



Maintenance Library

3279

**Color Display Station
Models 2A, 2B, 3A, and 3B**

**Maintenance Analysis
Procedures (MAPs)**

SY33-0069-3
(Part 2)

IBM Maintenance Library

3279 Color Display Station
Models 2A, 2B, 3A, and 3B
Maintenance Analysis
Procedures (MAPs)

SY33-0069-3
(Part 2)

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	BB	6	010
0200	BB	6	010
0300	BB	6	010
0400	BB	6	010
0500	BB	6	010
0600	BB	6	010
0700	BB	6	010
0800	A	1	001
0800	BB	6	010
0900	BB	6	010
1000	BB	6	010

001

(ENTRY POINT A)

- Start here to isolate any failure on the IBM 3279 display station. After using the MAPs once without repairing the problem, you are directed to return to MAP 0000 entry point BB and go through the MAPs a second time. If the trouble remains, request assistance through your normal channels.
- The MAPs instruct you to reseal/exchange parts in a specific sequence. The first part is the most probable cause of failure, the second is the next most probable, and so on.
- Try reseating cards, top card connectors, and their associated cables and test before exchanging parts.
- Where a new part does not repair a problem, inspect the continuity of its associated cables connectors and planar strips.
- Reinstall the original when a new part does not repair the problem.
- When the analog card, the amplifier card, or any major FRU is exchanged, the 3279 may need adjustment. (See MIM Chapter 5).
- If the failure is intermittent, inspect cards and cable connectors for correct seating. Verify that the supply voltages are within tolerance as described in MIM Chapter 5.1.

(Step 001 continues)

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	005	0100	A
6	013	0100	A
6	008	0200	FF
6	007	0700	A
6	006	1000	A

GENERAL LOGIC PROBE (G.L.P.).

To use the General Logic Probe (P.N. 453212), set the switches as follows:-
 TECHNOLOGY...MULTI
 LATCH.....NONE
 GATE REF....GND
 Power up the probe by connecting:-
 Black wire to any D08 pin (ground) &
 Red wire to any D03 pin (+5V).
 Test by probing on D08 & D03 pins.

OSCILLOSCOPE.

If using an oscilloscope in place of a G.L.P., interpret the indicators on the G.L.P. as follows:-
 The GREEN light ON represents a voltage of less than +1V.
 The RED light ON represents a voltage of greater than +2V.
 Both lights ON indicates a waveform pulsing beyond both these limits.

(Step 001 continued)

DANGER

When the 3279 power ON/OFF switch is ON , the following are connected directly to the mainline power:-
 -The twisted-pair connection from P3 pins 8 and 9 (on the power supply) to the analog card (P7).
 -The degauss coil.
 -Front panel fuse & switch, and
 -Parts of the power supply card.
 •Be careful when measuring voltages in these areas.
 •Switch power OFF and remove the power cord from the mainline socket before such actions as:-
 -disassembling,
 -inspecting for failures,
 -making resistance measurements, etc.

(Step 001 continues)

(Step 001 continued)

- If a tilt/rotate table is used, lock it in the horizontal position.
- Ensure that the 3279 is correctly connected to a working Control Unit (or IDPA) with correct color setup code, or some symptoms will differ from those required for the MAPs.
- Always switch power off before disconnecting cards.

CAUTION

Correct ground connections and cable positions are essential for effective lightning and flashover protection. See Figure 6-5 for grounding details.

(Step 001 continues)

GENERAL
=====

FAILURE
=====

INDEX.
=====

After using this index, whether or not the repair action was good,

- Continue with the MAP at entry point AC (page 6).

SYMPTOM.	PROBABLE FAILING FRU OR REPAIR ACTION.
<p>Your problem may be described in this column, if so see right → If not, continue with the MAP at entry point AC (page 6).</p>	<p>For each symptom, this column contains a list of failing parts, repair actions, or adjustments, in order of probability. •Try them in the order shown. If you need confirmation before ordering (or while waiting for) spares •Continue with the MAP at entry point AC.</p>
<p>POWER.</p> <p>A1 Indicator LED 1 is OFF.</p> <p>A3 Indicator LED 2 is OFF & LED 1 ON) A4 Indicator LED 2 is ON immediately) after power on.</p> <p>A6 Frequent exchange of amplifier card or power supply required.</p> <p>A8 Display often switches power off.</p>	<p>1 Mainline power or fuse. 2 Power supply.</p> <p>1 Analog card.</p> <p>1 Selector pen (intermittent short in lead).</p> <p>1 Bleed assembly.</p>

(General Failure Index continues.)

GENERAL FAILURE INDEX (Continued).

SYMPTOM.	PROBABLE FAILING FRU OR REPAIR ACTION. *Afterwards, continue at Entry Point AC (page 6)
BRIGHTNESS.	
C1 Display blank (LEDs 1 & 2 ON.)) C2 Screen bright all over.) C3 Brightness low or not adjustable.) C4 Very faint picture.) C5 Very bright,) badly focussed characters.)	1 Brightness control or connections.
NOTE. For symptoms C7, C8, & E1, record the position of the relevant controls before attempting adjustments. If correct adjustment can not be achieved, reset the controls to their original positions before continuing.	
C7 Blue or Green is too bright or too dim.	1 Adjust the Color Balance (NOT RED MAX); see preceding note and MIM 5.2.1 & 5.3.6
C8 Red is too bright or too dim.	1 Adjust the Red Brightness and Color Balance; see previous note and MIM 5.2.1, 5.3.5 & 5.3.6
DISPLAY	
E1 Display wrong size or not 'square'.	1 Adjust the raster controls; see preceding note and MIM 5.2.2 and Figure 1-4.
E3 Part of display is missing or part is too dim.	1 Analog card. 2 CRT.
E5 Jitter of, or unsteady display.	1 Disconnect P27, the degauss coil; if the jitter is reduced, 1) inspect the degauss coil for correct position (Parts catalog Figure 2) 2) exchange the power supply. 2 Relocate the 3279 away from adjacent electrical equipment. 3 For horizontal jitter only, try small adjustments of the H CENT potentiometer. 4 Verify EHT connection to analog card. (Inspect end of EHT lead for excess flux.) 5 Exchange bleed assembly.
SUBSYSTEM	
G1 Keyboard does not work in NORMAL) but is OK in TEST mode.)	1 Check the coaxial device cable. 2 If connected to IDPA - is it set to Manual Operation Mode?
G2 No ready symbol.)	3 Logic card C2.
G3 All characters cursor and separator line are green.)	4 Verify that the system diskette is customized for color.
CONVERGENCE	
J1 Convergence is poor, (or primary colors displaced) AND convergence routine causes no obvious movement.	1 Use MAP 0600, Entry Point A. 2 Amplifier card. 3 Logic card B2. 4 Convergence/purity coils, Verify position before exchanging. 5 Verify ± 12 V supplies to amplifier card. 6 Logic card C2.
J3 Convergence is poor.	1 As above. 2 Inspect error log for timeouts and parity error (indicating coaxial device cable problems).
J5 Display has to be converged each time power is switched on.	1 Battery. (Inspect the date stamp.) 2 Battery wiring. (See figure 6-6 & 6-4 part2.) 3 Use MAP 0600, Entry point A.

(General Failure Index continues.)

GENERAL FAILURE INDEX (Continued).

SYMPTOM.	PROBABLE FAILING FRU or REPAIR ACTION. *Afterwards, continue at Entry Point AC (page 6)
CONTROLS. L1 All characters are either green) or white. (No red or blue.)) L2 0000/00 switch does not function.) L4 A,a/A switch does not function. L5 NORMAL/TEST switch does not function. L7 Indicator 3 always ON. L8 Security key does not function.) L9 X 0= always appears in OIA.)	1 0000/00 switch or cable (Figure 6-8) 2 Logic card C2 then D2. 1 Switch or cable (Figure 6-8). 2 Logic card D2. 1 Switch or cable (Figure 6-8). 2 Logic card D2 then C2. 1 NORMAL/TEST Switch or cable. (Figure 6-8). 1 Security key or connections (Figure 6-8). 2 Use MAP 0800, Entry point GG
KEYBOARD. N1 One or more keyboard keys failing. (Confirm with Offline Test Mode 2, see MIM section 2.5.2) N3 Attribute select keys have no effect.	1 Reseat keyboard cable plug (P23). 2 If no character enters, exchange key module. 3 If wrong character enters, exchange keyboard logic card. 4 If character is correct, inspect keyboard ID jumpers (Figure 6-11) 5 Use MAP 0700, Entry point A. 1 Verify keyboard jumpers for PSHIC0; figure 6-1.
FEATURES R1 No APL (Use Offline Test Mode to read keyboard ID. MIM 2.5.3 and Figure 6-11.) R3 Incorrect APL characters.	1 Verify keyboard jumpers (Figure 6-11) or exchange keyboard if incorrect. 2 Inspect logic card E2 for APL module (Fig 6-14) and correct top card connectors (Figure 1-6). 3 Verify Control Unit customization. 1 APL module on logic card E2.

(General Failure Index continues.)

GENERAL FAILURE INDEX (Continued).

VIDEO OUTPUT FACILITY.

=====

The following symptoms are associated only with this option.
The switches, indicator, and BNC connectors are in the customer access area (Figure 1-3).

- If the repair fails, go to MAP 1000 entry point A.
- If O.K. continue with MAP at entry point AC (page 6).

SYMPTOM.	PROBABLE FAILING FRU or REPAIR ACTION.
<u>SYMPTOMS ON 3279.</u>	
T1 No separator line and no symbols in OIA (but at least, cursor visible).	1 Ensure the VIDEO CONTROL switch is NOT set to TEST. 2 Inspect VIDEO CONTROL switch and wiring.
<u>SYMPTOMS ON THE ATTACHED MONITOR.</u>	
V1 No separator line and no symbols in OIA (but at least cursor visible).	1 No fault. This is normal.
V2 The display is missing or unstable. (Loss of sync.)	1 Ensure that the customer has used the PDG. 2 Inspect the SYNC POLARITY switch, the SYNC BNC connector and internal cable (Figure 6-13). 3 Logic card C2.
V3 The display has one or more colors missing or incorrect. (Loss of video.)	1 Ensure that the customer has used the PDG. 2 Inspect the R G and B BNC connectors and internal cable (Figure 6-13). 3 Logic card C2.
V4 Blue too light or too dark. (Note. Enhance mode increase the brightness of the blue by adding green at half intensity.)	1 Inspect the VIDEO CONTROL switch and cable (Figure 6-13.) 2 Logic card C2.
V5 Excessive flicker.	1 Ask the customer to readjust the BRIGHTNESS and CONTRAST controls on the monitor; some tend to flicker at high brightness. 2 Logic card C2.

(Step 001 continues)

260CT81

(Step 001 continued)

(ENTRY POINT AC)

Start here after using the Failure Index.

Is the problem repaired by using the Failure Index?

Y N

002

Does the power supply fail when the 3279 is in use or being serviced? (Lamp 1 changes from ON to OFF - it may flash a few times.)

Y N

003

Inspect the keyboard. Is there a keyboard clicker problem or a mechanical failure of the keyboard, for example; a broken key, missing keytop or jammed key?

Y N

004

Does it look as if the problem is with the Video Output (RPQ) logic?

Y N

005

GO TO MAP 0100, ENTRY POINT A.

006

GO TO MAP 1000, ENTRY POINT A.

007

GO TO MAP 0700, ENTRY POINT A.

008

GO TO MAP 0200, ENTRY POINT FF.

009

GO TO STEP 010,
ENTRY POINT BB.

010

(ENTRY POINT BB)

Return here after attempting a repair.

Switch power OFF .

Reinstall any parts removed.

Replug any connectors.

Remove any jumpers used in the MAPS.

Correct any adjustments as necessary.

Verify correct operation.

Is all correct?

Y N

011

Is this the first time through this step of the MAPS?

Y N

012

Use the ERROR LOG and the ERROR CODE - to - FRU list (MIM section 2.6.3 and MIM section 2.6.8) to aid you in your action plan. Also examine the Failure Index again, (see above). Some examples are:

1. -Swap the suspected FRU from another machine.
2. -Request assistance through your normal support channels.
3. -Measure voltages for level (and ripple if possible). See MIM section 3.1 and MIM section 3.2.
4. -Verify connections to control unit; inspecting for ground loops, and bad AC ground connections.
5. -Inspect the line voltage for sudden changes. Verify that the line voltage matches the machine voltage label and that the power supply card part number is correct.
6. -The MAPS do not point to failures in the logic connector strips. If the MAPS call for a card exchange and this does not correct the problem, suspect associated strip or top card connectors or cables.

013

GO TO MAP 0100, ENTRY POINT A.

