.
- Probe A-A1-TP16, '+ Horizontal Drive' (MIM 217).

Up light: On
Down light: On

Are the lights correct?
Y N

040
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

041
- Use MIM 217 to trace the '+ Horizontal Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Display Unit (MIM 181).

X DATA ENTRY MAP

9

A-A1 DISPLAY

PAGE 10 OF 18

042

* * * * * * * * * * * * * * * * * *

DANGER

* * * * * * * * * * * * * * * * * *

THE NEXT PROCEDURE IS A POSSIBLE SHOCK HAZARD, BE EXTRA CAREFUL.

- Power off.
- Disconnect the Display AC connector (MIM 141).
- Power on.
- With the CE meter, measure the AC voltage for the display at the AC voltage connector (MIM 141).

Is 99 to 121 Vac present?

Y N

043

GO TO MAP 8000, ENTRY POINT A.

044

- Power off.
- Check the Display fuse (MIM 141).

Is the Display fuse OK?

Y N

045

- Replace the Display fuse (MIM 141).
- Reconnect the Display AC connector (MIM 141).
- Power on.
- If the new fuse opens, replace the Display Unit (MIM 181).

Z

W Z MAP 1010-10

9

046

- Defective Display Unit (MIM 181).

047

- Probe the display connector P20-006, '+ Horizontal Drive' (MIM 217).

Up light: On
Down light: On

Are the lights correct?

Y N

048

- Power off.
- Disconnect A-A1-P01 (MIM 217).
- Power on.
- Probe A-A1-TP16, '+ Horizontal Drive' (MIM 200, 217).

Up light: On
Down light: On

Are the lights correct?

Y N

049

- Power off.
- Reconnect A-A1-P01 (MIM 217).
- Power on.
- Probe the display connector P20-008 (MIM 217).

Up light: On
Down light: On

Are the lights correct?

Y N

1 1 1 1
2 2 2 1 EC840874 PEC839787
A A A A
A B C D MAP 1010-10

050
- Power off.
- Disconnect A-A1-P01 (MIM 217).
- Power on.
- Check to see that the Brightness Control and Contrast Control are fully clockwise.
- Probe A-A1-TP10, '+ Video Drive' (MIM 200, 217).

Up light: On
Down light: On

Are the lights correct?
Y N

051
- Probe A-A1B04, '18 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

052
- Probe A-C8B03, '18 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

053
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-C8B03, '18 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

054
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

055
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

056
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

057
- Probe A-A2B04, '- POR' (MIM 531).

Up light: On
Down light: Off

Are the lights correct?
Y N

058
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

059
- Probe A-A2B04, '- POR' (MIM 531).
- Momentarily jumper the line at A-C1-TP40, '- Test POR', to frame ground (MIM 303).

Up light: On
Down light: Pulses

Are the lights correct?
Y N

060
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

061
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

062
- Use MIM 217 to trace the '+ Video Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Display Unit (MIM 181).

063
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

064
- Use MIM 217 to trace the '+ Horizontal Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Display Unit (MIM 181).

065
- Probe P20-008, '+ Video Drive', at the display connector P20-008 (MIM 217).

Up light: On
Down light: On

Are the lights correct?
Y N

066
- Power off.
- Disconnect the Display connector P20 (MIM 217).
- Power on.
- Check to see that the Brightness Control and Contrast Control are fully clockwise.
- Probe A-A1-TP10, '+ Video Drive' (MIM 200, 217).

Up light: On
Down light: On

Are the lights correct?
Y N

067
- Probe A-A3B05, '1 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

068
- For the line probed in the previous step.

Up light: Off
Down light: On

Are the lights correct?
Y N

069
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

070
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-A3B05, '1 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

071
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

072
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

073
- Connect the CE meter from A-A1-TP-12, 'Brightness Control', to ground (MIM 217).
- The voltage should change from 0 to +5 Vdc as the Brightness Control is turned clockwise.

Is the voltage correct?
Y N

074
- Power off.
- Disconnect A-A1-P01 (MIM 200, 217).
- Remove the +5 Vdc lead from the Brightness Control terminal 3 (MIM 217).
- Measure the resistance from A-A1-P01-14 to frame ground.
- The meter should change from approximately 0 to 100 ohms as the Brightness Control is turned from maximum counterclockwise to maximum clockwise.

Is the meter reading correct?
Y N

075
- Use MIM 217 to trace the 'Brightness Control' line for opens or grounds.

- - - - - OR - - - - -

- Defective Brightness Control (MIM 077, 217).

076
- Power on.
- Measure the voltage from the +5 Vdc lead, removed from terminal 3 of the Brightness Control, to frame ground.

Is +4.5 to +5.5 Vdc present?
Y N

A A
R S

A A A
P R S 1 3

077
- Power off.
- Remove the +5 Vdc lead from the Contrast Control terminal 3 (MIM 217).
- Power on.
- Measure the voltage from the +5 Vdc lead, removed from terminal 3 of the Contrast Control, to frame ground.

Is +4.5 to +5.5 Vdc present?
Y N

078
GO TO MAP 8000, ENTRY POINT A.

079
- Repair the open wire between Contrast Control terminal 3 and Brightness Control terminal 3 (MIM 217).

080
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

081
- Use MIM 217 to trace the '+ Video Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

DATA ENTRY MAP

A-A1 DISPLAY

082
- Use MIM 217 to trace the '+ Video Drive' line for opens or grounds.

- - - - - OR - - - - -

- Defective Display Unit (MIM 181).

083
- Defective the Display unit (MIM 181).

084
- Probe A-A3B04, '9 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

085
- For the line probed in the previous step.

Up light: Off
Down light: On

Are the lights correct?
Y N

086
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

087
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-C7D04, '9 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

088
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

089
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

090
- Probe A-A7B09, '2.25 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

091
- For the line probed in the previous step,

Up light: Off
Down light: On

Are the lights correct?
Y N

092
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

093
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-A1B04, '18 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

094
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

095
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cables is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

096
- Probe A-A4B04, '- POR CMD' (MIM 531).

Up light: On
Down light: Off

Are the lights correct?
Y N

097
- Suspect a ground on Logic Board (MIM 501, 531).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

098
- Probe A-A2B04, '- POR' (MIM 531).

Up light: On
Down light: Off

Are the lights correct?
Y N

099
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-A2B04, '- POR', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

100
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

101
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

102
- Probe A-A2B04, '- POR' (MIM 531).
- Momentarily jumper the line at A-C1-TP40, '- Test POR', to frame ground (MIM 303).

Up light: On
Down light: Pulses

Are the lights correct?
Y N

103
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

104
Do you have a Magnetic Stripe Reader (MSR) or Elapsed Time Counter (ETC) feature installed (A-B1) (MIM 501)?
Y N

105
(ENTRY POINT D)

Do you have an auxiliary Data Station feature installed (A-E1, A-F1 or A-G1) (MIM 501)?
Y N

106
(ENTRY POINT E)

Do you have a Keyboard/Display Storage feature card installed in A-B7 (MIM 207, 501)?
Y N

107
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

108
- Power off.
- Remove the Keyboard/Display storage card (A-B7) (MIM 207).
- Power on.

Does Power On Checkout terminate correctly?
Y N

109
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

110
- Defective Keyboard/Display Storage card (A-B7) (MIM 207).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

111
- Power off.
- Remove the Data Station Adapter card (A-E1) (MIM 501).
- Power on.

Does Power On Checkout terminate correctly?
Y N

112
GO TO PAGE 17,
STEP 106,
ENTRY POINT E.

113
- Defective Data Station Adapter card (A-E1) (MIM 501, 503).

114
- Power off.
- Remove the MSR/ETC card (A-B1) (MIM 501).
- Power on.

Does Power On Checkout terminate correctly?
Y N

115
GO TO PAGE 17, STEP 105,
ENTRY POINT D.

116
- Defective MSR/ETC card (A-B1) (MIM 501).

117
- Perform the repair action.

A-E1 DISPLAY MAP

PAGE 1 OF 10

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	007	0600	A
2	010	0600	A
4	022	0600	A
7	037	0600	A
7	040	0600	A
7	042	0600	A
8	046	0600	A
8	047	0600	A
2	008	0600	A
10	064	1026	B

001
(ENTRY POINT A)

- The system must be dedicated to maintenance at this time.
- The display controlled by the Data Station Adapter card will be attached to partition 1 or 1 and 2 in main storage, depending on whether the second Data Station is a 5281 or 5282 Data Station. See MIM 201 or 203.
- The display adapter control and signal lines are common for both 5281 and 5282 Data Stations, with the exception of the partitions of keyboard display storage and main storage to which displays are attached.
- Ensure all voltages are present at the A-E1 card Logic Board pins. If any voltage is missing, go to MAP 8000, Entry Point A (MIM 531).
- Power off.
- 'IPL' Diagnostic Diskette 1 from Data Station 0 (MIM 941).
- Do not use the current definition.
- Select a single partition.
- Select 6 lines.
- Load 'DCP' (MIM 951).
- Select and run MDI 1060 (MIM 961).

Was the failure found by MDI 1060?

Y N

1

A-E1 DISPLAY

PAGE 2 OF 10

002
- Select and run MDI 1070 (MIM 961).

Was the failure found by MDI 1070?
Y N

003
Is the failing Display completely dark?
Y N

004
Is the Display stable?
Y N

005
- Probe A-E4D04, '18 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

006
- For the line probed in the previous step,

Up light: Off
Down light: On

Are the lights correct?
Y N

007
- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

008
- The '18 MHz Clock' line is failing. Suspect a shorted net. Use the net list (MIM 531) to isolate the problem.

- - - - - OR - - - - -

- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

009
- Probe A-E3D02, '1 MHz clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

010
- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

011
- Probe A-E1-TP08, '+ Vertical Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

012
- Power off.
- Connect the terminating resistor, P/N 417566 (5.1K) (MIM 903), from A-E1-TP-08 (+ Vertical Drive) to A-E1-TP-15 (ground) (MIM 200, 201, 203, 227).
- Power on.
- Probe A-E1-TP08, '+ Vertical Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

013
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead of the meter to A-E1-P01-5, '+ Vertical Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?
Y N

014
- Use MIM 227 to trace the '+ Vertical Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

015
- Failing Data Station Adapter Card (A-E1) (MIM 501).

016
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead of the meter to A-E1-P01-5, '+ Vertical Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?
Y N

017
- Use MIM 227 to trace the '+ Vertical Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

018
- Failing Data Station Adapter Card (A-E1) (MIM 501).

019
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

-If the failure is not isolated by the Data Station Maps, replace the Data Station Adapter Card (A-E1) (MIM 501).

020
- The High Intensity Drive line is turned on by an attribute to highlight fields.

Is there a problem with the intensity of highlighted fields?
Y N

021
- Probe A-A5B08, '+ Diagnostic Force Video' (MIM 531).

Up light: Off
Down light: On

Are the lights correct?
Y N

022
- Failing Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

023
- Failing Data Station Adapter card (A-E1) (MIM 501).

4

A-E1 DISPLAY

PAGE 5 OF 10

024

- Load 'CRTTEST' on the failing data station (MIM 933).
- Select TU03.
- Set up the CE meter and dB meter as in the ripple voltage level service check (MIM 463).
- Set the dB meter to the -20 dB scale.
- Connect the positive lead to A-E1-TP09, '- High Intensity Drive', and the negative lead to ground at A-E1-TP-15 (MIM 201, 203 227).
- The meter should read approximately full scale on the 6 Volt scale.
- Press the 'Enter' key on the data station to return to the prompt display.
- The meter should read approximately 0 on the 6 Volt scale.
- Press the 'Enter' key.
- Screen will continuously change from high intensity pattern to normal screen.
- The meter should continuously change from about full scale to about 0 reading.

Are the meter readings correct?

Y N

6

P Q

025

- Power off.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead to A-E1-P01-12, '- High Intensity Drive' and the negative lead to ground (MIM 201, 203 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?

Y N

026

- Use MIM 227 to trace the '- High Intensity Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

027

- Failing Data Station Adapter Card (A-E1) (MIM 501).

A-E1 DISPLAY

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028
- Power off.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead to A-E1-P01-12, '- High Intensity Drive and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?
Y N

029
- Use MIM 227 to trace the '- High Intensity Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

030
GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

031
Is Keylock feature installed?
Y N

032
(ENTRY POINT B)

- Probe A-E1-TP11, '+ Video Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

033
- Power off.
- Connect the terminating resistor, P/N 4177566 (5.1K) (MIM 903), from A-E1-TP-11, '+ Video Drive', to A-E1-TP-15 (ground) (MIM 200, 201, 203, 227).
- Power on.
- Probe A-E1-TP11, '+ Video Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

034
- Probe A-E1-TP10, '+ Horizontal Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

6

A-E1 DISPLAY

PAGE 7 OF 10

035
- Probe A-E4D04, '18 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

036
- Probe A-C8B03, '18 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

037
- The '18 MHz Clock' line is failing. Suspect a shorted net. Use the net list (MIM 531) to isolate the failure.

- - - - - OR - - - - -

- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

038
- Failing Data Station Adapter Card (A-E1) (MIM 501).

039
- Probe A-E1B02, '- POR' (MIM 531).

Up light: On
Down light: Off

Are the lights correct?
Y N

040
- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

041
- Probe A-E1B02, '- POR' (MIM 531).
- Momentarily jumper the '- Test POR' line at A-C1-TP-040 to frame ground (MIM 303).

Up light: On
Down light: Pulses

Are the lights correct?
Y N

042
- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

043
- Failing Data Station Adapter Card (A-E1) (MIM 501).

A-E1 DISPLAY

PAGE 8 OF 10

044
- Probe A-E3D02, '1 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

045
- For the line probed in the previous step,

Up light: Off
Down light: On

Are the lights correct?
Y N

046
- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

047
- The '1 MHz Clock' line is failing. Suspect a shorted net. Use the net list (MIM 531) to isolate the problem.

- - - - - OR - - - - -

- Failing Diskette/Main MPU Card (A-C1) (MIM 303).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

048
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive end of the meter to A-E1-P01-4, '+ Video Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?
Y N

049
- Use MIM 227 to trace the '+ Video Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

050
- Failing Data Station Adapter Card (A-E1) (MIM 501).

DATA ENTRY MAP

A-E1 DISPLAY

051
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive end of the meter to A-E1-P01-4, '+ Video Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms to 150 ohms.

Is the meter reading correct?
Y N

052
- Use MIM 227 to trace the '+ Video Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

053
- Failing Data Station Adapter Card (A-E1) (MIM 501).

054
- Probe A-E1-TP10, '+ Horizontal Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

055
- Power off.
- Connect the terminating resistor, P/N 4177566 (5.1K) (MIM 903), from A-E1-TP-10, '+ Horizontal Drive', to A-E1-TP-15, ground (MIM 200, 201, 203, 227).
- Power on.
- Probe A-E1-TP10, '+ Horizontal Drive' (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

056
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead of the meter to A-E1-P01-8, '+ Horizontal Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms and 150 ohms.

Is the meter reading correct?
Y N

057
- Use MIM 227 to trace the '+ Horizontal Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

058
- Failing Data Station Adapter Card (A-E1) (MIM 501).

059
- Power off.
- Remove the terminating resistor.
- Set the CE meter to the RX1 scale.
- Disconnect P01 on A-E1 (MIM 201, 203, 227).
- Connect the positive lead of the meter to A-E1-P01-8, '+ Horizontal Drive', and the negative lead to ground (MIM 201, 203, 227).
- The meter should read in the range of 30 ohms and 150 ohms.

Is the meter reading correct?
Y N

060
- Use MIM 227 to trace the '+ Horizontal Drive' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

061
- Failing Data Station Adapter Card (A-E1) (MIM 501).

062
GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

063
- Ensure that the keylock switch is in the local position (MIM 229).
- Probe A-E1D04, '- Keylock Disable' (MIM 531).

Up light: On
Down light: Off

Are the lights correct?
Y N

064
GO TO MAP 1026, ENTRY POINT B.

065
GO TO PAGE 6, STEP 032, ENTRY POINT B.

066
End of call.

067
End of call.

A-A1 KEYBOARD MAP

PAGE 1 OF 11

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	B	3	003
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	005	0600	A
4	012	0600	A
9	040	0600	A
9	043	0600	A
9	045	0600	A
9	049	0600	A
10	052	0600	A
6	021	0600	A
7	027	0600	A
5	016	0600	A
6	022	0600	A
8	033	0600	A
7	028	0600	A
8	034	0600	A
5	015	0600	A
9	041	0600	A
11	059	0600	A
10	055	0600	A
11	062	0600	A
3	008	0600	A

001
(ENTRY POINT A)

- Data station cover removal procedure is in MIM 031.
- Keyboard cover removal procedure is in MIM 031.

- To diagnose single or multiple key failures, load the keyboard scan test into the partition to which the keyboard is attached (MIM 931).

- - - - - - - - - - - - - - - - - NOTES - - - - - - - - - - - - - - - - -

1. If the display station is powered on and there is power to the keyboard, the operation of the interface lines may be checked by probing the interface lines while pressing any typamatic key.
2. To determine if there is power applied to the keyboard, see MIM 219 for the location of power probe points.

(Step 001 continues)

(Step 001 continued)

KEYBOARD		
SYMPTOMS	COMMENTS	REPAIR ACTION
SINGLE KEY FAILURE	A SINGLE KEY FAILS TO OPERATE CORRECTLY OR A CHARACTER REPEATS ON THE SCREEN.	1. CLEAN OR REPLACE THE KEYBOARD PAD PC BOARD. 2. CLEAN OR REPLACE FAILING KEY MODULE (MIM 121).
MULTIPLE KEY FAILURES	SUSPECTED BIT FAILURES CHANGING ALL CHARACTERS OR INVALID SCAN CODES. LOOK FOR FAILURES GROUPED BY ROWS OR COLUMNS. THE POWER ON CHECKOUT FUNCTION (MIM 931) MAY BE USED TO COMPARE SCAN CODES TO THOSE IN MIM 113.	1. RESEAT CABLES TO AND FROM THE KEYBOARD LOGIC CARD (MIM 101). 2. CLEAN TOP AND BOTTOM CONNECTOR CONTACTS ON THE KEYBOARD PAD PC BOARD (MIM 127). 3. REPLACE THE KEYBOARD LOGIC CARD (MIM 101). 4. REPLACE THE KEYBOARD PAD PC BOARD (MIM 127).
NO KEYBOARD RESPONSE	NO RESPONSE TO ANY KEY.	1. CHECK POWER TO THE KEYBOARD (MIM 219). 2. IF ANY VOLTAGE IS MISSING, GO TO POWER MAP 8000, ENTRY POINT A. 3. MAP 1020, STEP 003, ENTRY POINT B.
SPEAKER FAILURE	SPEAKER FAILS TO CLICK OR BUZZ.	MAP 1020, STEP 048, ENTRY POINT C.

Did you find the indication in the symptom index?

Y N

002
Note: The System must be dedicated to maintenance at this time.
- Power off.
- Ensure that all Diskette locking levers are open.
- Power on.
- Wait at least 30 seconds for the condition code table to be displayed on Data Station 0 (MIM 931).

Is there a Scan code for Keyboard 0 displayed in line 1 of the condition code tables (MIM 931)?
Y N

003
(ENTRY POINT B)

- Probe the '100 Hz Clock' line at A-A4B02 (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

004
- For the line probed in the previous step:

Up light: Off
Down light: On

Are the lights correct?
Y N

005
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

006
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positve lead to A-A4B02, '100 Hz Clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

007
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531).
- Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic board.

008
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

009
- Answer the following questions for a single key depression.
- Probe A-A1-TP1, '- Serial Data Keyboard A' (MIM 200, 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

010
- Probe J01-005, '- Serial Data' on the Keyboard Logic Card (MIM 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

011
- Probe J01-01, '- POR', on the Keyboard Logic Card (MIM 219).

Up light: On
Down light: Off

Are the lights correct?
Y N

012
- Use the MIM 219 to trace the '- POR' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

013
- Power off.
- Disconnect A-A1-P01 (MIM 200,219).
- Power on.
- Probe J01-05, '- Serial Data', on the Keyboard Logic card (MIM 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

DATA ENTRY MAP

A-A1 KEYBOARD

PAGE 5 OF 11

014
- Use MIM 219 to trace the '- Serial Data' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard Pad PC Board (MIM 101, 127).

015
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

016
- Use MIM 219 to trace the '- Serial Data' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard/Display MPU Card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

017
- Probe A-A1-TP3, '+ Serial Data Clock Keyboard A' (MIM 200, 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

018
- Probe J01-006, '+ Serial Data Clock', on the Keyboard Logic card (MIM 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

019
- Power off.
- Disconnect A-A1-P01 (MIM 200,219).
- Power on.
- Probe J01-006, '+ Serial Data Clock', on the Keyboard Logic card (MIM 219).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

EC840874 PEC839787

DATA ENTRY MAP

A-A1 KEYBOARD

PAGE 6 OF 11

020
- Use MIM 219 to trace the '+ Serial Data Clock' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard Pad PC Board (MIM 101, 127).

021
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

022
- Use MIM 219 to trace the '+ Serial Data Clock' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard/Display MPU Card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

MAP 1020-6

023
- Probe A-A1-TP2, '- Strobe Keyboard A' (MIM 200, 219).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

024
- Probe J01-004, '- Strobe', on the Keyboard Logic card (MIM 219).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

025
- Power off.
- Disconnect P01 (MIM 200,219).
- Power on.
- Probe J01-004, '- Strobe', on the Keyboard Logic Card (MIM 219).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

EC840874 PEC839787

MAP 1020-6

S T U V 6 6 6 6 DATA ENTRY MAP

A-A1 KEYBOARD

PAGE 7 OF 11

026
- Use MIM 219 to trace the '- Strobe' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard Pad PC Board (MIM 101, 127).

027
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

028
- Use MIM 219 to trace the '- Strobe' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard/Display MPU Card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

029
- Probe A-A1-TP4, '- Break Code Keyboard A' (MIM 200, 219).

Up light: On
Down light: On

Are the lights correct?
Y N

8
W X

X MAP 1020-7

030
- Probe J01-007, '- Break Code', on the Keyboard Logic card (MIM 219).

Up light: On
Down light: On

Are the lights correct?
Y N

031
- Power off.
- Disconnect P01 (MIM 200, 219).
- Power on.
- Probe J01-007, '- Break Code' on the Keyboard Logic Card (MIM 219).

