IBM

SY31-0652-0

Control Unit Maintenance Analysis Procedures

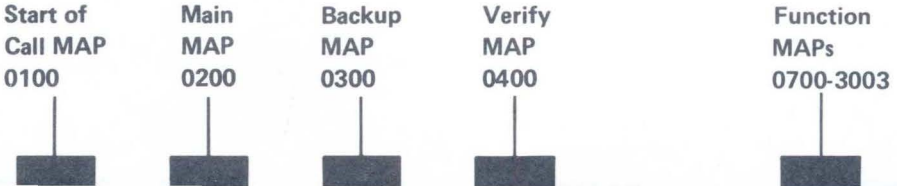
5294

IBM

SY31-0652-0

Control Unit Maintenance Analysis Procedures

5294



First Edition (January 1984)

IBM has prepared this maintenance manual for the use of IBM customer engineers/customer service representatives in the installation, maintenance, or repair of the specific machines indicated. IBM makes no representations that it is suitable for any other purpose.

Information contained in this manual is subject to change from time to time. Any such change will be reported in subsequent revisions.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates.

Publications are not stocked at the address given below. Requests for IBM publications should be made to your IBM representative.

This publication could contain technical inaccuracies or typographical errors. A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be addressed to IBM Corporation, Information Development, Department 245, Rochester, Minnesota, U.S.A. 55901. IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

© Copyright International Business Machines Corporation 1984

Preface

These maintenance analysis procedures (MAPs) are to be used for servicing the IBM 5294 Control Unit (work station controller). They are to be used by qualified maintenance personnel who are assumed to have completed the 5294 Control Unit education course.

This manual is designed for use with the *IBM 5294 Control Unit Maintenance Library*, SY31-0653. Definitions of terms and abbreviations that are not common, but are used in the MAPs, are in the *Glossary* of the *5294 Control Unit Maintenance Library*.

It is important that you start your call with Start of Call MAP 0100, which leads to a repair action.

There are several DANGER notices in this manual. You can use the blank lines below each notice to translate the notice into your own words. Specific DANGERs are listed in the *Safety* section.

Related Publications

- *IBM Synchronous Data Link Control General Information*, GA27-3093
- *IBM 5250 Information Display System Functions Reference Manual*, SA21-9247
- *IBM 5251 Display Station Models 2 and 12 Maintenance Information Manual*, SY31-0463
- *IBM Systems Network Architecture Handbook, Customer Service Division*, S229-4522
- *Introduction to Data Communications for Customer Engineers*, ZY31-0634
- *IBM 5294 Control Unit Setup Procedure*, GA21-9369
- *IBM 5294 Control Unit Operator's Guide*, GA21-9370

Contents

SAFETY ..... **VII**
Danger Notices vii
HOW TO USE THE MAPS ..... **IX**
MAP Organization ix
MAP Flow ix
Using the MAPs x
START OF CALL MAP **0100**
MAIN MAP **0200**
BACKUP MAP **0300**
VERIFY MAP **0400**
FUNCTION MAPS **0700-3003**

DANGER NOTICES

Throughout this manual, the word DANGER is used to inform you of an action that could cause a personal injury. If desired, translate these notices and write your own words on the blank lines provided on these pages.

The 5294 Control Unit has the following specific DANGERs:

- 550 Vdc is present at the power supply.

  _____

  _____

- Line voltage is present at the inside rear of the machine (I/O panel) and at the inside front of the machine (control panel).

  _____

  _____

  _____

  _____

If the need for a safety inspection occurs for this machine, see the section *Safety Inspection* in the *IBM 5294 Control Unit Maintenance Library*.

CSR SAFETY PRACTICES

All Customer Service Representatives 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 CSRMs 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 Service Representative 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 CSR 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 CSRs 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.

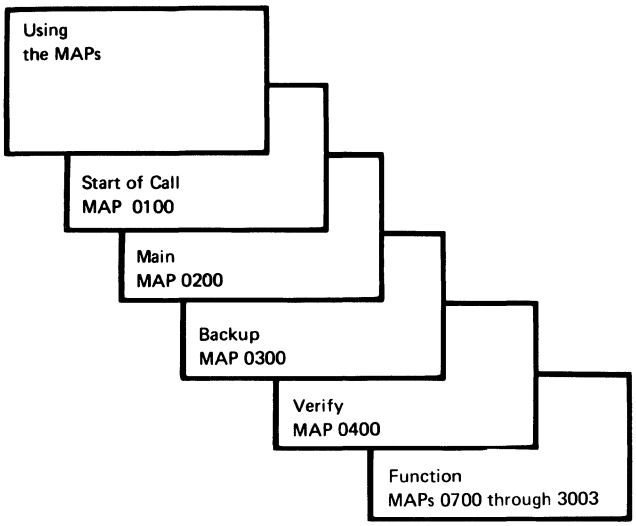
Rescue Breathing for Adults

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

MAP ORGANIZATION



Start of Call MAP 0100

The Start of Call MAP is the starting point for each service call. This MAP contains a symptom index, which is a list of single indications that are grouped by major units. These single indications lead either directly to a repair action in the maintenance information section of the maintenance library manual or to the Main MAP.

Main MAP 0200

The Main MAP generates symptoms from several indications. This MAP selects one indication at a time, with the most important and least difficult indication first, which results in the quickest path to a repair action.

Backup MAP 0300

The Backup MAP generates symptoms from indications, the same as the Main MAP, but uses fewer indications. As a result, the Backup MAP does not isolate the failure as close to the failing FRU as the Main MAP.

The Backup MAP relies on either the reports from the customer or the indications of intermittent failures (failures that were present but may not be present now).

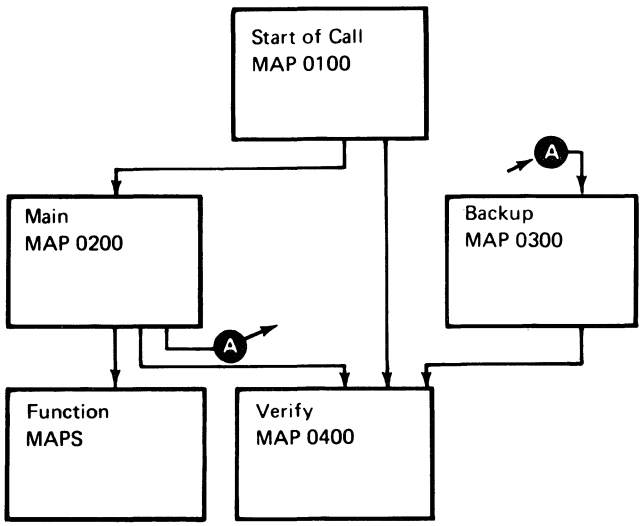
Verify MAP 0400

The Verify MAP is used after a repair action is made to ensure that the work station operates correctly.

Function MAPs 0700–3003

The Function MAPs are used with the circuit diagrams and procedures in the maintenance library manual.

MAP FLOW



USING THE MAPS

When using the MAPs, you must:

READ CAREFULLY. The MAPs can be used as an aid to find the failure only if you follow instructions and answer questions accurately.

FOLLOW THE SEQUENCE. Always do the procedure one step at a time. Some steps have additional information that pertains to that step. This information is directly across the page from the step and is an aid in describing why questions or an action is needed to determine the failing part.

Reference numbers refer to a location graphic, maintenance procedure, chart, or other pertinent information in the maintenance library manual.

FOLLOW THE INSTRUCTIONS. Instructions must be carried out exactly and in the order given. Questions rely on instructions immediately before the questions. Do not change the conditions prepared by the instructions before answering the questions.

5294

START OF CALL MAP 0100

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

No entries in this table

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	009	0200	C
2	010	0300	A

001

(Entry Point A)

**** CAUTION**********
Ensure that any job on a terminal is signed off before using that terminal for concurrent mode diagnostics. Also ensure that all jobs are signed off before running dedicated mode diagnostics, powering off the machine, or disconnecting from the communication line.
****

INSTRUCTIONS

1. Before using this MAP, record all symptoms if the failure is still on the machine.

2. Ensure that at least one display station is attached, powered on, and is in a ready condition.

3. If this MAP or other MAPs do not correctly isolate the failure, go to Backup MAP 0300, Entry Point A.

One or more of the following indicates an error condition:
- A system reference code (SRC) displayed on an attached display station (MIM 2100).
- 5294 Power LED off.
- 5294 Ready LED off.
- 5294 Work Station Active LED off when one or more work stations are attached and powered on.

Is there an error condition?
Y N

002
Is there any failure present on the 5294 or the attached work stations?
Y N

2 2 2
A B C

System reference code (SRC) is a general term for a displayed code and includes operator error codes, diagnostic error codes, and operator or CE/CSR message codes.

Correct operation for normal power-on sequence when the Test switch is set to Normal:

- Power on.
- All LEDs go on for about 1 second for a lamp test.
- All LEDs except Power LED go off.
- The Ready LED goes on when diagnostics have been completed.
- The Work Station Active LED goes on if any attached work station is powered on and responds to polling from the controller.
- The controller is now ready to operate once the communication link to the host system is established.

003
Did the customer report an SRC?
Y N

004
If the failure is intermittent, do one of the following:
1. If everything is operating correctly at present, check all error logs for logged errors (MIM 2050 and 2013).
   Go to MAP 0300, Entry Point A.
2. If you are not sure of the correct operation of the 5294, start at MAP 0200, Entry Point A.

005
- Power off.
- Wait 5 seconds, then power on.
- Wait 10 seconds for diagnostics to be completed.

Does an error condition exist?
Y N

006
Did the customer report a D1XXXX, D2XXXX, D73XXX, or D77XXX SRC?
Y N

007
Did the customer report a D912XX or D914XX SRC?
Y N

008
Go to Page 3, Step 016, Entry Point C.

009
Go To Map 0200, Entry Point C.

010
Go To Map 0300, Entry Point A.

011
Go to Step 013, Entry Point B.

012
Record all the symptoms you have and then:
Go to Page 8, Step 019, Entry Point D.

013

(Entry Point B)

Is an SRC displayed?
Y N

014
Go to MAP 0200, Entry Point A.

015
Go to Page 3, Step 016, Entry Point C.

016

(Entry Point C)

ERROR CODES		
See MIM 2100 for a description of all error codes.		
ERROR CODE	**ADDITIONAL INFORMATION**	**ACTION**
004X or 005X	Communications error NOTE: If a 0040 error is displayed, check that the modem/DCE or Channel Service Unit is connected to the controller, powered on, and in normal operating mode	Go to MAP 0200, Entry Point C
0086	Occurs when trying to use MSR, light pen, self-check, or copy-to-print feature	Probable cause: feature mismatch Go to MAP 0200, Entry Point E
008X	A configuration setup error occurred when trying to configure the controller	Check the error code and correct the error condition. Use MIM 0460 for information on configuration
0099	Occurs when trying to communicate with the host system Ensure that the Test switch is set to Normal	Go to MAP 0200, Entry Point C

(Step 016 continues)

(Step 016 continued)

ERROR CODE	ADDITIONAL INFORMATION	ACTION
XXXX	Applies only to any other operator error code during correct operation that is not listed above	Check definition of the code (MIM 2100), Go to MAP 0200, Entry Point D
10XXXX	X.25 operator error	Operational error or X.25 configuration error If the above two are OK, replace the ROS feature card at C5 and/or X.25 ROS module on the card at C5
1XXXXX	X.25 error	Check definition of the code (MIM 2100), then go to MAP 3002, Entry Point A
D10001 D10002 (See Note 1)	All LEDs off	Go to MAP 0200, Entry Point A
D11001 (See Note 1)	Power LED on and all other LEDs off	Go to MAP 0200, Entry Point A
D13002 (See Note 1)	Power LED on, Ready LED on, Work Station Active LED off	Go to MAP 0200, Entry Point A
D13003 (See Note 1)	Power LED on, Ready LED off Work Station Active LED on	Go to MAP 0900, Entry Point A
D2XXXX	Feature ROS failure	Go to MAP 0700, Entry Point A

(Step 016 continues)

(Step 016 continued)

D3800X	RAM failure	Replace planar
D410XX D510XX D610XX D710XX	Work station adapter test	Replace planar
D73YXX Y = 1 thru F	Twinaxial driver/receiver test Use MIM 0520 to identify the failing port(s) from the value of Y in the SRC	Replace driver/ receiver card, planar, internal I/O cable For further isolation Go to MAP 0200, Entry Point A
D77YXX Y = 0 thru F	At least one error free response was received from the port(s) indicated by the port identifier Y in the SRC	Probable causes: External, such as cable or an attached work station. Driver/receiver card Planar For further isolation Go to MAP 0900, Entry Point A.
D810XX	Comm adapter level 1 test	Replace planar
D90009	Comm card type config error	Correct comm card type setting in the configuration table (MIM 0460)

(Step 016 continues)

(Step 016 continued)

ERROR CODE	ADDITIONAL INFORMATION	ACTION
D910XX	Comm adapter level 2 test	Replace planar
D912XX D914XX	Comm adapter level 2 test	Replace comm card, planar For further isolation Go to MAP 1000, Entry Point A
DA1060	CMOS CRC error	Enter config and retry (MIM 0460). If the problem appears again, replace planar
DXXXXX	Any other error code NOTE: Wait 5 seconds between power off and power on to avoid false error indications	Go to MAP 0200, Entry Point B
ERRORS DETECTED DURING NORMAL OPERATION		
Do not use these errors for normal problem determination unless no other diagnostics errors (DXXXXX) are available.		
E0XXXX	Parity or bus time out errors during operation	Planar, Feature ROS card at C5 socket, Feature ROS card at C7 socket
EXXXXX (Not E0XXXX)	Parity or bus time out errors during operation	Replace planar

(Step 016 continues)

(Step 016 continued)

FXXXXX	Error detected during operation	Ensure that EC down load is at the latest level Planar, Feature ROS card at C5 socket, Feature ROS card at C7 socket If the same failure occurs, call support

NOTE 1 : These error codes are for reporting only and will not be displayed.