014

- Check all ground connections have been replaced correctly, see Figure 6-5.
- Replace all covers and bezel.
- Replace MIM in document tray and close rear gate.
- Replace any MIM supplement used, in the keyboard tray.
- Verify correct operation.
- End of call.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0200	BB	5	046

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	032	0000	BB
5	051	0200	A
2	010	0300	A
4	040	0300	A
7	088	0300	A
7	090	0300	A
7	096	0300	A
8	101	0300	A
3	026	0300	BB
3	028	0300	BB
7	089	0300	BB
3	030	0300	CC
5	055	0400	A
5	057	0400	CC
4	036	0400	DD
4	038	0400	DD
4	042	0500	A
8	104	0500	A
9	126	0500	A
2	008	0600	A
3	022	0600	A
3	024	0600	A
4	034	0600	A
3	018	0700	A
3	020	0700	A
8	098	0700	A
9	122	0700	A
6	081	0700	BB
9	120	0700	CC
9	121	0700	EE
9	124	0700	EE
5	053	0800	A
7	094	0800	A
3	016	0800	CC
2	012	0800	DD
2	014	0800	EE
4	045	0800	FF
8	112	0900	BB

001
(ENTRY POINT A)

DANGER

When the 3279 power ON/OFF switch is ON , the following are connected directly to the mainline power:-

- The twisted-pair connection from P3 pins 8 and 9 (on the power supply) to the analog card (P7).
- The degauss coil.
- Front panel fuse & switch, and
- Parts of the power supply card.

•Be careful when measuring voltages in these areas.

•Switch power OFF and remove the power cord from the mainline socket before such actions as:-

- disassembling,
- inspecting for failures,
- making resistance measurements, etc.

(Step 001 continues)

TO RUN ONLINE TESTS 0 - 8.
=====

For more detail see MIM section 2.6.1

- Set the TEST/NORMAL switch to TEST and back to NORMAL.
 - Hold down the ALT key, press TEST, and release both.
- The word TEST appears in the OIA.
- Key in /n and press ENTER where n is the test number.
- One of patterns shown in the MIM section 2.6 should display.
- TO LEAVE THE TEST,
- Hold down ALT and press TEST.

CONTROL MAP

PAGE 2 OF 9

(Step 001 continued)

- Switch power OFF and remove the power cord from the mainline power socket.
- Check the screws holding the analog card and power supply cards.
- Reseat the plugs on the video and amplifier cards.
- Reseat the video card.
- Reseat the cards in the logic gate and the top card connectors.
- Reseat the connectors on the rear of the logic gate. (A2, A3, A5)
- Lift off the bezel.
- Reseat the plugs on the bezel. (P11, P12) (Figure 1-2)
- Reseat the plug (P28) near the analog card socket.

•Switch power ON .

•Set switches:-

TEST/NORMAL to TEST,
0000/00 to 0000,
A,a/A to A,a.

- Turn security key (if present) fully clockwise.
 - Turn BRIGHTNESS knob fully clockwise.
 - Wait at least 1 minute or until an image appears.
 - Turn BRIGHTNESS knob until the screen brightness is acceptable.
- The pattern shown in Figure 2-2 (TEST MODE 1) should display in green, with a green cursor in the top left corner. The characters should be good.

Is EVERYTHING in this image correct?

Y N

002

GO TO PAGE 5, STEP 046,
ENTRY POINT BB.

003

Test operation with the control unit and

the coaxial device cable as follows:-

- Run ONLINE TEST 0; see page 1.

The pattern shown in Figure 2-4 should display.

Is ALL correct?

(Ignore any convergence problems).

Y N

004

GO TO PAGE 7, STEP 091,
ENTRY POINT CC.

005

•Return cursor under C of CK field. (If

misconverged, use the green cursor.)

- Press keys \hat{a} (insert) J K L

Field should become jKCK

The symbols \times should appear in the

operator information area.

Are ALL actions correct?

Y N

006

GO TO PAGE 7, STEP 091,
ENTRY POINT CC.

A

MAP 0100-2

007

- Press the RESET key.

Is the convergence good?

Take the Y path if you don't know.

Y N

008

GO TO MAP 0600, ENTRY POINT A.

009

The brightness should change smoothly as the control is turned from minimum to maximum.

Can the brightness be changed as expected by the brightness control?

(Ignore problems affecting BLUE only)

Y N

010

GO TO MAP 0300, ENTRY POINT A.

011

If a selector pen is NOT installed take the Y path now.

- Set the brightness control to center position.

•Press the light pen tip (do not point it at the screen).

White bars appear through all characters

in lines 2 and 3 of the test pattern.

The blue characters become BRIGHTER but

the red and green do not change.

- Set the brightness control back to an acceptable level.

•Press the pen against the white >SEL PEN field in line 2.

The field changes to >SEL PEN.

•Press the pen against the blue >SEL PEN field in line 3.

The field changes to ?SEL PEN.

•If \times -f appears in the indicator row, press RESET key and retry.

Did all occur as expected?

Y N

012

GO TO MAP 0800, ENTRY POINT DD.

013

•If an MSR/MHS is NOT installed, take the Y path now.

•Move the cursor to the first position of the 5th row.

•Use the MSR/MHS to read the test card.

The green lamp on the MSR/MHS should light

and the cursor move. (The characters read from the card may or may not display.)

 \times -f will appear in the indicator row.

Did all occur as expected?

Y N

014

GO TO MAP 0800, ENTRY POINT EE.

200CT81

3

B

MAP 0100-2

015
•If ECS or PS (feature cards E2 and F2) are NOT installed, take the Y path now.
•Run ONLINE TEST 8; see page 1.
The pattern shown in Figure 2-7 should display.
Is the pattern correct?

Y N

016
GO TO MAP 0800, ENTRY POINT CC.

017
•Set the TEST/NORMAL switch to TEST.
•Press all the keys in turn (except CONTROL).
The characters shown in Figure 2-3 (TEST MODE 2) should appear. Note the 4 keys which give double characters.
Are all keys correct?

Y N

018
GO TO MAP 0700, ENTRY POINT A.

019
•Set the TEST/NORMAL switch to NORMAL.
•Press any alphanumeric key four or five times.
Does the clicker sound each time a key is pressed?

Y N

020
GO TO MAP 0700, ENTRY POINT A.

021
•Run ONLINE TEST 7; see page 1.
A yellow (or red on green) pattern (-|-|-) should appear at the center of the screen.
Does this occur?

Y N

022
GO TO MAP 0600, ENTRY POINT A.

023
•Press space bar 26 times, until 13 patterns display together in white.
•Look for any misconvergence. Do not mistake misconvergence for bad focus or bad color balance (impure white).
Is the convergence good?

Y N

024
GO TO MAP 0600, ENTRY POINT A.

025
•Set the brightness control fully clockwise.
Is the display as bright as you would expect?

Y N

026
GO TO MAP 0300, ENTRY POINT BB.

027
(ENTRY POINT DD)
•Check color purity as follows:
•Set the TEST/NORMAL switch to TEST.
•Press keys CONTROL 0 I (red characters).
•Jumper D2Y02 to D2Y08 (reverse video).
Do not leave this jumper connected for more than 20 seconds.

Is the red color good over ALL the screen?

Y N

028
•Go to MIM section 5.3.2 to adjust the color purity. If this corrects the problem,
GO TO MAP 0000, ENTRY POINT BB.
If you cannot correct the problem,
GO TO MAP 0300, ENTRY POINT BB.

029
•Check the color balance as follows:
•Remove the jumper D2Y02 to D2Y08.
•Jumper C2W09 to C2W28 (color bars).
•Jumper C2G06 to C2D08 (force characters).
•Set the TEST/NORMAL switch to NORMAL.
The three primary colors (red, green, blue) should be equally bright and the secondary colors distinct, at both high and low settings of the front panel BRIGHTNESS control.
Is all correct?

Y N

030
•Go to MIM section 5.3.7 to correct the color balance. If this corrects the problem,
GO TO MAP 0000, ENTRY POINT BB.
If you cannot correct the problem,
GO TO MAP 0300, ENTRY POINT CC.

031
•Look at the focus in this test pattern.
•Look at both the center of the screen and the corners.
Is the focus good?

Y N

032
•Go to MIM section 5.3.4 to adjust the image focus.
•Switch power OFF .
•If you cannot correct the problem, see Figure 4-7 and Figure 6-7 to check the continuity of the FOCUS connection through P26. If the problem remains, exchange the analog card then the video card then the CRT.
GO TO MAP 0000, ENTRY POINT BB.

033

- Remove the jumper C2M09 to C2M28.
 - Jumper C2M07 to C2M28. (force white).
 - Hold down the ALT key, press the TEST key, release both.
- The screen will be full of white characters.
- Check convergence carefully all over the screen.

Is the convergence good?

Y N

034

GO TO MAP 0600, ENTRY POINT A.

035

- Fit the alignment mask to the screen.
- Is the image SIZE and SHAPE correct?

Y N

036

- Remove jumpers.
- Go to MIM section 5.3.5 to adjust the raster controls correctly (See also Figure 1-4).
- If this corrects the problem, GO TO MAP 0000, ENTRY POINT BB.
- If you cannot correct the problem, GO TO MAP 0400, ENTRY POINT DD.

037

- Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
- Look for a skip gap above and below the separator line. It should be 1-3 mm (0.05-0.1 inches) wide. See Figure 2-1.

Is the skip good?

Y N

038

GO TO MAP 0400, ENTRY POINT DD.

039

- Remove jumpers.
 - Set the TEST/NORMAL switch to TEST.
 - Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
- Does the image appear as shown in Figure 2-1?

Y N

040

GO TO MAP 0300, ENTRY POINT A.

041

- Release Intensity Override.
 - t0
 - Set the 0000/00 switch to 00.
- The color of the pattern (Figure 2-4) should change so that all characters become green except the characters on line 2 which will be white. The separator line and characters in the OIA remain blue.
- Does this occur?

Y N

042

GO TO MAP 0500, ENTRY POINT A.

043

- Set the 0000/00 switch back to 0000.
 - Check that the A,a/A switch is set to A,a
 - Move the cursor down a few lines and press the 'q' key.
- A character 'q' should appear.
- Set the A,a/A switch to A .
- The 'q' will become 'Q' .
- Does this occur?

Y N

044

- Switch power OFF .
 - See Figure 6-8 to check for an open or short circuit in the wiring to the A,a/A switch.
 - Check the switch. Exchange any failing FRU.
 - If no failure is found, exchange logic card D2.
- GO TO MAP 0000, ENTRY POINT BB.

045

GO TO MAP 0800, ENTRY POINT FF.

046

(ENTRY POINT BB)

•Observe the TEST MODE 1 pattern:
(If the image is missing or too poor to answer the question, take the Y path.)
Do the focus, and purity adjustments look good?

Y N

047

•Make any necessary adjustments to the controls (see Figure 1-4).
You may use MIM section 5.3.4 (Focus) or MIM section 5.3.2 (Purity) to make the adjustment.
If this corrects the problem,
GO TO MAP 0000, ENTRY POINT BB.
If the problem is still present,
GO TO PAGE 3, STEP 027,
ENTRY POINT DD.

048

•Observe the TEST MODE 1 pattern:
(If the image is missing or too poor to answer the question, take the Y path.)
Do the raster adjustments look good?
If the TEST MODE 1 pattern is visible but the width or height is wrong or the corners of the pattern are not square (for example) take the N path.

Y N

049

•Make any necessary adjustments to the controls (see Figure 1-4).
You may use MIM section 5.3.5 to make the adjustment.
If this corrects the problem,
GO TO MAP 0000, ENTRY POINT BB.
If the problem is still present,
GO TO PAGE 3, STEP 027,
ENTRY POINT DD.

050

Is lamp 1 (power good) ON ?

Y N

051

GO TO MAP 0200, ENTRY POINT A.

052

•If this display contains no feature cards, (E2, F2, G2, G4) take the Y path now.
•Switch power OFF and remove any feature cards.
•Replace the C5-D5(-E5) top card connector, if moved. See Figure 1-6.
•Observe TEST MODE 1 pattern again (step 001).

Is test still bad?

Y N

053

GO TO MAP 0800, ENTRY POINT A.

054

•Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
The image on the screen may not be very bright.
•If the image is unstable, take the Y path now.
•Look for the following:-
(A) The image filling most of the screen.
(B) A blank margin at right-hand side.
(C) The 3 rasters not aligned so that the 3 primary colors Red, Green and Blue are visible. See Figure 2-1.
Are (A), (B), and (C) all good?
Ignore other problems.

Y N

055

GO TO MAP 0400, ENTRY POINT A.

056

•Continue to engage Intensity Override.
•Look near the bottom of the image for the gaps by the separator line and look at the diagonal flyback lines.
•See Figure 2-1.
Are these gaps and lines VISIBLE and STABLE?
(If you don't know take the Y path.)

Y N

057

GO TO MAP 0400, ENTRY POINT CC.

058

•Release Intensity Override.
Is the image now stable?
(Take the Y path if you don't know.)

Y N

059

•Exchange logic card C2 then D2
GO TO MAP 0000, ENTRY POINT BB.