Up light: On
Down light: On

Are the lights correct?
Y N

032
- Use MIM 219 to trace the '- Break Code' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard Pad PC Board (MIM 101, 127).

EC840874 PEC839787

8 8
Y Z

033
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

034
- Use MIM 219 to trace the '-Break Code' line for opens or grounds.

- - - - - OR - - - - -

- Defective Keyboard/Display MPU Card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

035
- To ensure correct operation of the 'Break Code' line, go to MIM 111 and do the service check.

Is the service check good?
Y N

036
- Defective Keyboard Logic card (MIM 101).

037
- Power off.
- IPL Diagnostic Diskette 1 from Data Station 0 (MIM 941).
- Do not use the current definition.
- Select a single partition.
- Select 6 lines.
- Load 'DCP' (MIM 951).
- Select MDI 1070 (MIM 961).

Can 'DCP' be loaded and MDI 1070 be selected?
Y N

038
Is there another keyboard on the system?
Y N

039
- Power off.
- Make the 'IPL' Diskette not ready.
- Power on.
- Use the Power On Checkout function (MIM 931) to determine if the scan codes from the keyboard are correct. See MIM 113 for scan codes.

Are the scan codes correct?
Y N

040
- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

041
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

042
- Load 'DCP' from another Data Station (MIM 913, 951).
- Select MDI 1070 (MIM 961).

Can 'DCP' be loaded and MDI 1070 be selected?
Y N

043
- Defective Keyboard/Display Storage card (A-B7) (MIM 207).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

044
- Run MDI 1070 for more isolation.

Was the failure found by MDI 1070?
Y N

045
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

046
- End of call.

047
- Run MDI 1070 for more isolation.

Was the failure found by MDI 1070?
Y N

048
(ENTRY POINT C)

Is this a speaker failure only?
Y N

049
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

050
- Probe the '100 Hz Clock' line at A-A4B02 (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

051
- For the line probed in the previous step.

Up light: Off
Down light: On

Are the lights correct?
Y N

052
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

053
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positve lead to A-A4B02, '100 Hz Clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

A A A
J K L

054
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531).
- Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic board.

055
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

056
- Probe A-A1-TP6, '- Click Keyboard A' (MIM 200, 219).
- Answer the following questions for a single key depression.

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

057
- Power off.
- Disconnect P01 (MIM 200,219).
- Set the CE meter to the RX1 scale.
- Connect the NEGATIVE lead to P01-5, '- Click A' (Keyboard A), and the POSITIVE lead to ground.

NOTE:
This measurement must be made with the positive lead connected to ground to ensure an accurate reading.

Is the resistance measured between 30 and 50 ohms?

Y N

058
- Use MIM 219 to trace '- Click' line for opens or grounds.

- - - - - OR - - - - -

- Use MIM 219 to isolate a failing Speaker.

- - - - - OR - - - - -

- Defective Keyboard Logic card (MIM 101).

059
- Defective Keyboard Logic card (MIM 101).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

060
- Use MIM 219 to isolate a failing Speaker.

061
- End of call.

062
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

063
- Perform the repair action.

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A-E1 KEYBOARD MAP

PAGE 1 OF 6

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	033	0600	A

001
(ENTRY POINT A)

- Power off.
- Ensure that all Diskette locking levers are open.
- Ensure that the 5281/5282 Data Station is powered on.
- Power on.
- Wait at least 30 seconds for the condition code table to be displayed on Data Station 0 (MIM 931).

Is there a Scan code for keyboard 1 or 2 displayed in line 1 of the condition code table?
Y N

002
- Probe the '100 Hz Clock' line at A-E2D13 (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

003
- Suspect an open net on the '100 Hz Clock' line (MIM 531).

004

- Press and hold any typamatic key on the failing keyboard.
- Probe A-E1-TP12, '+ Serial Data Keyboard A', or A-E1-TP1, '+ Serial Data Keyboard B' (MIM 201, 203, 227).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

005

- Power off.
- Remove the Data Station cable from the cable connector panel position labeled 1 or 1/2 (J103) (MIM 227).
- Set the C.E. Meter to the RX1 scale.
- Measure the resistance from the cable connector panel J103-13, ' + Serial Data Keyboard A', or pin 3, '+ Serial Data Keyboard B', to frame ground (MIM 227).
- The meter should read in the range of 50 to 100 Ohms.

Is the meter reading between 50 to 100 ohms?
Y N

NOTE:

- 1. If the display station is powered on and there is power to the keyboard, the operation of the interface lines may be quickly checked by probing the interface lines while pressing any typamatic key.

006
- Use MIM 227 to trace the '+ Serial Data Keyboard A or B' line for opens or grounds.

- - - - - OR - - - - -

- Defective Data Station Adapter Card (A-E1) (MIM 501).

007
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.
- If the failure is not isolated by the Data Station MAP's, replace the Data Station Adapter Card (A-E1) (MIM 501).

008
- Probe A-E1-TP6 '- Serial Data Clock Keyboard A' or A-E1-TP2 '- Serial Data Clock Keyboard B' (MIM 201, 203, 227).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

009
- Power off.
- Remove the Data Station cable from the cable connector panel position labeled 1 or 1/2 (J103) (MIM 227).
- Set the C.E. Meter to the RX1 scale.
- Measure the resistance from the cable connector panel J103-12, ' - Serial Data Clock Keyboard A', or J103-02, '- Serial Data Clock Keyboard B', to frame ground (MIM 227).
- The meter should read in the range of 50 to 100 Ohms.

Is the meter reading between 50 to 100 ohms?
Y N

010
- Use MIM 227 to trace the '- Serial Data Clock Keyboard A or B' line for opens or grounds.

- - - - - OR - - - - -

- Defective Data Station Adapter Card (A-E1) (MIM 501).

011
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.
- If the failure is not isolated by the Data Station MAP's, replace the Data Station Adapter Card (A-E1) (MIM 501).

012
- Probe A-E1-TP14, '+ Strobe Keyboard A', or A-E1-TP4, '+ Strobe Keyboard B', (MIM 201, 203, 227).

Up light: Pulses with a key pressed.
Down light: On

Are the lights correct?
Y N

013
- Power off.
- Remove the Data Station cable from the cable connector panel position labeled 1 or 1/2 (J103) (MIM 227).
- Set the C.E. Meter to the RX1 scale.
- Measure the resistance from the cable connector panel J103-10, ' + Strobe Keyboard A', or pin 14, ' + Strobe Keyboard B', to frame ground (MIM 227).
- The meter should read in the range of 50 to 100 Ohms.

Is the meter reading between 50 to 100 ohms?
Y N

014
- Use MIM 227 to trace the '+ Strobe Keyboard A or B' line for opens or grounds.

- - - - - OR - - - - -

- Defective Data Station Adapter Card (A-E1) (MIM 501).

015
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.
- If the failure is not isolated by the Data Station MAP's, replace the Data Station Adapter Card (A-E1) (MIM 501).

016
- Probe A-E1-TP13, '+ Break Code Keyboard A', or A-E1-TP5, '+ Break Code Keyboard B', (MIM 201, 203, 227).

Up light: On
Down light: On

Are the lights correct?
Y N

017
- Power off.
- Remove the Data Station cable from the cable connector panel position labeled 1 or 1/2 (J103) (MIM 227).
- Set the C.E. Meter to the RX1 scale.
- Measure the resistance from the cable connector panel J103-11, ' + Break Code Keyboard A', or pin 1, '+ Break Code Keyboard B', to frame ground (MIM 227).
- The meter should read in the range of 50 to 100 Ohms.

Is the meter reading between 50 to 100 ohms?
Y N

DATA ENTRY MAP

A-E1 KEYBOARD

PAGE 5 OF 6

018
- Use MIM 227 to trace the '+ Break Code Keyboard A or B' line for opens or grounds.

- - - - - OR - - - - -

- Defective Data Station Adapter Card (A-E1) (MIM 501).

019
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.
- If the failure is not isolated by the Data Station MAP's, replace the Data Station Adapter Card (A-E1) (MIM 501).

020
- Power off.
- 'IPL' Diagnostic Diskette 1 from Data Station 0 (MIM 941).
- Do not use the current definition.
- Select a single partition.
- Select 6 lines.
- Load 'DCP' (MIM 951).
- Select and run MDI 1070 (MIM 961).

NOTE:
The system must be dedicated to maintenance at this time.

Was the failure isolated by MDI 1070?
Y N

021
(ENTRY POINT B)

Is this a speaker failure only?
Y N

6
N P Q

022
- Defective Data Station Adapter Card (A-E1) (MIM 501).

023
- Probe the '100 Hz Clock' line at A-E2D13 (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

024
- Suspect an open net on the '100 Hz Clock' line (MIM 531).

025
- Probe A-E1-TP7, '- Click Keyboard A', or A-E1-TP3, '- Click Keyboard B' (MIM 201, 203, 227).

Up light: On
Down light: Pulses with a key pressed.

Are the lights correct?
Y N

026
- Power off.
- Unplug A-E1-P01 (MIM 201, 203, 227).
- Set the C.E. Meter to the RX10 scale.
- Measure the resistance from A-E1-P01-3, ' - Click Keyboard A', or A-E1-P01-14, ' - Click Keyboard B', to frame ground (MIM 201, 203, 227).
- The meter should read in the range of 200 to 350 Ohms.

Is the meter reading between 200 to 350 ohms?
Y N

027
- Use MIM 227 to trace the '- Click Keyboard A or B' line for opens or grounds.

- - - - - OR - - - - -

- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.
- If the failure is not isolated by the Data Station MAP's, replace the Data Station Adapter Card (A-E1) (MIM 501).

028
- Defective Data Station Adapter Card (A-E1) (MIM 501).

029
- GO TO THE 5281 OR 5282 DATA STATION DATA ENTRY MAP 1000, ENTRY POINT A.

030
End of call.

031
- Power off.
- Remove the Data Station Adapter card (A-E1) (MIM 501, 503).
- Power on.
- Wait at least 30 seconds for the condition code table to be displayed on Data Station 0.

Is the scan code still displayed in line 1 of the condition code table (MIM 931)?
Y N

032
- Defective Data Station Adapter card (A-E1) (MIM 501).

033
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

ERROR CODE MAP

PAGE 1 OF 3

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0300	A	1	001
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	0100	A
2	014	0100	A
3	021	0300	A
3	016	0600	A
2	010	0600	A
3	020	0600	A
2	012	1000	B
2	007	1000	C

001
(ENTRY POINT A)

- Power off.
- Insert Diagnostic Diskette 1 in drive 4000 and close the locking lever.
- Power on.
- When the First Display Prompt (50-01) (MIM 941) is displayed on Data Station 0,
- Press the 'X' key and then the ENTER key.

Is there a '9930' error displayed?
Y N

002
Is there a '9231' error displayed?
Y N

003
Is the Keyboard Information Prompt (50-02) (MIM 941) visible on Data Station 0?
Y N

THE SYSTEM MUST BE DEDICATED TO MAINTENANCE AT THIS TIME.

004
Is Prompt 50-06 (MIM 941) visible on Data Station 0?
Y N

005
GO TO MAP 0100, ENTRY POINT A.

006
- To determine the answer to the Prompt on the display, go to MIM 207.
- Enter the correct option and press the ENTER key.

Is there a 9119 error displayed?
Y N

007
GO TO MAP 1000, ENTRY POINT C.

008
- Power off.
- Remove the Data Station Adapter Card (A-E1) (MIM 501).
- Power on.
- When the First Display Prompt (50-01) (MIM 941) is displayed on Data Station 0,
- Press the 'X' key and then the ENTER key.
- When Prompt (50-06) (MIM 941) is displayed.
- Select the no option and press the ENTER key.

Is there a 9119 error displayed?
Y N

009
- Defective Data Station Adapter card (A-E1) (MIM 501, 503).

010
- Defective Keyboard/Display Storage card (A-B7) (MIM 207, 501, 503).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200, 501, 503).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

011
- Press the ENTER key.

Is Prompt 50-03 (MIM 941) visible on Data Station 0?
Y N

012
- This is a display failure.

GO TO MAP 1000, ENTRY POINT B.

013
- Select the current definition and press the ENTER key.

Is there a 9120 error displayed?
Y N

014
GO TO MAP 0100, ENTRY POINT A.

015
- Power off.
- 'IPL' Diagnostic Diskette 1 from Data Station 0 (MIM 941).
- Do not use the current definition.
- Select a single partition.
- Select 6 lines.
- Load 'DCP' (MIM 951).
- Select and run MDI 1070 (MIM 961).

Was the failure found by MDI 1070?
Y N

016
- Defective Data Station Adapter card (A-E1) (MIM 501, 503).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200, 501, 503).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

017
End of call.

018
- Power off.
- Remove the Data Station Adapter Card from location A-E1 (MIM 501).
- Power on.
- When the First Display Prompt (50-01) (MIM 941) is displayed on Data Station 0,
- Press the 'X' key and then the ENTER key.

Is there a 9231 error displayed.
Y N

019
- Defective Data Station Adapter card (A-E1) (MIM 501, 503).

020
- Defective Keyboard/Display Storage card (A-B7) (MIM 207, 501, 503).

- - - - - OR - - - - -

- Defective Keyboard/Display MPU card (A-A1) (MIM 200, 501, 503).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

021
GO TO MAP 0300, ENTRY POINT A.

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KEYLOCK MAP

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
1000	A	1	001
1011	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	006	0600	A
2	005	0600	A
3	010	0600	A
4	012	0600	A
4	016	1010	A
4	019	1010	A

001
(ENTRY POINT A)

Are all Displays dark?
Y N

002
- Ensure that the keylock switch is in the locked position (MIM 229).
- Any display which is not dark is failing.

Are all displays failing?
Y N

003
Is display number 0 failing?
Y N

004
Defective Data Station Adapter card (A-E1) (MIM 501, 503).

KEYLOCK

PAGE 2 OF 4

005
- Defective Keyboard Display MPU card (A-C1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

006
- Defective Keyboard Display MPU card (A-C1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

007
- Ensure the keylock switch is in the local position (MIM 229).
- Probe both lines in the chart;

LOCAL POSITION

PIN	LINE NAME	Probe condition
A-A1B02	-COMM REMOTE	Up Light: On Down Light: Off
A-A1B07	-KEYLOCK DISABLE	Up Light: On Down Light: Off

CHART A

Are the lights correct?

Y N

008
(ENTRY POINT B)

- Power off.
- Remove A-A1-P03 (MIM 229).
- Install a jumper from A-A1-J03-1 to A-A1-J03-3 (MIM 229).
- Power on.
- Probe both lines in the chart;

NORMAL POSITION

PIN	LINE NAME	Probe Condition
A-A1B02	-COMM REMOTE	Up Light: Off Down Light: On
A-A1B07	-KEYLOCK DISABLE	Up Light: On Down Light: Off

CHART B

Are the lights correct?
Y N

009
Do you have an auxiliary Data Station Adapter card installed in A-E1 (MIM 501)?
Y N

010
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

011
- Power off.
- Remove the Data Station Adapter card (MIM 501).
- Power on.
- Probe the lines in Chart B.

Are the lights correct?
Y N

012
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'ROS Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

013
- Defective Data Station Adapter card (A-E1) (MIM 501).

014
- Defective keylock cable (MIM 229).

- - - - - OR - - - - -

- Defective keylock switch (MIM 229).

015

Is communications feature installed?
Y N

016
GO TO MAP 1010, ENTRY POINT A.

017
- Ensure the keylock switch is in the normal position (MIM 229).
- Probe the lines in Chart B.

Are the lights correct?
Y N

018
GO TO PAGE 3, STEP 008,
ENTRY POINT B.

019
GO TO MAP 1010, ENTRY POINT A.

MAGNETIC STRIPE READER

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	070	0100	A
6	040	0100	A
14	106	0100	A
5	027	0600	A
4	023	0600	A
5	030	0600	A
6	036	0600	A
12	086	0600	A
13	093	0600	A
12	090	0600	A
13	096	0600	A
14	102	0600	A
4	024	0600	A

001
(ENTRY POINT A)

Does this machine have the communications feature?
Y N

002
- There can be up to three magnetic stripe readers attached to the MSR control card. Each MSR is attached to a partition in storage which is the same one used by its associated keyboard. These partitions/stations are numbered 0, 1, and 2.
- The signal lines to and from the MSR control card are common to all three stations. The only exceptions are the 'Photocell' and 'Raw Data' inputs coming into plugs on the side of the card from the reader stations. Each of these plugs works with a specific partition only.
- To check each station for correct operation load 'MSRTEST' from the diagnostic diskette at the associated keyboard station and pass the test MSR card (P/N 8331402) through the reader (MIM 751). The correct message which should appear on the screen is: BBB0123456789BACDE0123456789.
- All three stations need not be used on any given system.

Is station 0 working (answer 'yes' if no MSR is attached to this station)?
Y N

003
- Disconnect the connector at A-B1J01 (MIM 773).
- Check for +5 Vdc from A-B1-J01-8 to ground at A-B1-J01-7 (MIM 785).

Is +4.5 to +5.5 Vdc present?
Y N

004
- Defective MSR card (A-B1) (MIM 501, 773).

005
- Check for -5 Vdc from A-B1-J01-10 to ground at A-B1-J01-9 (MIM 785).

Is -4.5 to -5.5 Vdc present?
Y N

006
- Defective MSR card (A-B1) (MIM 501, 773).

007
- Plug the connector back in at A-B1-J01.
- With a CE meter, check for +2 Vdc to +3 Vdc from A-B1TP-12 to frame ground (MIM 773).

Is the voltage correct?
Y N

008
- Defective Reader Assembly (MIM 761).

009
- Probe A-B1-TP-10, '+ Photocell MSR A' (MIM 773, 785).

Up light: Off
Down light: On

Are the lights correct?
Y N

010
- Defective Reader Assembly (MIM 761).

011
- Insert the test card into the reader and leave it approximately in the center of the slot.
- Probe A-B1-TP-10, '+ Photocell MSR A' (MIM 773, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

012
- Disconnect the MSR cable at A-B1-J01 (MIM 773)
- Probe A-B1-TP-10, '+ Photocell MSR A' (MIM 773, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

013
- Defective MSR card (A-B1) (MIM 501, 773).

014
- Defective Reader Assembly (MIM 761).

015
- Probe A-B1-TP-09, '+ Raw Data MSR A' (MIM 773, 785).

Up light: On
Down light: On

Are the lights correct as a test card is passed through the reader (MIM 751)?
Y N

016
- Disconnect the MSR cable at A-B1-J01 (MIM 773).
- Probe A-B1-TP-09, '+ Raw Data MSR A' (MIM 773, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

017
- Defective MSR card (A-B1) (MIM 501, 773).

018
- Defective Reader Assembly (MIM 761).

019
(ENTRY POINT B)

- Probe A-B2B04, '- POR' (MIM 531).
- Momentarily install a jumper from A-C1-TP-040, '- Test POR', to frame ground (MIM 303).

Up light: On
Down light: Pulses

Are the lights correct?
Y N

020
- Leave probe on A-B2B04, '- POR' (MIM 531).
- Remove the jumper from A-C1-TP-040, '- Test POR', to ground (MIM 303).

Up light: On
Down light: Off

Are the lights correct?
Y N

021
- Power off.
- With the CE meter set to the RX1 scale,
- Connect the positive lead to A-B2B04, '- POR', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

J K L M

022
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

023
- Defective Diskette/Main MPU card (A-C1) (MIM 303, 501).
- If a'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

024
- Defective Disk/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

025
- Probe A-B2B02, '1 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

026
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

027
- Defective Diskette/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

028
- Power off.
- With the CE meter set to the RX1 scale.
- Connect the positive lead to A-B2B02, '1 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

029
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at at time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

030
- Defective Disk/Main MPU card (A-C1) (MIM 303, 501).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

031
- Load 'MSRTEST' from the diagnostic diskette at the keyboard station associated with the failing MSR (MIM 971).
- Probe A-B2B07, '- Extended Sense Bit' (MIM 531).
- Pass the test card through the reader several times (MIM 751).

Up light: On
Down light: Pulses

Are the lights correct each time a test card is passed through the reader?
Y N

032
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

033
- Defective MSR card (A-B1) (MIM 501, 773).

034
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B2B07, '- Extended Sense Bit', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

035
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at at time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

036
- Defective Keyboard/Display MPU card (A-A1) (MIM 200, 501).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

037
- Pass the test card through the reader several times while observing the display.

Is an error message presented on the display each time?
Y N

038
- The test card should be passed through the reader reader upside down to cause an error condition.
- Pass the card through the reader upside down, so that the magnetic stripe will not be read by the reader.

Is any error message presented on the display?
Y N

039
- Defective MSR card (A-B1) (MIM 501, 773).

040
GO TO MAP 0100, ENTRY POINT A.

041
- Defective MSR card (A-B1) (MIM 501, 773).

042
Is station 1 working (answer 'yes' if no MSR is attached to this station.)?
Y N

043
- Probe A-B1-TP-08, '+ Photocell MSR A' (remote) (MIM 773, 787).

Up light: Off
Down light: On

Are the lights correct?
Y N

044
- Power Off.
- Disconnect the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 16, '+ Photocell MSR A' (remote), to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Does the meter read between 50 to 100 ohms?
Y N

045
- Use MIM 787 to trace the '+ Photocell MSR A' (remote) line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501, 773).

046
- Use the data station MSR MAP's for more FRU isolation.

047
- Insert the test card into the reader, leaving it approximately in the center of the slot.
- Probe A-B1-TP-08, '+ Photocell MSR A' (remote) (MIM 773, 787).

Up light: On
Down light: Off

Are the lights correct?
Y N

048
- Power Off.
- Disconnect the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 16, '+ Photocell MSR A' (remote), to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Does the meter read between 50 to 100 ohms?
Y N

049
- Use MIM 787 to trace the '+ Photocell MSR A' (remote) line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501).

050
- GO TO THE 5281 OR 5282 DATA STATION MAP 1030, ENTRY POINT A.

051
- Probe A-B1-TP-07, '- Raw Data MSR A' (MIM 773, 787).

Up light: On
Down light: On

Are the lights correct as a test card is passed through the reader (MIM 751)?
Y N

052
- Power Off.
- Disconnect the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 17, '-Raw Data MSR A', to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Does the meter read between 50 to 100 ohms?
Y N

053
- Use MIM 787 to trace the '-Raw Data MSR A' line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501, 773).

054
- GO TO THE 5281 OR 5282 DATA STATION MAP 1030, ENTRY POINT A.