Did you find the error code in the error code index?

Y N

017
Go to MAP 0200, Entry Point A.

018
-Perform the indicated repair action.
Go to Verify MAP 0400, Entry Point A.

019

(Entry Point D)

- From the list below, pick the symptom that best matches the reported and/or observed symptom.

FAILURE SYMPTOMS		
COMMUNICATIONS		
MAJOR SYMPTOM	**MINOR SYMPTOM**	**ACTION**
Communication with the host system lost or cannot be established	1. Always in CSU mode	Test switch circuit failure Use MIM 0320 to isolate failure
	2. 004X, 005X or 0099 may be displayed	Check that the Test switch is set to Normal Go to MAP 0200, Entry Point C
Communication slow	Input inhibit stays on longer than usual NOTE: This may be caused by increase in host system work load	Go to MAP 3003, Entry Point A
OPERATOR PANEL		
LEDs	Only one LED fails	Use MIM 0320 to isolate failure
CE tests cannot be run and CSU cannot be selected	Will not go into Test status	Test switch circuit failure Use MIM 0320 to isolate failure
Will always be in CSU mode	Will always be in Test status	Test switch circuit failure. Use MIM 0320 to isolate failure

(Step 019 continues)

(Step 019 continued)

ATTACHED WORK STATION PROBLEMS		
This section is to be used only after verifying that no problems have been detected by the controller and attached work station diagnostics.		
System Available LED off	No free-key mode	Go to MAP 0200, Entry Point A
Characters displayed do not match the key pressed.	System Available LED on	Go to MAP 0200, Entry Point D
Free-key mode fails	System Available LED on	Go to MAP 0200, Entry Point D
MSR and/or Light Pen feature(s)	Do(es) not operate correctly	Go to MAP 0200, Entry Point D
Self-check	Does not operate correctly	Go to MAP 0200, Entry Point D
Others		Go to MAP 0200, Entry Point A

Did you find the symptom in the symptom index?

Y N

020
Go to MAP 0200, Entry Point A.

021
-Perform the indicated repair action.
Go to Verify MAP 0400, Entry Point A.

MAIN MAP 0200

PAGE 1 OF 16

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	B	1	002
0100	C	7	063
0100	D	11	100
0100	E	12	106

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	054	0700	A
6	050	0900	A
15	138	0900	A
11	098	0900	B
11	103	0900	B
7	066	1000	A
10	091	1000	A
9	074	1000	B
10	087	1000	B
7	066	1001	A
9	074	1001	B
9	082	1001	B
9	073	3001	A
9	080	3001	A
9	081	3002	A

001
(Entry Point A)

- Power off.
- Set the Test switch to Normal.
- If the DDSA card is installed at socket C1 (MIM 1064), disconnect the communication cable from the Channel Service Unit before powering on.
  NOTE: This will cause a 0040 error after power on in normal mode. Reset the error and continue.
- At least one display station is attached and powered on. Ensure that the display station is in ready condition.
- Power on.

The internal diagnostics program runs each time the controller is powered on.

Is the Ready LED on?
Y N

The Ready LED on indicates that power-on diagnostics have been completed.

002
(Entry Point B)

Is error code DXXXXX displayed?
Y N

A DXXXXX error code indicates a power-on diagnostics error.

6 6 2
A B C

003
Is the Power LED on?
Y N

004
Is the fan running?
Y N

005
- Power off.

DANGER

If you are not careful, you could receive an electrical shock while performing the following procedure(s).

_____
_____
_____
_____

Is the AC fuse OK (MIM 0112)?
Y N

006
Replace the fuse.
Go to Verify MAP 0400, Entry Point A.

007
- Measure the voltage at the customer power outlet.

Is the AC voltage present and inside the limits (MIM 0220)?
Y N

008
Report the AC voltage problem to the customer.
- Reconnect the communication cable at the Channel Service Unit if the DDSA card is installed.

3
D E F

E F

009
- Power off.
- Unplug the line cord from the controller.
- Check the continuity of the line cord.

Is the line cord OK?
Y N

010
Replace the line cord.
- Reconnect the communication cable at the Channel Service Unit if the DDSA card is installed.

Go to Verify MAP 0400, Entry Point A.

011
Replace the internal AC cable assembly.
- Reconnect the communication cable at the Channel Service Unit if the DDSA card is installed.

Go to Verify MAP 0400, Entry Point A.

012
Is the System Available LED on at any attached work station?
Y N

013
- Power off.
- Remove all cards except the planar.
- Power on.

Is the Power LED on?
Y N

3 3 3
G H J

014

- Measure the voltage across the power supply AC connector (MIM 0210).

DANGER

If you are not careful, you could receive an electrical shock while performing the following procedure(s).

_____

_____

_____

_____

Is the AC voltage present?

Y N

015

Replace the internal AC cable assembly.

Go to Verify MAP 0400, Entry Point A.

016

Is the AC voltage inside the limits (MIM 0220)?

Y N

017

Report to the customer that the AC voltage is out of tolerance.

- Reconnect the communication cable at the Channel Service Unit if the DDSA card is installed.

018

- Power off.
- Reinstall the removed cards and remove the planar.
- Remove the access panel from the bottom of the machine.
- Power on.
- Measure the +5 V at A2D03.

Is +5 V present?

Y N

K L

019

- Power off.
- Remove all cards and the power supply.
- Measure the resistance from each voltage pin to the ground pins at the DC power supply connector on the logic board (MIM 0230).

  Resistance of less than 100K indicates a ground.

Is the resistance less than 100K for any voltage line?

Y N

020

Replace the power supply (MIM 0240)

Go to Verify MAP 0400, Entry Point A.

021

Replace the logic board (MIM 0640).

Go to Verify MAP 0400, Entry Point A.

022

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

Go to Verify MAP 0400, Entry Point A.

023

Reinstall the removed cards one at a time and power on after each replacement. Replace the card that causes the Power LED to go off or remain off.

Go to Verify MAP 0400, Entry Point A.

024

Use MIM 0320 to isolate the cause of the Power LED failure.

Go to Verify MAP 0400, Entry Point A.

025

Is the fan running?

Y N

026

- Measure the voltage at the fan AC connector (MIM 0242).

Is the AC voltage present?

Y N

4 M 4 N 4 P

027
An internal AC cable problem has caused a fan failure which has caused a logic failure. Replace the internal AC cable assembly (MIM 0241) and return to Entry Point A of this MAP.

028
No cooling due to fan failure has also caused a logic failure. Replace the fan (MIM 0242) and return to Entry Point A of this MAP.

029
Is the Work Station Active LED on?
Y N

030
- As you do the next procedure, observe the control panel LEDs. All LEDs are set on for about 1 second by the '-POR' line from the planar for a lamp test.
- Power off.
- Wait 5 seconds, then power on.

During the power-on sequence, does the Power LED go on and remain on and the other LEDs go on for approximately 1 second and then go off?
Y N

031
- Power off.
- Remove the access panel from the bottom of the machine.
- Connect the Logic Probe power leads:
  Red lead to any D03 (+5 V)
  Black lead to any D08 (Gnd)
- Connect the Logic Probe ground lead to any D08 (Gnd).
- Probe the '-POR' line at A2B12

Is the line at a down level for about 1 second when the 5294 is powered on?
Y N

6
Q R S T

R S T

032
Check the '-POR' line for open or ground on the logic board between A2B12 and power supply connector B1 (MIM 0611).

If there is an open or ground on the logic board, replace the logic board (MIM 0640).

If there is no open or ground on the logic board, replace the power supply (MIM 0240).

Go to Verify MAP 0400, Entry Point A.

033
Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

034
- Power off.
- Remove all cards from sockets C5, C7, D5, and D7.
- Power on.
- Wait 10 seconds for power-on diagnostics to be completed.

Is the Ready LED on now?
Y N

035
- Power off.
- Remove the access panel from the bottom of the machine.
- Connect the Logic Probe power leads:
  Red lead to any D03 (+5 V)
  Black lead to any D08 (Gnd)
- Connect the Logic Probe ground lead to any D08 (Gnd).
- Probe the '-clock POR' line at A2B13.
- Power on.

Is the line at a down level for about one-half second when the 5294 is powered on?
Y N

5 5 5
U V W

036

Check the '-clock POR' line for open or ground on the logic board between A2B13 and power supply connector A1 (MIM 0611).

If there is an open or ground on the logic board, replace the logic board (MIM 0640).

If there is no open or ground on the logic board, replace the power supply (MIM 0240).
Go to Verify MAP 0400, Entry Point A.

037

- Power off.
- Probe the '-reset bus' line at A4B10.
- Power on.

Is the line at a down level for about 1 second when the 5294 is powered on?

Y N

038

- Power off.
- Remove the driver/receiver cards at C3 and C4.
- Probe the '-reset bus' line at A4B10.
- Power on.

Is the line at a down level for about 1 second when the 5294 is powered on?

Y N

039

- Power off.
- Remove all cards and cables from the logic board.
- Check for a ground at A4B10.

Is there a ground?

Y N

040

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

041

Replace the logic board (MIM 0640).
Go to Verify MAP 0400, Entry Point A.

X Y

042

Reinstall the removed cards one at a time and power on after each replacement. Replace the card that causes a failure.
Go to Verify MAP 0400, Entry Point A.

043

- Measure the following voltages:
  -5 V at A1B06
  +8.5 V at A2B11

Are the DC voltages present?

Y N

044

- Power off.
- Remove the power supply (MIM 0240).
- Check the failing voltage line for an open between socket A1 or A2 and power supply connector A10 or A8 (MIM 0611).

If there is an open or ground on the logic board, replace the logic board (MIM 0640).
If there is no open or ground on the logic board, replace the power supply (MIM 0240).
Go to Verify MAP 0400, Entry Point A.

045

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

046

Replace the removed cards one at a time and power on after each replacement. Replace the card that causes the Ready LED to go off or stay off.
If the failing card is a patch card and you receive a new planar, the new planar replaces both the patch card and the planar.
Go to Verify MAP 0400, Entry Point A.

047
- As you do the next procedure, observe the control panel LEDs. All LEDs are set on for about 1 second by the '-POR' line from the planar for a lamp test.
- Power off.
- Wait 5 seconds, then power on.

During the power-on sequence does the POWER LED go on and remain on and the other LEDs go on for approximately 1 second and then go off?
Y N

048
Use MIM 0320 to isolate the cause of Ready LED failure.
Go to Verify MAP 0400, Entry Point A.

049
- Power off.
- Disconnect all twinaxial cables at the controller end.
- Power on.

Is the Ready LED on now?
Y N

050
Go To Map 0900, Entry Point A.

051
Either an attached work station is failing or a twinaxial cable is defective.
- Connect the twinaxial cables one at a time and power on after each connection. The cable that causes an error when connected or one of the work stations attached to that cable is the cause of the problem.
- Possible causes are:
  Open or shorted twinaxial cable,
  Twinaxial cable not terminated,
  A work station is transmitting continuously.
- Power off each work station attached to the failing cable one at a time, then power off, wait 5 seconds, and power on the 5294 to locate the failing work station. If the problem still exists with all attached work stations powered off, suspect a cable problem or environmental noise. Use the twinaxial cable check procedure (MIM 3001) to check out the cable.

Go to Verify MAP 0400, Entry Point A.

052
Is error code D2XXXX displayed?
Y N

053
Find the displayed error code in the following table and go to the entry point shown.

ERROR CODE	PAGE	STEP NUMBER	ENTRY POINT
D3XXXX	15	134	AB
D4XXXX	15	134	AB
D5XXXX	15	134	AB
D6XXXX	15	134	AB
D7XXXX	15	135	AC
D8XXXX	15	134	AB
D9XXXX	7	066	AD
DAXXXX	16	140	AE
OTHER	16	141	AF

054
Go To Map 0700, Entry Point A.

055
Is the fan running?
Y N

056
- Measure the voltage at the fan AC connector (MIM 0242).