060

Is there a permanent raster in one or more of the 3 colors? (It may be very dim.)

Y N

061

Is the screen completely blank or do all characters display too dim or too bright?

Y N

062

Do some groups of '0' characters (or a full screen of '0') appear.?

Y N

063

There may be distorted characters on the screen. These may have dots missing or have too many dots (vertical lines) or may be flashing. (Ignore convergence.)
Do any characters look similar to this?

Y N

064

Are there any diagonal lines across the display or any smeared characters?

Y N

065

Does the cursor appear under the 2nd or 3rd character on the top line of the test pattern?

Y N

066

•Verify the TEST/NORMAL switch as follows:
 •Set the TEST/NORMAL switch to NORMAL. The ready symbol should appear.
 •Set the TEST/NORMAL switch to TEST. The TEST MODE 1 pattern should return. Is the switch OK?

Y N

067

•See Figure 6-8 to check the continuity of the wiring to the TEST/NORMAL switch, especially the 0V connection from analog card P4 pin 10 to LED card P12 pin 6.
 •Check the switch.
 •Exchange any failing FRU.
 •If no failure is found, exchange logic card C2 then D2 then E2.
 GO TO MAP 0000, ENTRY POINT BB.

068

Does a green pattern similar to the correct TEST MODE 1 pattern appear, but has characters in the wrong sequence or upper case characters only?

See Figure 2-2.

Y N

069

Are there any '8' characters on the screen?

Check in NORMAL mode also.

Y N

070

•Set the TEST/NORMAL switch to NORMAL.
 Does the ready symbol appear?

Y N

071

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

072

•Run ONLINE TEST 0; see page 1.
 •Check the pattern displayed against Figure 2-4.
 Is it correct? (Ignore color problems.)

Y N

073

•Exchange logic card D2 then C2.
 GO TO MAP 0000, ENTRY POINT BB.

074

Are the COLORS correct also?

Y N

075

•Exchange logic card E2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

076

•Exchange logic card D2 then C2.
 GO TO MAP 0000, ENTRY POINT BB.

077

•Exchange logic card D2 then C2.
 GO TO MAP 0000, ENTRY POINT BB.

078

•Verify that the A,a/A switch is set to A,a. Press the TEST key.

Does a large 'X' character appear?

Y N

079

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

080

•Switch power OFF .
 •See Figure 6-8 to check the continuity of the wiring to the A,a/A switch.
 •Check the switch.
 •Exchange any failing FRU.
 •If no failure is found, exchange logic card D2 then C2.
 GO TO MAP 0000, ENTRY POINT BB.

081

GO TO MAP 0700, ENTRY POINT BB.

082

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

083

- Check the +5v and the +8.5v on the video card test points - see Figure 6-9.

Are both voltages correct?

Y N

084

- Switch power OFF .
- See Figure 6-7 to check the continuity of the voltage supplies. Repair any failure found.

GO TO MAP 0000, ENTRY POINT BB.

085

- Exchange logic card C2 then D2.

GO TO MAP 0000, ENTRY POINT BB.

086

- Exchange logic card D2 then C2.

GO TO MAP 0000, ENTRY POINT BB.

087

- If the screen is not blank, take the Y path now.
- Press keys CONTROL and B O I
- Set the TEST/NORMAL switch to NORMAL.

Does the screen always remain completely blank?

Y N

088

- Exchange logic card C2. If this corrects the problem, GO TO MAP 0000, ENTRY POINT BB.
- If the problem remains, GO TO MAP 0300, ENTRY POINT A.

089

GO TO MAP 0300, ENTRY POINT BB.

090

GO TO MAP 0300, ENTRY POINT A.

091

(ENTRY POINT CC)

- Observe the TEST 0 pattern at high and low settings of the BRIGHTNESS control on the front panel.

- Take the Y path if the image is missing or too poor to answer the question.
- Do not mistake a missing color(s) or a continuous raster for poor color balance.

Do the raster, focus, purity and color balance adjustments look good?

Y N

092

- Make any necessary adjustments to the CE controls (see Figure 1-4). You may use MIM section 5.3.5 (Raster) or MIM section 5.3.4 (Focus) or MIM section 5.3.2 (Purity) or MIM section 5.3.7 (color balance) to make the adjustment. Only use MIM section 5.3.6 if necessary.

If this corrects the problem, GO TO MAP 0000, ENTRY POINT BB.

If the problem is still present, GO TO PAGE 3, STEP 027, ENTRY POINT DD.

093

- If this display contains no feature cards, (E2, F2, G2, G4) take the Y path now.
- Switch power OFF and remove any feature cards.
- Replace the C5-D5(-E5) top card connector, if moved. See Figure 1-6.
- Switch power ON .
- Repeat preceding test (step 003 or 005). Is test still bad?

Y N

094

GO TO MAP 0800, ENTRY POINT A.

095

- Set the TEST/NORMAL switch to TEST.
- Engage Intensity Override. (Turn the brightness knob fully counterclockwise.) The image on the screen may not be very bright.

Around some of the edges the three rasters should not be aligned and the 3 primary colors (Red, Green, Blue) should be visible in some areas around the edge. See Figure 2-1.

Does the image look similar to this?

Y N

096

GO TO MAP 0300, ENTRY POINT A.

T
7

097

- Release Intensity Override. (Turn Brightness knob fully clockwise and then back if too bright.)
- Press the keys with the following legends shown in Figure 2-3:
B C I J K L K Q / pp ? x)

Note - On most keyboards the legends 'pp', '?', 'x' and ')' are on the keys marked 'ALT', 'ENTER', 'TEST' and 'â'. The cursor should move as each character is entered.

Is all as expected?

Y N

098

GO TO MAP 0700, ENTRY POINT A.

099

- Press these keys in sequence:
CONTROL C CONTROL B B O I
- Press these keys in sequence:
CONTROL C
- Press these keys in sequence:
CONTROL B B O Q

Does the entire display become RED then GREEN then BLUE?

Y N

100

- Set the TEST/NORMAL switch to NORMAL and back to TEST.
- Connect a jumper from C2U11 to C2U08. A solid red raster should cover the characters on the screen.
- Remove the jumper.
- Now connect the jumper from C2S12 to C2U08. A solid blue raster should cover the characters on the screen.
- Remove the jumper.

Did you see both the red and blue rasters?

Y N

101

GO TO MAP 0300, ENTRY POINT A.

102

- Run ONLINE TEST 0; see page 1. The pattern shown in Figure 2-4 should display.
- Is the problem with this test pattern that it does not display in the correct colors or there is a color missing?

Y N

103

- Exchange logic card D2 then C2.

GO TO MAP 0000, ENTRY POINT BB.

104

GO TO MAP 0500, ENTRY POINT A.

105

- Set the TEST/NORMAL switch to NORMAL. Is there a ready symbol in the indicator row?

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

106

- Does the display show a green separator line and a green cursor in the top left-hand corner and NOTHING else?

Y N

107

- Does an error code appear on the screen or is there an entry in the error log for this display? (See MIM section 2.6.3 on how to read the error log.)

(Take N path if you don't know.)

Y N

108

- Does the display remain in TEST MODE even when the TEST/NORMAL switch is set to NORMAL?

Y N

109

- Exchange logic card C2 then D2.

GO TO MAP 0000, ENTRY POINT BB.

110

- Switch power OFF .
- See Figures 6-8 to verify and repair wiring and connections to the TEST/NORMAL switch.

GO TO MAP 0000, ENTRY POINT BB.

111

- Use the 'Error Code-to-FRU' list (MIM section 2.6.8) to isolate the failing FRU.

GO TO MAP 0000, ENTRY POINT BB.

112

GO TO MAP 0900, ENTRY POINT BB.

113

The screen should appear:-

- (A) White cursor at top left.
- (B) Blue separator line near the bottom.
- (C) Any symbols in the indicator row should be blue.

- Ignore any other image on the screen.

Are (A), (B) & (C) correct?

Y N

114

- Attempt to enter the convergence routine. (See MIM section 5.3.3.)

Do the symbols X#? appear in the indicator row?

Y N

Y N

115

- Exchange logic card C2 then D2.

GO TO MAP 0000, ENTRY POINT BB.

116

- Exchange logic card B2 then C2 then D2.

GO TO MAP 0000, ENTRY POINT BB.

117
•Hold down the ALT key, press the TEST key, & release both.

Does the word 'TEST' appear in the indicator row?

Y N

118
•Hold down the ALT key, press the ALT CURSOR key, & release both.

Does the reverse cursor appear?

Y N

119
Does the normal flashing cursor appear?

Y N

120
GO TO MAP 0700, ENTRY POINT CC.

121
GO TO MAP 0700, ENTRY POINT EE.

122
GO TO MAP 0700, ENTRY POINT A.

123
•Press the '/' key.
Does a '/' symbol appear on the screen (in the top left hand corner)?

Y N

124
GO TO MAP 0700, ENTRY POINT EE.

125
•Press the ENTER key.
(ONLINE TEST 0).
The pattern shown in Figure 2-4 should display.
Are the colored fields displayed in the correct colors?
Ignore any other differences.

Y N

126
GO TO MAP 0500, ENTRY POINT A.

127
•Exchange logic card C2 then D2.
GO TO MAP 0000, ENTRY POINT BB.

004

- Remove the power cord from the mainline power socket.
 - Remove the bezel.
 - With the power switch in the ON position, measure the continuity from the power supply edge connector (P3) to the power cord.
- Pins 11 and 14 (test points) of P3 should be connected one to each power cord pin. See Figure 1-2 and Figure 6-15.

Are both connections good?

Y N

005

- Switch power OFF .
- Check the mainline fuse.

Has the fuse failed?

Y N

006

- See Figure 6-15 to check the continuity of the ON/OFF switch, fuse and fuseholder and the connecting cables.

•Exchange the failing FRU.
GO TO MAP 0000, ENTRY POINT BB.

007

- Exchange the fuse and test operation.
- Switch OFF and wait 1 minute.
- Switch ON and wait 10 minutes.

Did the fuse fail again?

Y N

008

GO TO MAP 0000, ENTRY POINT BB.

009

- Switch power OFF and remove the power cord from the mainline power socket.
- Remove power supply card.
- Exchange the mainline fuse again.
- Switch power ON WITHOUT reinstalling the power supply card.

Did the fuse fail?

Y N

010

- Switch power OFF and remove the power cord from the mainline power socket.

•Exchange the power supply card.
GO TO MAP 0000, ENTRY POINT BB.

011

- Remove the power cord from the mainline power socket.

•See Figure 6-15 to verify the insulation of the input power wiring.
GO TO MAP 0000, ENTRY POINT BB.

012

- Switch power OFF and remove the power cord from the mainline power socket.
- Remove the power supply card.
- Check the fuse on the power supply card.

NOTE: If necessary, remove the plastic cover to inspect the fuse. Replace the cover.

Is the fuse good?

Y N

013

- Do NOT repair or exchange the fuse.
 - Exchange the power supply card.
- GO TO MAP 0000, ENTRY POINT BB.

014

- Leave the power supply card out.
- See Figure 1-2 and Figure 3-2. Check the continuity of the LOPT sense winding to the analog card as follows:
- Measure resistance between locations 8 and 9 on the power supply card edge connector SOCKET (P3).

Is the resistance 0 ohms?

Y N

015

- See Figure 4-7. Check that P7 (LOPT sense) is plugged-in.
 - If the resistance is still not 0, verify the continuity of the cable from P3 to P7 and repair.
 - If no problem is found, exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

016

- Verify the seating of the power supply card in the card edge connector.
 - If no problem found, exchange the power supply card.
 - Ensure that it matches the machine voltage label and the mainline ac voltage.
- GO TO MAP 0000, ENTRY POINT BB.

017

- Connect the meter to +5 V on the logic board.

(0 V = B2D08, +5 V = B2D03).

Does the meter indicate +4.5 to +5.5 Volts?

Y N

018

- Switch power OFF .
 - Disconnect the logic gate A3 cable.
 - Switch power ON .
- Does the meter now indicate +4.5 to +5.5 volts?

Y N

019

- Switch power OFF and remove the power cord from the mainline power socket.
 - Exchange the power supply card.
- GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	FF	6	065
0100	A	1	001
0400	CC	6	060

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
5	058	0100	BB

001
(ENTRY POINT A)

DANGER

When the 3279 power ON/OFF switch is ON , the following are connected directly to the mainline power:-

- The twisted-pair connection from P3 pins 8 and 9 (on the power supply) to the analog card (P7).
- The degauss coil.
- Front panel fuse & switch, and
- Parts of the power supply card.

•Be careful when measuring voltages in these areas.

•Switch power OFF and remove the power cord from the mainline socket before such actions as:-

- disassembling,
- inspecting for failures,
- making resistance measurements, etc.