055
GO TO PAGE 4, STEP 019, ENTRY POINT B.

056
Is station 2 working (answer 'yes' if no MSR is attached to this station)?
Y N

057
- Probe A-B1-TP04, '+ Photocell MSR B' (remote) (MIM 773, 787).

Up light: Off
Down light: On

Are the lights correct?
Y N

058
- Power Off.
- Disconnect the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 18, '+ Photocell MSR B' (remote), to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Does the meter read between 50 to 100 ohms?
Y N

059
- Use MIM 787 to trace the '+ Photocell MSR B' (remote) line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501, 773).

060
- GO TO THE 5281 OR 5282 DATA STATION MAP 1030, ENTRY POINT A.

061
- Insert the test card into the reader, leaving it approximately in the center of the slot.
- Probe A-B1-TP-04, '+ Photocell MSR B' (remote) (MIM 773, 787).

Up light: On
Down light: Off

Are the lights correct?
Y N

1
0
A A
G H

A
H

062
- Power Off.
- Unplug the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 18, '+ Photocell MSR B' (remote), to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Is the meter reading within the required range?
Y N

063
- Use MIM 787 to trace the '+ Photocell MSR B' (remote) line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501, 773).

064
- GO TO THE 5281 OR 5282 DATA STATION MAP 1030, ENTRY POINT A.

065
- Probe A-B1-TP-03, '- Raw Data MSR B' (MIM 773, 787).
- Observe the probe while the test card is being moved through the reader (MIM 751).

Up light: On
Down light: On

Are the lights correct as a test card is passed through the reader (MIM 751)?
Y N

066
- Power Off.
- Disconnect the connector from J103 of the cable connector panel (MIM 787).
- Set the CE meter to the RX1 scale.
- Measure the resistance from the back panel connector (J103) pin 19, '-Raw Data MSR B', to frame ground (MIM 787).
- The meter should read in the range of 50 to 100 ohms.

Does the meter read between 50 to 100 ohms?
Y N

067
- Use MIM 787 to trace the '-Raw Data MSR B' line for opens or grounds.

- - - - - OR - - - - -

- Defective MSR card (A-B1) (MIM 501, 773).

A A
J K

A A A A
1 C J K
8

068
- GO TO THE 5281 OR 5282 DATA STATION MAP 1030, ENTRY POINT A.

069
GO TO PAGE 4, STEP 019, ENTRY POINT B.

070
GO TO MAP 0100, ENTRY POINT A.

071
(ENTRY POINT C)

- There can be only one magnetic stripe reader attached to the MSR control card. The MSR is attached to partition 0 in storage, which is the same as the one used by its associated keyboard.
- To check for correct operation, load 'MSRTEST' from the diagnostic diskette and pass the test MSR card (P/N 8331402) through the reader (MIM 751). The correct message which should appear on the screen is: BBB0123456789BACDE0123456789.
- Disconnect the connector at A-B1-J01 (MIM 771).
- Check for +5 Vdc from A-B1-J01-8 to ground at A-B1-J01-7 (MIM 785).

Is +4.5 to +5.5 Vdc present?
Y N

072
- Defective MSR card (A-B1) (MIM 501, 771).

073
- Check for -5 Vdc from A-B1-J01-10 to ground at A-B1-J01-9 (MIM 785).

Is -4.5 to -5.5 Vdc present?
Y N

074
- Defective MSR card (A-B1) (MIM 501, 771).

075
- Plug the connector back in at A-B1-J01.
- Probe '+ Photocell MSR A' at A-B1-TP-02 (MIM 771, 785)

Up light: Off
Down light: On

Are the lights correct?
Y N

076
- Defective Reader Assembly (MIM 761).

077
- Insert the test card into the reader, leaving it approximately in the center of the slot.
- Probe A-B1-TP-02, '+ Photocell MSR A' (MIM 771, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

078
- Disconnect the MSR cable at A-B1-J01 (MIM 771)
- Probe A-B1-TP-02, '+ Photocell MSR A' (MIM 771, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

079
- Defective MSR card (A-B1) (MIM 501, 771).

080
- Defective Reader Assembly (MIM 761).

081
- Probe A-B1-TP-01, '+ Raw Data MSR A' (MIM 771, 785).

Up light: On
Down light: On

Are the lights correct as a test card is passed through the reader (MIM 751)?
Y N

082
- Disconnect the MSR cable at A-B1-J01 (MIM 771).
- Probe A-B1-TP-01, '+ Raw Data MSR A' (MIM 771, 785).

Up light: On
Down light: Off

Are the lights correct?
Y N

083
- Defective MSR card (A-B1) (MIM 501, 771).

084
- Defective Reader Assembly (MIM 761).

085
- Probe A-B2B04, '- POR' (MIM 501).
- Install a jumper from A-C1-TP-040, '- Test POR', to ground (MIM 303).

Up light: Off
Down light: On

Are the lights correct?
Y N

086
- Defective Disk/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

087
- Leave probe on A-B2B04, '- POR' (MIM 501).
- Remove the jumper from A-C1-TP-040, '- Test POR', to ground (MIM 303).

Up light: On
Down light: Off

Are the lights correct?
Y N

088
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B2B04, '- POR' (MIM 531), and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

089
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

090
- Defective Diskette/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

091
- Probe A-B2B02, '1 MHz Clock' (MIM 531).

Up light: On
Down light: On

Are the lights correct?
Y N

092
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

093
- Defective Disk/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

094
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B2B02, '1 MHz clock', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

095
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

096
- Defective Diskette/Main MPU Card (A-C1) (MIM 303, 501).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

097
- Load 'MSRTEST' from the diagnostic diskette (MIM 971).
- Probe A-B2B07, '- Extended Sense Bit' (MIM 531).
- Pass the test card through the reader several times (MIM 751).

Up light: On
Down light: Pulses

Are the lights correct each time a test card is passed through the reader?
Y N

098
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

099
- Defective MSR card (MIM 501).

100
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B2B07, '- Extended Sense Bit', and the negative lead to ground.

Is the meter reading 30 ohms or above?
Y N

101
- Leave the meter connected as in the previous step.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

102
- Defective Keyboard/Display MPU Card (A-A1) (MIM 200, 501).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

103
- Pass the test card through the reader several times while observing the display.

Is an error message presented on the display each time?
Y N

A B
Z A

104
- The test card should be passed through the reader upside down to cause an error condition on purpose.
- Pass the card through the reader upside down, so that the magnetic stripe will not be read by the reader.

Is any error message presented on the display?
Y N

105
- Defective MSR card (A-B1) (MIM 501, 771).

106
GO TO MAP 0100, ENTRY POINT A.

107
- Defective MSR card (A-B1) (MIM 501, 771).

ELAPSED TIME COUNTER MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
1000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	003	0600	A
4	021	0600	A
2	006	0600	A
3	011	0600	A
4	018	0600	A
3	012	0600	A

001
(ENTRY POINT A)

- The Elapsed Time Counter can be activated from any keyboard on the system. It may be tested for correct operation by loading 'TMRTEST1' from the diagnostic diskette and observing a digital display of elapsed time in hours, minutes, and seconds on the associated display. Any, or all, stations can be set up to show this display at the same time and each will show how much time has elapsed since the program was entered at that keyboard.

- Probe A-B1D07, '100 Hz Clock', (MIM 501).

Up light: On
Down light: On

Are the lights correct?
Y N

002
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

DATA ENTRY MAP

TIME COUNTER

003
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

004
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B1D07, '100 Hz clock', and the negative lead to Logic ground.

Is the meter reading 30 ohms or above?

Y N

005
- Leave the meter connected.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

006
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

007
- Probe A-B2B04, '- POR' (MIM 501).
- Momentarily install a jumper from A-C1-TP40, '- Test POR', to Logic ground (MIM 303).

Up light: On
Down light: Pulses

Are the lights correct?

Y N

008
- Leave the probe connected.
- Remove the jumper installed in the last step.

Up light: On
Down light: Off

Are the lights correct?

Y N

009
- Power off.
- Set the CE meter to the RX1 scale.
- Connect the positive lead to A-B2B04, '- POR', and the negative lead to Logic ground.

Is the meter reading 30 ohms or above?

Y N

EC840874 PEC839787

010
- Leave the meter connected.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

011
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

012
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

013
- Load 'TMRTEST1' (MIM 971).
- Probe A-B2B08, 'Timer Overflow' (MIM 501)

Up light: On
Down light: Pulses

Are the lights correct?
Y N

014
- Leave the probe connected.

Up light: Off
Down light: On

Are the lights correct?
Y N

015
- Defective Elapsed Time Counter card (A-B1) (MIM 501, 773).

016
- Power Off.
- Set the C.E. meter to the RX1 scale.
- Connect the positive lead to A-B2B08, '- Timer Overflow', and the negative lead to Logic ground.

Is the meter reading 30 ohms or above?
Y N

017
- Leave the meter connected.
- Use the net list (MIM 531). Remove each card in the net, one at a time, until the meter reads 30 ohms or above.
- Replace the last card removed.
- If all the cards in the net have been removed and the meter reading is still below 30 ohms, suspect a ground on the Logic Board.

TIME COUNTER

PAGE 4 OF 4

018
- Defective Keyboard/Display MPU card (A-A1) (MIM 200).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

019
- Load 'TMRTEST2' (MIM 971).

Do you get this message: 'IOD bits 4-7 test out OK' on the display?
Y N

020
- Defective Elapsed Time Counter Card (A-B1) (MIM 501, 773).

021
GO TO MAP 0600, ENTRY POINT A.

DISKETTE DRIVE ENTRY MAP

PAGE 1 OF 9

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	2	001
0220	A	2	001
0300	A	2	001
2280	A	2	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	008	0100	A
4	016	0600	A
4	014	0600	A
9	042	0600	A
4	013	2010	A
6	025	2010	A
9	039	2010	A
9	041	2010	A
7	029	2010	A
7	031	2010	A
8	037	2010	A
6	026	2280	A
6	027	2280	A
4	011	8000	A

001
(ENTRY POINT A)

```
**********************************************************************
* NOTE:                                                              *
*  BE SURE TO RETURN THE SYSTEM                                      *
*          TO THE CUSTOMER IN ITs ORIGINAL                           *
*                CONFIGURATION AND RUN  SYSTEST  SEE MIM 971,975*
**********************************************************************
```

This is the Diskette Drive Entry Map.
For your convenience, information about your 5280 system can be kept by filling out the configuration record below.

Mark the information below, as required, so you can accurately return this system to its original configuration at the end of this call.
If this information was previously marked, check the system configuration for changes (Due to RPQs, MESs, ETC).

CONTROL UNIT TYPE: 5285 SERIAL NUMBER_____

1. DRIVE TYPE: 1 2D ADDRESS_____
2. DRIVE TYPE: 1 2D ADDRESS_____

DATA STATION TYPE: 5281 5282 SERIAL NUMBER_____

1. DRIVE TYPE: 1 2D ADDRESS_____
2. DRIVE TYPE: 1 2D ADDRESS_____

Has the system been IPL'ed with Diagnostic Diskette 1?

Y N

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9 3
A B

DISKETTE ENTRY MAP

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002

- Remove all diskette(s) from the drives attached to this system.
- Attempt to 'IPL' the system using Diagnostic Diskette 1.
- Do Not attempt to 'IPL' the failing drive.
- If the system cannot be 'IPLed', leave the diskette in the failing drive with the locking lever closed and the condition codes displayed.

Can the system be IPL'ed from any drive?

Y N

003

- Probe the lines in the table. See MIM 905 For Probe setup.

Line Name	Probe
4F Clk Phase 2	A-C2D10
4F Clk Phase 1	A-C2D13
4 MHz clock	A-C5B05
250 Hz clock	A-C6D02
2.25 MHz clock	A-C7B09
1 MHz clock	A-C7D02
9 MHz clock	A-C7D04
6 MHz clock	A-C8B02
18 MHz clock	A-C8B03
200 KHz clock	A-C8B05
41.66 Hz clock	A-C8B09
400 Hz clock	A-C8B12
100 Hz clock	A-C8D07
1 KHz clock	A-C8D10

Up light: On
Down light: On

Are the lights correct?

Y N

004

Is only the Down Light on?

Y N

005

- The card listed across from the failing line is the defective card.

Line Name	Card
4F Clk Phase 2	A-D3
4F Clk Phase 1	A-D3

- All other clock lines, Defective Diskette/Main MPU card (A-C1) (MIM 303).

006

- The failing clock line is grounded.
- See MIM 531 for cards in the net that could cause this failure. If the line is not listed,
- Defective Diskette/Main MPU card (A-C1) (MIM 303).

007

- Insert the Diagnostic Diskette 1 into the failing drive and close the locking lever.
- See MIM 931 for an explanation of the condition codes.

Are the condition codes displayed?

Y N

008

GO TO MAP 0100, ENTRY POINT A.

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DISKETTE ENTRY MAP

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009

NOTE: The XX preceding the Hex number can be any number, but not '00'.

Is the condition code a Hex XX10 through XXFF?

Y N

010

- Measure +5, -5 and +8.5 Vdc for voltage and ripple at the Diskette/Main MPU card (A-C1) (MIM 461, 463 and 531).
- Check ALL listed points on the card.

Are all of the measurements within tolerance?

Y N

011

GO TO MAP 8000, ENTRY POINT A.

012

- Probe A-C1-TP16 '+Write/Erase Sense 4000', on the Diskette/Main MPU card (MIM 313).

Up light: Off
Down light: On

Are the lights correct?

Y N

013

GO TO MAP 2010, ENTRY POINT A.

014

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

015

Is the condition code a Hex XX18 through XX20, XX23 through XX2C, or XX2E through XXFF?

Y N

016

- Defective VFO card (A-D3)(MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

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DISKETTE ENTRY MAP

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017

- Locate the condition code (Hex) in the table, locate the correct note letter(s) and look to the right to find the comment.

Condition Code Table

COND CODE	SEE NOTES
XX18	A,Q
XX1C	B,Q
XX20	C,Q
XX23	D,Q
XX24	E,Q
XX26	F,L,Q
XX29	H,G,L Q
XX2A	J,L,S
XX2C	R,Q
XX2E	K,L,S
XX30	M,L,S
XX32	K,L,S
XX34	N,L,S
XX38	N,P,L S
XXFF	L,S

*******NOTES*******

XX = DO NOT CARE

A -Speed slow or no index pulses detected.
B -Speed too fast.
C -Erase Mis-match error.
D -Dropped Ready.
E -Missing Address Marks.
F -CRC error.
G -Missing Data Address Marks.
H -Bad Track error.
J -Controlled Address Mark in the IPL data, Non-recoverable
K -Vol-label Mis-match, check and rewrite.
L -Suspect the diskette.
M -Non-'IPL' diskette.
N -Incorrect Header Label, check and rewrite.
P -Storage Size Mis-compare.
Q -GO TO MAP 2010, ENTRY POINT A.
R -Read or Access problem.
S -GO TO MAP 2280, ENTRY POINT B.

018
(ENTRY POINT B)

Can the problem be isolated to a group of drives (remote Data Station drives only or local drives only)?
Y N

019
Can the problem be isolated to one diskette drive?
Y N

020
(ENTRY POINT E)

Is an error code present or reported?
Y N

021
(ENTRY POINT D)

Did the customer save the Error Log?
Y N

022
Can the problem be isolated to one or more diskette(s) that seem to fail on more than one drive?
Y N

023
Can the problem be isolated to one or more diskette(s) that seem to fail on one type of drive (31SD or 51TD)?
Y N

024
- If a diskette works correctly in one diskette drive, but has too many errors or does not work at all in another drive, this type of failure is probably a 'Diskette Interchange' problem.

Is the symptom related to a diskette interchange problem?
Y N

025
GO TO MAP 2010, ENTRY POINT A.

026
GO TO MAP 2280, ENTRY POINT A.

027
GO TO MAP 2280, ENTRY POINT A.

028
- Suspect the diskette(s) as being defective.
- Run the diskette surface analysis program 'TMEDIA' (MIM 971) on the failing diskette(s) on more than one drive.

Are over 50 percent of the errors indicated on the two drives from the same sectors?
Y N

DISKETTE ENTRY MAP

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029
- Suspect an interchange problem due to an incorrect hardware adjustment.

GO TO MAP 2010,
ENTRY POINT A.

030
- Suspect the diskette(s).
- Run the diskette surface analysis program 'TMEDIA' (MIM 971), with a good diskette of the same type on one of the same drives.

Did this test complete without any errors?
Y N

031
- Suspect problems with the diskette drive.

GO TO MAP 2010,
ENTRY POINT A.

032
- Try to initialize the failing diskette after the customer data has been transferred to another diskette.
- If the diskette cannot be successfully initialized, it is suggested that this diskette be taken out of service.

033
- Attempt to run 'TSYSEREP' (MIM 975).

Can useful information be obtained?
Y N

034
GO TO PAGE 6, STEP 018,
ENTRY POINT B.

035
GO TO PAGE 8, STEP 036,
ENTRY POINT C.

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DISKETTE ENTRY MAP

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036
(ENTRY POINT C)

- Locate the Error Code in the table, locate the correct Note Letter(s) and look to the RIGHT to find the comments.

Error Code Table

ERROR CODE(s)	NOTES
0133/0731	K,L
3151/3251	R,N
3201/3212/3272	A,N
3261	A,K,L
3203	C,K,L
3207	D,N
3301	H,Q,N
3302	B,Q,N
3303	F,Q,N
3304	G,N
3305	J,Q,M
3306	E,S,N
3307	T,Q,P

**********NOTES**********

A -Write/Erase mis-match error.
B -Write verify error.
C -Storage overrun error.
D -Missing address mark.
E -Missing data address mark.
F -Missing sector.
G -Seek error.
H -Data CRC error.
J -ID field CRC error.

K -Defective Diskette/Main MPU card (A-C1) (MIM 303).
L -If a 'Ros Patch' cable is connected to the card, GO TO MAP 0600, ENTRY POINT A
M -GO TO MAP 2280, ENTRY POINT B.
N -GO TO MAP 2010, ENTRY POINT A.
P -GO TO MAP 2280, ENTRY POINT A.
Q -Suspect a defective diskette.
R -Diskette drive Dropped Ready. CHECK: The diskette, to ensure it is correct for the type of drive it is installed in, and the Locking Lever is Closed. Reseat the Diskette I/O cables.
S -Suspect the diskette drive that wrote the diskette. Check for a write failure
T -Initialization problem, re-initialize the diskette in another diskette drive.

- If the error code that is displayed is not in the table GO TO PAGE 6, STEP 018, ENTRY POINT B.

037
GO TO MAP 2010, ENTRY POINT A.

DISKETTE ENTRY MAP

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038
Are there two diskette drives installed in the IBM 5285?
Y N

039
GO TO MAP 2010,
ENTRY POINT A.

040
Do All diskette drives connected to the Diskette/Main MPU card fail (MIM 303)?
Y N

041
GO TO MAP 2010,
ENTRY POINT A.

042
- Defective VFO card (A-D3) (MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

043
GO TO PAGE 6, STEP 021,
ENTRY POINT D.

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DISKETTE BASE SWAP MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2000	A	2	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	008	0600	A
11	097	0600	A
5	034	0600	A
8	067	0600	A
10	081	0600	A
9	075	0600	A
3	019	0600	A
2	010	0600	A
12	100	0600	A
12	103	0600	A
10	083	2210	A
5	036	2210	A
9	077	2210	A
8	069	2210	A
3	017	2250	A
6	046	2250	A
4	028	2250	A
11	094	2250	A
3	014	2260	A
4	025	2260	A
6	043	2260	A
11	089	2260	A
3	021	2270	A

001
(ENTRY POINT A)

When using this MAP you will be expected to swap Cards, Cables and Diskette Drives. Whenever a swap is called for, 'POWER OFF THE COMPLETE SYSTEM'. Also, when the problem has been fixed, return the system to the customer in the original configuration.

Do All diskette drives connected to this system fail?
Y N

002
Are there failing diskette drives located in both the IBM 5285 and 5281 or 5282?
Y N

003
Are only 51TD diskette drives failing?
Y N

004
(ENTRY POINT S)

Is the failing diskette drive located in an IBM 5281 or 5282?
Y N

005
Is the failing diskette drive in an 'OEM' Data Station?
Y N

1 1 1
2 2 1 5 4
A B C D E F

006
(ENTRY POINT B)

Is there only one Diskette Drive installed in the IBM 5285?
Y N

007
Is only ONE of the diskette drives failing?
Y N

008
- Defective VFO card (A-D3) (MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

009
- Swap plug P40 with P44 on the Diskette/Main MPU card (A-C1) (MIM 313).

Does the same diskette drive fail?
Y N

010
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

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3 3
G H

011
- Without moving the plugs (P40 and P44) back to their original positions, swap the I/O CP connectors between diskette drives 4000 and 4400 (MIM 313).

Does the same diskette drive fail?
Y N

012
- Defective cable between the Diskette/Main MPU card and the failing diskette drive (MIM 313).

013
Are there any diskette drives connected to this system that are the same type as the failing drive (31SD or 51TD)?
Y N

014
GO TO MAP 2260, ENTRY POINT A.

015
- Swap the Diskette Drive Control cards between the two drives (Diskette MIM 377).

Does the same diskette drive fail?
Y N

016
- Defective Diskette Drive Control card (Diskette MIM 377).

017
GO TO MAP 2250, ENTRY POINT A.

018
- Move plug P40 to J44 on the Diskette/Main MPU card (A-C1) (MIM 313).
- Remove the Diskette/Main MPU card and ensure the switches are set to include drive 4400 (A-C1) (MIM 303 and 313).
- Install the Diskette/Main MPU card (A-C1).

Does the diskette drive still fail?
Y N

019
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

020
Is there a Data Station with a diskette drive connected to this system?
Y N

021
GO TO MAP 2270, ENTRY POINT A.

022
- Swap the diskette drives between the IBM 5281 or 5282 Data Station and the IBM 5285 (MIM 301).

Does the same diskette drive fail?
Y N

023
- Defective cable between the Diskette Drive Control card and the Diskette/Main MPU card (MIM 313).

024
Are there any diskette drives connected to this system that are the same type as the failing drive (31SD or 51TD)?
Y N

025
GO TO MAP 2260, ENTRY POINT A.

026
- Swap the Diskette Drive Control cards between the two drives (Diskette MIM 377).

Does the same diskette drive fail?
Y N

027
- Defective Diskette Drive Control card (Diskette MIM 377).