Is the voltage present?
Y N

057
Replace the internal AC cable assembly (MIM 0241).

Go to Verify MAP 0400, Entry Point A.

058
Replace the fan (MIM 0242).

Go to Verify MAP 0400, Entry Point A.

059
- As you do the next procedure, observe the control panel LEDs.
- Power off.
- Wait 5 seconds, then power on.

Do all LEDs go on and remain on constantly when 5294 is powered on?
Y N

060
Reset any displayed code.

A failing work station is a work station that has one or more of the following conditions:
No system available
Failure in free-key mode.
An operator reported keyboard, display, printer, or an Expanded Function feature problem.
Answer no to the following question if the only problem is a failure to communicate with the host system or a 004X, 005X, 0099, or 1XXXXX code displayed.

Are one or more attached work stations failing?
Y N

061
- As you do the next procedure, observe the control panel LEDs. All LEDs are set on for about 1 second by the '-POR' line from the planar for a lamp test.
- Power off.
- Wait 5 seconds, then power on.

During the power-on sequence, does the Power LED go on and remain on and the other LEDs go on for approximately 1 second and then go off?
Y N

062
Use MIM 0320 to isolate the cause of the LED failure.
Go to Verify MAP 0400, Entry Point A.

14AA 10AB AC

063
(Entry Point C)

Is the EIA card or the DDSA card installed (MIM 1064)?
Y N

064
- Power off.
- Disconnect the communication cable from the DCE (modem) and connect to the wrap connector; then connect the other end of the wrap connector to the DCE.
- Refer to MIM 1052.
- Remove the jumper from the I position and install the jumper in the J position.
- Ensure that the DCE is powered on and in normal operating mode.

NOTE: This test with the XLCA card requires that the DCE be connected and providing clock signals for the work station controller.

- Power on.
- Enable wrap level 2 by selecting CE test 62 (MIM 2012).

Is error code 62XXXX (not 620000) displayed?
Y N

065
Go to Page 8, Step 068, Entry Point C2.

066
(Entry Point AD)

If the EIA card or the DDSA card is installed:
Go To Map 1000, Entry Point A.

If the XLCA card is installed:
Go To Map 1001, Entry Point A.

8AD

067
- Power off.
- Disconnect the communication cable from the DCE (modem) and install the wrap connector at the end of the communication cable.
- Power on.
- Enable wrap level 3 by selecting CE test 63 (MIM 2012).
- A 630004 code will be displayed to indicate that the wrap connector should be installed.
- Press the Enter key to start the test.

Is error code 63XXXX (not 630000) displayed?
Y N

068
(Entry Point C2)

Does the Comm Line Sync LED blink while the test is running?
Y N

069
Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

070
- Remove the wrap connector if installed.
- Reconnect the cable to the modem/DCE.
- See the table at the right for wrap 4 ability.
- Enable wrap level 4 by selecting the CE test 64 (MIM 2012).

NOTE: If a 640005 code is displayed, set the modem/DCE to the position for a local loopback (LL) or an analog loopback (AL); then press the Enter key to start the test.
If the wrap 4 test cannot be run on the attached modem/DCE, answer NO to the following question.

Is error code 64XXXX (not 640000) displayed?
Y N

Comm Card	EIA	DDSA	XLCA
Wrap 4 (DCE)	Note 1	Not available	Note 2

NOTES:
1. CE test 64 can be run on all IBM 386X or 387X modems and other modems/DCE that support a wrap controlled by interface pin 18 (MIM 0460.4) or by a modem/DCE operator switch.
   Refer to MIM 1030 for more information.
2. To perform this test, set the DCE for a local wrap by using the appropriate operator control on the DCE operator panel. If the DCE does not have a local wrap capability, wrap 4 cannot be performed.

1 1
0 0 9
A A A
E F G

071
- Reconnect the communication cable at the DCE or Channel Service Unit.
- Attempt to establish communication with the host system.

Does the Comm Line Sync LED blink?
Y N

072
Is the EIA card or the XLCA card installed (MIM 1064)?
Y N

073
Online communication failure.
- Press the Error Reset key on the terminal to exit the customer setup mode.
- Set the Test switch on the controller to Normal.
- Power off, wait 5 seconds, then power on.
- Check the PLE error log (MIM 2013, test C2).

Go To Map 3001, Entry Point A.

074
If the EIA card is installed:
Go To Map 1000, Entry Point B.

If the XLCA card is installed:
Go To Map 1001, Entry Point B.

075
- Run the display verification section of the online tests to determine if communication with the host system is possible.
- To run the online test:
  - At the sign-on screen, press the Cmd key, then press the Test Request key on the attached display station.
    The Online Verification menu will be displayed.
  - Select the desired option and follow the prompts.

Did the online test run correctly?
Y N

A H
A J

076
- Power off.
- Set the Test switch on the controller to Test.
- Power on.
- After power-on diagnostics have been completed, press the Cmd and Test Request keys on an attached display station.
- A configuration table will be displayed (MIM 0460).
- Check that the 5294 station address is correct and that the communication configuration displayed matches the actual configuration.

Is the configuration OK?
Y N

077
Correct the configuration record (MIM 0460) and retry the failing operation.

078
Is the XLCA card installed (MIM 1064)?
Y N

079
Is the X.25 feature installed (MIM 0740)?
Y N

080
Online communication failure.
- Return the controller to its normal setup.

Go To Map 3001, Entry Point A.

081
Online communication failure.
- Return the controller to its normal setup.

Go To Map 3002, Entry Point A.

082
Go To Map 1001, Entry Point B.

083
Does a failure occur every time the customer attempts a specific job?
Y N

1 0 A K
1 0 A L

084
No failure was found.
- If the failure still occurs, use Backup MAP 0300.
- If the failure is intermittent, check the HE log (MIM 2013, test C1) and PLE error log (MIM 2013, test C2) and go to MAP 0300, Entry Point A.
- Return the controller to its normal setup.

085
Report to the customer that the failure appears to be a host system problem, probably a programming error.
- Return the controller to its normal setup.

086
- Record the 64XXXX error code.
- Disconnect the communication cable at the I/O panel.
- Do not connect the wrap connector.
- Select CE/CSR test 63.
- Ignore the 630004 prompting code.
- Press the Enter key to start the test.

NOTE: This checks for a failure of the '-wrap 2 control' line.

Is error code 63XXXX (not 630000) displayed?
Y N

087
Go To Map 1000, Entry Point B.

088
The modem/DCE is failing.
- Report to the customer the failure indicated by the displayed 64XXXX error code that you recorded.
- Return the controller to its normal setup.
- Power on.

AAE
B E
7 8

089
- Power off.
- Remove the wrap connector at the DCE end of the communication cable.
- Reconnect the communication cable to the DCE.
- Disconnect the communication cable at the I/O panel and connect the wrap connector to the 25-pin connector on the I/O panel.
- Power on.
- Enable wrap level 3 by selecting CE test 63 (MIM 2012).
- A 630004 code will be displayed to indicate that the wrap connector should be installed.
- Press the Enter key to start the test.

Is error code 63XXXX (not 630000) displayed?
Y N

090
Replace the external communication cable.
Go to Verify MAP 0400, Entry Point A.

091
There is a failure in the planar, the communication card, or the internal communication cable.
Go To Map 1000, Entry Point A.

092
Is the System Available LED on at the failing work station?
Y N

093
- Power off.
- Set the Test switch to Test.
- Power on.

Is the System Available LED on at the failing work station now?
Y N

1 1 1
1 1 1
A A A
M N P

094
- Power off.
- Disconnect all twinaxial cables at the controller end.
- Move the twinaxial cable for the failing work station to a different port on the controller.
- Power on.

Is the System Available LED on at the failing work station now?
Y N

095
- Power off.
- Install a jumper between J5-1 and J5-2 on the planar (MIM 0410).
- Set the Test switch to Normal.
- Power on.
- Power-on diagnostics should loop now. This is indicated by the Ready LED flashing at 5 to 10 second intervals.

Are the power-on diagnostics looping?
Y N

096
- Remove the jumper installed between J5-1 and J5-2 on the planar (MIM 0410).

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

097
The failure is in the attached work station or the twinaxial cable.
Check for setup problems (work station address, cabling, and so on).
Use the MIM for the failing work station to isolate the failure.
The cable check procedure (MIM 3000) can be used to isolate a cable failure.
- Reconnect the communication cable at the Channel Service Unit if the DDSA card is installed.
- Remove the jumper installed between J5-1 and J5-2 on the planar (MIM 0410).
- Reconnect the twinaxial cables to the controller.
- Power on.

AQ

098
One of the following is failing:
- Driver/receiver card
- Planar
- Internal I/O cable
- Logic board

For isolation to a single FRU
Go To Map 0900, Entry Point B.

099
Correct the configuration record (MIM 0460) and retry the failing operation.

Go to Verify MAP 0400, Entry Point A.

100
(Entry Point D)

Is the failing work station a printer?
Y N

101
- Record and reset any error.

Does free-key mode operate on the failing display station?
Y N

102
Is the problem wrong characters displayed?
Y N

103
One of the following is failing:
- Driver/receiver card
- Planar

For isolation to a single FRU
Go To Map 0900, Entry Point B.

104
The failure is in the attached work station. Use the maintenance package for the failing work station to isolate the failure.
Go to Verify MAP 0400, Entry Point A.

105
Is the problem wrong characters displayed?
Y N

14AAR 13AAS 12AAT

106
(Entry Point E)

Is the problem a 0086 error when attempting to perform an MSR, light pen, or self-check operation?
Y N

107
Is the reported problem a self-check failure?
Y N

108
Is the reported problem an MSR failure?
Y N

109
Is the reported problem a light pen failure?
Y N

110
No controller failure identified.
- Check the work station addressing and the configuration (MIM 0460).
- If a failure still exists, it is probably a work station problem.
- Use the maintenance package for the failing work station to isolate the failure.

111
- Key in a line of characters while in free-key mode or with the verification test menu displayed. Place the light pen tip on any character. An error code of 0036 should be displayed.
- Remove the light pen from the screen.
- Press the Reset key.
- Press the Field Exit key.
- Place the light pen tip over a row of characters and slowly move along the row.
- The cursor should follow the light pen movement + or - 2 positions.
- Place the light pen tip over a character and press the light pen tip against the screen to activate the tip switch. An error code of 0037 should be displayed.

Did the light pen check out OK?
Y N

1 1
3 3
A A A A A
U V W X Y

A A A
W X Y

112
The failure is probably in the attached work station. Use the maintenance package for the failing work station to isolate the failure.
If no failure is found in the work station, replace the Expanded Function feature ROS module and/or the feature ROS card (MIM 0740 and 0741).
Go to Verify MAP 0400, Entry Point A.

113
The failure is caused by operator error or a host system programming problem.
Go to Verify MAP 0400, Entry Point A.

114
- Pass the MSR test card through the reader while in free-key mode or with the Online Verification Test Prime Option menu displayed?

Does the MSR test card read correctly when used in free-key mode or in the free key field on the verification menu?
Y N

115
The failure is probably in the attached work station. Use the maintenance package for the failing work station to isolate the failure.
If no failure is found in the work station, replace the Expanded Function feature ROS module and/or the feature ROS card (MIM 0740 and 0741).
Go to Verify MAP 0400, Entry Point A.

116
The failure is caused by an operator error, a defective MSR card, or a host system programming problem.
Go to Verify MAP 0400, Entry Point A.

117
- Select the Specified Input Field screen of the online verification tests.
- Field Advance to the self-check fields.
- Enter AF127656 in the 1st self check field.
- Enter AF127655 in the 2nd self check field.

Is error code 0015 displayed after entering the number given for either self-check field?
Y N

118
The failure is caused by entry of incorrect check digits or a host system programming problem.
Go to Verify MAP 0400, Entry Point A.

119
Replace the Expanded Function feature ROS module (MIM 0741).
If the failure continues, replace the feature ROS card in socket C5 (MIM 0740).
Go to Verify MAP 0400, Entry Point A.

120

Is the Expanded Function feature ROS module installed (MIM 0710)?
Y N

121
The MSR, light pen, self-check, and copy-to-print functions cannot be used unless the Expanded Function feature is installed on the controller.

- Set the Test switch on the controller to Normal.
- Power off.

Go to Verify MAP 0400, Entry Point A.

122
Replace the Expanded Function feature ROS module (MIM 0741).
If the failure continues, replace the feature ROS card in socket C5 (MIM 0740).
Go to Verify MAP 0400, Entry Point A.