- Switch power OFF .
- Verify that the power cord is plugged in to an active outlet.
- Reseat the A2 and A3 logic gate cables and verify that the problem is still present.
- Switch power OFF .
- Wait 10 seconds.
- Switch power ON and look CAREFULLY at lamp 1.

Does lamp 1 (POWER GOOD) flash at least once and then go OFF?

Y N

002

- Connect a meter to +8.5 V on the logic board. (0 V = B2D08, +8.5 V = B2B11).
 - Switch power OFF and wait at least 30 seconds.
 - Switch power ON .
- Did the voltage pulse once or several times (approximately once a second) and then fall to zero? The voltage pulse may be very small. Switch the meter down a range if necessary.

Y N

003

Is the voltage constant between 7.6 and 9.4 Volts?

Y N

3 3 2 2
A B C D

020

- Switch power OFF .
 - Unseat the analog card.
 - See Figure 6-8 and Figure 3-2.
 - Check the +5v cable from the logic A3 connector to the analog card P4-34 for continuity and short circuit to ground.
 - If no problem is found exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

021

- See Figure 6-8 and Figure 3-2 and the table below to check the supplies to the analog card and the LED Indicators.

VOLTAGE.	TOL.	LOGIC GATE	ANALOG CARD P4	
			Wire	TP
+5 Vdc	0.5V	B2J03	34	37
-5 Vdc	0.5V	B2G06	29	5
+8.5Vdc	0.9V	B2G11	35	36
0 V	B2J08	30	10

- Switch power OFF .
 - Check continuity:-
Analog P4-10 to LED P12-6.
Analog P4-34 to LED P12-7.
- Did you find a problem?

Y N

022

- Exchange the analog card (then the power supply card)
- GO TO MAP 0000, ENTRY POINT BB.

023

- Trace and repair wiring if possible or exchange any failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

024

GO TO STEP 025,
ENTRY POINT BB.

025

(ENTRY POINT BB)

- Switch power OFF and connect a meter to +5 V on the logic board.
(0 V = B2D08, +5 V = B2D03).

There now follows a sequence of FRU disconnecting and reconnecting to find which FRU is overloading the power supply.

CAUTION

When investigating with FRUs disconnected:-

- Do NOT switch power ON for more than 5 minutes.
- Do NOT leave the 3279 unattended with power on.

Remember POWER should not be switched back (Step 025 continues)

(Step 025 continued)

ON until 10 seconds after POWER OFF.

- Disconnect the keyboard.
 - Switch power ON .
- Is the +5 V supply now present (between +4.5 V and +5.5 V)?

Y N

026

- Leave the keyboard disconnected.
 - Switch power OFF .
 - Disconnect the video card plugs P14 and P16. See Figure 1-4.
 - Switch power ON .
- Is the +5 V supply now present?

Y N

027

- Switch power OFF .
 - Reconnect the video card connectors P14 and P16.
 - Disconnect amplifier card plug P18. See Figure 1-4.
 - Switch power ON .
- Is the +5 V supply now present?

Y N

028

- Switch power OFF .
 - Reconnect amplifier card connector P18.
 - Disconnect amplifier card connectors P17A and P17B.
 - Switch power ON .
- Is the +5 V supply now present?

Y N

029

- Switch power OFF .
 - Reconnect amplifier card connectors P17A and P17B.
 - Disconnect the logic gate A3 cable.
 - Switch power ON .
- Is the +5 V supply now present?

Y N

030

- Switch power OFF .
 - Reconnect the logic gate A3 cable.
 - Disconnect the logic gate A2 cable.
 - Connect a meter to power supply connector P3-1 (+12V). See Figure 1-2.
 - Use the potentiometer mounting plate as ground.
 - Switch power ON .
- Does the +12 V supply pulse once or several times and then fall to zero?

Y N

031

Is the +12 V supply constant between +10 and +15 Volts?

Y N

032

- Switch power OFF and remove the power cord from the mainline power socket.
 - Exchange the power supply card.
- GO TO MAP 0000, ENTRY POINT BB.

033

There may be a short circuit in a logic card.

- Switch power OFF .
- Reconnect the A2 logic gate connector.
- Remove the logic cards one at a time in the following order, each time testing the +12V:

Feature cards G4, G2, F2, E2

Base cards C2, D2

Convergence logic card B2

- If the problem disappears, exchange the last card removed.

Has the problem gone?

Y N

034

GO TO PAGE 6, STEP 060,
ENTRY POINT CC.

035

GO TO MAP 0000, ENTRY POINT BB.

036

- Switch power OFF .
 - Reconnect the logic gate A2 connector.
 - Unseat the analog card from its edge connector (P4).
 - Switch power ON .
- Does the +12 V supply (at P3-1) still pulse once or several times and then fall to zero?

Y N

037

- Switch power OFF .
 - Disconnect P5 from the analog card. (Figure 4-7)
 - Reseat the analog card.
 - Switch power ON .
- Does the +12 V supply at P3-1 now pulse once or several times and then fall to zero?

Y N

038

- Switch power OFF .
 - Exchange the video card.
- GO TO MAP 0000, ENTRY POINT BB.

039

- See Figure 1-2.
 - Meter the +103V supply to the analog card at test points P3-39 and 40.
- Does it pulse when power is switched ON?

Y N

040

- Switch power OFF .
- See Figure 3-2.
- Meter the 103V wiring for short circuits.
- Repair or exchange any failing FRU.
- If no problem found, exchange the power supply card.

041

- Switch power OFF .
 - Exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

042

- Switch power OFF and remove the power cord from the mainline power socket.
 - Exchange the power supply card.
- GO TO MAP 0000, ENTRY POINT BB.

043

(ENTRY POINT EE)

- Switch power OFF .
- Reconnect the logic gate A3 cable.
- Unseat the analog card from its edge connector P4.

•Switch power ON .

- See Figure 1-2 and Figure 3-3 and use a logic probe to trace these signals:

HORIZ RETRACE: D2J13-B2G13

HORIZ SYNC: B2J13-A3D13-Analog card P4-1 to Analog card P4-2 (TP).

VERT RETRACE: D2G08-C2G07-B2G08

VERT SYNC: C2G12-A3D12-Analog card P4-28 to Analog card P4-3 (TP).

Do BOTH probe lamps light at ALL the above points?

Y N

044

- Switch power OFF .
 - Check cables and connectors for continuity or short circuits to ground.
 - Repair or exchange any failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

045

- Switch power OFF .
 - Reconnect the logic gate A3 cable.
 - Remove the EHT cable from the LOPT on the analog card. See MIM section 4.5.4 para6. The free end of the EHT cable is safe - let it remain in the bottom of the box.
 - Reinstall the analog card.
 - Switch power ON .
- Is the +5 V supply now present?
Y N

046

- There is probably a short circuit on the analog card.
- Switch power OFF .
 - First disconnect both the audible alarm connector P8 and the bezel lamps card connector P12. See Figure 1-2.
 - Switch power ON and test.
 - Switch power OFF if the problem remains, and exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

047

- Switch power OFF and remove the power cord from the mainline power socket.
 - Exchange the bleed assembly. (See MIM section 4.8.4.)
 - If the problem is still present, exchange the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

048

- Switch power OFF .
 - Exchange the amplifier card.
 - See MIM Chapter 5 to make adjustments.
- GO TO MAP 0000, ENTRY POINT BB.

049

- Switch power OFF .
- Reconnect the amplifier card connector P18.

Does this display have a selector pen installed?

Y N

050

GO TO STEP 052,
ENTRY POINT DD.

051

- Remove the selector pen logic card G4.
 - Switch power ON .
- Is the +5 V supply now present?

Y N

052

- Reinstall the selector pen card.
- (ENTRY POINT DD)

- Remove the convergence logic card B2.
 - Switch power ON .
- Is the +5 V supply now present?
Y N

053

- There seems to be a short circuit in the wiring of the the +12V and -12 V supplies to the selector pen card. The problem may be present even if there is no selector pen installed.
- Switch power OFF and see Figure 6-16. Repair any problem.
- GO TO MAP 0000, ENTRY POINT BB.

054

- Exchange logic card B2.
- GO TO MAP 0000, ENTRY POINT BB.

055

- Exchange logic card G4.
- GO TO MAP 0000, ENTRY POINT BB.

056

- Switch power OFF .
 - Exchange the video card. If the problem remains, verify the connections to the video card shown in Figure 6-7.
 - Repair any problem.
- GO TO MAP 0000, ENTRY POINT BB.

057

Can the TEST MODE 1 pattern now be displayed?

Y N

058

- There is a slight overload on the power supply - the analog card is probably failing. Leave the keyboard disconnected and
- GO TO MAP 0100, ENTRY POINT BB.

059

- Switch power OFF .
 - Meter the keyboard cable for short circuits (Figure 6-12) and repair as necessary.
 - If no problem, exchange the keyboard logic card.
- Another possible failure is a slight overload on the power supply; removing a FRU has lowered the current within tolerance. See MIM section 3.1.
- GO TO MAP 0000, ENTRY POINT BB.

060

(ENTRY POINT CC)

- Switch power OFF and remove the power cord from the mainline power socket.
- Reinstall any disconnected FRUs.
- Remove the analog card.
- Disconnect the deflection coils (Connector P6, near the center of the analog card with 4 colored wires) - see Figure 4-7.
- Inspect the plug and connector for loose and dirty contacts and broken wires.
- Repair any damage.

Did you find the problem?

Y N

061

The horizontal scan coil is connected to the RED and BLUE wires.
The vertical scan coil is connected to the YELLOW and GREEN (or BLACK) wires.
The resistance of each coil should be less than 2 ohms.

- Measure the resistance of the 2 scan coils.

Do both coils seem good?

Y N

062

- Exchange the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

063

- Exchange the analog card.
 - If the problem remains, exchange the power supply card, then CRT.
- GO TO MAP 0000, ENTRY POINT BB.

064

GO TO MAP 0000, ENTRY POINT BB.

065

(ENTRY POINT FF)

- Start here to isolate problems causing the power supply to stop (i.e. lamp 1 changing from ON to OFF - with or without flashing).
- Wait one minute.
- Look at lamp 1 carefully.
- Switch power ON .

Does lamp 1 flash?

Y N

066

Is lamp 1 ON?

Y N

067

GO TO PAGE 1, STEP 001,
ENTRY POINT A.

068

If, during more testing,
lamp 1 changes to OFF again:-

- Switch power OFF .
- Wait one minute.
- Switch power ON .
- If lamp 1 lights, continue MAP from where you stopped.
- If lamp 1 remains off,
GO TO STEP 001,
ENTRY POINT A.

- Probe pins P4-2 & 3 (horizontal & vertical sync Test Points on analog card).

Do both lamps light on both pins?

Y N

069

GO TO PAGE 4, STEP 043,
ENTRY POINT EE.

070

- Switch power OFF and remove the power cord from the mainline power socket.
- Reinstall any disconnected FRUs.
- Remove the analog card.
- Disconnect the deflection coils (Connector P6, near the center of the analog card with 4 colored wires) - see Figure 4-7.
- Inspect the plug and connector for loose and dirty contacts and broken wires.
- Repair any damage.

Did you find the problem?

Y N

V W X
6 6 6

POWER MAP

MAP 0200-7

PAGE 7 OF 7

071

The horizontal scan coil is connected to the RED and BLUE wires.
The vertical scan coil is connected to the YELLOW and GREEN (or BLACK) wires.
The resistance of each coil should be less than 2 ohms.

•Measure the resistance of the 2 scan coils.

Do both coils seem good?

Y N

072

•Exchange the CRT.
GO TO MAP 0000, ENTRY POINT BB.

073

•See MIM section 3.1
GO TO MAP 0000, ENTRY POINT BB.

074

GO TO MAP 0000, ENTRY POINT BB.

075

GO TO PAGE 1, STEP 001,
ENTRY POINT A.

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MAP 0200-7

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	BB	4	042
0100	CC	2	008
0400	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	023	0800	HH

001

(ENTRY POINT A)

- Set the TEST/NORMAL switch to TEST.
 - Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
- You should see all 3 colors (red, green and blue) in some areas around the edge of the screen - as in Figure 2-1.
- Can you see all the 3 colored rasters ?

Y N

002

Are only one or two colored rasters visible? (No characters.)

Y N

003

The following symptoms in Intensity Override should not prevent the display from operating normally:

- Only 2 of the 3 rasters visible and some dim characters just visible.
- The rasters do not appear and any characters remain in view.

Have you got either of these problems?

Y N

004

- Release Intensity Override.
- GO TO PAGE 4, STEP 042,
ENTRY POINT BB.

005

- If symptom (a) is present, exchange the video card.
 - For symptom (b), probe the VIDEO FORCE signal on the video card (Test Point G1, Figure 6-9).
- The signal should normally be UP and should go DOWN when Intensity Override is engaged.

Does this occur?