028
GO TO MAP 2250, ENTRY POINT A.

029
- The following is a list, by probability, of cards and cables which could cause a failure in a remote Data Station.

Replace these parts, one at a time, in an attempt to determine if the problem is in the IBM 5285. The cables can be checked for opens using the CE meter and MIM 319.

If these cards and cables DO NOT fix the problem: Advise the customer to call the OEM Service Representitive.

1.Defective Diskette Driver/Receiver card (A-D1) (MIM 305).
2.Defective VFO card (A-D3) (MIM 501).
3.Defective Diskette/Main MPU card (A-C1) (MIM 303).
4.Defective cable between P48 and P4C and J111 (MIM 319).
5.If a ROS Patch cable is connected to the Diskette/Main MPU card:
Go To Map 0600, Entry Point A

030
- Measure +5 and -5 Vdc at P02 on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 209 and 455).
- Measure +5, -5 and +24 Vdc on the Diskette Drive Control card for the failing drive (IBM 5281 or 5282 MIM 325).

Check all of these for both voltage and ripple (5281 or 5282 MIM 463).

Are All of the measurements within tolerence?
Y N

031
- GO TO MAP 8000, ENTRY POINT A of the Data Station that has the incorrect voltage or ripple (IBM 5281 or 5282).

032
Are all of the Diskette Drives attached to this Data Station failing?
Y N

033
- Swap plug P48 with P4C on the Diskette Driver/Receiver card (A-D1) (MIM 319).

NOTE: The failing diskette drive will now have the other address (was 48 now 4C or was 4C now 48).

Does the same diskette drive fail?
Y N

034
- Defective Diskette Driver/Receiver card (A-D1) (MIM 305).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

035
- Swap the input plugs P09 and P11 at the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

Note: For this and future step's, the failing drive is back to it's original address.

Does the same diskette drive fail?
Y N

036
GO TO MAP 2210, ENTRY POINT A.

037
- Swap input plugs P09 and P11 back to their original positions.
- Swap the output plugs P10 and P12 at the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

Does the same diskette drive fail?
Y N

038
- Defective Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 211).

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039
- Swap the I/O CP connectors at the Diskette Drive Control cards (IBM 5281 or 5282 MIM 325).

Does the same diskette drive fail?
Y N

040
- Defective cable between the Diskette Drive Control card and the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

041
Is the failing diskette drive a 51TD?
Y N

042
(ENTRY POINT E)

Are there any diskette drives connected to this system that are the same type as the failing drive (31SD or 51TD)?
Y N

043
GO TO MAP 2260,
ENTRY POINT A.

044
- Swap the Diskette Drive Control cards between the two drives (Diskette MIM 377).

Does the same diskette drive fail?
Y N

045
- Defective Diskette Drive Control card (Diskette MIM 377).

046
GO TO MAP 2250,
ENTRY POINT A.

047
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP', select MDI 2050 and the failing 51TD diskette drive. Select option 20, and then select option 5 (Head Select 1).
- This MDI will loop automatically.
- Probe TPB03 '+ Select Head 1' on the Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: Ignore

Are the lights correct?
Y N

048
GO TO PAGE 9, STEP 072,
ENTRY POINT D.

049
GO TO STEP 042,
ENTRY POINT E.

050
Are the AC Drive Motors turning?
Y N

051
- GO TO MAP 8000, ENTRY POINT A in the IBM 5281 or 5282 MAPs.

052
Is there only one diskette drive installed in the Data Station?
Y N

053
Is there a diskette drive installed in the IBM 5281 or 5282 that is a '51TD'?
Y N

054
(ENTRY POINT C)

- Power Off the controller.
- Measure for ground between A3B05 '- Write Trigger' and A3D08 'Ground' on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

NOTE: Leave the meter connected to these points until you are told to remove it.

Does the meter read 20 ohms or more?
Y N

055
- Remove J48 from the Diskette Driver/Receiver card (A-D1) (MIM 319).

Does the meter read 20 ohms or more?
Y N

056
- Remove the Diskette I/O Interface cable from J111 (MIM 319).

Does the meter read 20 ohms or more?
Y N

057
- Remove the Diskette I/O Interface cable from J111 on the Data Station (IBM 5281 or 5282 MIM 325).

Does the meter read 20 ohms or more?
Y N

058
- Remove P11 from the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

Does the meter read 20 ohms or more?
Y N

059
- Defective Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 211).

060
- Defective cable between J111 and the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

061
- Defective Diskette I/O Interface cable, advise the Customer.

062
- Defective cable between J111 and the Diskette Driver/Card (MIM 319).

063
- Defective Diskette Driver/Receiver card (A-D1).

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064
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP', select MDI 2050 and diskette drive address 4800. Select option 15 (Write Data).
- Load a scratch diskette into address 4800, select track 1 and sector 15.
- Loop on this command until told to terminate or load another MDI.
- Probe A3B05 '- Write Trigger' on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 209 and 325).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

065
- Probe A-D1-TP22 '- Write Trigger' on the Diskette Driver/Receiver card (A-D1) (MIM 319).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

A
Y Z A

Y Z A
A

066
- Probe AD1D10 '+ Write Trigger' on the Diskette Driver/Receiver card (A-D1) (MIM 319).

Up light: On
Down light: Pulses

Are the lights correct?
Y N

067
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card, GO TO MAP 0600, ENTRY POINT A.

068
- Defective Diskette Driver/Receiver card (A-D1).

069
GO TO MAP 2210, ENTRY POINT A.

070
- Defective Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 211).

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071
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP', select MDI 2050 and the failing 51TD diskette drive. Select option 20, and then select option 5 (Head Select 1).
- This MDI will loop automatically.
- Probe TPB03 '+ Select Head 1' on the Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: Ignore

Are the lights correct?
Y N

072
(ENTRY POINT D)

- Probe A3D04 '+ Select Head 1' on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

Up light: Pulses
Down light: Ignore

Are the lights correct?
Y N

073
- Probe A-D1-TP23 '+ Head Select 1' on the Diskette Driver/Receiver card (A-D1) (MIM 319).

Up light: Pulses
Down light: Ignore

Are the lights correct?
Y N

074
- Probe A-C1B10 '- Head Select 1' on the Diskette/Main MPU card (A-C1) (MIM 319).

Up light: Ignore
Down light: Pulses

Are the lights correct?
Y N

075
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

076
- Defective Diskette Driver/Receiver card (A-D1).

077
GO TO MAP 2210,
ENTRY POINT A.

078
- Defective Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 211).

079
GO TO PAGE 7, STEP 054,
ENTRY POINT C.

080
- Swap the output plug P48 with P4C at the Diskette Driver/Receiver card (A-D1) (MIM 319).
- Remove the Diskette/Main MPU card and ensure the switches are set to include drive 4800 and 4C00 (A-C1) (MIM 303).
- Install the Diskette/Main MPU card (A-C1).

Does the diskette drive still fail?
Y N

081
- Defective Diskette Driver/Receiver card (A-D1) (MIM 305).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

082
- Swap the cable plugs back to their origional positions on the Diskette Driver/Receiver card (A-D1) (MIM 319).
- Swap the input plugs P09 with P11 at the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

NOTE: Plug P09 may be taped back to the cable harness that P11 is connected to.

Does the diskette drive still fail?
Y N

083
GO TO MAP 2210, ENTRY POINT A.

084
- Swap the cable plugs back to their origional positions on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).
- Move the output plug P12 from J12 to J10 on the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

Ensure the jumper, located on the Data Station Driver/Receiver card is plugged for a two drive configuration (IBM 5281 or 5282 MIM 211).

Does the diskette drive still fail?
Y N

085
- Defective Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 211).

086
Is there a drive of the same type located in the system (31SD or 51TD)?
Y N

087
- Swap the diskette drives between the IBM 5281 or 5282 Data Station and the IBM 5288 (MIM 301).

Does the same diskette drive still fail?
Y N

088
- Defective cable between the Diskette Drive Control card and the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

089
- Swap the diskette drives back to their origional positions (MIM 301).

GO TO MAP 2260, ENTRY POINT A.

090
- Swap the Diskette Drive Control cards between the two drives (Diskette MIM 377).

Does the same diskette drive still fail?
Y N

091
- Defective Diskette Drive Control card (Diskette MIM 377).

092
- Swap the diskette drives between the IBM 5281 or 5282 Data Station and the IBM 5288 (MIM 301).

Does the same diskette drive still fail?
Y N

093
- Defective cable between the Diskette Drive Control card and the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

094
- Swap the diskette drives back to their origional positions (MIM 301).

GO TO MAP 2250, ENTRY POINT A.

095
- Load 'DCP' and select MDI 2050 option 20. Select a failing drive and Select option 7 (MFM Mode In).
- Probe A-C2D11 '+ MFM Mode' on the Diskette/Main MPU card (A-C1) (MIM 531).

Up light: Pulses
Down light: Ignore

Are the lights correct?
Y N

096
Is there a problem with the diskette drive coming Ready?
Y N

097
- Defective VFO card (A-D3) (MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

098
GO TO PAGE 2, STEP 004,
ENTRY POINT S.

099
GO TO PAGE 2, STEP 004,
ENTRY POINT S.

DISKETTE BASE SWAP

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100
- Defective Diskette Driver/Receiver card (A-D1) (MIM 305).

- - - - - OR - - - - -

- Defective VFO card (A-D3) (MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

101
Is there a Data Station with a diskette drive connected to this system?
Y N

102
GO TO PAGE 2, STEP 006, ENTRY POINT B.

103
- Defective VFO card (A-D3) (MIM 501).

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

DISKETTE CABLE SWAP MAP

PAGE 1 OF 1

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2010	A	1	001
2280	A	1	001

001
(ENTRY POINT A)

- Power Off the IBM 5285 and the IBM 5281 or 5282.
- Inspect both ends of the cable that goes from the Diskette Driver/Receiver card to the Cable Connector panel at J111 (MIM 319).

Are any wires or pins damaged?
Y N

002
- Inspect both ends of the cable that goes from the Data Station Driver/Receiver card to the Cable Connector panel at J111 (IBM 5281 or 5282 MIM 325).

Are any wires or pins damaged?
Y N

003
- Defective cable between the Diskette Driver/Receiver card and the Cable Connector panel J111 (MIM 319).

- - - - - OR - - - - -

- Defective cable between the Data Station Driver/Receiver card and the Cable Connector panel J111 (IBM 5281 or 5282 MIM 325).

- - - - - OR - - - - -

- If neither of the above, advise the customer you suspect that the I/O interface cable is defective.

004
- Repair or replace the defective cable or pins.

005
- Repair or replace the defective cable or pins.

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2 DRIVE, N/DDCC

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	2280	A
3	024	8000	A

001
(ENTRY POINT A)

- Power Off.
- Carefully move the Head/Carriage on the failing drive, to the innermost track.
- Power On and observe the Head/Carriage on the failing drive.

Does the Head/Carriage access to the outermost track?
Y N

002
- Stepper Motor Drive Band loose or out of adjustment (Diskette MIM 361).
- Stepper Motor Drive Pulley loose or out of adjustment (Diskette MIM 359).

- - - - - OR - - - - -

- Defective Stepper Motor (Diskette MIM 357).

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003
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP' and run MDI 2060 to test the failing drive.
- Answer the following questions as you run this MDI.

Does the MDI stop with ' Drive Failed To Come Ready'?
Y N

004
Was the 'Drive in Use' LED working correctly?
Y N

005
GO TO MAP 2280, ENTRY POINT A.

006
Is the Head loading and unloading?
Y N

007
- Defective Solenoid (Diskette MIM 349).

- - - - - OR - - - - -

- Bail Actuator cable not installed correctly (Diskette MIM 349).

- - - - - OR - - - - -

- Head Load Bail out of adjustment (Diskette MIM 346).

008
Was a Read problem encountered?
Y N

3
B C D

009
Was a Write problem encountered?
Y N

010
Did MDI 2060 complete correctly?
Y N

011
- Defective Head/Carriage assembly (Diskette MIM 341).

012
- Suspect a defective diskette.

- - - - - OR - - - - -

- Suspect a Customer User problem.

013
- Defective Head/Carriage assembly (Diskette MIM 341).

014
- Do the Head Load Solenoid and Bail service check (Diskette MIM 343).
- Do the Drive Band service check (Diskette MIM 361).
- Do the Head/Carriage service check (Diskette MIM 337).

Was a problem observed when doing these service checks?
Y N

015
- Defective Head/Carriage assembly (Diskette MIM 341).

016
- Load and run 'SYSTEST' to test the failing drive (MIM 975).

Is the drive still failing?
Y N

017
- End of call. Remember to return the IBM 5285 to the customer in its original configuration.

018
- Defective Head/Carriage assembly (Diskette MIM 341).

019
Is the belt installed?
Y N

020
- Check the belt for wear and to determine why the belt came off. See the Diskette MIM's for any replacement or adjustment needed.

021
Is the AC Motor turning?
Y N

022
Is the failing drive located in an IBM 5281 or 5282?
Y N

023
- Measure for the correct AC voltage at the Diskette AC Connector (MIM 453).

Is the AC voltage present at the Diskette AC Connector?
Y N

024
GO TO MAP 8000, ENTRY POINT A.

025
- Defective AC Drive Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective AC Motor Starting Capacitor (Diskette MIM 353).

026
- Measure for the correct AC voltage at the Diskette AC Connector (IBM 5281 or 5282 MIM 453).

Is the AC voltage present at the Diskette AC Connector?
Y N

027
- GO TO MAP 8000, ENTRY POINT A of the Data Station that has the incorrect voltage or ripple (IBM 5281 or 5282).

028
- Defective AC Drive Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective AC Motor Starting Capacitor (Diskette MIM 353).

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2 DRIVE, N/DDCC

PAGE 4 OF 4

029
- Probe TPE03 (31SD) or TPE01 (51TD) '+ Index' on the failing drive at the Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

030
- Defective PTX (Diskette MIM 375).

- - - - - OR - - - - -

- Defective LED (Diskette MIM 371).

031
- Defective AC Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective Drive Belt.

- - - - - OR - - - - -

- Slipping AC Drive Belt Pulley.

- - - - - OR - - - - -

- Collet not engaging diskette correctly (Diskette MIM 335).

2 DRIVE, DDCC

PAGE 1 OF 5

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	009	2280	A
5	037	8000	A

001
(ENTRY POINT A)

- Power Off.
- Carefully move the Head/Carriage on the failing drive to the innermost track.
- Observe to see if the stepper motor pulley and drive band are tight are operating correctly. If not, see the Diskette MIM's for the replacement or adjustment procedures.
- Power On.
- Observe the Head/Carriage on the failing drive.

Does the Head/Carriage access to the outermost track?
Y N

002
- Probe TPF02 (31SD) or TPG01 (51TD) '+ Write/Erase Sense' on the failing Diskette Drive Control card (MIM 313).

Up light: Off
Down light: On

Are the lights correct?
Y N

EC840874

2 2 2
A B C

003
- Defective Diskette Drive Control card (Diskette MIM 377).

004
- Measure the voltage on the Diskette Drive Control card test points MC-0, MC-1, MC-2 and MC-3. Connect the negative meter lead to ground, TPF01 if the failing drive is a 31SD or to TPA05 if it is a 51TD and the positive lead to the TP's.

Three of the TP's should be at +24Vdc and one of them should be at + or - 1 Vdc (Diskette MIM 331).

Are the voltages correct?
Y N

005
- Defective Diskette Drive Control card (Diskette MIM 377).

006
- Defective Stepper Motor (Diskette MIM 357).

007
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP' and run MDI 2060, test the failing drive.
- Answer the following questions as you run this MDI.

Does the MDI stop with 'Drive Failed To Come Ready'?
Y N

008
Was the 'Drive In Use' LED working correctly?
Y N

009
GO TO MAP 2280, ENTRY POINT A.

010
Is the Head loading and unloading?
Y N

011
- Probe TPE02 (31SD) or TPB05 (51TD) '+ Head Engage' on the failing Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

012
- Defective Diskette Drive Control card (Diskette MIM 377).

013
- See if the Head Load Bail moves enough to load the head(s) when the locking lever is closed. See Diskette MIM 344 for service check.

Does the Head Load Bail move enough to allow the head(s) to load?
Y N

EC840874

014
- Bail Actuator cable not installed correctly (Diskette MIM 349).

- - - - - OR - - - - -

- Head Load Bail out of adjustment (Diskette MIM 346).

015
- Disconnect the Head Load Solenoid plug from the Diskette Drive Control card (Diskette MIM 333).
- Measure the resistance of the Head Load Solenoid by measuring on the cable plug between the A03 and A04 hole.
- The resistance should be from 113 to 250 ohms.

Is the Solenoid resistance within these limits?
Y N

016
- Defective Solenoid (Diskette MIM 349).

017
- Defective Diskette Drive Control card (Diskette MIM 377).

018
Was a Read problem encountered?
Y N

019
Was a Write problem encountered?
Y N

020
Did MDI 2060 complete correctly?
Y N

021
- Defective Head/Carriage assembly (Diskette MIM 341).

- - - - - OR - - - - -

- Defective Diskette Drive Control card Diskette MIM 377).

022
- Suspect a defective diskette.

- - - - - OR - - - - -

- Suspect a User problem.

023
- Defective Head/Carriage assembly (Diskette MIM 341).

024
- Do the Head Load Solenoid and Bail service check (Diskette MIM 343).
- Do the Drive Band service check (Diskette MIM 361).
- Do the Head/Carriage service check (Diskette MIM 337).

Was a problem observed when performing these service checks?
Y N

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025
- Defective Head/Carriage assembly (Diskette MIM 341).

- - - - - OR - - - - -

- Defective Diskette Drive Control card (Diskette MIM 377).

- - - - - OR - - - - -

- Defective cable between the Diskette Drive Control card and the Data Station Driver/Receiver card (IBM 5281 or 5282 MIM 325).

026
- Load and run 'SYSTEST' to test the failing drive (MIM 975).

Is the drive still failing?
Y N

027
- End of call. Remember to return the IBM 5285 to the customer in its original configuration.

028
- Defective Head/Carriage assembly (Diskette MIM 341).

029
Is the belt installed?
Y N

030
- Check the belt for wear and to determine why the belt came off. See the Diskette MIM's for any replacement or adjustment procedure.

031
Is the AC Motor turning?
Y N

032
Is the failing diskette drive located in the IBM 5285?
Y N

033
- Measure for the correct AC voltage at the Diskette AC Connector. Use IBM 5281 or 5282 MIM 453.

Is the AC voltage present at the Diskette AC Connector?
Y N

034
- GO TO MAP 8000, ENTRY POINT A of the Data Station that has the incorrect voltage or ripple (IBM 5281 or 5282).

035
- Defective AC Drive Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective AC Motor Starting Capacitor (Diskette MIM 353).

036
- Measure for the correct AC voltage at the Diskette AC Connector. Use IBM 5285 MIM 453.

Is the AC voltage present at the Diskette AC Connector?
Y N

EC840874

037
GO TO MAP 8000,
ENTRY POINT A.

038
- Defective AC Drive Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective AC Motor Starting Capacitor (Diskette MIM 353).

039
- Probe TPE03 (31SD) or TPE01 (51TD) '+ Index' on the failing Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

040
- Defective Diskette Drive Control card (Diskette MIM 377).

- - - - - OR - - - - -

- Defective PTX (Diskette MIM 375).

- - - - - OR - - - - -

- Defective LED (Diskette MIM 371).

041
- Defective AC Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective Drive Belt.

- - - - - OR - - - - -

- Slipping AC Drive Belt Pulley.

- - - - - OR - - - - -

- Collet not engaging diskette correctly (Diskette MIM 335).

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ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
4	027	0600	A
4	030	2280	A
2	006	8000	A
2	009	8000	A

001
(ENTRY POINT A)

- This Map is to be used for a minimum configuration system, that is one diskette drive located in the 5285 and no other diskette drives attached to this system.

Can the system be IPL'ed?
Y N

002
Is the belt installed?
Y N

003
- Check the belt for wear and to determine why the belt came off. See the Diskette MIM's for any replacement or adjustment procedure.

004
Is the AC Motor turning?
Y N

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005
- Measure for the correct AC voltage at the Diskette AC Connector (MIM 453).

Is the AC voltage present at the Diskette AC Connector?
Y N

006
GO TO MAP 8000,
ENTRY POINT A.

007
- Defective AC Drive Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective AC Motor Starting Capacitor (Diskette MIM 353).

008
- Measure +5, -5 and +24 Vdc for voltage and ripple at the Diskette Drive Control card (MIM 313, 461 and 463).

Are all of the measurements within tolerence?
Y N

009
GO TO MAP 8000, ENTRY POINT A.

010
Is a 'Ros Patch' cable connected to the Base Diskette MPU 'Ros Patch' Signal Cable Connector (A-C1) (MIM 303)?
Y N

4
D E

011
(ENTRY POINT B)

- Due to the lack of swappable FRUs, it is suggested at this time the following be replaced one at a time to determine the failing FRU or isolate the problem.

1. VFO card (A-D3).
2. Diskette Drive Control card (Diskette MIM 377).
3. Cable between the Diskette/Main MPU card and the Diskette Drive Control card (MIM 313).
4. Diskette/Main MPU card (A-C1) (MIM 303).

Does the diskette drive still fail?
Y N

012
- End of call. Run 'SYSTEST' before returning the system to the Customer.

013
- Load a good scratch Diskette 1 into the failing drive.
- Probe TPE03 (31SD) or TPE01 (51TD) '+ Index' on the failing Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

EC840874

3 3
F G

014
- Defective PTX (Diskette MIM 375).

- - - - - OR - - - - -

- Defective LED (Diskette MIM 371).

015
- Do the Diskette Speed service check (Diskette MIM 367).

Was a problem observed when doing this service check?
Y N

016
- Power Off.
- Carefully move the Head/Carriage on the drive to the innermost track.
- Observe to see if the stepper motor pulley and drive band are tight and are operating correctly. If not see the Diskette MIM's for the adjustment or replacement procedures.
- Power On.
- Observe the Head/Carriage on the drive.

Does the Head/Carriage access to the outermost track?
Y N

017
- Defective Stepper Motor (Diskette MIM 357).

018
- Do the Head Load Solenoid and Bail service check (Diskette MIM 343).

Was a problem observed when doing this service check?
Y N

019
- Preform the Drive Band service check (Diskette MIM 361).
- Preform the Head/Carriage service check (Diskette MIM 337).

Was a problem observed when doing these service checks?
Y N

020
- Defective Head/Carriage assembly (Diskette MIM 341).