123
- Power off.
- Set the Test switch on the controller to Test.
- Power on.
- After power-on diagnostics have completed press the Cmd and Test Request keys on an attached display station.
- A configuration table will be displayed (MIM 0460).
- Check that the country ID for each display station is correct.

Does the configuration displayed match the actual configuration of the attached display stations?
Y N

124
Correct the configuration record (MIM 0460) and retry the failing operation.
- Press the Error Reset key on the terminal to exit customer setup mode.
- Set the Test switch on the controller to Normal.
- Power off.

Go to Verify MAP 0400, Entry Point A.

125
- Exit the customer setup mode.
- Refer to the display station maintenance documentation and check the display station for correct scan code generation.

Is the display station scan code generation correct?
Y N

126
The failure is in the attached work station. Use the maintenance package for the failing work station to isolate the failure.

- Set the Test switch on the controller to the Normal.
- Power off.

Go to Verify MAP 0400, Entry Point A.

127
Replace the feature translate card in socket C7 if the card is present (MIM 0113).
If no card is installed in socket C7, replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

128

- Check the address switch setting on the printer and check the configuration (MIM 0460).
- If a failure still exists, it is probably a printer problem.
- Use the maintenance package for the failing printer to isolate the failure.

129

- Power off.
- Remove the planar.
- Remove the access panel from the bottom of the machine.
- Connect the Logic Probe power leads:
  Red lead to any D03 (+5 V)
  Black lead to any D08 (Gnd)
- Connect the Logic Probe ground lead to any D08 (Gnd).
- Power on.
- Probe the '-POR' line at A2B12 and the '-clock POR' line at A2B13.

Is either line at a down level?

Y N

130

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

131

- Power off.
- Remove the communication card.
- Power on.
- Probe the line that was at a down level.

Is the line at a down level now?

Y N

132

Replace the communication card (MIM 1040).
Go to Verify MAP 0400, Entry Point A.

AZ

AZ

133

Check the line that was at a down level for a ground on the logic board (MIM 0611).
If there is an open or ground on the logic board, replace the logic board (MIM 0640).
If there is no open or ground on the logic board, replace the power supply (MIM 0240).
Go to Verify MAP 0400, Entry Point A.

134
(Entry Point AB)
Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

135
(Entry Point AC)

Is the Work Station Active LED on?
Y N

136
Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
Go to Verify MAP 0400, Entry Point A.

137
- Power off.
- Disconnect all twinaxial cables at the controller end.
- Power on.

Is the Ready LED on now?
Y N

138
Reconnect all twinaxial cables.
Go To Map 0900, Entry Point A.

139
Either an attached work station is failing or a twinaxial cable is defective.
- Connect the twinaxial cables one at a time and power on after each connection. The cable that causes an error when connected or one of the work stations attached to that cable is the cause of the problem.
- Possible causes are:
  Open or shorted twinaxial cable
  Twinaxial cable not terminated
  A work station is transmitting continuously
- Power off each work station attached to the failing cable one at a time, then power off, wait 5 seconds, and power on the 5294 to locate the failing work station. If the problem still exists with all attached work stations powered off, suspect a cable problem or environmental noise. Use the twinaxial cable check procedure (MIM 3000) to check out the cable.

Go to Verify MAP 0400, Entry Point A.

140
(Entry Point AE)
Correct the configuration record (MIM 0460) and retry the failing operation.
Go to Verify MAP 0400, Entry Point A.

141
(Entry Point AF)
For any other DXXXXX error code, check to see if the error code is listed in MAP 0100 or MAP 0300. If the error code is not listed in MAP 0100 or MAP 0300, do the following:

- Power off.
- Remove cards, if any, from sockets C5, D5, C7, and D7.
- Power on.
- If the failure symptom changes, leave the cards out and restart at MAP 0100, Entry Point A.
- If the same error code is displayed, continue with this step.
- Check that all voltages are in tolerance for voltage and ripple (MIM 0231 and 0232).If the voltages are out of tolerance, replace the power supply (MIM 0240).
- If all the voltages are OK, replace the following FRUs in the order listed:
  Planar
  Communication card
  Driver/receiver card

- Power on after each replacement to verify the fix.

Go to Verify MAP 0400, Entry Point A.

BACKUP MAP 0300

001

(Entry Point A)

All problems must be started at Start of Call MAP 0100.

This MAP has three sections:

1. An index of possible causes listed by error code in order of probability.

2. An index of possible causes listed by major symptom in order of probability.

3. An error log table, which uses the ERAP error log (MIM 2050) or the error log buffer (MIM 2013).

NOTES:

1. If more than one FRU is listed in the probable cause column, perform one FRU replacement per call and record the date.

2. If a cable is listed as the probable cause, consider reseating the cable prior to replacing it.

3. When a logic FRU is listed as the probable cause, reseat the card and check all associated cables before replacing the FRU.

4. If two or more symptoms are reported as occurring at different times, attempt to isolate the failure by using the most frequently occurring symptom or by finding which FRUs are common to all symptoms.

- Look for the error in the index.

(Step 001 continues)

(Step 001 continued)

ERROR CODE INDEX

OPERATOR ERROR CODES

ERROR CODE	ADDITIONAL INFORMATION	PROBABLE CAUSE
0001 through 0029	Occurs during correct operation or entry	Attached display station Planar
0031 through 0035	Occurs during correct operation of MSR	MSR media Attached display station Expanded function feature ROS module (pos. #1) on ROS card at C5 Planar
0036 or 0037	Occurs during correct operation of the light pen with valid light pen entry fields	Attached display station Expanded function feature ROS module (pos. #1) on ROS card at C5 Planar
004X or 005X or 006X	Use error code 004X or 005X to enter table under logged device error codes	Go to communication error code section page 10 in this MAP
0099	Occurs during correct operation. Host system or communication problem	Check PLE log. Use PLE log entries to enter the error log table in this MAP. If no PLE log entries are present, go to MAP 3003, Entry Point A
10XXXX	Occurs during correct operation or entry	Incorrect configuration X.25 ROS module (pos. #2) on ROS card at C5 Planar

(Step 001 continues)

(Step 001 continued)

11XXXX	Probable network problem Check error code lists for cause definition	If problem is caused by the 5294 failure: X.25 ROS module (pos. #2) on ROS card at C5 Planar
Other	Occurs during correct operation	Attached display station Planar Driver/receiver card

D I A G N O S T I C E R R O R C O D E S

ERROR CODE	ADDITIONAL INFORMATION	PROBABLE CAUSE
D11001	Power LED on All other LEDs off	Planar Feature ROS card/modules Power supply Logic board
D13002	Power and Ready LEDs on Work Station Active LED off	Driver/receiver card Twinaxial cable Attached work station Planar Logic board
D13003	Power and Work Station Active LEDs on Ready LED off	Driver/receiver card Planar Power supply Logic board
D20040 OR D20080 OR D200C0	1. Only one module on feature ROS card at C5	Feature ROS card at C5 X.25 ROS module (pos. #2)
	2. Two or more modules on feature ROS card at C5	X.25 ROS module (pos. #2) Feature ROS card at C5
D20100	1. Only one module on feature ROS card at C5	Feature ROS card at C5 Expanded function feature ROS module (pos. #1)
	2. Two or more modules on feature ROS card at C5	Expanded function feature ROS module (pos. #1)

(Step 001 continues)

(Step 001 continued)

DIAGNOSTIC ERROR CODES		
ERROR CODE	ADDITIONAL INFORMATION	PROBABLE CAUSE
D20200	Power-on diagnostic error	Feature translate EPROM card at C7 if installed Planar
D20800 D21000 D22000 D24000 D28000	Power-on diagnostic error	Planar
D2XXXX not listed above	Power-on diagnostic error	Planar Feature ROS card at C5 Expanded function feature ROS module (pos. #2) X.25 ROS module (pos. #2) Feature translate EPROM card at C7
D3XXXX D410XX D510XX D610XX D710XX	Power-on diagnostic error	Planar
D73YXX	Power-on diagnostic error during twinaxial interface test. Y in the SRC equals 1 to F and identifies the failing port(s)	Driver/receiver card Planar Internal I/O cable Logic board Twinaxial cable
D77YXX	At least one error-free response was received from the port identified by the port identifier Y in the SRC	Attached work station Twinaxial cable Driver/receiver card Planar

(Step 001 continues)

(Step 001 continued)

D810XX	Communication adapter test	Planar
D900XX	Invalid communication card type in configuration record	Correct communication card type in the configuration record
D910XX	Communication adapter test	Planar
D912XX D914XX	Communication adapter test	Communication card Planar Logic board
DA1060	1 | First occurrence	Perform customer configuration and retry
	2 | Second occurrence	Planar
DXXXXX	Any other error code	Planar Power supply Logic board Feature ROS card/modules
EXXXXX	Error detected during operation	Planar
FXXXXX	Error detected during operation	Check EC load level for latest level If OK, replace planar If failure continues to occur, call for support

(Step 001 continues)

(Step 001 continued)

F A I L U R E S Y M P T O M I N D E X			
When using observed symptoms, the minor symptom column can help isolate the cause of failure. Also, review the internal error log or the error history table for entries that can help define the cause of the failure.			
MAJOR SYMPTOM		MINOR SYMPTOM	PROBABLE CAUSE
COMMUNICATIONS			
Comm Line Sync LED off	1	004X, 005X, or 0099	See entry for operator error codes
	2	No operator errors	Communication lost (see below)
Communication slow		Input inhibit on longer than usual. NOTE: This may be caused by host system work load increase.	Go to MAP 3003, Entry Point A
Communication with host system lost		The Comm Line Sync LED may be off or blinking depending on the network	Check PLE log. Use PLE log entries to enter the error log table in this MAP. If no PLE log entries are present, go to MAP 3003, Entry Point A
LED INDICATIONS			
All LEDs off			Fuse Power supply Customer AC power Internal AC cable asm Planar or logic cards Logic board

(Step 001 continues)

(Step 001 continued)

Power LED on All other LEDs off		Planar Feature ROS cards Power supply Logic board
Power and Ready LEDs on Work Station Active LED off		Driver/receiver card Twinaxial cable Attached work station Planar Logic board
Power and Work Station Active LEDs on Ready LED off		Driver/receiver card Planar Power supply Logic board
Single LED failure	5294 works OK. All operations normal	LED assembly Planar

OTHER SYMPTOMS			
Power supply fuse blows	1	Single occurrence	Power line disturbance Replace fuse
	2	Multiple occurrences (check voltage distribution)	Suspect: Power supply
Symptoms not described			Power supply Planar

(Step 001 continues)

(Step 001 continued)

ATTACHED WORK STATION SYMPTOMS

This section is to be used only after ensuring that no problem has been detected by the controller or attached work station diagnostics. These are symptoms that are observed on the work stations.

MAJOR SYMPTOM	MINOR SYMPTOM	PROBABLE CAUSE
System Available off	No free-key mode	Twinaxial cable Driver/receiver card Internal I/O cable Planar Attached work station
System Available on	No character displayed when a key is pressed	Driver/receiver card Planar Logic board Attached work station
System Available on	Characters displayed do not match the key pressed Free key mode fails	Incorrect configuration Feature translate ROS card at C7, if installed Planar
Light pen	Fails on all attached display stations	Feature ROS card at C5 Expanded function feature module on ROS card at C5
	Fails on some attached display stations, works correctly on others	Attached work station problem

(Step 001 continues)

(Step 001 continued)

System Available off or blinking and/or	Fails on only one work station when more than one are attached to the same port	Twinaxial cable Attached work station Incorrect configuration Driver/receiver card
Line Sync off or blinking and/or Line check on	Fails on more than one work station or only one is attached to the port	Twinaxial cable Attached work station Incorrect configuration Driver/receiver card Planar Internal I/O cable Logic board
Magnetic Stripe Reader (MSR)	Fails on all attached display stations	Feature ROS card at C5 Expanded function feature module on ROS card at C5 Attached work station
	Fails on some attached display stations, works correctly on others	Attached work station problem
Overstrike/hex key failure	Machine operates normally for all other functions	Incorrect configuration Feature translate card at C7, if installed Planar
Self-check	Fails when correct check digits are entered	Feature ROS card at C5 Expanded function feature module on ROS card at C5 Attached work station
Other	Other attached work station errors when no internal failure of the work station can be found	Twinaxial cable Driver/receiver card Internal I/O cable Planar Feature ROS cards

(Step 001 continues)

(Step 001 continued)

ERROR LOG TABLE

- Find the last error code from the error history table or the error log buffer (MIM 2013, test C2).
- Find the error code in the error column of the table below.
- The FRUs are listed under the probable cause column.

See error history table in MIM 2090 for more detailed information for the error codes.
Refer to MIM 2050 for a general description of the error log and MIM 2100 section for error codes.

COMMUNICATION ERROR CODES

This table indicates the possible causes for the communication error codes.

The possible causes are listed in order of probability for each communication feature.