Y N

006

- Switch power OFF
 - See Figure 6-7 to trace the VIDEO FORCE signal.
 - See Figure 6-7 to verify the continuity of the connections to the Intensity Override switch on the brightness potentiometer.
 - If you find no problem, exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

007

- Switch power OFF .
 - Exchange the video card.
- GO TO MAP 0000, ENTRY POINT BB.

008

- Release Intensity Override.

(ENTRY POINT CC)

- See Figure 6-7 and Figure 6-9.
- Meter the 3 video card grid test points shown below. Use the -150 V dc meter range. Use a ground braid or the brightness potentiometer plate as ground.
- With the brightness control set to MINIMUM, the voltages on the test points should be between -50 V dc and -80 V dc.
- With the control set to MAXIMUM, the test point voltages should be between -20 V dc and -60 V dc.

GREEN GRID Test Point = GG

BLUE GRID Test Point = BG

RED GRID Test Point = RG

Do the 3 grid voltages look good?

Y N

009

Is only the blue grid voltage bad?

Y N

010

(ENTRY POINT DD)

- On the amplifier card, adjust the settings of the color balance potentiometers for the bad color. See Figure 1-4.

Can the bad grid voltage be corrected?

Y N

011

Are all 3 voltages bad?

Y N

012

- See Figure 6-7 and Figure 1-4.
 - Switch power OFF .
 - Check the continuity of the P15 connector on the video card to the amplifier card connectors P17A and P17B.
 - If the continuity is good exchange the amplifier card.
- Has the problem gone?

Y N

013

- Exchange the video card, then the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

014

GO TO MAP 0000, ENTRY POINT BB.

015

- Verify the continuity from P4-20 to P17-5 and the brightness potentiometer circuit. See figure 6-7. If the continuity is good, exchange the analog card.

016

- Set up the red brightness & color balance. See MIM section 5.3.6 & MIM section 5.3.7.

- Check for a possible intermittent problem.
- GO TO MAP 0000, ENTRY POINT BB.

017

Is the blue grid voltage constant (and between -10 V and -20 V dc) as the brightness control is turned?

Y N

018

GO TO STEP 010,
ENTRY POINT DD.

019

Meter the TP 'J' on the amplifier card. See Figure 6-10.

Is the voltage between 0 - 0.2V dc?

Y N

020

- Switch power OFF .
 - Check continuity of the blue bright-up signal from IP 'J' on the amplifier card to P18-3 through C2U02. See Figure 6-7.
- Is continuity good?

Y N

021

- Repair or exchange failing FRU:- strip, wiring or amplifier card.
- GO TO MAP 0000, ENTRY POINT BB..

022

- Exchange card C2 then amplifier card then B2.
- GO TO MAP 0000, ENTRY POINT BB..

023

GO TO MAP 0800, ENTRY POINT HH.

024

- Switch power OFF .
 - Exchange the video card.
 - If the problem remains exchange the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

A
1

025

•Release Intensity Override.
Turn up the brightness.
Is the problem that ALL 3 rasters are permanently on (as if Intensity Override is always active)?

Y N

026

Is the problem that ONE RASTER is permanently on?
(that is, there is a solid RED, GREEN, or BLUE raster which may be dim or bright). Some characters may be just visible.

Y N

027

•Set the TEST/NORMAL switch to TEST.
•Look at the normal cursor - it should be WHITE - that is, made up of RED and BLUE and GREEN.

Is the problem that ONE of the 3 primary colors is never displayed on the screen?

Y N

028

GO TO PAGE 4, STEP 042,
ENTRY POINT BB.

029

•Ground the suspect video signal for a few seconds, where it comes on to the video card.

GREEN = Test Point GI
RED = Test Point RI
BLUE = Test Point BI

See Figure 6-9.

Does a full raster appear in the correct color?

Y N

030

•Switch power OFF .
•Exchange the video card.
•If the problem remains, exchange the CRT.
GO TO MAP 0000, ENTRY POINT BB.

031

•Switch power OFF .
•Check the continuity of the connections below. See Figure 1-4 for plug locations.

VIDEO SIGNAL	LOGIC	Through	VIDEO CARD Wire	ITP.
Green	C2S11	A5D11	P14-5	GI
Red	C2U11	A5D12	P14-7	RI
Blue	C2S12	A5D13	P14-9	BI

•Repair any problem found or exchange logic card E2 then the video card.
GO TO MAP 0000, ENTRY POINT BB.

K L

MAP 0300-3

032

•Switch power OFF .
•Remove the P14 connector from the video card. See Figure 1-4.
•Switch power ON .
•Set the TEST/NORMAL switch to NORMAL.
•Use a LOGIC PROBE to look at the 3 video signals on the logic board.
GREEN = A5D11
RED = A5D12
BLUE = A5D13

Are any of them DOWN all the time?

Y N

033

•Verify the +5V supply to the video card. (See Figure 6-7.) If no problem found, Switch power OFF and exchange the video card.
GO TO MAP 0000, ENTRY POINT BB.

034

•Switch power OFF .
•Measure the resistance to ground of the suspect signal.

Is it 10 ohms or less?

Y N

035

•Exchange logic card C2.
GO TO MAP 0000, ENTRY POINT BB.

036

There appears to be a short to ground.
•Disconnect logic card C2.

Has the short disappeared?

Y N

037

•Look for a failure in the wiring between the video card and the logic board or on the logic board. See Figure 6-7 and Figure 3-2.
GO TO MAP 0000, ENTRY POINT BB.

038

•Exchange logic card C2.
GO TO MAP 0000, ENTRY POINT BB.

039

•Switch power OFF .
•Reseat the video card on the CRT.
•Switch power ON .
•See Figure 6-9 to check that the following supplies are present on the card.

TEST POINT	VOLTAGE		TOLERANCE
70	+70 Vdc	+10 -5 V	
8.5	+8.5Vdc	±0.9 V	
5	+5 Vdc	±0.5 V	
RG	-20V to -80Vdc		
NOTE: RG comes from the -150V supply and is changed by the BRIGHTNESS control.			

Are the voltages correct?

Y N

040

- See Figure 1-4 and Figure 6-7 to check bad voltages and cable connections.
 - Exchange the failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

041

- Switch power OFF .
 - See Figure 6-7 to verify the continuity of the VIDEO FORCE signal.
 - See Figure 6-7 to verify the continuity of the connections to the Intensity Override switch on the brightness potentiometer.
 - If you find no problem, exchange the video card, then the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

042

(ENTRY POINT BB)

- (Do not use Intensity Override.)
- You may have:
 - a) screen too DIM or BRIGHT
 - b) brightness not variable
 - c) limited brightness or brightness does not change smoothly when control turned from minimum to maximum
 - d) screen BLANK

Were you sent here for any of the above problems?

Y N

043

- You may have a color balance or purity problem.
- Go to the adjust instructions (MIM Chapter 5).
- If necessary adjust the purity controls (MIM section 5.3.2) to make the color the same all over the screen.
- If necessary adjust the color balance controls (MIM section 5.3.7) to make white.

Are the purity and color balance correct?

Y N

044

Is it a purity problem?

Y N

045

GO TO PAGE 2, STEP 008,
ENTRY POINT CC.

046

- Switch power OFF .
 - See Figure 1-2 and Figure 6-15 to verify the degauss coil and its plug (P27).
- The degauss coil should measure 15 - 20 ohms.
- Verify the continuity of the purity coils from amplifier card P19 - see Figure 3-3 and Figure 1-4.
- Each coil should measure between 130 and 170 ohms.

Are all coils good?

Y N

047

- Exchange the failing coil assembly.
 - If the problem remains, exchange the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

048

- Check the amplifier card fuse and exchange if necessary.
 - If the problem remains, exchange the amplifier card then the analog card, then the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

049

GO TO MAP 0000, ENTRY POINT BB.

050

- Meter -150V ($\pm 20V$) supply, from the analog card (P4-43). Use the potentiometer mounting plate as ground.
 - If voltage is bad, switch power OFF and exchange the analog card.
 - Verify the adjustment of the Red Brightness and Color Balance controls. See MIM section 5.3.6 & MIM section 5.3.7
 - Switch power OFF .
 - See Figure 6-7 for the connections to the brightness potentiometer and the Intensity Override switch.
 - Check continuity of the wiring from these controls to the analog and amplifier cards. Repair or exchange as necessary.
 - Reseat the analog card.
 - Reseat P15 on video card - see Figure 1-4
 - If no problem found, exchange the analog card (then the amplifier card, then the video card).
- GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM		ENTER THIS MAP	
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	CC	5	056
0100	DD	5	068

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
4	053	0200	CC
4	055	0300	A
5	065	0500	BB

001
(ENTRY POINT A)

DANGER

When the 3279 power ON/OFF switch is in ON , the following are connected directly to the mainline power:-

- The twisted-pair connection from P3 pins 8 and 9 (on the power supply) to the analog card (P7).
- The degauss coil.
- Front panel fuse & switch, and
- Parts of the power supply card.

•Be careful when measuring voltages in these areas.

•Switch power OFF and remove the power cord from the mainline socket before such actions as:-

- disassembling,
- inspecting for failures,
- making resistance measurements, etc.

- Release Intensity Override. (If engaged.)
- Switch power OFF .
- Reset the A2, A3 & A5 logic gate connectors.
- See Figure 6-5. Check the continuity of frame ground (potentiometer mounting plate on bezel) to P3-4 and P4 pins 14, 24 and 30.
- Repair if necessary.
- Switch power ON .
- Measure the voltages shown in the table opposite using the brightness potentiometer plate as ground.

Was ALL correct?

Y N

002

- Switch power OFF .
- Check continuity of A2D08 to the frame ground.
- Repair if necessary. See Figure 6-8 and Figure 3-2.
- Switch power ON .
- Measure the voltages shown in the table opposite using the brightness potentiometer plate as ground.

Was ALL correct?

Y N

003

Was any voltage less than 1.0V dc?

Y N

Y N

Y N

ANALOG CARD P4 TEST POINTS	VOLTAGES AND TOLERANCES
37	+5.0 Vdc ± 0.8 V
36	+8.5 Vdc ± 1.0 V
5	-5.0 Vdc ± 0.8 V

LOGIC GATE PINS	VOLTAGES AND TOLERANCES
B2D03	+5.0 Vdc ± 0.8 V
B2B11	+8.5 Vdc ± 1.0 V
B2B06	-5.0 Vdc ± 0.8 V

004

- Switch power OFF .
- Remove and reseat the power supply card and then reseat the power supply cable in the logic board (A2).

Is the problem solved?

Y N

005

- Switch power OFF .
- Disconnect the logic gate A2 cable.
- Switch power ON .
- Meter the 103V supply (P3-5), using the potentiometer mounting plate as ground.

Is the supply between 110 Vdc and 140 Vdc?

Y N

006

- Switch power OFF .
- Exchange the power supply card.
GO TO MAP 0000, ENTRY POINT BB.

007

- Switch power OFF .
- Exchange the analog card.
(Other FRU'S or wiring problems may give similar symptoms.)
GO TO MAP 0000, ENTRY POINT BB.

008

GO TO MAP 0000, ENTRY POINT BB.

009

- Switch power OFF .
- Verify seating of logic gate A2 connector.
- If no problem found, exchange power supply card.
GO TO MAP 0000, ENTRY POINT BB.

010

- See Figure 3-2 to check the power distribution to the analog card.
- Reseat connectors and logic cards or exchange/repair the failing FRU.
GO TO MAP 0000, ENTRY POINT BB.

011

- Measure the voltages shown in the table below using the potentiometer mounting plate as ground.

ANALOG CARD P4 PINS	VOLTAGES AND TOLERANCES
14	0V & 103V return
15	+103Vdc ±8.0V
39	GND test point
40	+103Vdc test point

Is ALL correct?

Y N

012

Are the voltages measured on pins 15 and 40 different?

Y N

013

- Measure 103V dc at power supply connector P3-5.
- See Figure 1-2.

Is the voltage more than 111 V dc?

Y N

014

Is the voltage less than 95 V dc?

Y N

015

- Switch power OFF .
- Exchange analog card then the power supply.
GO TO MAP 0000, ENTRY POINT BB.

016

- Switch power OFF .
- Exchange the power supply then the analog card.
GO TO MAP 0000, ENTRY POINT BB.

017

Is the voltage the same at the analog card test point? (P4-40)

Y N

018

- There is a problem in the 103 V connection from the power supply to the analog card.
- Use Figure 3-2 to isolate and repair.
GO TO MAP 0000, ENTRY POINT BB.

019

- Switch power OFF .
- Exchange analog card.
- If this corrects the problem
GO TO MAP 0000, ENTRY POINT BB.
- If the problem remains,
GO TO PAGE 3, STEP 037,
ENTRY POINT EE.

020

- Switch power OFF .
- Check seating of the analog card in its edge connector. There should be continuity between pins 15 and 40 when the analog card is seated.
- Exchange the analog card if no problem found.
GO TO MAP 0000, ENTRY POINT BB.