- - - - - OR - - - - -

- Defective cable between the Diskette Drive Control card and the Diskette/Main MPU card (MIM 313).

021
Can the system be IPL'ed now?
Y N

022
- Defective Head/Carriage assembly (Diskette MIM 341).

023
- End of call. Run 'SYSTEST' before returning the system to the Customer (MIM 975).

EC840874

024
- Defective Solenoid (Diskette MIM 349).

- - - - - OR - - - - -

- Bail Actuator cable not installed correctly (Diskette MIM 349).

- - - - - OR - - - - -

- Head Load Bail out of adjustment (Diskette MIM 346).

025
- Defective AC Motor (Diskette MIM 351).

- - - - - OR - - - - -

- Defective Drive Belt.

- - - - - OR - - - - -

- Slipping AC Drive Belt Pully.

- - - - - OR - - - - -

- Collet not engaging diskette correctly (Diskette MIM 335).

026
- Power Off and remove the 'Ros Patch' cable.
- Install a 'Ros Patch' jumper on the Diskette/Main MPU card (A-C1) (MIM 303).
- Power On.

Does the diskette drive still fail?
Y N

027
GO TO MAP 0600, ENTRY POINT A.

028
GO TO PAGE 2, STEP 011, ENTRY POINT B.

029
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP' and run MDI 2060 to test the failing drive.
- Answer the following questions as you run this MDI.

Was the 'Drive in Use' LED working correctly?
Y N

030
GO TO MAP 2280, ENTRY POINT A.

031
Was a Read problem encountered?
Y N

032
Was a Write problem encountered?
Y N

033
Is the failing diskette drive a 51TD?
Y N

034
- Suspect a defective diskette.

- - - - - OR - - - - -

- Suspect a User problem.

EC840874

035
- Load a good scratch Diskette 2 or 2D into the failing drive.
- Probe TPE01 '+ Index' on the Diskette Drive Control card (Diskette MIM 331).

Up light: Pulses
Down light: On

Are the lights correct?
Y N

036
- Defective PTX (Diskette MIM 375).

- - - - - OR - - - - -

- Defective LED (Diskette MIM 371).

- - - - - OR - - - - -

- Defective Diskette Drive Control card (Diskette MIM 377).

- - - - - OR - - - - -

- Defective cable between the Diskette Drive Control card and the Diskette/Main MPU card (MIM 313).

037
- Due to the possibility of multiple FRUs causing this problem it is suggested that the following be replaced one at a time to determine the failing FRU or isolate the problem.

1. Diskette Drive Control card (Diskette MIM 377).
2. Cable between the Diskette/Main MPU card and the Diskette Drive Control card (MIM 313).
3. Head/Carriage assembly (Diskette MIM 341).

038
- Due to the possibility of multiple FRUs causing this problem it is suggested at this time the following be replaced one at a time to determine the failing FRU or isolate the problem.

1. Diskette Drive Control card (Diskette MIM 377).
2. Cable between the Diskette/Main MPU card and the Diskette Drive Control card (MIM 313).
3. Head/Carriage assembly (Diskette MIM 341).
4. Diskette/Main MPU card (A-C1) (MIM 303).
5. If the above Do Not resolve this problem,

GO TO MAP 0600, ENTRY POINT A.

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039
- Do the Drive Band service check (Diskette MIM 361).
- Do the Head/Carriage service check (Diskette MIM 337).

Was a problem observed when doing these service checks?
Y N

040
- Defective Head/Carriage assembly (Diskette MIM 341).

041
- Load and run 'SYSTEST' to test the failing drive (MIM 975).

Is the drive still failing?
Y N

042
- End of call.

043
- Defective Head/Carriage assembly (Diskette MIM 341).

INTER LED

PAGE 1 OF 8

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
2000	A	1	001
2250	A	1	001
2260	A	1	001
2270	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	050	0600	A
6	054	0600	A
7	059	0600	A
7	063	0600	A
8	068	0600	A
7	066	0600	A
2	003	2000	A
3	018	2000	A
4	027	2000	A
5	037	2000	A
5	044	2000	A
3	022	2000	A
5	042	2000	A
6	056	2000	A
7	065	2000	A
8	069	2000	A

001
(ENTRY POINT A)

Did you enter this MAP because of a 'Drive In Use' LED failure?

Y N

EC840874

5 2
A B

002
- If a diskette works correctly in one diskette drive, but has too many errors or does not work at all in another drive, this type of failure is probably a 'Diskette Interchange' problem. See MIM 963 for a description of other Media problems.

Did you enter this MAP because you suspect a diskette or interchange problem?
Y N

003
GO TO MAP 2000, ENTRY POINT A.

004
Does the diskette(s) fail in more than one drive.
Y N

005
Can the System be IPL'ed?
Y N

006
- Do the Drive Band service check (Diskette MIM 361) and the Head/Carriage service check (Diskette MIM 337) on the drive you are having problems with.

Was a problem observed when performing these service checks?
Y N

007
- Defective Head/Carriage assembly (Diskette MIM 341).

008
- Load and run 'SYSTEST' to test the drive you were having problems with (MIM 975).

Are you still having problems with the drive?
Y N

009
- End of call. Return the system to the customer in its original configuration.

010
- Defective Head/Carriage assembly (Diskette MIM 341).

011
- IPL the system with Diagnostic Diskette 1.
- Load 'DCP' and run MDI 2060 to test the failing drive. Be sure to use a known good scratch diskette.

Did the drive fail when running this MDI?
Y N

012
- Load and run 'TMEDIA' to test the diskette(s) you are having problems with (MIM 971).

Did the diskette(s) fail when running this test?
Y N

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013
- Do the Drive Band service check (Diskette MIM 361) and the Head/Carriage service check (Diskette MIM 337) on the drive you are having problems with.
- If the problem occurs again, replace the Head/Carriage assembly (Diskette MIM 341).

014
- Initialize the diskette(s) you are having problems with. Run 'TMEDIA' again and test the diskette(s) (MIM 971).

Did the diskette(s) fail when running this test?
Y N

015
- Suspect that the heads are worn or that the Head/Carriage is out of alignment on the drive that wrote the diskette.

016
- Defective Diskette(s), advise the customer to take these diskette(s) out of service.

017
Was a Read problem encountered?
Y N

018
- The problem is not an interchange problem,

GO TO MAP 2000, ENTRY POINT A.

019
- Do the Drive Band service check (Diskette MIM 361) and the Head/Carriage service check (Diskette MIM 337) on the drive you are having problems with.
- Load 'DCP' and run MDI 2060 again to test the failing drive. Be sure to use another known good scratch diskette.

Did the drive fail when running this MDI?
Y N

020
- Load and run 'SYSTEST' to test the drive you were having problems with (MIM 975).

Are you still having problems with the drive?
Y N

021
- End of call. Return the system to the customer in its original configuration.
- If the problem occurs again, replace the Head/Carriage assembly (Diskette MIM 341).

022
- If Read errors occur, replace the Head/Carriage assembly (diskette MIM 341). If other errors occur,

GO TO MAP 2000, ENTRY POINT A.

023
- Defective Head/Carriage assembly (Diskette MIM 341).

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024
Are you having problems with more than one diskette?
Y N

025
(ENTRY POINT B)

Did you run 'TMEDIA' to test the diskette?
Y N

026
- Load and run 'TMEDIA' to test the diskette you are having problems with (MIM 971).

Are any errors displayed when running this test?
Y N

027
- The problem is not an interchange problem,
GO TO MAP 2000,
ENTRY POINT A.

028
- Initialize the diskette you are having problems with. Run 'TMEDIA' again to test the diskette (MIM 971).

Does the diskette fail when running this test?
Y N

029
- Suspect that the heads are worn or that the Head/Carriage is out of alignment on the drive that wrote the diskette.

- - - - - OR - - - - -

- Mark this diskette and if the problem occurs again, advise the Customer to take this diskette out of service.

030
- Defective Diskette, advise the customer take this diskette out of service.

031
- Initialize the diskette you are having problems with. Run 'TMEDIA' again to test the diskette (MIM 971).

Does the diskette fail when running this test?
Y N

032
- Suspect that the heads are worn or that the Head/Carriage is out of alignment on the drive that wrote the diskette.

- - - - - OR - - - - -

- Mark this diskette and if the problem occurs again, advise the Customer to take this diskette out of service.

EC840874

033
- Defective Diskette, advise the customer take this diskette out of service.

034
Was the failing diskette(s) written on this system?
Y N

035
- Suspect the system's drive(s) that wrote this diskette(s).

036
- Run 'TMEDIA' with a known good scratch diskette (MIM 971).
- Test all the drives connected to this system.

Does only one drive give you errors?
Y N

037
- You have a hardware failure because of the multiple failures.

GO TO MAP 2000, ENTRY POINT A.

038
- Do the Drive Band service check (Diskette MIM 361) and the Head/Carriage service check (Diskette MIM 337) on the drive you are having problems with.

Were problems encountered when doing these service checks?
Y N

039
- Defective Head/Carriage assembly (Diskette MIM 341).

040
- Load and run 'SYSTEST' to test the drive you were having problems with (MIM 975).

Are you still having problems with the drive?
Y N

041
- End of call. Return the system to the customer in its original configuration.
- If the problem occurs again, replace the Head/Carriage assembly (Diskette MIM 341).

042
- If Read errors occur, replace the Head/Carriage assembly (diskette MIM 341). If other errors occur,

GO TO MAP 2000, ENTRY POINT A.

043
Are all the drives working correctly except for the 'Drive In Use' LED?
Y N

044
GO TO MAP 2000, ENTRY POINT A.

045
- Power Off the controller.
- Remove All diskette(s) from the drives and leave All the locking lever(s) open.
- Power On the controller.

Do all the 'Drive In Use' LEDs turn on?
Y N

EC840874

046
More than one 'Drive In Use' LED fail?
Y N

047
Is the failing 'Drive In Use' LED in the controller?
Y N

048
- Probe A-C1B08 (4800) or A-C2D05 (4C00) '- File In Use' for the failing LED on the logic board (MIM 501).

Up light: On
Down light: Off

Are the lights correct?
Y N

049
- Leave the probe on the previous point.

Up light: Off
Down light: On

Are the lights correct?
Y N

050
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

051
- There is an open or short in this line, use MIM 313 and Logic Diagram LD01-3 to isolate the failure.

052
- IPL the system with Diagnostic Diskette 1.

Do all the 'Drive In Use' LEDs turn off?
Y N

053
- Probe A-C1B08 (4800) or A-C2D05 (4C00) '- File In Use' for the failing LED on the logic board (MIM 501).

Up light: Off
Down light: On

Are the lights correct?
Y N

054
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

055
- There is an open or short in this line, use MIM 313 and Logic Diagram LD01-3 to isolate the failure.

056
- There is no problem with the 'Drive In Use' LEDs.

GO TO MAP 2000, ENTRY POINT A.

057
- Probe A-C1-TP30 (4000) or A-C1-TP31 (4400) for the failing LED on the Diskette/Main MPU card (A-C1) (MIM 313).

Up light: On
Down light: Off

Are the lights correct?
Y N

058
- Leave the probe on the previous point.

Up light: Off
Down light: On

Are the lights correct?
Y N

059
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

060
- There is an open or short in this line, use MIM 313 and Logic Diagram LD01-3 to isolate the failure.

061
- IPL the system with Diagnostic Diskette 1.

Do all the 'Drive In Use' LEDs turn off?
Y N

062
- Probe A-C1-TP30 (4000) or A-C1-TP31 (4400) for the failing LED on the Diskette/Main MPU card (A-C1) (MIM 313).

Up light: Off
Down light: On

Are the lights correct?
Y N

063
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

064
- There is an open or short in this line, use MIM 313 and Logic Diagram LD01-3 to isolate the failure.

065
- There is no problem with the 'Drive In Use' LEDs.
GO TO MAP 2000, ENTRY POINT A.

066
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

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067
- IPL the system with Diagnostic Diskette 1.

Do all the 'Drive In Use' LEDs turn off?
Y N

068
- Defective Diskette/Main MPU card (A-C1) (MIM 303).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

069
- There is no problem with the 'Drive In Use' LEDs.

GO TO MAP 2000, ENTRY POINT A.

ENTRY MAP

PAGE 1 OF 3

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0220	A	1	001
0300	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	007	0100	A
3	010	0100	A

001
(ENTRY POINT A)

THIS IS THE COMMUNICATIONS ENTRY MAP.

For your convenience, information about your communications system can be kept by filling out the configuration record on the right. When you have completed the configuration record, continue with the following question.

HARDCOPY CONFIGURATION RECORD FOR DIAGNOSTIC USE:

If this information was previously marked, go to Note at the end of this block.
IF not:

- See MIM 811,812,823, and 825 to determine which cards are installed and how they are configured.

- Mark the information below as required so you can accurately answer questions about the communications configuration when needed by the diagnostic programs.

MIM 823
( ) EIA

MIM 825
( ) DDSA - (US only) - 2400 bps
( ) DDSA - (US only) - 4800 bps

MIM 812
( ) 38LS - switched -
Equalizer switch ____ set ON
(Only World Trade except Canada)

(Step 001 continues)

(Step 001 continued)

MIM 812

( ) 3&LS - nonswitched -
( )2 wire ( )4 wire
( )30 ms CTS delay, 0 ms echo clamp
( )80 ms CTS delay, 50 ms echo clamp
( )230 ms CTS delay, 150 ms echo clamp
( )Transmit level (Only World Trade except Canada) = ____ dB
Equalizer switch ____ set On (only World Trade except Canada)

MIM 811

( )Programmable Attenuators on the Communications MPU card

Note: If this is the first CE call on the communications system, verify that the CTS delay and the echo clamp are compatable with the remote station(s).

Continue with the question to the left.

Is the system totally available for your use?
Y N

002
- Do not run diagnostics until the customer is finished with the machine

003
Has the system been IPLED using the C E DIAGNOSTIC DISKETTE 1?
Y N

3 3
A B

004
- To IPL the system see MIM 941.
- A full screen Reverse Image on all displays is the way the system indicates a parity check.

Is a Parity Check the indicated error?
Y N

005
(ENTRY POINT B)

Has DCP been loaded?
Y N

006
- To load DCP see MIM 951.

Were you able to load DCP?
Y N

007
- Check for obvious problems, such as:
- Diskette inserted improperly.
- Wrong diskette inserted.
- If 'DCP' still cannot be loaded,

GO TO MAP 0100,
ENTRY POINT A.

008
- Enter the communications MDI area map number (3001) and press the 'Enter' key (This should give a menu of the MDIs available to be used for communications).
- Enter the communications test number (3010).
- Follow the prompts given by the MDIs.

009
- Enter the communications MDI area map number (3001) and press the 'Enter' key (This should give a menu of the MDIs available to be used for communications).
- Enter the communications test number (3010).
- Follow the prompts given by the MDIs.

010
GO TO MAP 0100, ENTRY POINT A.

011
GO TO STEP 005,
ENTRY POINT B.

This page is intentionally left blank.

3&LS XMIT/RECV CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001
3010	B	2	006
3010	C	3	013
3010	D	5	030
3010	F	12	065

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
15	086	0600	A
16	101	0600	A
19	115	0600	A
12	060	0600	A
16	096	0600	A
14	075	0600	A
14	081	0600	A
5	028	0600	A
5	027	0600	A
8	041	0600	A

001
(ENTRY POINT A)

USE THIS MAP TO CHECK THE MODEM TRANSMIT OR RECEIVE LEVEL FOR A 3&LS INTERNAL MODEM.

For this map use the IBM CE meter with the dB adapter.

1749231 - CE meter
1749299 - dB adapter
1647116 - adapter plug assembly
2728116 - earphone

User instructions are supplied with the parts.

Ensure that the CE meter is set to the .6 ma scale and the +/- DC switch is on + DC when using the dB adapter.

Do you want the procedure for a transmit check with a switched network?

Y N

1

2 2
A B

002
Do you want the procedure for a receive check with a switched network?
Y N

003
Do you want the procedure for a transmit check with a nonswitched network?
Y N

004
Do you want the procedure for a receive check with a nonswitched network?
Y N

005
- You are in the wrong map.
- Return to the MDIs.

006
(ENTRY POINT B)

THIS IS THE RECEIVE LEVEL CHECK PROCEDURE FOR A NONSWITCHED NETWORK.

- Set the dB meter to the bridge position.
- For a 2 wire network, Connect the dB meter leads to the Red and Green (White on some cables) terminals in the 4 pin plug connector. For a 4 wire network, connect the leads to the Yellow and Black terminals.
- Have the remote station transmit a constant test pattern of hex FFFF.

Is the receive level correct? (US should be between -15 and -17 dB. In World Trade, this information may be obtained from the PTT representative.)
Y N

007
- Have the remote station check that the transmit level is correct.

- - - - - OR - - - - -

- Telephone network problem.
- Have the customer inform the person responsible.

008
Is the system connected to a 4 wire nonswitched network?
Y N

009
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

010
- To check the internal and external cables,
- Connect the dB meter to A-D8B09 '+ Rec nonsw data' and A-D8D13 '- Rec Nonsw data' (MIM 865, probe point C).

Is the receive level correct?
Y N

011
- see MIM 865 to find the failure.

012
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

013
(ENTRY POINT C)

THIS IS THE TRANSMIT LEVEL CHECK PROCEDURE FOR A NONSWITCHED NETWORK.

- At this point, the communications MDIs should be loaded and transmitting a constant test pattern of hex FFFF.
- Take the cover off the 4 pin plug connector to the telephone line.
- The plug must be connected to the telephone line to read the dB level correctly.
- Set the dB meter to the bridge position.
- Connect the dB meter to the Red and Green (or White in some cables) terminals inside the plug.
- The transmit level for US and Canada nonswitched networks is 00 dB. For World Trade countries (except Canada), this information may be obtained from the PTT representative.)

Does the dB meter indicate the value expected within a tolerance of one dB?
Y N

014
- Connect the dB meter between A-D8B02 '+ Xmit Nonsw Data', (MIM 865, probe point C) and A-D8D05, '- Xmit Nonsw Data', (MIM 865, probe point C).

Is the dB level correct?
Y N

015
Note: A quick way to identify a communications MPU card which has programmable attenuation is as follows:
If there are 4 transmit level attenuators on the lower left quadrant of the communications MPU card, the card has programmable attenuation (MIM 811).

Does the communications MPU card have programmable attenuation?
Y N

016
Is this a world trade machine?
Y N

017
- Defective 38LS line adapter card (A-D7)(MIM 812).

018
- See 38LS switch setting chart in MIM 813, 815, or 817 to determine which switches should be on.

Are all switches on the 38LS line adapter card set correctly?
Y N

019
- Set correctly and retry the test.

020
- Defective 38LS line adapter card (A-D7)(MIM 812).

021
- Defective 38LS line adapter card (A-D7)(MIM 812).

022
- Power off.
- Remove the 38LS card.
- Check continuity between A-E8B02, '+ Xmit Nonsw Data' (MIM 865, probe point D), and the red lead AT THE 4 PIN PLUG CONNECTOR to the telephone line.
- Check continuity between A-E8D05, '- Xmit Nonsw Data', (MIM 865, probe point D), and the green lead AT THE 4 PIN PLUG CONNECTOR to the telephone line.

Is continuity good?
Y N

023
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-03 '+ Xmit Nonsw Data' (MIM 865, probe point E), and the red lead AT THE 4 PIN PLUG.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-04 '- Xmit Nonsw Data' (MIM 865, probe point E) and the green lead AT THE 4 PIN PLUG.

Is continuity good?
Y N

024
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-13 '+ Xmit Nonsw Data' (MIM 865, probe point F), and the red lead AT THE 4 PIN PLUG.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-14 '- Xmit Nonsw Data' (MIM 865, probe point F) and the green lead AT THE 4 PIN PLUG.

Is continuity good?
Y N

025
- Defective external cable.

026
- Defective internal cable.

027
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

028
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

029
- The test is complete.
- Return to the MDIs, answer 'Y', and follow the prompts.

030
(ENTRY POINT D)

THIS IS THE RECEIVE LEVEL CHECK PROCEDURE FOR A SWITCHED NETWORK.

- Set the dB meter to the bridge position.

Is the World Trade line plate being used?
Y N

031
THIS IS THE RECEIVE LEVEL CHECK PROCEDURE FOR A SWITCHED NETWORK USING THE CBS COUPLER ONLY.

- Ensure that the test switch (if present) on the CBS type coupler is in the normal position.
- Have the receiving system powered on and connected to the coupler.
- Set the dB meter to the -30 dB scale.
- Set the dB meter to the 'Bridge' position.
- Connect meter across 'Data Tip' & 'Data Ring' on the receiving coupler.
- Call the transmitting station from the receiving station.
- Have the transmitting system transmit constant hex FFFF test patterns.
- You will hear a constant tone at the receiving station.
- Carefully place the telephone switch in the alternate position to permit the constant tone to be switched to 'Data Tip' and 'Data Ring' on the coupler.
- Keep the telephone off hook until all measurements have been made.
- Measure the dB level.

Is the receive level correct? (US should be between -21.5 and -27.2 dB. In World Trade, this information may be obtained from the PTT representative.)
Y N

7
R S

032
- Disconnect '+Data Tip' and 'Data Ring' wires FROM THE COUPLER.
- Set the dB meter to the '600 ohm' position.
- Connect meter across 'Data Tip' & 'Data Ring' ON THE RECEIVING COUPLER.

Does the db measurement look close to the expected value for normal operation?
Y N

033
- Have the person at the transmitting station ensure that his transmit dB level is correct at the coupler.
- If his tranmit level is correct, place another call to see if another connection improves the received dB level.
- If these were not the cause of the bad receive dB level measurement, have the customer place a call to the telephone company.

034
GO TO PAGE 7, STEP 036,
ENTRY POINT E.

035
Note: If you cannot verify the following dB measurements (bad dB meter or such), seeing that '-Carrier Det' is active verifies that the 3&LS is receiving the signal.
- Probe A-D7B12, '- Carrier Det' (MIM 867, probe point B).

Up light: Off
Down light: On

Are the lights correct?
Y N

036
(ENTRY POINT E)

- Reconnect '+Data Tip' and '+Data Ring' wires to the coupler if they were removed.
- Power off.
- Remove the 3&LS card.
- Check continuity between A-D7D06 'Data Tip (DT)' and the White lead AT THE COUPLER.
- Check continuity between A-E5D08 'Data Ring (DR)' and the Black lead AT THE COUPLER.