The possible causes are referred to by a number that corresponds to a failure cause or FRU in the cause number list.

MAP 3003 may be used with all 004X, 005X, and 006X error codes to help isolate the failure.

Cause Number List

1. Communication card
2. External communication cable
3. Internal communication cable
4. Planar
5. Communication line/network
6. Modem/DCE
7. Host system
8. Configuration error
9. Power supply

(Step 001 continues)

(Step 001 continued)

Error Code	EIA	XLCA	DDSA
0040	6,2,3,1,4,8	6,5,2,3,1,4,8	5,6,1,2,4,8
0041	5,6,2,3,1,4,8	6,5,2,1,3,4	5,1,2,4
0042	6,1,2,3,4	6,2,1,3,4	1,4
0043	6,1,4,8,9	8	8
0044	5,6,1,2,4,3,8	8	8
0045	6,5,4	6,5,4	
0046	6,4	6,4	
0047	6,4	6,4	
0050	6,2,4,1,3	6,2,4,1,3	1,4
0051	6,1,2,3,4	6,2,1,3,4	1,4
0052	4	4	4
0053	6,5	6,5	
0054	7,4	7,4	7,4
0062 0063	4	4	4
0064	5,6,1,2,3,4	5,6,1,2,3,4	5,1,2,3,4
0065 0066	6,1,2,3,4	6,1,2,3,4	5,1,4
0067 0068 0069	5,6,1,2,3,4	5,6,1,2,3,4	5,1,2,3,4
006A	7,5,6	7,5,6	7,5,6
006B		1,4	
006C	5,6	5,6	
006D	5,6,7	5,6,7	

(Step 001 continues)

(Step 001 continued)

LOGGED DEVICE ERROR CODES			
ERROR CODE	ERROR NAME	ERROR DESCRIPTION	PROBABLE CAUSE
01XX or 02XX	Attached work station errors	Suspect a twinaxial cable problem for parity checks, line checks, etc. Suspect a 5294 problem only if no problems are found on the attached workstation or with the twinaxial cable.	Driver/receiver card Planar Power supply

Did you find the failing FRU or did you replace a FRU for an intermittent problem?

Y N

002

- Use the information you have and the maintenance information manual for a free-lance approach.

003

- Record the FRU replaced, the symptoms, and the date.

VERIFY MAP 0400

ENTRY POINTS

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

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0100	A
2	005	0100	A
2	007	0100	A
2	009	0300	A

001

(Entry Point A)

- Power off.
- Replace the access panel at the bottom of the machine if removed earlier.
- Reconnect all disconnected feature(s) and cables.
- Set the Status switch to Normal.
- Wait 5 seconds, then power on.
- Attempt to repeat the original error.
- Verify that no new errors have occurred.

Does the original error still occur?

Y **N**

002

Does the 5294 power on without errors and operate correctly offline?

Y **N**

003

- Use the Start of Call MAP with the symptom you have now.

Go To Map 0100, Entry Point A.

Correct operation for normal power-on sequence:

- Set the Test switch to Normal.
- Power on.
- All LEDs go on for about 1 second for a lamp test.
- All LEDs except Power go off.
- The Ready LED goes on when diagnostics have been completed.
- The Work Station Active LED goes on if any attached work station is powered on and responds to polling from the controller.
- The controller is now ready to operate once the communication link to the host system is established.

2 A 2 B

004
- Run the online test, select prime option 1 (MIM 2014).

Does the online test run correctly?
Y N

005
- Use the Start of Call MAP with the symptom you have now.

Go To Map 0100, Entry Point A.

006
- If necessary, run the customer application.
- If not necessary, take the yes (Y) leg of the following question.

Does the customer application function correctly now?
Y N

007
- Use the Start of Call MAP with the symptom you have now.

Go To Map 0100, Entry Point A.

008
End of call.

009
Go To Map 0300, Entry Point A.

ROS PROBLEM ISOLATION MAP 0700

ENTRY POINTS

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

001

(Entry Point A)

Is a card installed in socket D5 and/or socket D7?
Y N

002

(Entry Point B)

Is a card installed in socket C5 and/or socket C7?
Y N

003

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

004
- Power off.
- Remove the feature card at C7, if installed.
- Power on and wait 10 seconds for power-on diagnostics to be completed.
- Answer YES to the following question if no card is installed at C7.

Is there a failure?
Y N

005
If the multinational translate ROS module is on the planar and a card is installed in C7, ensure that the module disable jumper is installed (MIM 0410).

Replace the card in socket C7.

2 A B

B

006
Are there two or more modules on the C5 card (MIM 0710)?
Y N

007

Either the ROS feature card or the ROS module is failing. Refer to the following chart and replace the most probable FRU first. The ROS module will either be replaced or transferred to the new ROS card (MIM 0740 and 0741).

D2 XXXX XXXX=	PROBABLE FRU
0100	Module #1 ROS card C5
0040	Module #2 ROS card C5
0080	Module #2 ROS card C5
00C0	See Note
Any not listed above	ROS card C5 Module #2 Module #1

NOTE: If a XXXX= 0040, 0080, or 00C0 and module #2 is not installed, the failing FRU is the X.25 EPROM card at D7.

008

Do you have an error code D2 0040, D2 0080, D2 00C0, or D2 0100?
Y N

2 C 2 D

009

The most probable cause is the ROS card C5.

Obtain a new ROS card and transfer the modules to the new card.
If a failure still occurs, remove the modules one at a time and power on after each removal. The failing module is the one removed just prior to the power on OK (MIM 0740).

010

Refer to the chart and replace the module indicated (MIM 0741).

D2 XXXX XXXX=	PROBABLE FRU
0100	Module #1
0040 0080 00C0	Module #2 See Note

NOTE: If a XXXX= 0040, 0080, or 00C0 and module #2 is not installed, the failing FRU is the X.25 EPROM card at D7.

If the failure still occurs, do the following :

- Remove the modules from the old card (MIM 0741).
- Install the modules in a new ROS card.
- Reinstall the new ROS card (MIM 0740).

A
1

011

- Power off.
- Remove the cards at D5 and/or D7.
- Power on and wait 10 seconds for power-on diagnostics to be completed.

Is there a failure?

Y N

012

- Re-install the removed cards one at a time and power on. Replace the card that causes a failure when installed.

If the failing card is a patch card and you receive a new planar, the new planar replaces both the planar and the patch card.

013

Go to Page 1, Step 002, Entry Point B.

DRIVER/RECEIVER INTERFACE MAP 0900

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0200	A	1	001
0200	B	1	004

001

(Entry Point A)

- Power off.
- Refer to MIM 0520 for any information.
- Disconnect cable J01 from the logic board (MIM 0520).
- Power on.
- Wait 10 seconds for power-on diagnostics to complete.

Is the Ready LED on?
Y N

002
- Power off
- Reconnect cable J01 to the logic board.
- Select the twinaxial continuous transmit test by installing a jumper between J5-4 and J5-3 on the planar (MIM 0410).
- Remove the access panel from the bottom of the controller.
- Power on.
- Wait 10 seconds for the continuous transmit test to start.
- Probe all 'Rcv data' lines at socket A4 (MIM 0520).

NOTE: If an SRC D7 3YXX is displayed, probe only the line(s) for the failing port(s) indicated by Y (MIM 0520).

Are all the 'Rcv data' lines pulsing?
Y N

2 2
A B C

003
-Probe the failing lines at C3 or C4 (MIM 0520).

Are all signals pulsing?
Y N

004

(Entry Point B)

- Power off.
- Remove the driver/receiver card(s) at C3 and C4.
- Select the twinaxial continuous transmit test, if not previously done, by installing a jumper between J5-4 and J5-3 on the planar (MIM 0410).
- Remove the access panel from the bottom of the controller.
- Power on.
- Wait 10 seconds for the continuous transmit test to start.
- Probe the '+Xmit data' line and the 'X2FO' line at C3 or C4 (MIM 0520).
- Probe the'+DXE' line(s) for the failing port(s) at C3 or C4 (MIM 0520).

Are all lines pulsing?
Y N

005
- Probe the '+Xmit data' line and the 'X2FO' line at A4 (MIM 0520).
- Probe the '+DXE' line(s) for the failing port(s) at A4 (MIM 0520).

Are all lines pulsing?
Y N

006
- Power off.
- Check for a ground on the line(s) not pulsing.

If there is a ground, replace the logic board (MIM 0640).
If there is no ground, replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
- Reinstall the card(s) removed at earlier steps.

2 2 2
D E F

007
Replace the logic board (MIM 0640).
- Reinstall the card(s) removed at earlier steps.
- Remove the jumper installed between J5-3 and J5-4 on the planar (MIM 0410).

008
- Power off.
- Check for open or ground between the twinaxial connector of the failing port and the corresponding pins at C3 or C4 on the logic board (MIM 0520).

Is there an open or a ground?
Y N

009
- Ensure that +5 V and -5 V are present on sockets C3 and C4 (MIM 0520). If any voltage is missing, use MIM 0230 to isolate the cause.

- Check for a ground on any 'Rcv data' line that was not pulsing. If there is a ground, use MIM 0520 to isolate the cause.

If the above two are OK, replace the driver/receiver card.
- Remove the jumper installed between J5-3 and J5-4 on the planar (MIM 0410).

010
- Disconnect cable J01.
- Check the failing port connections for open or ground between J01 on the logic board and corresponding pins at C3 or C4 (MIM 0520).

Is there an open or a ground?
Y N

011
Replace the internal I/O cable.
- Reinstall the card(s) removed at earlier steps.
- Remove the jumper installed between J5-3 and J5-4 on the planar (MIM 0410).

012
Replace the logic board.
- Reinstall the card(s) removed at earlier steps.
- Remove the jumper installed between J5-3 and J5-4 on the planar (MIM 0410).

A B D 1 1 1

013
Replace the logic board.

014
- Power off.
- Remove the jumper installed between J5-3 and J5-4 on the planar (MIM 0410).

Replace :
1. Driver/receiver card.
2. Planar (MIM 0440) and re-enter the congiguration (MIM 0460).

Go to Verify MAP 0400, Entry Point A.

015
Open or grounded internal I/O cable. Repair or replace the internal I/O cable.

Communication MAP 1000

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	1	001
0200	B	6	056

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	058	3001	A
6	059	3002	A

001

(Entry Point A)

- Use this MAP when either the EIA card or DDSA card is installed.
- Ensure that the communication card type defined in the configuration record matches the communication card installed (MIM 1064 and 0460).
- Use MIM 1021A if the old style EIA card is installed at location C1.
- Use MIM 1021B if the new style EIA card is installed at location C1.
- Use MIM 1022 if DDSA card is installed at location C1.

NOTES:
1. Before you replace any FRU, reseat the cards and communication cables. Also, check that the jumpers are set correctly (MIM 1050 for EIA, MIM 1051 for DDSA).
2. Ensure that the communication cable is disconnected from the Channel Service Unit if the DDSA card is installed. This is necessary to prevent interference with other stations on a multipoint network.

Did you come to this MAP because of a wrap level 3 error code (638AXX or 638CXX)?

Y **N**

002

- Compare the last 2 characters of the error code with the wrap 2 error code column of table 1021 or 1022.

Did you find the error code in the table?

Y **N**

3A 2B 2C

003
- Replace the following FRUs in the order listed.
  1. Planar
  2. Communication card
- Power on after replacing each FRU and enable the CE test 62 to verify the fix.

004

(Entry Point C)

Are any lines indicated by this error code a P-type line (MIM 102X)?
Y N

005

(Entry Point D)

Are any lines indicated by this error code an X-type line (MIM 102X)?
Y N

006

(Entry Point E)

- Enable the CE test 62 with the loop-on-error function (MIM 2012).
- Probe all R-type signal lines indicated by the displayed error code at both the C1 and A1 pins of the logic board.

NOTE: The time between pulses may be as long as 10 seconds. Wait at least 10 seconds before answering.

Does the signal line pulse at both pins?
Y N

007
Do all the lines pulse at the C1 pins?
Y N

3
D E F G H

E F G H

008
NOTE: The failing line is the one that is not pulsing.

Is the failing line at a down level?
Y N

009
Replace the communication card (MIM 1040) and set the jumpers (MIM 1050 or 1051).
- Return the controller to its normal setup.

010
Go to Page 5, Step 050, Entry Point G.

011
Replace the logic board (MIM 0640).

012
- Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
- Return the controller to its normal setup.

013
- Enable the CE test 62 with the loop-on-error function (MIM 2012).

- Probe all X-type signal lines indicated by the displayed error code at both the A1 and C1 pins of the logic board (MIM 102X).

NOTE: The time between pulses may be as long as 10 seconds. Wait at least 10 seconds before answering.

Do all the line(s) pulse at both pins?
Y N

014
Do all the lines pulse at the A1 pins?
Y N

3 3 3
J K L

015

NOTE: Except for the '- wrap 2 control' line, the failing line is the one that is not pulsing. The '- wrap 2 Control' line should always be at a down level while the test is running.