021

Wait one minute or until lamp 2 lights. Is lamp 2 lighted?

Y N

022

•Turn HEIGHT control fully counterclockwise. See Figure 1-4.
Is lamp 2 lighted?

Y N

023

- Switch power OFF .
- Exchange the analog card.
- If this corrects the problem, GO TO MAP 0000, ENTRY POINT BB.
- If the problem remains, GO TO STEP 037, ENTRY POINT EE.

024

- See MIM section 5.3.5 to make necessary adjustments to raster.
- Switch power OFF and exchange the analog card if raster can not be correctly adjusted.
- GO TO MAP 0000, ENTRY POINT BB.

025

- See Figure 1-2 and the table below to check the output voltages at the analog card socket P4.
- Use the brightness potentiometer mounting plate as meter ground.

ANALOG CARD SOCKET (P4) PIN NO.	VOLTAGES AND TOLERANCES
31	+12 Vdc $\pm 1.5V$
50 (TP)	+6.3Vdc $\pm 0.8V$
43	-150 Vdc $\pm 20 V$
48 (TP)	+70 Vdc $\pm 10 V$ -5 V

Are they all correct?

Y N

026

Is pin 43 between -70 and -170 volts?

Y N

027

GO TO STEP 037,
ENTRY POINT EE.

028

Is pin 50 voltage wrong?

Y N

029

- Switch power OFF .
- Exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

030

NOTE: The filament voltage (P4-50) can rise to 12 V dc or more if there is a broken connection to the filament or if the filament has an open circuit.
•Measure the voltage between analog card P4-31 (12 Vdc) and P4-47 (return).
Is there more than 8 Vdc?

Y N

031

- Switch power OFF .
- Exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

032

- There may be an open circuit in the 6.3 V supply or return to the CRT filament.
- Switch power OFF .
 - Use Figure 6-7 to check continuity.
 - See Figure 4-7 for filament resistance.
 - Isolate to one of:
 - a) Wiring or connectors
 - b) CRT filament
 - c) Video card
 - d) Analog card
 - GO TO MAP 0000, ENTRY POINT BB.

033

•Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
Is there any image on the screen?

Y N

034

•Release Intensity Override.
Is the CRT filament lighted?

Y N

035

- Switch power OFF .
- See Figure 6-7 to measure voltages and resistances to isolate the failure.
- Exchange the failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

036

•Turn HEIGHT control fully counterclockwise.
Is problem solved?

Y N

037

(ENTRY POINT EE)

- Switch power OFF and remove the power cord from the mainline power socket.
- Remove the analog card.
- Disconnect the deflection coils (Connector P6, near the center of the analog card with 4 colored wires) - see Figure 4-7.
- Inspect P6 for loose and dirty contacts and broken wires.
- Repair any damage.
- Did you find the problem?

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

038
The horizontal deflection coil is connected to the RED and BLUE wires. The vertical deflection coil is connected to the YELLOW and GREEN (or BLACK) wires. The resistance of each coil should be less than 2 ohms.
•Measure the resistance of the 2 deflection coils.
•Inspect the short wire jumper on the plug and verify its continuity.
Do both coils and the jumper seem good?
Y N

039
•Repair wiring or connector if possible (then exchange the CRT).
GO TO MAP 0000, ENTRY POINT BB.

040
•Assemble any disconnected FRU's.
•Switch power ON [I].
•See Figure 6-9, video card test points.
•Measure the voltage at these points:

VIDEO CARD TEST POINTS	VOLTAGES AND TOLERANCES
400	280 - 450 Vdc
5	5.0 Vdc $\pm 0.5V$

Are both voltages correct?

Y N

041
•Switch power OFF [O].
•See Figure 6-7 to find open or short circuits.
•Exchange/repair video card, analog card, wiring or CRT.
GO TO MAP 0000, ENTRY POINT BB.

042
•See Figure 6-8 to verify the connections to the brightness potentiometer.
Was the problem found?

Y N

043
•Switch power OFF [O].
•Remove the analog card completely.
CAUTION
•Touch the EHT conductor to ground.
•Disconnect the EHT cable from the CRT. You may need to remove the bleed assembly to do this - See MIM section 4.8.4.
•Inspect the EHT cable and bleed assembly.
•Measure the resistance of the EHT cable from end to end (less than 25k ohm) and resistance to ground (either end) (240M ohm).

Is all correct?

Y N

044
•Exchange the bleed assembly.
GO TO MAP 0000, ENTRY POINT BB.

045
•Exchange the analog card.
Has the problem gone?
Y N
046
•Exchange the CRT.
GO TO MAP 0000, ENTRY POINT BB.

047
GO TO MAP 0000, ENTRY POINT BB.

048
GO TO MAP 0000, ENTRY POINT BB.

049
GO TO MAP 0000, ENTRY POINT BB.

050
•See MIM Chapter 5 to make necessary adjustments.
GO TO MAP 0000, ENTRY POINT BB.

051
(Intensity Override still engaged).
•Check the shape of the image. There should be...
a) ...raster(s) of lines so closely spaced that they nearly merge. (Look carefully at left and right hand edges).
b) ...the image filling most of the screen.
c) ...a blank edge at one side, at least.
Is the SHAPE correct?

Y N

052
•Release Intensity Override.
•Check adjustments of HEIGHT, WIDTH, H.CENT, FOCUS1 and FOC2 controls.
•See MIM section 5.3.4 and MIM section 5.3.5 and Figure 1-4.
Is the problem corrected?

Y N

053
GO TO MAP 0200, ENTRY POINT CC.

054
GO TO MAP 0000, ENTRY POINT BB.

055
GO TO MAP 0300, ENTRY POINT A.

056

(ENTRY POINT CC)

- Release Intensity Override.
 - Turn brightness control clockwise until the image is bright.
 - Set the TEST/NORMAL switch to NORMAL.
- Is there a single, stable separator line near the bottom of the screen?

Y N

057

- Connect the logic probe to the analog card socket P4-3. (Vert Sync TP) See Figure 1-2.
 - (Ground probe to potentiometer mounting plate.)
- Do both lamps light?

Y N

058

- Probe pin C2G12.
- Do both lamps light?

Y N

059

- Exchange logic card C2 then B2 then D2.
- GO TO MAP 0000, ENTRY POINT BB.

060

- Reset logic gate connector A3 and continue probing for Vert Sync signal until broken connector is found. (See Figure 3-3)
- GO TO MAP 0000, ENTRY POINT BB.

061

GO TO STEP 063,
ENTRY POINT BB.

062

Is there a single stable cursor?

Y N

063

(ENTRY POINT BB)

- Connect the logic probe to the analog card socket P4-2. (Horiz Sync TP) See Figure 1-2.
 - (Ground probe to potentiometer mounting plate.)
- Do both probe lamps light?

Y N

064

- Probe pin B2J13.
- Do both probe lamps light?

Y N

065

GO TO MAP 0500, ENTRY POINT BB.

066

- Reset logic gate connector A3, and continue probing for Horiz Sync signal until broken connection is found & repair it. See Figure 3-3.
- GO TO MAP 0000, ENTRY POINT BB.

067

- Switch power OFF .
 - Exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

068

(ENTRY POINT DD)

- Engage Intensity Override. (Turn the brightness knob fully counterclockwise.)
- Are the skip gaps visible?
(See Figure 2-1).

Y N

069

- Adjust the 'SKIP' potentiometer on the analog card. See Figure 1-4.
- Has it any effect?

Y N

070

- See Figure 3-3.
 - Use a LOGIC PROBE to trace the SKIP signal from the B2 logic card to the analog card.
 - Also use a meter to check continuity.
- At each of the following points BOTH probe lamps should be ON.

LOGIC board B2J11.
LOGIC board A3D11.
Analog card P4-26.
Analog card P4-27.
(Test Point)

- Isolate the problem to a connection failure or to the loss of a signal.
 - Reset the A3 logic gate connector. If no failure can be found, exchange the analog card.
 - If the signal source has been lost, exchange logic card C2 then B2.
- GO TO MAP 0000, ENTRY POINT BB.

071

- Set up the correct amount of SKIP. See MIM section 5.3.5.
 - If not possible, switch power OFF and exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

072

- Adjust the 'SKIP' potentiometer on the analog card. See MIM section 5.3.5 and Figure 1-4.

Can you correct the problem?

Y N

073

- Switch power OFF and exchange the analog card.
- GO TO MAP 0000, ENTRY POINT BB.

074

GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0400	BB	2	010
1000	A	1	001

EXIT POINTS .

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	002	0000	BB

001
(ENTRY POINT A)
 •Check the operation of the base color switch as follows. Probe B2J06.
 When switch is set to 0000 this pin should be DOWN.
 When switch is set to 00 this pin should be UP.
Is all correct?

Y N
002
 •See Figure 6-8 to check switch wiring and repair.
 GO TO MAP 0000, ENTRY POINT BB.

003
 •Check operation of the 2 color control signals as follows :
 •Set NORMAL/TEST switch to TEST.
 B2S08 should be UP.
 B2U06 should be UP.
Are they correct?

Y N
004
 •Exchange logic card B2 then C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

005
 •Set NORMAL/TEST switch to NORMAL.
 B2S08 should be DOWN.
 B2U06 should be DOWN.
Are they correct?

Y N
006
 •Exchange logic card B2 then C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

007
 •Run ONLINE TEST 7; see page 1..
 B2S08 should be DOWN.
 B2U06 should be UP.

Are they correct?
 Y N
008
 •Exchange logic card B2 then C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

009
 •Exchange logic card C2 then D2 then C2.
 GO TO MAP 0000, ENTRY POINT BB.

TO RUN ONLINE TESTS 0 - 8.
 =====
 For more detail see MIM section 2.6.1

•Set the TEST/NORMAL switch to TEST and back to NORMAL.
 •Hold down the ALT key, press TEST, and release both.
 The word TEST appears in the OIA.
 •Key in /n and press ENTER where n is the test number.
 One of patterns shown in the MIM section 2.6 should display.
 TO LEAVE THE TEST,
 •Hold down ALT and press TEST.

LOGIC MAP

PAGE 2 OF 2

A B

MAP 0500-2

010

(ENTRY POINT BB)

•See Figure 1-2 and Figure 3-3 and use a logic probe to trace the VERTICAL SYNC. signal.

LOGIC board C2G12 (source)
 LOGIC board A3D12
 ANALOG card PIN 28
 ANALOG card P4-3 (test point)

At all of the above points BOTH probe lamps should light.

Do they?

Y N

011

Is the signal at C2G12?

Y N

012

•Exchange logic card C2.
 GO TO MAP 0000, ENTRY POINT BB.

013

•Switch power OFF .
 •Check continuity and repair.
 GO TO MAP 0000, ENTRY POINT BB.

014

•See Figure 1-2 and Figure 3-3 and use a logic probe to trace the HORIZONTAL SYNC signal.

LOGIC board D2J13 (source)
 LOGIC board B2J13 (retimed)
 LOGIC board A3D13
 ANALOG card P4-1
 ANALOG card P4-2 (test point)

At all of the above points BOTH probe lamps should light.

Do they?

Y N

015

(ENTRY POINT CC)

•Probe D2J13 on the logic board.
 BOTH probe lamps should light.
 Do they?

Y N

016

•Use a logic probe on :
 C2D10 (DOT 8)
 C2B08 (DOT 5)
 C2D05 (DOT 1)
 C2B04 (DOT 0)
 Do BOTH lamps light each time?

Y N

017

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

018

•Exchange logic card D2 then B2.
 GO TO MAP 0000, ENTRY POINT BB.

019

•Use a logic probe on :

C2D10 (DOT 8)
 C2B08 (DOT 5)
 C2D05 (DOT 1)
 C2B04 (DOT 0)

Do BOTH lamps light each time?

Y N

020

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

021

•Use a logic probe on B2M08 (FEATURE CLOCK).

Do BOTH lamps light?

Y N

022

•Exchange logic card C2 then D2.
 GO TO MAP 0000, ENTRY POINT BB.

023

•Exchange logic card B2, (then C2, then inspect B2G13 connection).
 GO TO MAP 0000, ENTRY POINT BB.

024

•Switch power OFF .
 •Reset the analog card.
 •Switch power ON and test.
 Has the problem gone?

Y N

025

•Switch power OFF .
 •Exchange the analog card.
 •Make any necessary adjustments.
 GO TO MAP 0000, ENTRY POINT BB.

026

GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0800	A	1	001
0800	EE	1	009

001

TO RUN ONLINE TESTS 0 - 8.
 =====
 For more detail see MIM section 2.6.1

- Set the TEST/NORMAL switch to TEST and back to NORMAL.
- Hold down the ALT key, press TEST, and release both.

The word TEST appears in the OIA.
 •Key in /n and press ENTER
 where n is the test number.
 One of patterns shown in the MIM section 2.6 should display.
 TO LEAVE THE TEST:
 •Hold down ALT and press TEST.