Is continuity good?
Y N

037
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-07 'Data Tip (DT)' and the White lead AT THE COUPLER.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-23 'Data Ring (DR)'and the Black lead AT THE COUPLER.

Is continuity good?
Y N

038
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-09 'Data Tip (DT)' and the White lead AT THE COUPLER.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-21 'Data Ring (DR)' and the Black lead AT THE COUPLER.

Is continuity good?
Y N

039
- Defective external cable.

040
- Defective internal cable.

38LS XMIT/RECV CHECK

041
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

042
- Defective 38LS line adapter card (A-D7)(MIM 812).

043
- The receive test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

044

THIS IS THE RECEIVE CHECK FOR A 3&LS WITH WORLD TRADE LINE PLATE CONNECTED TO A PUBLIC SWITCHED NETWORK (MIM 869)

- Connect the dB meter to 'Telephone Line 1' and 'Telephone Line 2' AT THE END OF THE EXTERNAL CABLE (See Fig 1 at right).

Note: The Cable must be connected to the Public Switched network for correct dB level checking.

- At this point, the remote station should be transmitting a constant test pattern of hex FFFF.

Does the dB meter indicate the value expected within a tolerance of one dB?

Y N

Note: For World Trade the dB information may be obtained from the PTT representative.

Line name	WT line plate cable conn	extern cable lead color
Telephone Line 1	TB1-9	Red
Telephone Line 2	TB1-8	Green or White
Telephone Set 1	TB1-7	Yellow
Telephone Set 2	TB1-6	Black

Fig 1. Aid for dB level check on the telephone lines and at the PSN connector.

045
- Disconnect 'Telephone Line 1' and 'Telephone Line 2' wires FROM THE WALL MOUNTED CONNECTOR.
- Set the dB meter to the '600 ohm' position.
- Connect meter across 'Telephone Line 1' and 'Telephone Line 2' ON THE RECEIVING WALL MOUNTED CONNECTOR.

Does the db measurement look close to the expected value for normal operation?
Y N

046
- Have the person at the transmitting station ensure that his transmit dB level is correct at the wall mounted connector.
- If his transmit level is correct, place another call to see if another connection improves the received dB level.
- If these were not the cause of the bad receive dB level measurement, have the customer place a call to the telephone company.

047
- Power off.
- Disconnect external cable from the PTT interface.
- Check for an open line or a short to ground between TP1 (MIM 827) (which is a direct line to TB1-9) and THE END OF THE EXTERNAL CABLE.
- Check for an open line or a short to ground between TP2 (MIM 827) (which is a direct line to TB1-8) and THE END OF THE EXTERNAL CABLE.

Did the cables check out ok?
Y N

048
- Check the cable for open lines or shorts to ground from the external cable interface at the J140 connector (MIM 869, probe point H) to the PTT connector.

Did the cables check out ok?
Y N

049
- Defective external cable.

050
- Defective internal cable to the World Trade line plate.

051
- Defective World Trade line plate.

052
- Check for the correct dB level going into the the World Trade line plate.
- Connect the dB meter between TP1, 'Telephone Line 1', (MIM 827) (which is a direct line to TB1-9) and TB2, 'Telephone Line 2' (MIM 827) (which is a direct line to TB1-8).

Is the dB level correct?
Y N

053
- Check for the correct dB level at the J140 connector on the external cable (MIM 869, probe point H).
- Connect the dB meter between J140-13 '- Telephone Line 1', and J140-14 'Telephone Line 2'.

Is the dB level correct?
Y N

054
- Defective external cable.

055
- Defective internal cable that connects the World Trade line plate to J140.

056
Note: If you cannot verify the following dB measurements (bad dB meter or such), seeing that '- Carrier Det' is active verifies that the 38LS is receiving the signal.
- Probe A-D7B12, '- Carrier Det' (MIM 869, probe point B).

Up light: Off
Down light: On

Are the lights correct?
Y N

057
- Power off.
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-07, 'Data Tip', (MIM 869, probe point E), and the line plate connector A08 (MIM 869, probe point F).
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-23, 'Data Ring',(MIM 869, probe point E), and the line plate connector B08 (MIM 869, probe point F).

Is continuity good?
Y N

058
- Defective cable between the Communications MPU card and the World Trade line plate.

059
- Check continuity between A-E5-J01-23, 'Data Ring' (MIM 869, probe point E) and A-E5 D08.

Is continuity good?
Y N

060
- Defective Communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

061
- Remove the 38LS card.
- Check continuity between A-E7D06, 'Data Tip (DT)' (MIM 869, probe point D), and A-D7D06, (MIM 869, probe point C).
- Check continuity between A-D7B10 '- Rec Line Data' (MIM 869, probe point B) and A-E7B10, (MIM 869, probe point A).

Is continuity good?
Y N

062
- Defective Logic Board.

063
- Defective world trade line plate.

064
- The receive test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

065
(ENTRY POINT F)

THIS IS THE TRANSMIT LEVEL CHECK PROCEDURE FOR A SWITCHED NETWORK.

- Set the dB meter to the bridge position.

Is the World Trade line plate being used?
Y N

066
THIS IS THE TRANSMIT LEVEL CHECK PROCEDURE FOR A SWITCHED NETWORK USING THE CBS COUPLER ONLY.

- Ensure that the test switch (if present) on the CBS type coupler is in the normal position.
- Connect the dB meter to the 'Data Tip' (white lead) and 'Data Ring' (Black lead) AT THE COUPLER.
- At this point, the communications MDIs should be loaded and transmitting a constant test pattern of hex FFFF.

Does the dB meter indicate the value expected within a tolerance of one dB?
Y N

067
- See 3&LS switch setting chart in MIM &13, &15, or &17 to determine which switches should be on. (If using programmable attenuation, the 3&LS card should have been set for 00 dB).

Note: A quick way to identify a communications MPU card which has programmable attenuation is as follows:
  If there are 4 transmit level attenuators on the lower left quadrant of the communications MPU card, the card has programmable attenuation (MIM &11).

Are all switches on the 3&LS line adapter card set correctly?
Y N

068
- Set correctly and retry the test.

069
- Connect the dB meter between A-D7D05 'Data Tip (DT)' (MIM &67, probe point C), and A-D7D03 'Gnd'. The DB level should be equal to the LEVEL SET IN THE 3&LS 1INE ADAPTER CARD SWITCHES(MIM &12).

Is the dB level correct?
Y N

070
- Power off.
- Remove the 3&LS card.
- Check continuity between A-D&D09 '+Coupler Cut Through (CCT)', (MIM &67, probe point C), and the Brown lead AT THE COUPLER.

Is continuity good?
Y N

071
- Disconnect the internal cable from the communications MPU card at connector A-E5 J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-06 '+Coupler Cut Through (CCT)', (MIM &67, probe point E), and the Brown lead AT THE COUPLER.

Is continuity good?
Y N

072
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-06 '+Coupler Cut Through (CCT)', (MIM &67, probe point F), and the Brown lead AT THE COUPLER.

Is continuity good?
Y N

073
- Defective external cable.

074
- Defective internal cable.

075
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

076
- Check continuity between A-D7D05 '+Data Tip (DT)', (MIM 867, probe point C), and the White lead AT THE COUPLER.

Is continuity good?
Y N

077
- Disconnect the internal cable from the communications MPU card at connector A-E5 J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-07 '+Data Tip (DT)', (MIM 867, probe point E), and the White lead AT THE COUPLER.

Is continuity good?
Y N

078
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-09 '+Data Tip (DT)', (MIM 867, probe point F), and the White lead AT THE COUPLER.

Is continuity good?
Y N

079
- Defective external cable.

080
- Defective internal cable.

081
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

082
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D7D05, 'Data Tip', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

083
- Defective 38LS line adapter card (A-D7)(MIM 812).

084
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

085
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-07 'Data Tip', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

086
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

087
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-09 'Data Tip', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

088
- Defective internal cable.

089
- Defective external cable

090
- Defective logic board

091
- Power off.
- Remove the 38LS card.
- Check continuity between A-D7D06 'Data Tip (DT)' (MIM 867, probe point C), and the White lead AT THE COUPLER.
- Check continuity between A-E5D08 'Data Ring (DR)' and the Black lead AT THE COUPLER.

Is continuity good?
Y N

092
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-07 'Data Tip (DT)' (MIM 867, probe point E), and the White lead AT THE COUPLER.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-23 'Data Ring (DR)' (MIM 867, probe point E), and the Black lead AT THE COUPLER.

Is continuity good?
Y N

093
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-09 'Data Tip (DT)',(MIM 867, probe point F), and the White lead AT THE COUPLER.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-21 'Data Ring (DR)'and the Black lead AT THE COUPLER.

Is continuity good?
Y N

094
- Defective external cable.

095
- Defective internal cable.

096
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

097
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D7D06, 'Data Tip', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

098
- Defective 3&LS line adapter card (A-D7)(MIM 812).

099
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

100
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-07 'Data Tip', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

101
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

102
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-09 'Data Tip', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

103
- Defective internal cable.

104
- Defective external cable

105
- Defective logic board

106
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

107

THIS IS THE TRANSMIT CHECK FOR A 3&LS WITH WORLD TRADE LINE PLATE CONNECTED TO A PUBLIC SWITCHED NETWORK (MIM 827, 869).

- Connect the dB meter to 'Telephone Line 1' and 'Telephone Line 2' AT THE END OF THE EXTERNAL CABLE (See Fig 1 at right).

Note: The Cable must be connected to the Public Switched network for correct dB level checking.

- At this point, the communications MDIs should be loaded and transmitting a constant test pattern of hex FFFF.

Note: For World Trade the dB information may be obtained from the PTT representative.
France: -06 dB.

Line name	WT line plate cable conn	extern cable lead color
Telephone Line 1	TB1-9	Red
Telephone Line 2	TB1-8	Green or White
Telephone Set 1	TB1-7	Yellow
Telephone Set 2	TB1-6	Black

Fig 1. Aid for dB level check on the telephone lines and at the PSN connector.

Does the dB meter indicate the value expected within a tolerance of one dB?
Y N

108
- See 3&LS switch setting chart in MIM 821 to determine which switches should be on for the desired dB level.

Are all dB level switches on the 3&LS line adapter card set for the correct dB?
Y N

109
- Set correctly and retry the MDIs.

110
- Check for the correct dB level going into the the communications MPU card.
- Connect the dB meter between A-D7D05 'Data Tip (DT)', and A-E5D08 'Gnd' (MIM &69, probe point C).

Is the dB level correct?
Y N

111
- Defective 3&LS line adapter card (A-D7)(MIM &12).

112
- Check for the correct dB level at the World Trade line plate:
- Connect the dB meter between TP1 and TP2 (MIM &27).

Does the dB meter indicate the correct value now?
Y N

113
- Power off.
- Check the cable continuity from the communications MPU card to the World Trade line plate.
- Check the cable for shorts.

Is the cable the problem?
Y N

114
- Defective World Trade line plate.

Is the World Trade line plate the problem?
Y N

115
- Defective communications MPU card (A-E5)(MIM &11).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

116
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

117
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

118
- Power off.
- Disconnect external cable from the PTT interface.
- Check for an open line or a short to ground between TP1 (MIM &27) (which is a direct line to TB1-9) and THE END OF THE EXTERNAL CABLE.
- Check for an open line or a short to ground between TP2 (MIM &27) (which is a direct line to TB1-8) and THE END OF THE EXTERNAL CABLE.

Did the cable check out ok?
Y N

119
- Check the cable for open lines or shorts to ground from the World Trade line plate (MIM 869, probe point G) to the J140 connector(MIM 869, probe point H).

Did the cable check out ok?
Y N

120
- Defective internal cable coming from the World Trade line plate to the external cable interface at J140 connector.

121
- Check the cable for open lines or shorts to ground from the J140 connector (MIM 869, probe point H) to the PTT connector.

Did the cable check out ok?
Y N

122
- Defective external cable.

123
- Defective World Trade line plate.

124
- Defective World Trade line plate.

125
- The test is complete.
- Return to the MDIs, answer 'Y' and follow the prompts.

AUTO ANSWER COUPLER

PAGE 1 OF 13

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	009	0600	A
6	039	0600	A
7	055	0600	A
9	067	0600	A
11	092	0600	A
10	079	0600	A
11	087	0600	A
4	026	0600	A
7	050	0600	A

001
(ENTRY POINT A)

USE THIS MAP TO FIND PROBLEMS IN THE LOCAL 3&LS INTEGRATED MODEM OR LOCAL AUTO ANSWER TYPE COUPLER (CBS) BY USING ANOTHER TELEPHONE.

- Before continuing, verify that the connections from the modem to the coupler are correct (see color code chart on the right).
- Ensure that the test switch (if present) on the CBS type coupler is in the normal position.
- When measuring EIA levels, select the 60 Vdc scale on the CE meter to prevent meter damage.
- Place the +/- DC switch on the CE meter to the + DC position.
- The meter lead connections will be indicated by the MAP questions so that the expected signal will deflect the meter in a positive direction.
- Place the telephone(s) on hook.
- Some telephones have a Talk/Data

(Step 001 continues)

*** LINE NAMES AND COLOR CODES. ***

Lines are listed from left-to-right as they appear when looking at the coupler.

'Switch Hook' = Red
'Signal Ground' = Gray
'Data Modem Ready' = Yellow
'Coupler Cut Through' = Brown
'Off Hook' = Blue
'Ring Indicate' = Violet
'Data Tip' = White
'Data Ring' = Black

NOTES:

'+ EIA levels' are +3 to +25 Vdc when measured to 'Signal Ground'.

'- EIA levels' are -3 to -25 Vdc when measured to 'Signal Ground'.

All above coupler connections except 'Data Tip' and 'Data Ring' have active levels which are at '+ EIA levels.'

(Step 001 continued)
switch on the base. Place the Talk/Data Switch (if present on the telephone base) to Talk position.
- Connect the CE meter leads TO THE COUPLER as follows:
  Plus to 'Signal Ground' (gray)
  Minus to 'Switch Hook' (red)
- A positive deflection indicates a -EIA level.

Is 'Switch Hook', (red lead), at a - EIA level?
Y N

002
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Switch Hook' (red)

Is 'Switch Hook', (red lead), at a +EIA level?
Y N

003
- Disconnect the external cable from the machine at connector J140.

Did 'Switch Hook' (red lead) go to +EIA or -EIA level?
Y N

004
- The EIA level is not correct.
- Have the customer place a call to the telephone company.

3 3
A B C

005
- Power off.
- Reinstall the external cable at connector J140.
- Remove the 38LS line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D8B10, 'Switch Hook', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

006
- Defective 38LS line adapter card (A-D7)(MIM 812).

007
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line still grounded?
Y N

008
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-14 'Switch Hook', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

EC840874 PEC839787

3 3 3
D E F

009
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card, GO TO MAP 0600, ENTRY POINT A.

010
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-05 'Switch Hook', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

011
- Defective internal cable.

012
- Defective external cable.

013
- Defective logic board.

014
- Connect the CE meter leads TO THE COUPLER as follows:

  Plus to 'Signal Ground' (gray)
  Minus to 'Switch Hook' (red)

- Take the telephone off hook.
- A positive deflection indicates a -EIA level.

Does 'Switch Hook', (red lead), go to a -EIA level?
Y N

015
- Defective coupler or talk/data mode switch.

016
- The talk/data mode switch is reversed in the telephone.

017
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Switch Hook' (red)

- Take the telephone off hook.
- A positive deflection indicates a +EIA level.

Does 'Switch Hook', (red lead), go to a +EIA level?
Y N

018
- The talk/data mode switch is not wired to the coupler.
- Have the customer place a call to the telephone company.

019
Do you hear the dial tone? NOTE: Talk/Data mode switch NOT manually raised.
Y N

020
- Lift the talk/data mode switch.

Do you hear the dial tone?
Y N

021
- Power off.
- Remove the 3&LS card.
- Check continuity between A-D&D02 '+Data Modem Ready' (MIM &67, probe point C) and the Yellow lead AT THE COUPLER.

Is continuity good?
Y N

022
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE EXTERNAL CABLE check continuity between P01-15 '+Data Modem Ready' (MIM &67, probe point E) and the Yellow lead AT THE COUPLER.

Is continuity good?
Y N

023
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-20 '+Data Modem Ready' (MIM &67, probe point F) and the Yellow lead AT THE COUPLER.

Is continuity good?
Y N

024
- Defective external cable.

025
- Defective internal cable.

026
- Defective communications MPU card (A-E5)(MIM &11).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

027
- Defective 3&LS line adapter card (A-D7)(MIM &12).

028
Can calls be placed as with a normal telephone?
Y N

029
- The problem is in the telephone.
- Have the customer place a call to the telephone company.

030
- Place the telephone(s) on hook.
- Place a call from another telephone to the coupler number.

Does the bell ring in coupler telephone?
Y N

031
- Have the customer place a call to the telephone company to check that 'Ringer On The Line Side' option is installed.

032
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Ring Indicate' (violet)

While the call is being placed and the coupler telephone is ringing, does 'Ring Indicate', (violet lead), go to a +EIA level with each ring?
Y N

033
- Disconnect the external cable from the machine at connector J140.

Did 'Ring Indicate', (violet lead), go to a +EIA or -EIA level?
Y N

034
- The problem is in the coupler.
- Have the customer place a call to the telephone company.

035
- Power off.
- Reinstall the external cable at connector J140.
- Remove the 38LS line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D8B13, 'Ring Indicate', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

036
- Defective 38LS line adapter card (A-D7)(MIM 812).

037
- Remove the communications MPU card (A-E5)(MIM 811).

Is the line still grounded?
Y N

038
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-21, 'Ring Indicate', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

039
- Defective communications MPU card(A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

040
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-22, 'Ring Indicate', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

041
- Defective internal cable.

042
- Defective external cable.

043
- Defective logic board.

044
- Connect the CE meter leads TO THE COUPLER as follows:

  Plus to 'Signal Ground' (gray)
  Minus to 'Off Hook' (blue)

- A positive deflection indicates -EIA signal.

While the call is being placed and the coupler telephone is ringing, is 'Off Hook' (blue lead) at -EIA level?
Y N

045
- Power off.
- Remove the 38LS card.
- Check continuity between A-D8B03 '+Off Hook' (MIM 867, probe point C) and the Blue lead AT THE COUPLER.

Is continuity good?
Y N

046
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-17 '+Off Hook' (MIM 867, probe point E) and the Blue lead AT THE COUPLER.

Is continuity good?
Y N

047
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-04 '+Off Hook' (MIM 867, probe point F) and the Blue lead AT THE COUPLER.

Is continuity good?
Y N

048
- Defective external cable.

049
- Defective internal cable.

050
- Defective communications MPU card(A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

051
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D8B03, 'Off HOOK', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

052
- Defective 38LS line adapter card (A-D7)(MIM 812).

Y

Y

053
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

054
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-17 'Off Hook', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

055
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

056
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-04 'Off Hook', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

057
- Defective internal cable.

058
- Defective external cable.

059
- Defective logic board.

060
- Connect the CE meter leads TO THE COUPLER as follows:

  Plus to 'Signal Ground' (gray)
  Minus to 'Coupler Cut Through' (brown)

- A positive deflection indicates -EIA signal.

While the call is being placed and the coupler telephone is ringing, is 'Coupler Cut Through' (brown lead) at -EIA level?
Y N

9 A B

A C MAP 3012-8

061
- Disconnect the external cable from the machine at connector J140.

Did 'Coupler Cut Through' (brown lead) go to -EIA level?
Y N

062
- The problem is in the coupler.
- Have the customer place a call to the telephone company.

063
- Power off.
- Reinstall the external cable at connector J140.
- Remove the 38LS line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D8D09, 'Coupler Cut Through', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

064
- Defective 38LS line adapter card (A-D7)(MIM 812).

065
- Remove the communications MPU card.

Is the line still grounded?
Y N

9 9 A A D E

066
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-06, 'Coupler Cut Through', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

067
- Defective communications MPU card(A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

068
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-06, 'Coupler Cut Through', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

069
- Defective internal cable.

070
- Defective external cable.

071
- Defective logic board.

072
- Place the telephone(s) on hook.
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Data Modem Ready' (yellow)

(ENTRY POINT B)

- Again place a call from another telephone to the coupler number.
- When the coupler telephone rings, take the telephone off hook and observe the CE meter for a +EIA level.

Does 'Data Modem Ready' (yellow lead) go to +EIA level?
Y N

073

Did the telephone stop ringing when taken off hook?
Y N

074
- Power off.
- Remove the 38LS card.
- Check continuity between A-D8B10 '+Switch Hook' (MIM 867, probe point C) and the Red lead AT THE COUPLER.

Is continuity good?
Y N

075
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-14 '+Switch Hook' (MIM 867, probe point E) and the Red lead AT THE COUPLER.

Is continuity good?
Y N

076
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-05 '+Switch Hook' (MIM 867, probe point F) and the Red lead AT THE COUPLER.

Is continuity good?
Y N

077
- Defective external cable.

078
- Defective internal cable.

079
- Defective communications MPU card(A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

080
- Defective 3&LS line adapter card (A-D7)(MIM 812).

081
Is auto-call selected on the modem?
Y N

082
- Power off.
- Remove the 3&LS card.
- Check continuity between A-D&D02 '+Data Modem Ready' (MIM 867, probe point C) and the Yellow lead ON THE COUPLER.

Is continuity good?
Y N

083
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-15 '+Data Modem Ready' (MIM 867, probe point E) and the Yellow lead AT THE COUPLER.

Is continuity good?
Y N

084
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-20 '+Data Modem Ready' (MIM 867, probe point F) and the Yellow lead AT THE COUPLER.

Is continuity good?
Y N

085
- Defective external cable.

086
- Defective internal cable.

087
- Defective communications MPU card(A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

088
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D8D02, 'Data Modem Ready', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

089
- Defective 38LS line adapter card (A-D7)(MIM 812).

090
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

091
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-15 'Data Modem Ready', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

092
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

093
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-20 'Data Modem Ready', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

094
- Defective internal cable.

095
- Defective external cable.

096
- Defective logic board.

097
- Place the auto-call switch (on the 38LS) in the position to originate a normal telephone call.

GO TO PAGE 9, STEP 072,
ENTRY POINT B.

098
- Place the telephone(s) on hook.
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Off Hook' (blue)

- Again place a call from another telephone to the coupler number.
- When the coupler telephone rings, take the telephone off hook and observe the CE meter for a +EIA level.