- Answer NO if both probe lights are off.

Is the failing line at a down level?

Y N

016

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

- Return the controller to its normal setup.

017

Go to Page 5, Step 050, Entry Point G.

018

Replace the logic board (MIM 0640).

019

Are any lines indicated by the error code an R-type line?

Y N

020

Replace the communication card (MIM 1040) and set the jumpers (MIM 1050 or 1051).

- Return the controller to its normal setup.

021

Go to Page 2, Step 006, Entry Point E.

022

- Measure the voltage on the indicated line at the C1 pins of the logic board.

Is the voltage at the correct level?

Y N

023

- Measure the failing voltage at the logic board voltage test points (MIM 0611).

Is the voltage at the correct level?

Y N

M N P

A M N P
1

024

Replace the power supply (MIM 0240) .

- Return the controller to its normal setup.

025

Replace the logic board (MIM 0640).

026

Is this the only line with this error code?

Y N

027

Go to Page 2, Step 005, Entry Point D.

028

Replace the communication card (MIM 1040) and set the jumpers (MIM 1050 or 1051).

- Return the controller to its normal setup.

029

Does this controller have the DDSA card installed (MIM 1064)?

Y N

030

- Measure the -8.5 V at C1D07.

Is -8.5 V present?

Y N

031

- Measure the -8.5 V at A9, B9 at the power supply DC connector (MIM 0230).

Is -8.5 V present?

Y N

032

- Replace the power supply (MIM 0240).

033

- Replace the logic board (MIM 0640).

034

Was the displayed error code 638C41?

Y N

5 5 4
Q R S

035

(Entry Point F)

- Install the 25-pin cable wrap connector at the I/O panel.
- Install a red wire jumper from the X-type line to the R-type line at location C2 of the logic board, as shown by the wrap 3 path for the failing line (MIM 1021).
- Power on.
- Enable wrap level 3 by activating the CE test 63 (MIM 2012).

Does the test run without errors?

Y N

036

- Record the error code if not recorded earlier.
- Power off the controller.
- Remove the wrap connector, if installed.
- Remove the jumper installed at step 035.
- Use an ohmmeter to check for a ground on the failing line(s) at the C2 pins as indicated by the wrap 3 error code (MIM 1021).
  The resistance to ground for each line should be greater than 300 ohms for X-type lines and greater than 1500 ohms for R-type lines.
  A resistance to ground that is less than stated above is a ground condition for these lines.

Is the line grounded?

Y N

037

- Power on.
- Press the Error Reset key.
- Install the red wire jumper between the same X and R type line (same line name you used in step 035) at the corresponding C1 pins (MIM 1021).
- Enable wrap level 3 by activating the CE test 63 (MIM 2012).

Does the test run without errors?

Y N

5
T U V W

U V W

038

- Power off.
- Remove the jumper installed at step 037.
- Remove the EIA card.
- Power on.
- Reset any error.
- Enable the CE test 62 with the E option (MIM 2012).
- A different SRC may be displayed. Ignore it.
- Probe the R-type signal line at the C1 pin that the jumper was connected to in step 037.
- Answer NO if both probe lights are off.

Is the line at a down level?

Y N

039

Replace the EIA card (MIM 1040) and set the jumpers (MIM 1050).

- Return the controller to its normal setup.

040

- Check the failing line(s) for a ground on the logic board between locations A1 and C1.
- If there is a ground, replace the logic board (MIM 0640).

- If there is no ground, replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

041

Replace the EIA card (MIM 1040) and set the jumpers (MIM 1050).

- Return the controller to its normal setup.

042

- Disconnect the internal communication cable at location D2.

Is the line grounded now?

Y N

043

Replace the internal communication cable (MIM 1041).

- Return the controller to its normal setup.

5
X

044
- Remove the communication card from the logic board.

Is the line grounded now?
Y N

045
Replace the communication card (MIM 1040) and set the jumpers (MIM 1050 or 1051).
- Return the controller to its normal setup.

046
Replace the logic board (0640).

047
Repair or replace the internal communication cable.

048
- Power off the controller.
- Set the Test switch to Normal.
- Wait 5 seconds, then power on.
- Probe the '-wrap 2 control' line at C1D05.

Is the line at a down level?
Y N

049
Go to Page 4, Step 035, Entry Point F.

050

(Entry Point G)

- Power off.
- Remove the communication card.
- Power on.
- Reset any error.
- Enable the CE test 62 with the E option (MIM 2012).
- A different SRC may be displayed. Ignore it.
- Answer NO if both probe lights are off.

Is the line still at a down level?
Y N

051
Replace the communication card (MIM 1040) and set the jumpers (MIM 1050 or 1051).
- Return the controller to its normal setup.

Y

052
- Check for a ground on the '-wrap 2 control' line on the logic board (MIM 1021).
- If there is a ground, replace the logic board (MIM 0640).
- If there is no ground, replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

053
- Disconnect the internal communication cable at location D2.
- Install red wire jumpers as follows:
  C2B02 to C2B09
  C2D05 to C2D13
- Enable wrap level 3 by selecting the CE test 63 (MIM 2012).

Is error code 63 8AXX displayed?
Y N

054
- Replace the internal communication cable.
- Return the controller to its normal setup.

055

- Check the lines shown in the wrap 3 column of table 1022 for an open or ground between the C2 and D2 pins.
- If there is an open or ground, replace the logic board.
- If there is no open or ground, replace the DDSA card.
- Return the controller to its normal setup.

056

(Entry Point B)

- Power off the controller.
- Set the Test switch to Normal.
- Wait 5 seconds, then power on.
- Probe the '-wrap 2 control' line at C1D05.

Is the line at a down level?
Y N

057

- X.25 feature is installed if you have a feature ROS module installed in position 2 on the feature ROS card at C5 (MIM 0710).

Do you have an X.25 feature installed (MIM 0710)?
Y N

058
Online communication failure.
- Check PLE log (MIM 2013, test C2).

Go To Map 3001, Entry Point A.

059
Online communication failure.
- Check PLE log (MIM 2013, test C2).

Go To Map 3002, Entry Point A.

060
Go to Page 5, Step 050, Entry Point G.

Communication MAP 1001

PAGE 1 OF 8

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0200	A	1	001
0200	B	6	045

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
8	063	3001	A
8	064	3002	A

001

(Entry Point A)

1. Use this MAP only when the XLCA card is installed.

2. Ensure that the setting of the communication card type field in the configuration record matches the communication card installed (MIM 0460 and 1064).

3. Use the table of communication lines in MIM 1023 to answer the following questions.

NOTE: Before you replace any FRU, reseat the cards and communication cables. Also, check that the jumpers are set correctly (MIM 1052).

- Compare the last 2 characters of the error code with both error code columns of table 1023.

Did you find the error code in the table?

Y N

002

- Power off.
- Remove the XLCA card from location C1.
- Check all signal lines from logic board C2 to the DCE end of the external communication cable as shown in MIM 1023 for an open or short to ground or short to another line.

Are any of the lines open or grounded?

Y N

2A 2B 2C

003

Replace the following FRUs in the order listed.

1. Planar (MIM 0440 and 0460)
2. XLCA card (MIM 1040 and 1052)

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).
- Power on after replacing each FRU and enable the CE test 62 to verify the fix.

004

Use MIM 1023 to isolate the failing line to the logic board, the internal communication cable, or the external communication cable. Replace the identified FRU and verify the fix.

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

005

Is the error code 621103, 621115, or 621178?

Y N

006

(Entry Point C)

Are any lines indicated by this error code a P-type line (MIM 1023)?

Y N

007

(Entry Point D)

Are any lines indicated by this error code an X-type line (MIM 1023)?

Y N

4 4 3
D E F G

G

008

(Entry Point E)

- Enable the CE test 62 with the loop-on-error function (MIM 2012).
- Probe all R-type signal lines indicated by the displayed error code at both the C1 and A1 pins of the logic board.

NOTE: The time between pulses may be as long as 10 seconds. Wait at least 10 seconds before answering.

Does the signal line pulse at both pins?

Y N

009

Do all the lines pulse at the C1 pins?

Y N

010

NOTE: The failing line is the one that is not pulsing.

Is the failing line at a down level?

Y N

011

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

012

Go to Page 5, Step 042, Entry Point F.

013

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the logic board (MIM 0640).

014

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

015
- Enable the CE test 62 with the loop-on-error function (MIM 2012).
- Probe all X-type signal lines indicated by the displayed error code at both the A1 and C1 pins of the logic board.

NOTE: The time between pulses may be as long as 10 seconds. Wait at least 10 seconds before answering.

Do all the line(s) pulse at both pins?

Y N

016

Do all the lines pulse at the A1 pins?

Y N

017
- The failing line is the one that is not pulsing.
- Answer NO if both probe lights are off.

Is the failing line at a down level?

Y N

018

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

019

Go to Page 5, Step 042, Entry Point F.

020
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the logic board (MIM 0640).

021

Was the error code 621103?

Y N

022

Are any lines indicated by the error code an R-type line?

Y N

H J K

H J K

023
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

024

Go to Page 2, Step 008, Entry Point E.

025

NOTE: The Integrated Logic Probe must be used for the following steps. The General Logic Probe cannot be used.

- Connect the Integrated Logic Probe as follows:
  Red lead to any D03 pin
  Black lead to C3B06

- Set the Gate Ref switch on the probe to -1.3.

- Connect a jumper wire from the - Gating terminal of the probe to 'transmitted data' at C1D04.
- Enable the CE test 62 with the loop-on-error function (MIM 2012).
- Probe the lines shown in the following chart and check that the probe lights are as shown.

NOTE: The time between pulses may be as long as 10 seconds. Wait at least 10 seconds before answering.

LINE NAME	PIN	PROBE LIGHTS UP	PROBE LIGHTS DOWN
Receive A	C2B09	Off	Blinking
Receive B	C2D13	Blinking	Off

Do the probe lights match the probe light conditions shown in the chart for both lines?

Y N

026
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

4
L

027
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

028
- Measure the voltage on the indicated line at the C1 pins of the Logic board.

Is the voltage at the correct level?
Y N

029
- Measure the failing voltage at the logic board voltage test points (MIM 0611).

Is the voltage at the correct level?
Y N

030
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the power supply (MIM 0240) .

031
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the logic board (MIM 0640).

032
Is this the only line with this error code?
Y N

033
Go to Page 2, Step 007, Entry Point D.

034
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

035
- Power off.
- Remove the XLCA card from location C1.
- Check the 'SET A', 'SET B', 'transmit A', 'transmit B', 'receive A', and 'receive B' lines from the C2 pins to the DCE end of the external communication cable as shown in MIM 1023 for an open or ground.

Are any of the lines open or grounded?
Y N

036
NOTE: The Integrated Logic Probe must be used for the following steps. The General Logic Probe cannot be used.

- Do not re-install the XLCA card.
- Connect the Integrated Logic Probe as follows:
  Red lead to any D03 pin
  Black lead to C3B06
- Set the Gate Ref switch on the probe to +1.4V.
- Connect a jumper wire from the + Gating terminal of the probe to C2B13.
- Power on.
- Probe C2D04 and record the level observed.
- Move the jumper wire connected to the + Gate terminal from C2B13 to C2D04.
- Probe C2B13 and record the level observed.

Are both lines at a down level?
Y N

037
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Report to the customer that the Signal Element Timing signal from the DCE appears to be failing.

038

- Power off.
- Re-install the XLCA card at C1.
- Power on.
- Enable the CE test 69 with loop-on-error function (MIM 2012).
- Check the speed indicated by the run counter.

Does the speed indicated by the run counter match the operating speed of the customer DCE?

Y N

039

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).
- Replace the following:
  1. XLCA card (MIM 1040 and 1052).
  2. Planar (MIM 0440 and 0460).

040

Go to Page 2, Step 006, Entry Point C.

041

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Use MIM 1023 to isolate the failing line to the logic board, the internal communication cable, or the external communication cable. Replace the identified FRU and verify the fix.

042

(Entry Point F)

- Power off.
- Remove the communication card.
- Power on.
- Reset any error.
- Enable the CE test 62 with the E option (MIM 2012).
- If a different SRC is displayed, ignore it.
- Answer NO if both probe lights are off.

Is the line still at a down level?

Y N

043

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

044

- Check for a grounded line on the logic board.
- If there is a ground, replace the logic board (MIM 0640).
- If there is no ground, replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

045

(Entry Point B)

NOTE: The Integrated Logic Probe must be used for the following steps. The General Logic Probe cannot be used.

- Connect the Integrated Logic Probe as follows:
  Red lead to any D03 pin
  Black lead to C3B06

- Set the Gate Ref switch on the probe to -1.3.