If the BATTERY or some circuits on the convergence logic card B2 are failing, an error code 55 or 228 will appear on the screen when the 3279 is switched on. (The 3279 may have to be switched off for some hours before an error is generated.) The error code will be resettable (RESET key) and the operator could converge the screen using ONLINE TEST 7.

The battery is marked with its date (mmyy - month and year) and would be suspect if more than 3 years old.
 Some other failures will cause error codes 55, 56, 228, or 229 to appear but will NOT be resettable.

(ENTRY POINT A)

•Connect the 3279 to a control unit or IDPA and ready it.
 Do any of these error codes appear at any time: 55,56, 228, or 229 ?

Y N

002

•Enter the convergence routine (see MIM section 5.3.3) and attempt to converge EACH of the 13 positions.

Could you do so?

Y N

003

Did the convergence pattern appear in the correct colors?

Y N

004

•Exchange logic card B2 (then D2).
 GO TO MAP 0000, ENTRY POINT BB.

005

The convergence patterns should have moved smoothly when you pressed the cursor keys in step 002.

Was there ANY movement?

Y N

006

GO TO STEP 009,
 ENTRY POINT EE.

007

Was the movement always smooth?

Y N

008

•Exchange logic card B2 (then D2).
 GO TO MAP 0000, ENTRY POINT BB.

009

(ENTRY POINT EE)

•Meter the amplifier card test points as shown in the table below and verify that the correct voltages are present.
 •See Figure 6-10 for locations, and Figure 6-16 for circuit.

AMPLIFIER CARD TEST POINT	VOLTAGES AND TOLERANCES
M	+12 Vdc ±1.5 V
N	-12 Vdc ±1.5 V
K (fused)	+12 Vdc ±1.5 V

Use B2D08 as your meter ref.

Are the correct voltages present?

Y N

010

Is the voltage only wrong at test point 'K'?

Y N

011

•Probe the power supply card edge connector (P3) pins as shown in the table below.

Power Supply Card	
P3 Connector	VOLTAGES AND TOLERANCES
1	+12 Vdc ±1.5V
3	-12 Vdc ±1.5V

Use P3-2 as meter ref.

Are the correct voltages present?

Y N

012

If only the -12 V supply was lost the fuse on the amplifier card may have failed.

- Switch power OFF .
- Exchange the fuse if necessary.
- Switch power ON .
- If the fuse fails again (or if it was good), switch power OFF and remove the power cord from the mainline power socket and exchange the power supply.

GO TO MAP 0000, ENTRY POINT BB.

013

There seems to be a broken connection in the 12 volt supplies or return to the amplifier card.

- See Figure 6-16 to trace wiring and isolate the failure.

NOTE: If only the -12 V supply was lost, the fuse on the amplifier card should have failed.

- Exchange it if necessary after repairing the connection failure.

GO TO MAP 0000, ENTRY POINT BB.

014

- Switch power OFF .
- Exchange the fuse on the amplifier card and test. If the fuse fails again, exchange the amplifier card.
- See MIM Chapter 5 to make adjustments.

GO TO MAP 0000, ENTRY POINT BB.

015

- Meter 12 V LOPT supply:
 - + Meter lead — A5D02
 - Meter lead — A5B02

Is the voltage between 10 and 14 volts?

Y N

016

- Switch power OFF .
- Use Figure 6-16 to check the 12 V LOPT back to the analog card.
 - Isolate to one of:
 - a) Cables or connectors
 - b) Amplifier card
 - c) Analog card

GO TO MAP 0000, ENTRY POINT BB.

017

Set the TEST/NORMAL switch to NORMAL.

- Set the A₁/A switch to A.
 - Hold down the ALT key, press the TEST key, release both. (This is to ensure the screen is clear).
 - Jumper C2G06 to C2D08. Most locations on the screen will contain an 'A' character.
 - Jumper C2W07 to C2W28. The Characters should become white. If the convergence is bad they will be many-colored.
- Is the convergence good (or nearly good) near the center of the screen but gets worse toward the edges and corners?

Y N

Y N

018

- Verify that the convergence coil assembly is correctly located on the CRT. See Figure 4-8.
 - Attempt to improve the convergence at the center of the screen by adjusting the three static convergence thumbwheels and the blue lateral (STATIC BLAT) potentiometer. See Figure 1-4 and MIM section 5.3.1.
- Is the convergence now nearly good at the center of the screen, getting worse toward the edges?

Y N

019

(ENTRY POINT BB)

- Remove the jumpers.
- Use a logic probe to probe B2G08. (Vertical Retrace).

Do BOTH probe lamps light?

Y N

020

- Exchange logic card D2.

GO TO MAP 0000, ENTRY POINT BB.

021

- Switch power OFF .
- Exchange logic card B2, (then the amplifier card, then logic card D2).

GO TO MAP 0000, ENTRY POINT BB.

022

GO TO STEP 023,
ENTRY POINT FF.

023

(ENTRY POINT FF)

- Remove the jumpers.
- Use a logic probe to probe B2G08 (Vertical Retrace).

Do BOTH probe lamps light?

Y N

024

- Exchange logic card D2.

GO TO MAP 0000, ENTRY POINT BB.

025

- Run ONLINE TEST 7; see page 1. (convergence routine).
- Press the SPACE BAR ten (10) times.
 - NOTE: The next few steps check the convergence circuits.
- Press the UP cursor key and hold for about 10 seconds.
- Now press and hold the DOWN cursor key.
- Check that the GREEN pattern moves diagonally down (↘) 3-10 mm (0.1-0.4 inches).

Did the GREEN pattern move as expected?

Y N

026

Did the GREEN pattern show ANY movement?

Y N

Y N

027
GO TO STEP 035,
ENTRY POINT DD.

028
GO TO PAGE 5, STEP 050,
ENTRY POINT CC.

029
•Press and hold the UP cursor key.
•Check that the RED pattern moves diagonally down (↘) a similar amount to the green (3-10mm, 0.1-0.4 inches).
Did the RED pattern move as expected?

Y N
030
Did the RED pattern show ANY movement?
Y N

031
GO TO STEP 035,
ENTRY POINT DD.

032
GO TO PAGE 5, STEP 050,
ENTRY POINT CC.

033
(A) •Press the R key.
•Press the DOWN cursor key and hold for about 10 seconds.
•Now press and hold the UP cursor key. The blue pattern should move VERTICALLY up 4-10 mm (0.1 - 0.4 inches).
(B) •Press the LEFT cursor key and hold for about 10 seconds.
•Now press and hold the RIGHT cursor key. The RED pattern should move HORIZONTALLY (left) 2-8 mm (0.08 - 0.3 inches).
Were the expected movements seen?

Y N
034
Was SOME movement seen in BOTH (A) and (B) in the last step?
Y N

4 6
N P Q

035
(ENTRY POINT DD)
•Switch power OFF \square .
•Disconnect the P19 connector from the amplifier card. (See Figure 1-4).
•Inspect the convergence/purity coils for loose components.
•Check the continuity of the convergence coils from the plug on the end of the cable (P19):

COIL	P19 pins.	Resistance.
RED	11 12	<1 ohm
GREEN	9 10	<1 ohm
BLUE	7 8	<1 ohm
BLUE LAT	5 6	1-5ohm

Are all correct?
Y N

036
•Exchange the convergence coil assembly.
•See MIM Chapter 5 for adjustments to be made.
GO TO MAP 0000, ENTRY POINT BB.

037
•Reconnect the P19 connector.
•Switch power ON \square .

The following procedure will test all 4 convergence amplifiers. A fixed voltage (-5 V) will be connected to the INPUT of each amplifier in turn. Each time it will be checked that the colors move in the expected directions. If you know which amplifier is failing, you need test only that one.

•Set the NORMAL/TEST switch to TEST.

— GREEN —
•Jumper B2M06 (-5 V) to B2S06 for about 3 seconds.

The image should move in the direction shown in the figure below and hold there while the jumper is on. The movement should be 15-30 mm (0.6-1.2 inches).

— RED —
•Press keys CONTROL C CONTROL O I
•Jumper B2M06 (-5 V) to B2S05 for about 3 seconds.

The image should move in the direction shown in the figure below and hold there while the jumper is on. The movement should be 15-30 mm (0.6-1.2 inches).

— BLUE —
•Press keys CONTROL C CONTROL O Q
•Jumper B2M06 (-5 V) to B2U07 for about 3 seconds.

The image should move in the direction shown in the figure below and hold there (Step 037 continues)

CONVERGENCE MAP

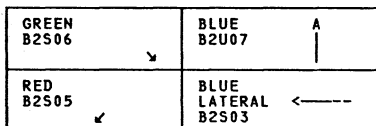
PAGE 4 OF 5

(Step 037 continued)
while the jumper is on.
The movement should be 15-30 mm (0.6-1.2 inches).

— BLUE LATERAL —

•Jumper B2M06 (-5 V) to B2S03 for about 3 seconds.

The image should move in the direction shown in the figure below and hold there while the jumper is on.
The movement should be 2-8 mm (0.2-0.6 inches).



Did your results match the expected results?

Y N

038

•See Figure 1-4. The amplifier card may have the 4 potentiometers marked 'GAIN'.

•If not take the N path now.

These are the gain controls for the convergence amplifiers.

•First write down their settings.

The red, green and blue controls are normally set 3/4 away from the counterclockwise position, and the blue lateral set fully clockwise (Maximum gain).

•If any are set less than normal, set them to normal and repeat step 037.

•If the results are still not as expected set all 4 gain controls to maximum (fully clockwise), and repeat step 037.

Do your results now match the expected results?

Y N

039

•Switch power OFF .

•Reset all 4 GAIN controls to the positions you wrote down.

•Reseat the A5 connector on the logic gate and the P18 connector (Figure 1-4) on the amplifier card.

•Switch power ON .

Is the problem fixed?

Y N

N P R S T U
3 3

MAP 0600-4

040

- Switch power OFF .
- Check the continuity of the connections in the table below. (See Figure 6-10)

LOGIC GATE PIN.	AMPLIFIER CARD TEST POINT
B2S05	F (red)
B2S06	G (green)
B2U07	H (blue)
B2S03	E (blue lat)

Is the continuity of each good?

Y N

041

- Locate and repair bad connection. See Figure 3-3
GO TO MAP 0000, ENTRY POINT BB.

042

- Exchange the amplifier card.
GO TO MAP 0000, ENTRY POINT BB.

043

- GO TO MAP 0000, ENTRY POINT BB.

044

- GO TO MAP 0000, ENTRY POINT BB.

045

- Exchange logic card B2 (then C2 then D2).
GO TO MAP 0000, ENTRY POINT BB.

046

- GO TO PAGE 5, STEP 050,
ENTRY POINT CC.

047

- Go to the adjust instructions, MIM Chapter 5 to set up static convergence and purity.
- Start at MIM section 5.3.1 to set up static convergence, then go to MIM section 5.3.2 to set up purity.
- If you make any purity adjustment, go back to MIM section 5.3.1 to check the static convergence.
- Verify that the raster is correctly centered etc. and then go to MIM section 5.3.3 to set up the dynamic convergence. Could you set up the purity and static convergence?

Y N

R S T U

5 5
V W

200CT81

MAP 0600-4

048

- Switch power OFF .
 - Verify the connections to the convergence/purity coil assembly from P19 on the amplifier card. (See Figure 3-3 and Figure 1-4.)
 - If no failure is found, exchange the amplifier card, then the convergence coil assembly
- GO TO MAP 0000, ENTRY POINT BB.

049

Could you set up dynamic convergence?
Y N

050

(ENTRY POINT CC)

- Switch power OFF .
 - Check position of the convergence coil assembly. See Figure 4-8.
 - Exchange the amplifier card if no problem is found.
 - See MIM Chapter 5 to carry out adjustments.
 - If the problem remains, exchange the B2 logic card (then D2 then C2).
- GO TO MAP 0000, ENTRY POINT BB.

051

GO TO MAP 0000, ENTRY POINT BB.

052

•Leave the convergence routine by holding down the ALT key and pressing TEST. Did an Error Code 228 or 229 (3274) or 55 or 56 (3276) appear?

Y N

053

•Set the TEST/NORMAL switch to TEST and back to NORMAL.
Is the convergence worse than you left it?

Y N

054

It may be an intermittent problem.
•See if the convergence coil assembly is loose.
•Look for loose cables and connectors and reset the convergence amplifier card and logic card B2.

GO TO MAP 0000, ENTRY POINT BB.

055

•Exchange logic card B2 (then D2 then C2)
GO TO MAP 0000, ENTRY POINT BB.

056

•Exchange logic card B2 (then D2 then C2.)
GO TO MAP 0000, ENTRY POINT BB.

057

Is the error code resettable?

Y N

058

•Exchange logic card B2 (then D2 then C2).
GO TO MAP 0000, ENTRY POINT BB.