Is 'Off Hook' (blue lead) at a +EIA level?
Y N

099
- Check continuity between A-D8B03 '+Off Hook' (MIM 867, probe point C) and the Blue lead ON THE COUPLER.

Is continuity good?
Y N

100
- The problem is in the cables.

101
- Place the telephone(s) on hook.
- Go back to the MDI prompt, answer 'Y', and follow the prompts.

102
- In order to see the delay expected,
- Place the telephone(s) on hook.
- Connect the CE meter leads TO THE COUPLER as follows:

  Minus to 'Signal Ground' (gray)
  Plus to 'Coupler Cut Through' (brown)

- Again place a call from another telephone to the coupler number.
- When the coupler telephone rings, take the telephone off hook and observe the CE meter for a +EIA level.

Does 'Coupler Cut Through' (brown lead) go to a +EIA level after 1 to 3 seconds of delay?
Y N

103
- The problem is in the coupler.
- Have the customer place a call to the telephone company.

104
- Place the telephone(s) on hook.
- Go back to the MDI prompt, answer 'Y', and follow the prompts.

105
- The talk/data mode switch is not wired correctly in the telephone.

Note: The delay indicates to the modem that it is being called. This signals the modem to send answer tone.

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NON AUTO ANSWER COUPLER

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001
3010	B	2	009

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	016	0600	A
5	025	0600	A
5	028	0600	A
3	017	0600	A
4	023	0600	A

001
(ENTRY POINT A)

USE THIS MAP TO FIND CONNECTION PROBLEMS BY USING ANOTHER TELEPHONE WHEN THE LOCAL STATION HAS A COUPLER WITH NO AUTO-ANSWER FUNCTION (CDT), (MANUAL CALL TO A MANUAL ANSWER STATION).

- Ensure the test switch (if present) on the CDT type coupler is in the normal position.
- Take the telephone off hook.

Do you hear the dial tone?
Y N

002
- Lift the data/talk mode switch.

Do you hear the dial tone?
Y N

003
- Telephone problem.
- Have the customer place a call to the telephone company.

2 2
A B

For this map use the IBM CE meter with the dB adapter.

1749231 - CE meter
1749299 - dB adapter
1647116 - adapter plug assembly
2728116 - earphone

User instructions are supplied with the parts.

Ensure that the CE meter is set to the .6 ma scale and the +/- DC switch is on + DC when using the dB adapter.

004
- The data/talk switch is not wired, correctly in the telephone.

005
- Place the telephone on hook.
- Have a call placed from another telephone.

Does the telephone ring?
Y N

006
- Telephone problem.
- Have the customer place a call to the telephone company.

007
- Take the telephone off hook.

Can you talk with the person on the other telephone?
Y N

008
- Telephone problem.
- Have the customer place a call to the telephone company.

009
- Place the telephone(s) on hook.
- Go back to the MDI prompt, answer 'Y', and follow the prompts.

(ENTRY POINT B)

THIS IS THE TRANSMIT LEVEL CHECK FOR A SWITCHED NETWORK WITH A CDT TYPE COUPLER.

- The communications MDIs should be loaded and set up to transmit a constant data pattern of hex FFFF.
- Again, place a call to the modem telephone from another telephone.
- Carefully place the talk/data mode switch into its alternate position. This puts the modem telephone into data mode.
- Do not place the modem telephone on hook.
- Connect the dB meter between 'Data Tip' and 'Data Ring' at the coupler.

Does the dB meter indicate the value expected (should be marked on the coupler) within a tolerance of one dB?
Y N

010
- See 38LS switch setting chart in MIM 813,815, or 817 to determine which switches should be on. (If using programable attenuation, the 38LS card should have been set for 0 db.

Are all switches on the 38LS line adapter card set correctly?
Y N

011
- Set correctly and rerun the test.

012
- Connect the dB meter between A-D7D05 'SW Data Xmit' and A-D7D08 'Gnd'. The DB level should be equal to the level set in the 38LS line adapter card switches.
- Note: A quick way to indentify a communications MPU card that has programmable attenuation is as follows:
  - If there are 4 transmit level attenuators on the lower left corner of the communications MPU card, the card has programmable attenuation(MIM 811).

Is the db level correct?
Y N

013
- Power off.
- Remove the 38LS card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D7D05, 'SW Data Xmit', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

014
- Defective 38LS line adapter card (A-D7)(MIM 812).

015
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

016
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

017
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

018
- Power off.
- Remove the 38LS card.
- Check continuity between A-D7D06 '+Data Tip' and the lead at the coupler.
- Check continuity between A-D7D08 '+Data Ring' and the lead at the coupler.

Is continuity good?
Y N

019
- Disconnect the internal cable from the communications MPU card at connector A-E5-J01.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-07 '+Data Tip' and the lead AT THE COUPLER.
- At the P01 connector ON THE INTERNAL CABLE check continuity between P01-23 '+Data Ring' and the lead AT THE COUPLER.

Is continuity good?
Y N

020
- Disconnect the external cable from the machine at connector J140.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-09 '+Data Tip' and the lead AT THE COUPLER.
- At the P140 connector ON THE EXTERNAL CABLE check continuity between P140-21 '+Data Ring' and the lead AT THE COUPLER.

Is continuity good?
Y N

021
- Defective external cable.

022
- Defective internal cable.

023
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

024
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure A-D7D06, 'Data Tip', to A-D8D08, 'Gnd' (MIM 867, probe point C).

Is the line grounded?
Y N

025
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

026
- Remove the communications MPU card (A-E5)(MIM 811)

Is the line grounded?
Y N

027
- Disconnect the internal cable from the A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P01 connector ON THE INTERNAL CABLE, measure from P01-07 'Data Tip', to P01-23 ,'Signal Ground' (MIM 867, probe point E).

Is the line grounded?
Y N

028
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600,
ENTRY POINT A.

D N P 2

029
- Disconnect the external cable from the machine at connector J140.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. At the P140 connector ON THE EXTERNAL CABLE, measure from P140-09 'Data Tip', to P140-21 ,'Signal Ground' (MIM 867, probe point F).

Is the line grounded?
Y N

030
- Defective internal cable.

031
- Defective external cable.

032
- Defective logic board.

033
Can the constant test pattern of hex FFFF be heard at the calling telephone?
Y N

034
- Telephone problem
- Have the customer place a call to the telephone company.

035
- The test is complete.
- Return to the MDIs, answer 'Y', and follow the prompts.

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DIGITAL DATA SERVICE ADAPTER

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001

001
(ENTRY POINT A)

USE THIS MAP TO TEST THE DIGITAL NETWORK WITH A REMOTE DDSA STATION (WRAP TEST PROCEDURE).

- Ensure that MDI 3010 runs without errors and the diagnostics at other stations also run without errors.
- If the disable double loopback (DDL) jumper is installed on the remote DDSA line adapter card, have the remote service person remove it (see MIM 825, jumper position E for the location of the jumper).
- Have the remote station loop a local wrap test.

Did the test run correctly?
Y N

002
- Verify that the local and remote stations are set up correctly to run the test. If they are set up correctly, the problem is in the digital telephone network.
- Have the customer inform the person responsible.

- Note: For normal operation DDL (MIM 825, jumper positon E) must be jumpered on all secondary stations on a multipoint network. If not, the wrap tests run by any secondary station will slow the operation of the rest of network.

003
Does the remote station have a remote wrap test?
Y N

004
- The test is complete.

005
- Remove the DDL jumper from the DDSA line adapter card at the local station and run MDIs.
- Have the remote station run the remote test.

Did the test run correctly?
Y N

006
- Verify that the local and remote stations are set up correctly to run the test.
- If the set up is correct, the problem is in the digital telephone network.
- Have the customer inform the person responsible.

007
- The local and remote BSCA and the digital network tested correctly.
- Replace the DDL jumper if it was removed.

OTHER COMM PROBLEMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	006	0600	A
3	008	0600	A
4	013	0600	A
3	009	0800	A
3	010	0800	A

001
(ENTRY POINT A)

PROBLEMS WHICH THE MAPS AND MDIS CANNOT FIND.

- Some failure conditions exist which the MDIs and MAPs cannot find because they do not cause an observable error.

Examples:

1. If 'Rate Select' is in the wrong state the symptom will be:
   The system is running slow, or performance is affected in an adverse way (different from that which the customer expects).
2. If 'Data Set Ready' is open, the line may float to the correct polarity and there will be no error.
3. Other problems that cannot be found by diagnostics are added here for your information. Customer reported error codes 4206, 4207, 5206, and 5207.
4. When all else fails to fix the problem, replace FRUs in the following order until the problem goes away.

1 - the feature line adapter card.
2 - the communications MPU card.
3 - the internal cable.
4 - the external cable.
5 - call for assistance.

For these and intermittent problems use the methods listed in Note 1:

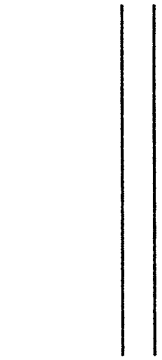
Note 1: DEALING WITH INTERMITTENT COMMUNICATIONS PROBLEMS.
(Step 001 continues)

(Step 001 continued)

- Have the customer maintain a record of the communications error log and the internal data trap by calling 'TCOMLOG' after his program ends in an abnormal termination.
- Use the program 'TCOMEREP' to display and print the error logs recorded by 'TCOMLOG'.
- Work with the customer to verify that the communications configuration record is correct. This may require knowing what the DCR name is and using the program 'SYSCCU' to look at the configuration record.
- Verify that all jumpers, strapping, and cable hook ups are correct for the communications feature and modems being used. (See MIM for strapping information.)
- Verify that all lines from the coupler have continuity through the cables, the communications MPU card, the logic board, and to the feature card (3&LS, EIA, or DDSA). (See MIM for cable routing and pin information.)
- For line problems:
  * Use the TRAP or PT-2 to make recordings of activity for later analysis.
  * Use the internal trap save program 'TCOMLOG' to save data sent and received at the communications MPU card.
- For BSC communications access method:
  * Use the BSC on line test to verify BSC operation of the line.
- For SDLC communications access method:
  * Have a host system run an SNA SDLC test on your system (this test is transparrent to your system and may be run when SNA is active).
- If there is an external IBM modem, use the tests provided by that modem.
- Marginal voltages cause intermittent problems. Check all voltages for nominal values. Check for excessive ripple in the DC supplies.
- Check common ground continuity between the machine and the telephone company interface.
- Vibrate the machine to show up loose connections.
- Heat and cool the machine to show up temperature sensitivity.

Is the communications MDI diagnostic routine in a hang condition?

Y N



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3 3
A B

002
- Run the MDI several times to show up intermittent problems.

Does the MDI run without error?
Y N

003
- Correct any problems indicated by MDIs.

004
Is the DDSA line adapter card installed?
Y N

005
- Probe A-D7B04, '- Rate Select'.
- For full rate the lights will be:

Up light: Off
Down light: On

- For half rate the lights will be:

Up light: On
Down light: Off

Are the lights correct?
Y N

006
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

007
- Probe A-D7B13, '- Data Set Ready'.

Up light: Off
Down light: On

Are the lights correct?
Y N

008
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

009
GO TO MAP 0800,
ENTRY POINT A.

010
GO TO MAP 0800, ENTRY POINT A.

011
- The 9 MHZ oscillator is essential to the communications MDI routines because it is used for timing. If the oscillator is not active, the diagnostic routine will not end.
- This problem is not detected by any diagnostic.
- Probe A-E5B08 '9 MHZ'.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

COMM PROBLEMS

PAGE 4 OF 4

012
- Trace the '9 MHZ' signal from its origin to find the failing FRU.
- The '9 MHZ' signal originates on the Main MPU card (See MIM 531 for the net list).

013
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

38LS WITH AUTOMATIC ANSWER

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
7	032	3018	A

001
(ENTRY POINT A)

USE THIS MAP TO FIND PROBLEMS USING THE 38LS WITH WORLD TRADE LINE PLATE (AUTOMATIC-ANSWER) TO THE PUBLIC SWITCHED NETWORK.

Is there a telephone associated with the data station?
Y N

002
(ENTRY POINT B)

- Connect a jumper from A-D7B02 '-Data Terminal Ready' to A-D7D08 'GND'.
- Dial the data station from another telephone.

The jumper will permit the machine to go to data mode after three good ring trains.

Is the busy tone present?
Y N

003
- Ring-back tone can be heard in another telephone. Data station answers after the third ring pulse train.

Is the 3.5 second answering tone (2100 Hz) present?
Y N

004

- Measure the DC voltage between A-D8D02 '-Data Indicate' and A-D8D08 'GND'.

A-D8D02 '-Data Indicate' is connected to a 'Transfer Relay' point in the line plate. When the machine is in data mode, A-D8D02 '-Data indicate' is approximately -3.5 Vdc; if not, it is open.

Is A-D8D02 '-Data Indicate' at approximately -3.5 Vdc after three ring pulse trains?

Y N

005

- Ensure that A-D7B02 '-Data Terminal Ready' is jumpered to A-D7D08 'GND'.
- Re-dial the data station from another telephone.
- With a voltmeter (5 Vac scale), measure A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2'.

A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2' signal levels:

Without ring current
Off: about 1 Vac.

With ring current
On: voltage increases by about 0.3 Vac.

'Current Detection 1' signal level can be different from 'Current Detection 2'.

Are both signals pulsing with the ring signal?

Y N

006

* * * * * * * * * * * * * * * * * *
DANGER
* * * * * * * * * * * * * * * * * *

THE NEXT PROCEDURE IS A POSSIBLE SHOCK HAZARD, BE EXTRA CAREFUL.

DC voltage up to 48 Vdc is present. The voltmeter must indicate a signal oscillating between 48 V and 78 V, and a gap of about 30 Vac between silent and ring periods.

DO NOT ground one of the telephone wires.

- Measure ac voltage at the telephone line.
- Signal measured can be higher than 150 Vac.

Are there ac pulses (ringing current) higher than 30 Vac?
Y N

007
- Ask the customer to call the PTT representative.

008
(ENTRY POINT C)

Suspect a short circuit in the connection.

- With an ohmmeter, check the telephone cable(s) from the line plate to the wall-mounted connector. See MIM 869 to find the failure.

Do the cable(s) check out correctly?
Y N

009
- Suspect the telephone cable(s).

010
- Defective World Trade line plate.

011
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

012
- Defective 3&LS line adapter card (A-D7)(MIM 812).

The 3&LS should activate the 'Transfer Relay' when 'Current Detection 1' and 'Current Detection 2' are activated (together three times), and when the machine is in data mode.

013
- Defective World Trade line plate.

014
- Check for 2100 Hz between A-D7D05 '+Data Tip' and A-D7D08 'GND'.

Use CE tool 'intercom' or 'dB meter'.

Is 2100 Hz present during 3.5 seconds?
Y N

015
- Defective 3&LS line adapter card (A-D7)(MIM 812).

The 3&LS should send a 2100 Hz tone when answering a call automatically.

016
- Defective World Trade line plate.

017
Does the answering tone stop after 3.5 seconds?
Y N

018
- Defective 38LS line adapter card (A-D7)(MIM 812).

019
- Auto-answer function is correct. Check other functions as needed.
- Remove the jumper from A-D7B02 '-Data Terminal Ready' to A-D7D08 'GND'.

020
- Power off.
- Keep the jumper on A-D7B02 and A-D7D08 'GND'.
- Re-dial the data station.

Is the busy tone present?
Y N

021
- Power on.
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:
On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

022
- Defective World Trade line plate.

023
- Measure A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2'.

A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2' signal levels:

On: -3 Vdc
Off: +1 Vdc

Are both signals approximately +1 Vdc?
Y N

024
- Defective World Trade line plate.

025
- Disconnect the machine from the telephone line (at the wall-mounted connector level).
- Remove the jumper from A-D7B02 '-Data Terminal Ready' to A-D7D08 'GND'.
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

026
- Defective World Trade line plate.

027
- Defective 38LS line adapter card (A-D7)(MIM 812).

AUTO ANSWER

PAGE 7 OF 7

028
- Disconnect the machine from the telephone line (at the wall-mounted connector level).
- Retry the call.

Is the busy tone present?
Y N

029
GO TO PAGE 3, STEP 008,
ENTRY POINT C.

030
- Ask the customer to call the PTT representative.

031
- Use MAP 3018 to check the manual answer operation, then return to this point.

Is the manual answer operation correct?
Y N

032
GO TO MAP 3018, ENTRY POINT A.

033
GO TO PAGE 1, STEP 002,
ENTRY POINT B.

Ring-back tone should be present.

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3&LS WITH MANUAL CALL

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP: ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001

001
(ENTRY POINT A)

USE THIS MAP TO FIND PROBLEMS USING THE 3&LS WITH WORLD TRADE LINE PLATE (MANUAL-CALL) TO THE PUBLIC SWITCHED NETWORK.

- Take the associated telephone off hook.

Is the dial tone present?
Y N

002
- Power off and retry the call.

Is the dial tone present?
Y N

003
Is the machine connected to the telephone line with a jack?
Y N

004
- Disconnect from the telephone line and connect the telephone directly to the line at the wall- mounted connector level).

Dial tone present, called telephone rings and connection is made.

(ENTRY POINT B)

- Dial another telephone.

Can you communicate correctly?
Y N

005
- Ask the customer to call the PTT representative.

006
(ENTRY POINT C)

Suspect a short circuit in the connection.

- With an ohmmeter, check the telephone cable(s) from the line plate to the wall-mounted connector. See MIM 869 to find the failure.

Is the cable(s) correct?
Y N

007
- Suspect the cable(s).

008
- Defective World Trade line plate.

009
- Disconnect the jack.
GO TO STEP 004,
ENTRY POINT B.

010
- Power on.
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

011
- Defective World Trade line plate.

012
- Defective 38LS line adapter card (A-D7)(MIM 812).

013
- Dial another telephone.

Dial tone present, called telephone rings and the connection is made.

Can you communicate correctly?
Y N

014
- Ask the customer to call the the PTT representative.

015
- Keep the telephone off hook.
- Connect a jumper from A-D7B02 '-Data Terminal Ready' to A-D7D08 'GND'.

No more tone; silent telephone.

Is the associated telephone disconnected from the line?
Y N

016
- Measure A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2'.

A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2' signal levels:

On: -3 Vdc
Off: +1 Vdc

Is one of these signals approximately -3 Vdc?
Y N

017
GO TO PAGE 2, STEP 006, ENTRY POINT C.

018
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

019
- Defective 38LS Line Adapter card (A-D7)(MIM 812).

The 'Transfer Relay' should be on when the machine is in data mode and the telephone lifted.

020
- Defective World Trade line plate.
- Remove the jumper from A-D7B02 '- Data Terminal Ready' to A-D7D08 'GND'.

021
- Remove the jumper from A-D7B02 '- Data Terminal Ready' to A-D7D08 'GND'.

Is the communication with another telephone functional again?
Y N

022
- Defective World Trade line plate.

Busy tone in the other telephone, and/or dial tone in the associated telephone.

023
- The local telephone line is correct.
- Ask the customer to make a data transmission to a remote data station.

Is the data transmission correct?
Y N

024
- Run MDI's again.
- If MDI's run correctly, suspect the line plate assembly.

025
- Manual call function is correct.
- Check other functions as needed.

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38LS WITH MANUAL ANSWER

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
3010	A	1	001
3016	A	1	001

001
(ENTRY POINT A)

USE THIS MAP TO FIND PROBLEMS USING THE 38LS WITH WORLD TRADE LINE PLATE (MANUAL-ANSWER) TO THE PUBLIC SWITCHED NETWORK.

- Dial the data station from another telephone.

Is the busy tone present?
Y N

002
- Wait for at least 3 rings.

Is the associated telephone ringing?
Y N

003
- In the other telephone: the modem answering tone or data can be heard.

Is the modem connected to the line?
Y N

38LS MANUAL ANSWER

PAGE 2 OF 6

004
- Take the associated telephone off hook.

Is the dial tone present?
Y N

005
GO TO PAGE 6, STEP 030, ENTRY POINT C.

006
- Ask the customer to call the PTT representative.

007
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:
On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

008
- Defective World Trade line plate.

009
- Defective 38LS line adapter card (A-D7)(MIM 812).

The 'Transfer Relay' should be off when the machine is not in data mode.

010
- Answer the call.

Can you communicate correctly?
Y N

011
- Ask the customer to call the PTT representative.

012
- Keep the telephone off hook.
- Connect a jumper from A-D7B02 '-Data Terminal Ready' to A-D7D08 'GND'.

No more tone; silent telephone.

Is the associated telephone disconnected from the line?
Y N

013
- Measure A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2'.

A-D8B10 'Current Detection 1' and A-D8B13 'Current Detection 2' signal levels:

On: -3 Vdc
Off: +1 Vdc

Is one of these signals approximately -3 Vdc?
Y N

014
GO TO PAGE 6, STEP 028, ENTRY POINT B.

015
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

016
- Defective 3&LS line adapter card (A-D7)(MIM 812).

The 'Transfer Relay' should be on when the machine is in data mode and the telephone lifted.

017
- Defective World Trade line plate.
- Remove the jumper from A-D7B02 '- Data Terminal Ready' to A-D7D08 'GND'.

018
- Remove the jumper from A-D7B02 '- Data Terminal Ready' to A-D7D08 'GND'.

Is the communication with the other telephone functional again?
Y N

019
- Defective World Trade line plate.

Busy tone in the other telephone, and/or dial tone in the associated telephone.

020
- The local telephone line is correct.
- Ask the customer to prepare the machine for a data transmission.
- Ask the remote station to dial the local data station.
- Answer the call manually.
- Make a data transmission .

Is the data transmission correct?
Y N

021
- Run MDIs again.
- If MDIs run correctly, suspect the line plate.

022
- The manual answer function is correct. Check other functions as needed.

023
- Power off and retry the call.

Is the busy tone still present?
Y N

024
- Power on.
- Measure A-D8B03 'Transfer Relay'.

A-D8B03 'Transfer Relay' signal levels:

On: -2.7 Vdc
Off: -4.5 Vdc

Is the signal approximately -2.7 Vdc?
Y N

025
- Defective World Trade line plate.

026
- Defective 38LS line adapter card (A-D7)(MIM 812).

The 'Transfer Relay' should be off when the machine is not in data mode.

027
Is the data station connected to the telephone line with a jack?
Y N

028
- Disconnect the data station from the telephone line and connect the associated telephone directly to the telephone line (at the wall-mounted connector level).

(ENTRY POINT B)

- Dial the data station from another telephone.