- Connect a jumper wire from the - Gating terminal of the probe to '-data terminal ready' at C1B02.
- Power on.
- Probe the lines shown in the following chart and check that the probe lights are as shown.

LINE NAME	PIN	PROBE LIGHTS UP	PROBE LIGHTS DOWN
Indicate A	C2D10	Blinking	Off
Indicate B	C2B04	Off	Blinking

Do the probe lights match the probe light conditions shown in the chart for both lines?
Y N

046
- Probe the '-data terminal ready' line at C1B02.

Is the line pulsing?
Y N

047
- Probe the '-data terminal ready' line at A1B02.

Is the line pulsing?
Y N

048
Is the line at a down level?
Y N

049
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

050
Go to Page 5, Step 042, Entry Point F.

051
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the logic board (MIM 0640).

052
- Power off.
- Remove the XLCA card from location C1.
- Check the 'indicate A', 'indicate B', 'control A', and 'control B' lines from the C2 pins to the DCE end of the external communication cable as shown in MIM 1023 for an open or ground.

Are any of the lines open or grounded?
Y N

053
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

054
Use MIM 1023 to isolate the failing line to the logic board, the internal communication cable, or the external communication cable. Replace the failing FRU and verify the fix.
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

055

NOTE: The Integrated Logic Probe must be used for the following steps. The General Logic Probe cannot be used.

- Connect the Integrated Logic Probe as follows:
  Red lead to any D03 pin
  Black lead to C3B06
- Set the Gate Ref switch on the probe to -1.3.

- Connect a jumper wire from the - Gating terminal of the probe to '-received line signal detector at A1B12.
- Power on.
- Probe the lines shown in the following chart and check that the probe lights are as shown.

LINE NAME	PIN	PROBE LIGHTS UP	PROBE LIGHTS DOWN
Indicate A	C2D10	Blinking	Off
Indicate B	C2B04	Off	Blinking

Do the probe lights match the probe light conditions shown in the chart for both lines?

Y N

056

- Power off.
- Remove the XLCA card from location C1.
- Check the 'indicate A', 'indicate B', 'control A', and 'control B' lines from the C2 pins to the DCE end of the external communication cable as shown in MIM 1023 for an open or ground.

Are any of the lines open or grounded?

Y N

057

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the XLCA card (MIM 1040) and set the jumpers (MIM 1052).

T U

T U

058

Use MIM 1023 to isolate the failing line to the logic board, the internal communication cable, or the external communication cable. Replace the failing FRU and verify the fix.

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

059

- Power off.
- Remove the XLCA card from location C1.
- Check the 'SET A', 'SET B', 'transmit A', 'transmit B', 'receive A', and 'receive B' lines from the C2 pins to the DCE end of the external communication cable as shown in MIM 1023 for an open or ground.

Are any of the lines open or grounded?

Y N

060

- Power off.
- Disconnect the external communication cable from the DCE.
- Set the Test switch to Normal.
- Power on and wait 10 seconds.
- Select concurrent diagnostic screen C2.
- Observe the '-Received line signal detector' bit in the EIA register display. It should be a 1.
- Install a jumper from C1D08 to C1B12.
- Observe the '-Received line signal detector' bit in the EIA register display. It should be a 0.

Was the '-Received line signal detector' bit in the EIA register correct for both observations?

Y N

061

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

8 8
V W

062

- X.25 feature is installed if you have a feature ROS module installed in position 2 on the feature ROS card at C5 (MIM 0710).

Do you have an X.25 feature installed (MIM 0710)?
Y N

063

Online communication failure.

- Check PLE log (Test C2, MIM 2013).
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Go To Map 3001, Entry Point A.

064

Online communication failure.

- Check PLE log (Test C2, MIM 2013).
- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

Go To Map 3002, Entry Point A.

065

Use MIM 1023 to isolate the failing line to the logic board, the internal communication cable, or the external communication cable. Replace the identified FRU and verify the fix.

- Move the jumper installed on the XLCA card from J position to I position (MIM 1052).

SDLC ONLINE COMMUNICATIONS MAP 3001

ENTRY POINTS

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

001

(Entry Point A)

NOTE: Answer YES if a busy signal is received by the calling system when the communication line is not being used. This MAP assumes that wrap level 2 (which is automatically run during power-on diagnostics) and wrap level 3 tests have run successfully.

Is the problem associated with the autoanswer function (failure to autoanswer)?
Y N

002
Was operator error code 004X or 005X displayed when attempting to run the online tests?
Y N

003

(Entry Point B)

- Read all of this step before starting.

Establish communication with the host system.

- Dial the host system operator on a nearby telephone and have the operator put your station online (vary on command).
- Request the host system operator to remain on the telephone to help you determine if the host system is attempting to communicate with your station.

NOTE: When the host system operator puts your station online, the system should immediately attempt to transmit to your station unless you are
(Step 003 continues)

4 3
A B

(Step 003 continued)
on a switched network.

If you are using a switched network, dial the host system on the communication line when the system is ready for the call. If the system does not receive a reply after a specified number of attempts, your station will be taken offline (and the line disconnected if on a switched line) and a message displayed for the system operator. When this happens, the operator must put your station back online before you answer the following questions about the lights and received signals.

IMPORTANT NOTICE
If the host system is not attempting to communicate with your station while you are answering the following questions, the results will not be valid.

Is a sign-on screen displayed?
Y N

004
- Select concurrent diagnostic mode.
- Observe the SDLC status byte by selecting C2 test (MIM 2013).

Is the 'Address compare' bit on?
Y N

005

- Observe the Comm Line Sync LED on the operator panel of the 5294.

Is the Comm Line Sync LED blinking?
Y N

006
The problem is external to this controller.
- Report to the host site that no data is being received from the communication line.

Probable cause: DCE or communication line failure.

3 2 2
C D E

007
- Set Test sitch on the controller to Test.
- On an attached display:
- Press the Cmd key, the Test Request key, and the C key.
- Select C1 (MIM 2013).
- SDLC configuration bits are displayed on the top line of the screen (MIM 2013).

Is the displayed configuration of the NRZI option correct for this setup (MIM 0460)?
Y N

008
- Correct the configuration data .
- Verify the fix.

009
- Report to the host site that flags are present on the communication line but no frames are present that contain the correct address for this station.

Probable cause: wrong address used by this station or the host system, or a host system problem.

010
Is the 'CRC OK' bit on?
Y N

011
- Report to the host site that SDLC frames are being received by this station but they contain CRC or frame sequence errors. Probable cause: line, modem/DCE, or host system problem.

012
Is the 'SNRM received' bit on?
Y N

013
Is the 'XID received' bit on?
Y N

F G H

F G H

014
- Report to the host site that SDLC frames are being received by this station without CRC errors and with the correct address but neither an SNRM nor an XID command has been received.

Probable cause: communication link failure or host system problem.

NOTE: If CE test 66 can be run without error, the communication link is OK (MIM 2012).

015
- Report to the host site that SDLC frames with the correct address and without CRC errors are being received, but a set normal response mode command has not been received.

Probable cause: communication link failure or host system problem.

NOTES:
1. On a multipoint network, another controller may be set for the same address. If this is the case set it to the correct address. If not sure, ask the customer for the correct setup.
2. If CE test 66 can be run without error, the communication link is OK (MIM 2012).

016
- Observe the SNA state byte.

Is the 'ACTLU received' bit on?
Y N

017
- Report to the host site that link level communication has been established but an ACTLU has not been received.

Probable cause: host system problem.

018
- Observe the SNA state byte.

Is the 'BIND received' bit on?
Y N

019
- Report to the host site that link level communication has been established and an ACTLU has been received but a BIND has not been received.

Probable cause: host system problem.

3
J

020
- Observe the SNA state byte.

Is the 'EC Load complete' bit on?
Y N

021
A failure has occurred during the EC download.
- Report to the host site that a failure occurred during the EC download time.

Probable cause: host system problem.

022
- Verify that the host system operator tried to vary on the display station that you were observing and that other display stations also fail.
- Report to the host site that everything appears normal except the host system is not presenting a sign-on screen to the stations for this controller.

Probable cause: host system problem.

023
- Press the Cmd key.
- Press the Test Request key.

Is the Online Verification Test menu displayed?
Y N

024
- Press the Reset key.
- Have one of the display operators try to sign on to run a normal job.

Can the operator sign on successfully?
Y N

025
- Report to the host site that everything appears normal except the host system is not accepting the input from the sign-on screen, either test request or normal job sign on.

Probable cause: host system problem.

K L

026
- Report to the host site that no cause of failure was found, but the system did not correctly respond to the test request.
- Request the host site to report the test request failure and the intermittent communication problem to the host system CE.

027
If this controller is attached to a switched network, the intermittent problem may be due to a variation in the quality of the line obtained each time a call is made.
- Check the entries in the error history table and refer to the communication error table at the end of Backup MAP 0300 for other possible causes.

028
Was operator error code 0052 displayed?
Y N

029
Was operator error code 0040 or 0043 displayed?
Y N

030
Was operator error code 0050 displayed?
Y N

031
Was operator error code 0042 or 0051 displayed?
Y N

032
Was operator error code 0044 displayed?
Y N

4 4 4 4 4 4
M N P Q R S

033
Was operator error code 0054 displayed?
Y N

034
- If any other 004X or 005X operator error code is displayed:
  You are in the wrong MAP, or
  The planar is defective.

035
- The problem is external to the controller.
- Report to the host site that SDLC commands are being received that are not valid for this controller.

036
Go to Page 1, Step 003, Entry Point B.

037
Does this controller have the EIA card installed (MIM 1064)?
Y N

038
Does this controller have the XLCA card installed (MIM 1064)?
Y N

039
Go to Page 6, Step 064, Entry Point D.

040
- Replace the XLCA card (MIM 1040).

041
The problem is external to this controller.
- Either the 'transmit clock' signal or the 'receive clock' signal from the DCE is failing.
- If the DCE is not an IBM modem, ask the customer to call the DCE service representative and report the failing clock signal.

042
Does this controller have the EIA card installed (MIM 1064)?
Y N

T U

A M N T U
1 3 3

043
- Replace the communication card (MIM 1040).

044
The problem is external to this controller. The 'clear to send' signal from the DCE is failing.
- If the DCE is not an IBM modem, ask the customer to call the DCE service representative and report that the 'clear to send' line is failing.

045
- Set the Test switch on the controller to Test.
- On an attached display:

- Press the Cmd key, the Test Request key, and the C key.
- Press enter to select the C1 screen.
- Communication configuration bits are displayed on the top line of the screen (MIM 2013).

Is the switched/nonswitched configuration bit correct for this setup (MIM 0460 and 2013)?
Y N

046
- Have the customer correct the configuration.

047
The problem is external to this controller.
- Report to the customer that the 'data set ready' signal from the DCE is failing (SRC 0040 or 0043) or the DDS network is out of service (SRC 0040 only).

048
- Replace the planar (0440) and re-enter the configuration (0460).

049

Is the controller configured for DTR operation?
Y N

5 5
V W

050
- Select the C2 screen and observe the EIA register.
- Dial the number for the controller communication line from a nearby telephone.
- The 'CDSTL' bit should be on within 2 or 3 rings.

Did the 'CDSTL' bit in the EIA register go on after 2 or 3 rings?
Y N

051
- If necessary, dial the controller.
- Watch the 'Ring indicate' bit.

Is the 'Ring indicate' bit set to 1 with each ring?
Y N

052
- Meter the 'ring indicate' line at D2(C2)-B13.

Does the 'ring indicate' line go plus (+3 V to +15 V) when a ring signal is received?
Y N

053
The problem is external to this controller. No 'ring indicate' signal is being received from the DCE.
- If the DCE is not an IBM modem, ask the customer to call the DCE service representative and report that no 'ring indicate' signal is being received from the DCE.

054
- Check that the EIA card jumpers are set correctly(MIM 1050).
- Replace the EIA card (MIM 1040) and set all jumpers correctly (MIM 1050).

055
- Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).

056

Is the 'data set ready' line active within 3 to 15 seconds after the ring stops?
Y N

X Y

057
- DCE failure on the 'data set ready' line.
- If the DCE is not an IBM modem, ask the customer to call the DCE service representative and report that the DCE is not responding to the 'data terminal ready' signal from the controller.

058
No problem in the autoanswer function.
Go to Page 1, Step 003, Entry Point B.

059
- Select the C2 screen and observe the EIA register.

Is the 'Data terminal ready' bit on?
Y N

060
- Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460)

061

Is the 'data set ready' bit on within 3 to 15 seconds after the ring stops?
Y N

062
- DCE failure on the 'data set ready' line.
- If the DCE is not an IBM modem, ask the customer to call the DCE service representative and report that the DCE is not responding to the 'data terminal ready' signal from the controller.

063
- No problem in auto answer function.
Go to Page 1, Step 003, Entry Point B.