Can you communicate correctly?
Y N

029
- Ask the customer to call the PTT representative.

030
(ENTRY POINT C)

- With an ohmmeter, check the telephone cable(s) from the line plate to the wall-mounted connector. See MIM 869 to find the failure.

Does the cable(s) check out correctly?
Y N

031
- Suspect the cable(s).

032
- Defective World Trade line plate.

033
- Disconnect the jack.
GO TO STEP 028,
ENTRY POINT B.

No busy tone, called telephone rings, and the connection is made.

Suspect a short circuit in the connection.

EIA WRAP ERROR MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
	-	+++	3-856

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
4	010	0600	A
5	017	0600	A
7	030	0600	A
7	031	0600	A
7	038	0600	A
7	032	0600	A
7	036	0600	A
8	042	0600	A
9	049	0600	A
9	053	0600	A
10	060	0600	A
5	020	0600	A
11	063	0600	A
11	070	0600	A
12	074	0600	A
12	081	0600	A

001
(ENTRY POINT A)

THIS IS THE COMMUNICATIONS MAP TO FIND PROBLEMS
WITH EIA CONTROL LINES THAT ARE OPENED OR SHORTED.

DISCRIPTION OF THE TEST BEING RUN:

The MDIs cause a test pattern to be transmitted out over the interface cables and back through the wrap connector with one line at a time activated. The output byte will be referred to as 'Transmitted' lines by this map (see Fig. 3).

The 'Received' lines are compared and the diagnostic LOOPS on any test in which the 'Received' lines are NOT CORRECT. This received pattern will be referred to as 'Received' lines by this map (see Fig. 3).

HOW TO IDENTIFY THIS DATA ON THE DISPLAY (see Figures 2 & 3).:

If an error occurs, the status bytes will be displayed. No status bytes displayed indicates the test did not fail. The 'Received'
(Step 001 continues)

(Step 001 continued)
lines byte appears on the screen in hexidecimal representation as the test is looping. It is the last hexadecimal byte displayed on the MDI status line just before the DCP options. On the display to the left of the 'Received'lines byte is the hexadecimal byte representation of the 'Transmitted' lines byte.

The hexadecimal value of the 'Received' lines should be equal to the hexadecimal value of the 'Transmitted' lines, except in the case of the Rate Sel (Note 1). Rate Sel, Hex 08 on the 'Transmitted' line should return a Hex 0A on the 'Received' line.

The questions in this map rely on your interpretation of these bytes of test data. You will need to see MIM 861 to obtain the necessary probe point information when needed by the map.

Transmitted lines	Received lines	Error
80	C0	extra bits
40	42	extra bits
00	80	extra bits
80	00	missing bits

Fig. 1. Example of error bytes displayed on the screen.

```
     1         2         3         4         5         6         7
4567890123456789012345678901234567890123456789012345678901234567890
___The following line shows how the MDI status is presented._______

     MDIXXXX XXXX* X  NCOMM01  XX   XX XX    PRESS HELP KEY FOR OPT
     Pgmname Step     Routine  No   ** **    ******DCP options*****
                                    |  |
              'Transmitted' lines___V  V___'Received'  lines
```

Fig. 2. Example of the MDI status line.

(Step 001 continues)

(Step 001 continued)

Hex	Bit	'Transmitted' lines	Bit	'Received' lines
80	0	Data Term Rdy ---------->	0	Data Set Rdy
40	1	Req To Send ---------->	1	Clear To Send
20	2	Test Control ---------->	2	Carrier Det
10	3	Sel Standby ---------->	3	Ring Ind
08	4	Rate Sel (Note 1) ---*---->	4	Rec Clk
04	5	open line |	5	open line
02	6	open line *---->	6	Xmit Clk
01	7	open line	7	open line

Fig. 3. This chart shows the pairs of lines that are wrapped. Each line is assigned a hex value that is used when the error is displayed on the screen.

Note 1: Both Xmit Clk and Rec Clk are driven by Rate Sel on the wrap test (Fig 3).

Is an error displayed on the screen?
Y N

002
- The failure is not present.

003
- You will need to see MIM 861 to locate the probe points referred to by this map.
- See Fig. 1 for examples of extra bits.

Are there extra bits being returned?
Y N

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8 4
A B

004
- Remove the wrap connector.
  Note: The 'Received' line displayed may change with the wrap connector removed. Ignore this byte for now.
- Probe the 'Transmitted' line at probe point F.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

005
THE SYMPTOMS INDICATE THAT THE 'TRANSMITTED' LINE IS LOSING THE SIGNAL.

- Probe the 'Transmitted' line at probe point D.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

006
- Probe the 'Transmitted' line at probe point C.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

007
- Probe the 'Transmitted' line at probe point B.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

008
- Probe the 'Transmitted' line at probe point A.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

009
- Power off.
- Remove the communications MPU card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure the 'Transmitted' line at probe point A.

Is the line grounded?
Y N

010
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

011
- Remove the EIA line adapter card.
- If the short goes away the EIA line adapter card is defective (A-D7)(MIM 823).
- If the short is still present the logic board is defective.

012
- The land pattern is open on the logic board

013
- Power off.
- Remove the EIA line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure the 'Transmitted' line at probe point C.

Is the line grounded?
Y N

014
- The EIA line adapter card is defective (A-D7)(MIM 823).

015
- Disconnect the internal cable from the communications MPU card A-E5-J01 connector.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure the 'Transmitted' line at probe point C.

Is the line grounded?
Y N

016
- The internal cable is defective.

017
- Remove the communications MPU card.
- If the short goes away the communications MPU card is defective.
- If the short is still present the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600,
ENTRY POINT A.

018
- The land pattern is open on the logic board

019
- Remove the internal cable
- Probe the 'Transmitted' line at probe point E.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

020
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

021
- The internal cable is defective.

022
- Reinstall the wrap connector.
- Probe the 'Received' line at probe point A.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

023
THE SYMPTOMS INDICATE THAT THE 'RECEIVED' LINE IS LOSING THE SIGNAL.

- Probe the 'Received' line at probe point B.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

024
- Probe the 'Received' line at probe point C.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

025
- Probe the 'Received' line at probe point D.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

7 7 7 7
M N P Q R

026
- Power off.
- Remove the Wrap Connector.
- Remove the EIA line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure the 'Received' line at probe point C.

Is the line grounded?
Y N

027
- Use the CE meter on the RX1 scale to measure the resistance of the 'Received' line from probe point F to probe point C for an open.

Is the line open?
Y N

028
- Use the CE meter on the RX1 scale to measure the resistance of the 'Received' line from probe point C to each of the other points listed at C. A short will read less than 20 ohms.

Is the line shorted to any other line?
Y N

029
- The EIA line adapter card is defective (A-D7)(MIM 823).

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7 7 7
S T U

030
- Remove the communications MPU card.
- If the short goes away the communications MPU card is bad.
- If the short is still present, the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

031
- Check each FRU to find the failure.
- The internal cable.
- The communications MPU card.
- The logic board.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

032
- Remove the parts listed below one at a time in the order given until the short goes away. The last part removed is defective.
- The internal cable.
- The communications MPU card.
- The EIA line adapter card.
- If the short is still present, the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

033
- The land pattern is open on the logic board.

034
- Power off.
- Remove the EIA line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance to a ground pin. A short will read less than 20 ohms. Measure the 'Received' line at probe point B.

Is the line grounded?
Y N

035
- The EIA line adapter card is defective (A-D7)(MIM 823).

036
- Remove the communications MPU card.
- If the short goes away, the communications MPU card is defective.
- If the short is still present, the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

037
- The land pattern is open on the logic board.

038
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

039
- Probe the extra 'Received' line at probe point A.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

040
THE SYMPTOMS INDICATE THAT THE EXTRA 'RECEIVED' LINE IS STUCK AT ITS ACTIVE LEVEL.

- Remove the wrap connector.
  Note: The 'Received' line displayed may change with the wrap connector removed. Ignore this byte for now.
- Probe the extra 'Transmitted' line at probe point F.

Up light: On
Down light: Off

Are the lights correct?
Y N

041
THE SYMPTOMS INDICATE THAT THE EXTRA 'RECEIVED' LINE IS PICKING UP THE 'RECEIVED' LINE.

- Reinstall the wrap connector.
- Probe the extra 'Received' line at probe point B.

Up light: Off
Down light: On

Are the lights correct?
Y N

042
- The logic board is defective.

- - - - - OR - - - - -

- The EIA line Adapter card is defective (A-D7)(MIM 823).

- - - - - OR - - - - -

- Defective communications MPU card (A-E5)(MIM 811)
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

043
- Probe the extra 'Received' line at probe point C.

Up light: On
Down light: Off

Are the lights correct?
Y N

044
- The EIA line Adapter card is defective (A-D7)(MIM 823).

045
- Probe the extra 'Received' line at probe point D.

Up light: On
Down light: Off

Are the lights correct?
Y N

046
- The EIA line Adapter card is defective (A-D7)(MIM 823).

- - - - - OR - - - - -

- The logic board is defective.

047
- Power off.
- Remove the wrap connector.
- Remove the EIA line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance for a short to the 'Transmitted' line. A short will read less than 20 ohms. Measure the extra 'Received' line at probe point D.

Is the line shorted to the line being wrapped?
Y N

048
The wrap connector is defective.

049
- Remove the parts listed below one at a time in the order given until the short goes away. The last part removed is defective.
- The internal cable.
- The communications MPU card.
- If the short is still present, the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

050
- Remove the internal cable
- Probe the extra 'Transmitted' line at probe point E.

Up light: On
Down light: Off

Are the lights correct?
Y N

051
- The internal cable is defective.

052
- Probe the extra 'Transmitted' line at probe point D.

Up light: On
Down light: Off

Are the lights correct?
Y N

053
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

054
- Probe the extra 'Transmitted' line at probe point C.

Up light: On
Down light: Off

Are the lights correct?
Y N

055
- The logic board is defective.

056
- Probe the extra 'Transmitted' line at probe point B.

Up light: Off
Down light: On

Are the lights correct?
Y N

057
- The EIA line adapter card is defective (A-D7)(MIM 823).

058
- Probe the extra 'Transmitted' line at probe point A.

Up light: Off
Down light: On

Are the lights correct?
Y N

059
- The logic board is defective.

060
- The EIA line adapter card is defective (A-D7)(MIM 823).

- - - - - OR - - - - -

- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

061
THE SYMPTOMS INDICATE THAT THE EXTRA LINE IS PICKING UP THE WRAPPED LINE.

- Remove the wrap connector.
  Note: The 'Received' line displayed may change with the wrap connector removed. Ignore this byte for now.
- Probe the extra 'Transmitted' line at probe point F.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

062
THE SYMPTOMS INDICATE THAT THE EXTRA LINE IS PICKING UP THE 'RECEIVED' LINE (WHICH IS UNDER TEST).

- Reinstall the wrap connector.
- Probe the extra 'Received' line at probe point B.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

063
- The logic board is defective.

- - - - - OR - - - - -

- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

064
- Probe the extra 'Received' line at probe point C.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

065
- The EIA line adapter card is defective (A-D7)(MIM 823).

066
- Probe the extra 'Received' line at probe point D.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

067
- The EIA line adapter card is defective (A-D7)(MIM 823).

- - - - - OR - - - - -

- The logic board is defective.

A
F

068
- Power off.
- Remove the wrap connector.
- Remove the EIA line adapter card.
- Use the CE meter on the RX1 scale to measure the resistance for a short to the 'Transmitted' line. A short will read less than 20 ohms. Measure the extra 'Received' line at probe point D.

Is the line shorted to the line being wrapped?
Y N

069
- The wrap connector is defective.

070
- Remove the parts listed below one at a time in the order given until the short goes away. The last part removed is defective.
- The internal cable.
- The communications MPU card.
- If the short is still present, the logic board is defective.
- If a 'Ros Patch' cable is connected to the card,

GO TO MAP 0600, ENTRY POINT A.

071
- Remove the internal cable
- Probe the extra 'Transmitted' line at probe point E.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

072
- The internal cable is defective.

073
- Probe the extra 'Transmitted' line at probe point D.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

074
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

075
- Probe the extra 'Transmitted' line at probe point C.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

076
- The logic board is defective.

077
- Probe the extra 'Transmitted' line at probe point B.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

078
- The EIA line adapter card is defective (A-D7)(MIM 823).

079
- Probe the extra 'Transmitted' line at probe point A.

Up light: On or Pulsing.
Down light: On or Pulsing.

Are the lights correct?
Y N

080
- The logic board is defective.

081
- Defective communications MPU card (A-E5)(MIM 811).
- If a 'Ros Patch' cable is connected to the card,
GO TO MAP 0600, ENTRY POINT A.

PRINTER ENTRY MAP

PAGE 1 OF 2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
100	A	1	001
220	A	1	001
300	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	004	0100	A
2	007	0600	A
2	008	0600	A

001
(ENTRY POINT A)

This is the Entry MAP for the printer.

Have you been through the Printer MAPs?
Y N

002
GO TO THE PRINTER ENTRY MAP.

003
- Power off the system.
- Open diskette locking levers on all drives.
- Wait 30 seconds and power on the system.

Is the Condition Code Table displayed (MIM 931)?
Y N

004
GO TO MAP 0100, ENTRY POINT A.

005
Is condition code 10 displayed for the Printer Attachment MPU (MIM 931)?
Y N

PRINTER ENTRY

PAGE 2 OF 2

006
Is condition code 08 or 04 displayed for the Printer Attachment MPU (MIM 931)?
Y N

007
- Defective Printer Attachment MPU card (A-D5) (MIM 501).
- If a 'ROS Patch' cable is connected to the card

GO TO MAP 0600, ENTRY POINT A.

- - - - - OR - - - - -

- Defective Diskette/Main MPU card (A-C1) (MIM 501).
- If a 'ROS Patch' cable is connected to the card

GO TO MAP 0600, ENTRY POINT A.

008
- Defective Printer Attachment MPU card (A-D5) (MIM 501).
- If a 'ROS Patch' cable is connected to the card

GO TO MAP 0600, ENTRY POINT A.

009
- 'IPL' the system using a diagnostic diskette (MIM 941).
- Load and run the Printer Attachment MPU MDI 7001 (MIM 961).
- Follow the instructions on the display.

POWER ENTRY MAP

PAGE 1 OF 5

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0200	A	1	001
0210	A	1	001
0600	A	1	001
1010	A	1	001
2000	A	1	001
2010	A	1	001
2250	A	1	001
2260	A	1	001
2270	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	004	8030	A

001
(ENTRY POINT A)

- Power off the controller.
- Check fuses F1-F2-F3-F4-F6 and CB1. (F6 present when communications feature installed).

Are the fuses and CB1 OK?
Y N

002
- Replace the open fuse or reset CB1.
- Power on.

Does the fuse open or CB1 trip again?
Y N

003
Verify machine for correct operation.

004
GO TO MAP 8030, ENTRY POINT A.

1

POWER ENTRY

PAGE 2 OF 5

005
- Power on the Controller.

Is the diskette drive motor(s) running?
Y N

006
- The problem is in the AC distribution to the diskette drive(s) (MIM 451 and 453).

007
Is the fan motor running?
Y N

008
- The problem is in the AC distribution to the fan (MIM 451, 453 and 457).

009
Is the display completely dark?
Y N

010
GO TO PAGE 3, STEP 016,
ENTRY POINT B.

011
Is the display CRT filament on?
Y N

012
* * * * * * * * * * * * * * * * *
DANGER
* * * * * * * * * * * * * * * * *

THE NEXT PROCEDURE IS A POSSIBLE SHOCK HAZARD, BE EXTRA CAREFUL.

- Check for 99 to 121 volts AC between J5-1 and J5-6 (MIM 451 and 457).
Is the AC voltage present?
Y N

013
- Defective Power Supply (MIM 470).

014
- The problem is in the Display.
GO TO MAP 1010, ENTRY POINT A

015
GO TO PAGE 3, STEP 016,
ENTRY POINT B.

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016
(ENTRY POINT B)

- Check all DC output voltages at J2 and J4 (MIM 451, 457 and 461).

NOTE: J4 will only be present if the Communication feature is installed.

Are there any output voltages present?
Y N

017
* * * * * * * * * * * * * * * * *
DANGER
* * * * * * * * * * * * * * * * *

THE NEXT PROCEDURE IS A POSSIBLE SHOCK HAZARD, BE EXTRA CAREFUL.

- Check primary input voltage at TB1 (MIM 451 and 457).
- Check that the customers input voltage and the machine transformer (T1) taps are matched correctly (MIM 451 and 457).

Is the voltage correct?
Y N

018
- The customers supply is incorrect or the line cord is open.

019
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

020
Are there any voltages missing at J2 or J4?
Y N

021
Are all the voltages within tolerance at J2 or J4?
Y N

022
Incorrect output voltage can be caused by an open AC capacitor (C7), an incorrect setting of primary taps on transformer (T1), an excessive load on the secondary, a defective diode or ground in the power supply (MIM 451 and 457).

023
Did you enter this MAP because of a missing voltage?
Y N

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024
- Check 'ripple' on all DC voltages (MIM 463).

- If excessive ripple is found on the +24, -5 or +8.5 Vdc outputs the Base Board assembly is defective (MIM 474).

- - - - - OR - - - - -

- Defective Power Supply if excessive ripple is found on the +5 Vdc output (MIM 470).

- - - - - OR - - - - -

- Defective Feature board or base board assembly if excessive ripple is found on the -8.5 Vdc output (MIM 471 and 474).

025
- Defective DC distribution cable.
- Use MIM 455 to isolate the problem.

026
Is there more than 1 voltage missing?
Y N

027
Is +5 Vdc the missing voltage?
Y N

028
Is +8.5 Vdc the missing voltage?
Y N

029
Is -5 Vdc the missing voltage?
Y N

030
Is +24 Vdc the missing voltage?
Y N

031
- Check for 7.65 to 9.35 Volts AC at the Feature board assembly from J3-3 to J3-4 and from J3-1 to J3-4 (MIM 451 and 457).

Are the AC voltages present at both points?
Y N

032
- Defective cable from J2 to J3 (MIM 451 and 457).

033
- Defective Feature board assembly (MIM 471).

034
- Check for 21.6 to 26.4 Volts AC at the Base Board assembly from J1-1 to J1-5 and J1-2 to J1-5 (MIM 451 and 457).

Are the AC voltages present at both points?
Y N

035
- Defective power supply and AC capacitor C7 (MIM 470 and 476)

036
- Defective base board assembly (MIM 474).

037
- Check for 4.5 to 5.5 Volts AC at the Base Board assembly from J1-7 to J1-6 and J1-8 to J1-6 (MIM 451 and 457).

Are the AC voltages present at both points?
Y N

038
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

039
- Defective base board assembly (MIM 474).

040
- Check for 7.65 to 9.35 Volts AC at the Base Board assembly from J1-9 to J1-4 and J1-10 to J1-4 (MIM 451 and 457).

Are the AC voltages present at both points?
Y N

041
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

042
- Defective base board assembly (MIM 474).

043
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

044
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

D.C. DISTRIBUTION MAP

PAGE 1 OF 3

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
8000	A	1	001

001
(ENTRY POINT A)

Is fuse F4 open?
Y N

002
Is CB1 tripped?
Y N

003

Is fuse F1 open?
Y N

004
Is fuse F2 open?
Y N

005
Is fuse F3 open?
Y N

006
- Power off.
- Disconnect the plug at J4 (MIM 451 and 457).
- Replace the fuse.
- Power on.

Does F6 open again?
Y N

007
- Defective feature PC board.

008
- Problem is in the -8.5 Vdc distribution to the Logic board (MIM 455).
- Remove modem card A-D7 to isolate the problem.

009
- Power off.
- Disconnect the plug at J2 (MIM 451 and 457).
- Replace the fuse.
- Power on.

Does F3 open again?
Y N

010
- Problem is in the +24 Vdc distribution to the diskette drives or remote keyboard display.
- Remove the cables until problem is isolated (MIM 455).

011
- Defective base PC board (MIM 474).

012
- Power off.
- Disconnect the plug at J2 (MIM 451 and 457).
- Replace the fuse.
- Power on.

Does F2 open again?
Y N

013
- Problem is in the -5 Vdc distribution.
- Power off.
- Reconnect the plug at J2.
- Replace the fuse.
- See the DC distribution diagram MIM 455.
- Disconnect the diskette drive and keyboard DC connectors.
- Power on.

Does F2 open again?
Y N

014
- Problem is in the diskette drives, keyboard or DC distribution cables.
- Reconnect cables until problem is isolated.

015
- Problem is in the Logic board, cards or DC distribution cables.
- Remove cards and cables until problem is isolated (MIM 455, 501 and 531).

016
- Defective base PC board (MIM 474).

017
- Power off.
- Disconnect the plug at J2 (MIM 451 and 457).
- Replace the fuse.
- Power on.

Does F1 open again?
Y N

018
- Problem is in the +8.5 Vdc distribution to the Logic board.
- Reconnect the plug at J2.
- Remove cards until problem is isolated (MIM 501 and 531).

019
- Defective base PC board (MIM 474).

020
- Power off.
- Disconnect the plug at J2 (MIM 451 and 457).
- Reset CB1.
- Power on.

Does CB1 trip again?
Y N

021
- Problem is in the +5 Vdc distribution.
- Power off.
- Reconnect the plug at J2.
- Reset CB1.
- See the DC distribution diagram MIM 455.
- Disconnect the diskette drive and keyboard DC connectors.
- Power on.

(Step 021 continues)

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(Step 021 continued)

Does CB1 trip again?
Y N

022
- Problem is in the diskette drives, keyboard or DC distribution cables.
- Reconnect cables until problem is isolated.

023
- Problem is in the Logic board, cards or DC distribution cables.
- Remove cards and cables until problem is isolated (MIM 455, 501 and 531).

024
- Defective power supply and AC capacitor C7 (MIM 470 and 476).

025
- Power off.
- Disconnect the plug at J5 (MIM 451 and 457).
- Replace the open fuse.
- Power on.

Does the fuse open again?
Y N

026
- The J5 connector distributes AC voltage to the Display Unit.
- Use the AC distribution diagram MIM 453 and wiring diagram MIM 457 to locate the cause of of overload in the J5 circuit.

027
- Check for a defective fan.
- If necessary, remove fan from TB1 and TB3 (MIM 451 and 457).
- If no problem is found with a fan, replace the power supply and AC capacitor C7 (MIM 470).

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