064

(Entry Point D)

- Determine the correct clock speed for this controller. Check machine history. Also check that the Channel Service Unit speed is the same as that set on the DDSA card.
- Enable the CE test 69 (MIM 2012).

The clock speed is displayed in decimal in a field to the right of the error display field.

Is the displayed clock speed correct?
Y N

065
- Check the speed selection on the DDSA card (MIM 1051).

Replace the DDSA card (MIM 1040).

066
- Perform the clock synchronization check (1031), then return to this step.

Is the clock synchronization circuit operating?
Y N

067
Replace the DDSA card (MIM 1040).

068
The problem is external to this controller.
- Report to the host site that signals were detected on the 'receive data' line but were not recognizable. Probable cause: host system or DDS network.

X.25 ONLINE COMMUNICATIONS MAP 3002

ENTRY POINTS

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

001

(Entry Point A)

Was an SRC displayed when attempting to perform the online test?
Y N

002

(Entry Point B)

- Read all of this step before starting.

Establish communication with the host system as follows:

- Dial the host system operator on a nearby telephone and have the operator put your station online (vary on command).
- Request the host system operator to remain on the telephone to help you determine if the host system is attempting to communicate with your station.
- Use the normal procedures for your site to establish communication with the host site.

Is a sign-on screen displayed?
Y N

003
- Select concurrent diagnostic mode.
- Observe the X.25 status byte by selecting the C2 test (MIM 2013).

Is the 'Address compare' bit on?
Y N

3 2
A B C D

004
- Observe the Comm Line Sync LED on the operator panel of the 5294.

Is the Comm Line Sync LED blinking?
Y N

005
The problem is external to this controller.
- Report to the customer that no data is being received from the network.

Probable cause: DCE or network failure.

006
- Report to the host site that flags are present on the communication line but no HDLC frames are present that contain the correct address for this station.

Probable cause: address used by the network is not 01 or 03.

007
Is the 'CRC OK' bit on?
Y N

008
- Report to the host site that HDLC frames are being received by this station but they contain CRC errors.

Probable cause: DCE or network problem.

009
Is the 'Link activated' bit on?
Y N

010
- Select the C1 screen.
- Check the X.25 configuration bits for the setting of the 'Link initialization' bit.

Is the 'Link initialization' bit correct for the network used?
Y N

011
Correct the setting of the 'Link initialization' bit and retry the failing operation.

012
- Report to the customer that the link can not be activated.

Probable cause: DCE or network problem.

2
E

013

Is the 'Packet level restarted' bit on?

Y N

014

- Report to the customer that the packet level restart request was not successful.

Probable cause: DCE or network problem.

015

NOTE: A significant delay may occur between the time that your station is varied on and the time that the data transfer state is entered. If the bit is not on, wait at least 2 minutes for it to turn on before answering the following question.

Is the 'Data transfer state entered' bit on?

Y N

016

- Report to the customer that the 5294 was unable to enter the data transfer state.

Probable cause: DCE or network problem.

017

- Observe the SNA state byte.

Is the 'ACTLU received' bit on?

Y N

018

- Report to the host site that link level communication has been established but an ACTLU has not been received . Probable cause: host system problem.

019

- Observe the SNA state byte.

Is the 'BIND received' bit on?

Y N

020

- Report to the host site that link level communication has been established and an ACTLU has been received but a BIND has not been received. Probable cause: host system problem.

F

B F 1

021

- Observe the SNA state byte.

Is the 'EC Load complete' bit on?

Y N

022

A failure has occurred during the EC download.

- Report to the host site that a failure occurred during the EC download time. Probable cause: host system problem.

023

- Verify that the host system operator tried to vary on the display station that you were observing and that other display stations also fail.

- Report to the host site that everything appears normal except the host system is not presenting a sign-on screen to the stations for this controller. Probable cause: host system problem.

024

- Press the Cmd key.
- Press the Test Request key.

Is the Online Verification Test menu displayed?

Y N

025

- Press the Reset key.
- Have one of the display operators try to sign on to run a normal job.

Can the operator sign on successfully?

Y N

026

- Report to the host site that everything appears normal except the host system is not accepting the input from the sign-on screen, either test request or normal job sign on. Probable cause: host system problem.

3 3
G H

027
- Report to the host site that no cause of failure was found, but the system did not correctly respond to the test request.
- Request the host site to report the test request failure and the intermittent communication problem to the host system CE.

028
The failure is intermittent. Refer to the PLE log for possible causes. If no errors are logged, the probable cause is a network or host system failure.

029
Was an SRC of 004X or 005X displayed when attempting to run the online tests?
Y N

030
Was an SRC of 1100XX or 1200XX displayed when attempting to run the online tests?
Y N

031
Was an SRC of 18XXXX, 19XXXX, or 1AXXXX displayed when attempting to run the online tests?
Y N

032
Was an SRC of 1BXX00 displayed when attempting to run the online tests?
Y N

033
If a 10XXXX SRC is displayed, the problem is probably due to an operator error or a configuration problem.
If a 10XXXX SRC occurs during correct operation, either the X.25 feature ROS module or the planar is failing.
If any other SRC is displayed, either you are in the wrong MAP or the planar is failing.

J K L M

034
- Refer to MIM section 2160 for the meaning of the cause code field of the SRC.
- Report the cause indicated by the cause code field to the customer.

Probable cause: Network failure.

035
- Refer to MIM section 2160 for the meaning of the cause code field and diagnostic field of the SRC. If the contents of the fields indicate a possible configuration problem, check the X.25 configuration (MIM 0460.2).
- If no configuration problem is found, replace the X.25 feature ROS module (MIM 0740) and retry the failing operation.
- If the failure still occurs, report the problem defined by the cause code and diagnostic fields to the customer.

Probable cause: Configuration does not match network subscription, X.25 feature ROS failure, or a network failure exists.

036
- Refer to MIM section 2160 for the meaning of the diagnostic field of the SRC. If the diagnostic field content indicates a possible configuration problem, check the X.25 configuration (MIM 0460.2).
- If no configuration problem is found, report the problem defined by the diagnostic field to the customer.

Probable cause: Configuration does not match the network subscription or a network failure exists.

037
Was operator error code 0052 displayed?
Y N

038
Was operator error code 0040 displayed?
Y N

039
Was operator error code 0050 displayed?
Y N

5 5 5 4
N P Q R

R 3

040
Was operator error code 0042 or 0051 displayed?
Y N

041
Was operator error code 0041 displayed?
Y N

042
Was operator error code 0054 displayed?
Y N

043
Was operator error code 0045 displayed?
Y N

044
Was operator error code 0046 displayed?
Y N

5 5 5 5
S T U V W X

W X

045
Was operator error code 0047 displayed?
Y N

046
Was operator error code 0053 displayed?
Y N

047
- If any other 004X or 005X operator error code is displayed:
  You are in the wrong MAP, or
  The planar is defective.

048
- Report to the customer that the T1 timeout expired after the tenth retry with no transmission received from the network.

Probable cause: DCE failure.

049
- Retry the failing operation.
- If the failure continues to occur, report to the customer that the network is sending a disconnect command to the 5294 when the 5294 is in disconnect mode.

Probable cause: DCE or network failure.

050
- Display the C2 screen and observe sense byte 1 of the 0046 error (MIM 2013).
- Compare the sense byte with the list of supported commands and responses in the X.25 theory section of the MIM.

Is the command contained in the I-field of the frame reject a valid HDLC command for the 5294?
Y N

051
- Replace the X.25 feature ROS module.
- If the failure continues to occur, report to the customer that the network is not receiving commands or responses correctly.

Probable cause: DCE or network failure.

5
Y

052
- The problem is external to the controller.
- Report to the customer that the network is rejecting commands or responses that are valid.

Probable cause: DCE or network failure.

053
- The problem is external to the controller.
- Report to the customer that either a disconnect command or disconnect signal was received during link setup.

Probable cause: DCE failure.

054
- The problem is external to the controller.
- Ask the customer to report to the network that HDLC commands are being received that are not valid for this controller.
- Sense bytes 1 through 3 of the 0054 error in the PLE log contain the rejected command and the reject cause.

055
Go to Page 1, Step 002, Entry Point B.

056
Does this controller have the EIA card installed (MIM 1064)?
Y N

057
- Replace the XLCA card (MIM 1040).

058
The problem is external to this controller.
- Either the 'transmit clock' signal (0051) or the 'receive clock' signal (0042) from the DCE is failing.
- Ask the customer to call the DCE service representative and report the failing clock signal.

059
Does this controller have the EIA card installed (MIM 1063)?
Y N

060
- Replace the communication card (MIM 1040).

Z

N P Z
3 3

061
The problem is external to this controller. The 'clear to send' signal from the DCE is failing.
- Ask the customer to call the DCE service representative and report that no 'clear to send' signal is being received from the DCE.

062
The problem is external to this controller.
- Ask the customer to call the DCE service representative and report that a ready signal is not being received from the DCE.

063
- Replace the planar (0440) and re-enter the configuration (0460).

Online Intermittent Problem MAP 3003

ENTRY POINTS

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

001

(Entry Point A)

Do you have a DDSA card installed?

Y N

002

(Entry Point B)

- Run the CE 63 test with C option 1000 times. The approximate run time is shown in the following table (MIM 2012).

Comm Card	CE Test	Run Time
EIA	63	2 min
DDSA	63	2 min to 13 min
XLCA	63	13 min

Did an error occur while the CE test was running?

Y N

2
A B C

B C

003

- The cause of the failure is probably external to this controller (greater than 90 percent probability). If the failure continues to occur, check the hardware error log and PLE (permanent link error) entries for this controller. Use the communication errors (004X, 005X, or 006X) to enter Backup MAP 0300.
- If an IBM external modem (or a modem/DCE with equivalent wrap capability) is attached, the CE 64 test can be run to verify correct operation of the DTE interface section of the modem/DCE. When the CE 64 test runs 1000 times without errors, it is more than 90 percent probable that there is no failure in the DTE interface section of the modem/DCE. Approximate run time is shown in the following table.

Modem/DCE Speed	Run Time
2400 bps	13 min
4800 bps	12 min
7200 bps	11 min
9600 bps	10 min

004

- Use MIM 1021, 1022, or 1023 to check the communication interface line indicated by the error code.

NOTE: If the last 2 digits of the error code are not listed in the table, the failure is at the logic board connection (main planar to communication card).

- Check the DC voltage levels (MIM 0231) and the ripple levels (MIM 0232).
- Replace the communication card (if not replaced earlier) and run the failing CE test three times as long as it took for the first failure to occur.

Did the error occur again?

Y N

2 2
D E

005
- End of call.

006

- Replace the planar (MIM 0440) and re-enter the configuration (MIM 0460).
- Verify the fix by running the CE 63 test. Use the longer time of (1) 1000 times, or (2) three times as long as it took for a failure to occur.

Did the error occur again?
Y N

007
- End of call.

008
- The cause of the failure is probably external to this controller. Suspect environmental problems such as electrical noise on the AC power line or electrical discharge.

009
- Perform the clock synchronization check (MIM 1031).

NOTE: If the checking cannot be done, then replace the DDSA card and retry the failing operation.

Is the clock synchronization circuit operating?
Y N

010
- Replace the DDSA card (MIM 1040) and set the jumpers (MIM 1051).
- To verify the fix, go to Page 1, Step 002, Entry Point B.

011
Go to Page 1, Step 002, Entry Point B.

READER'S COMMENT FORM

Please use this form only to identify publication errors or to request changes in publications. Direct any requests for additional publications, technical questions about IBM systems, changes in IBM programming support, and so on, to your IBM representative or to your nearest IBM branch office. You may use this form to communicate your comments about this publication, its organization, or subject matter with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

Possible topics for comment are:

	Page No(s).		Page No(s).
Accuracy	_____	Figure/Diagram	_____
Adjustments/Procedures	_____	Index/Table of Contents	_____
Completeness	_____	Organization	_____
Cross-references	_____	Other _____	_____

Comments:

Please provide the information requested below; we will contact you. Thank you for your cooperation.

Name: _____

Job Title: _____

Address: _____

_____

_____

Zip Code

Telephone:

_____

(IBM Tie Line) (Extension)

_____

(Area Code) (Local Number)

No postage necessary if mailed in the U.S.A.

SY31-0652-0

Cut Along Line

Fold and tape | Please do not staple | Fold and tape

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 40 ARMONK, N. Y.

POSTAGE WILL BE PAID BY ADDRESSEE:

International Business Machines Corporation
Information Development
Department 245
Rochester, Minnesota, U.S.A. 55901

Fold and tape | Please do not staple | Fold and tape

IBM

IBM 5294 Control Unit Maintenance Analysis Procedures Printed in U.S.A. SY31-0652-0

IBM 5294 Control Unit Maintenance Analysis Procedures Printed in U.S.A. SY31-0652-0

SY31-0652-0