059

- Switch power OFF .
- Check the connections to the battery.
- Disconnect the A3 logic gate connector.
- Probe the free end of the A3 connector to measure the battery voltage:
 - + meter lead to pin D07
 - meter lead to pin B07.

A new battery will measure 4.1 V.

Is it less than 3.5 V?

Y N

060

- Reconnect the A3 connector.
 - Measure the voltage on B2B08. This voltage should be 0.5 V to 1.0 V less than the battery voltage.
- Is it correct?

Y N

061

•Measure the voltage on B2J09. This should be the same as the battery voltage.

Is it correct?

Y N

062

There is a connection failure.

- Check:
 - B2J09..A3D07..P20-4..Battery/red
 - B2J08..A3B07..P20-1..Battery/black
 - Exchange the failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

063

•Exchange logic card B2.
GO TO MAP 0000, ENTRY POINT BB.

064

The battery seems good.
•Exchange logic card B2.
•Set up Dynamic convergence; See MIM section 5.3.3.

GO TO MAP 0000, ENTRY POINT BB.

065

- Check for correct voltage at the following points:-
 - B2J09..A3D07..P20-4..Battery/red
 - B2J08..A3B07..P20-1..Battery/black
 - If the problem is still present get the customer to exchange the battery.
 - If the problem remains when the customer installs a new battery, exchange logic card B2.
- GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0100	A	1	001
0100	BB	1	002
0100	CC	1	006
0100	EE	2	019
0800	A	1	001
0900	A	1	001
1000	EE	2	019

001 (ENTRY POINT A)
 •Switch power OFF .
 •Reconnect the keyboard if it is disconnected.
 Keys binding, broken or worn are mechanical failures.
 Is this a mechanical failure or clicker problem?
 Y N

002 (ENTRY POINT BB)
 •Switch power OFF .
 •Remove the keyboard top cover. See MIM section 4.11.2.
 •Disconnect and reseal the internal keyboard connector. (See Figure 6-11.) the keyboard cable connector and the keyboard cable connector on the logic gate. (D5).
 •Switch power ON .
 •See Figure 6-11 and Figure 6-12 and Table 7.1 (column 2) and check the voltages at the internal keyboard cable connector.

Voltage. Tolerance.	Internal Keyboard Connector	Logic Gate.
0V meter ref	D08	D5D08
+5 Vdc ±0.5V	D03	D5D03
+8.5Vdc ±0.9V	B11	D5B11
-5 Vdc ±0.5V	B06	D5B06

Are all voltages correct?
 Y N

003
 •Disconnect the keyboard cable connector from the logic gate (D5).
 •See Figure 6-11 and Figure 6-12.
 •Check the voltages shown in Table 7.1 (column 3) on the logic gate.
 Are all the voltages correct?
 Y N

004
 There is probably a failure in the logic board strips.
 •See Figure 3-2 and Figure 6-4.
 GO TO MAP 0000, ENTRY POINT BB.

005
 •See MIM Figure 6-11 and Figure 6-12 and Table 7.1 to check connections and isolate to a failing cable or connector.
 GO TO MAP 0000, ENTRY POINT BB.

006 (ENTRY POINT CC)
 •See Figure 6-11 and verify that the keyboard jumpers are plugged correctly for this type of keyboard.
 Were they correct?
 Y N

007
 •Set up keyboard jumpers correctly.
 GO TO MAP 0000, ENTRY POINT BB.

008
 •(Check keyboard ID bits.)
 •Probe the keyboard connector in the back of the logic gate (D5). See Table 7.2 (column 2).
 •Record if each signal is UP or DOWN. Bits which are jumpered should be DOWN and bits which are not jumpered should be UP.

ID bit	Logic Gate	Keyboard internal connector
0	D5B05	D04
1	D5B07	D05
2	D5B10	D09
3	D5D12	D10

Are the ID bits correct?
 Y N

009
 •Probe the internal keyboard connector. See Table 7.2 (column 3) and record the results. Bits which are jumpered should be DOWN. Bits which are not jumpered should be UP.
 Are the ID bits correct?
 Y N

010
 •Switch power OFF .
 •Exchange the keyboard logic card.
 GO TO MAP 0000, ENTRY POINT BB.

011
•Switch power OFF .
•See Figure 6-11 and Figure 6-12 and Table 7.2 to check connections and isolate to a failing cable or connector.
GO TO MAP 0000, ENTRY POINT BB.

012
•Probe internal keyboard connector pin D07 (POR).
The UP lamp on the probe should be on. The DOWN lamp should flash when the TEST/NORMAL switch is operated.
Is all correct?
Y N

013
•Probe D5B09 (POR).
•Repeat the last test.
Is all correct?
Y N

014
•Switch power OFF .
•See Figure 6-12 and trace the connections from keyboard pin D07 to D5B09.
•Isolate to a failing cable or connector.
GO TO MAP 0000, ENTRY POINT BB.

015
•Exchange logic card D2.
GO TO MAP 0000, ENTRY POINT BB.

016
•Probe D5D10 (DATA AVAILABLE).
•Press each keyboard key. The signal should pulse DOWN once as each key is pressed. Ignore any characters displayed on the screen.
Did any key fail this test?
Y N

017
•Probe internal keyboard connector pin D02 (KEYBOARD ACKNOWLEDGE).
•Press ANY keyboard key. The signal should pulse DOWN as the key is pressed. Ignore any characters displayed on the screen.
Was a down pulse seen?
Y N

018
•Switch power OFF .
•See Figure 6-11 and Figure 6-12 and check continuity from internal keyboard connector pin D02 to logic gate D5D05.
•Repair or exchange as necessary.
•If the continuity is good, exchange logic card C2.
GO TO MAP 0000, ENTRY POINT BB.

019
(ENTRY POINT EE)
•Probe D5D07 (MAKE /BREAK).
•Press the following keys - ALT, SHIFT (right and left) and SHIFT LOCK. (These keys are identified with the following legends in Figure 2-3 (TEST MODE 2): mm nn oo pp).
The signal should pulse UP as each of these keys is RELEASED.
Did these keys pass this test?
Y N

020
•Probe on the internal keyboard connector pin B12 (MAKE/BREAK).
•Press the following keys - ALT, SHIFT (right and left) and SHIFT LOCK. (These keys are identified with the following legends in Figure 2-3 (TEST MODE 2): mm nn oo pp).
The signal should pulse UP as each of these keys is RELEASED.
Did the keys pass this test?
Y N

021
•Exchange the keyboard logic card.
GO TO MAP 0000, ENTRY POINT BB.

022
•See Figure 6-12 and trace the connections from internal keyboard connector pin B12 to D5D07.
•Isolate to a failing cable or connector.
GO TO MAP 0000, ENTRY POINT BB.

023
•Probe the logic gate pins shown in Table 7.3 Column 3.
•Press the Q key (see Figure 2-3) each time. Each pin should pulse UP as the Q key is pressed.

Keyboard Scan bit	Logic Gate	
	Connector	Logic Gate
0	B05	D5B08
1	D06	D5D09
2	D13	D5B04

Did each pin pulse up?
Y N

024
•Probe the internal keyboard connector pins shown in Table 7.3 Column 2.
•Press the Q key each time. The signal should pulse UP each time the Q key is pressed.
Did each pin pulse up?
Y N

025

- Switch power OFF .
- Exchange the keyboard logic card, then the keyboard cable (there may be a short circuit between two lines in the cable or to ground). GO TO MAP 0000, ENTRY POINT BB.

026

- See Figure 6-12 and Table 7.3 to trace connections and isolate to a failing cable or connector. GO TO MAP 0000, ENTRY POINT BB.

027

- See Figure 6-11 and Figure 6-12 and probe the logic gate pins shown in Table 7.4 Column 3.
- Press the P key (see Figure 2-3) each time. The signal should pulse UP each time the key is pressed.

Keyboard Scan bit	Connector	Logic Gate
3	B08	D5D11
4	B09	D5B12
5	B10	D5D13
6	B13	D5B13

Did each pin pulse up?

Y N

028

- Probe the internal keyboard connector pins shown in Table 7.4 Column 2.
- Press the P key each time. Each pin should pulse UP as the P key is pressed.

Did each pin pulse up?

Y N

029

- Switch power OFF .
- Exchange the keyboard logic card, then the keyboard cable (there may be a short circuit between two lines in the cable or to ground). GO TO MAP 0000, ENTRY POINT BB.

030

- See Figure 6-12 and Table 7.4 to trace the connections and isolate to a failing cable or connector. GO TO MAP 0000, ENTRY POINT BB.

031

- Switch power OFF .
- Exchange logic card D2 then the keyboard logic card. GO TO MAP 0000, ENTRY POINT BB.

032

Did only one key fail the last test?

Y N

033

- Switch power OFF .
- See Figure 6-12 and verify the continuity of, DATA AVAILABLE (D5D10 to keyboard internal connector B07) KEYBOARD ACKNOWLEDGE (D5D05 to keyboard internal connector D02)
- Repair any problem found. Was any problem found?

Y N

034

- Exchange the keyboard logic card, then logic card D2, then the keyboard base card. GO TO MAP 0000, ENTRY POINT BB.

035

GO TO MAP 0000, ENTRY POINT BB.

036

- Switch power OFF .
- Exchange the key module for the failing key. GO TO MAP 0000, ENTRY POINT BB.

037

Clicker may be permanently enabled or disabled or not sounding correctly. Is this a clicker failure?

Y N

038

(ENTRY POINT DD)

- See MIM section 4.11 and check keyboard logic card and base card for failures. Are there any visible failures?

Y N

039

- Clean base card with isopropyl alcohol and assemble.

040

- Exchange any failing module and assemble. GO TO MAP 0000, ENTRY POINT BB.

041

•See MIM section 4.11.4 and Figure 6-11 and check that the assembly is tight. Is the clicker assembly tight?

Y N

042

- Tighten the assembly and exchange the fastening spring if necessary. GO TO MAP 0000, ENTRY POINT BB.

043
•Switch power ON .
•Set the TEST/NORMAL switch to NORMAL.
•Ensure that the 3279 is online.
•Probe D5D06. This pin should go alternately UP and DOWN as the clicker () key on the keyboard is repeatedly pressed.

When the signal is UP the clicker should be enabled and when DOWN it should be disabled.

Does this occur?

Y N

044
Attempt to enter ONLINE TEST MODE as follows:

•alltest.
Is 'TEST' displayed in the indicator row?

Y N

045
The clicker is probably OK.
GO TO PAGE 1, STEP 002,
ENTRY POINT BB.

046
•Exchange logic card D2.
GO TO MAP 0000, ENTRY POINT BB.

047
•Probe internal keyboard connector pin B03. The signal should go alternately UP and DOWN as the clicker () key on the keyboard is repeatedly pressed.

Does this occur?

Y N

048
•Switch power OFF .
•See Figure 6-12 and check the connection D5D06 to internal keyboard connector pin B03.
•Isolate to a failing cable or connector and repair.
GO TO MAP 0000, ENTRY POINT BB.

049
•Meter the +8.5 V at pin B11 on the internal keyboard connector.

Is the voltage correct?

Y N

050
•See Figure 6-12 and Table 7.1 to check connections and isolate to a failing cable or connector.
GO TO MAP 0000, ENTRY POINT BB.

051
•Leave the clicker enabled (signal in UP condition).
•Probe the clicker pin farthest from the keyboard connector on the keyboard logic card and press any alphanumeric key.

Does the DOWN lamp flash on for each key pressed?

Y N

052
•Switch power OFF .
•Exchange the keyboard logic card.
GO TO MAP 0000, ENTRY POINT BB.

053
•Switch power OFF .
•Exchange the clicker assembly.
GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	A	1	001
0100	CC	1	002
0100	DD	4	031
0100	EE	7	077
0100	FF	3	015
0300	DD	4	031
0900	A	1	001
0900	GG	3	025

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	003	0000	BB
5	050	0600	EE

**001
(ENTRY POINT A)**

If you know which feature is causing the problem go to the entry point shown in the table below:

FEATURE or FUNCTION	ENTRY POINT
AUDIBLE ALARM	FF -page 3
SECURITY KEYLOCK	GG -page 3
MRC, MSR or MHS	EE -page 7
SELECTOR PEN	DD -page 4
ECS or PS	CC -page 1
KEYBOARD	MAP 0700 A
CONVERGENCE	MAP 0600 A
VIDEO OUTPUT RPQ	MAP 1000 A

CAUTION

Switch power OFF before exchanging logic cards.

The PS modules are easily damaged by static electricity.

- Do NOT touch the pins.
- Do NOT put the module down except in the packing supplied or on to a conducting pad.

If there is a machine check (X nnn) error code displayed on the screen or in the error log for this display go to the entry point in the table below:
(See MIM section 2.6.3 on how to read the error log)

ERROR CODE	ENTRY POINT
44, 61 or 222	DD -page 4
43, 45, 60 or 224	EE -page 7
41, 42, 210 or 212	MAP 0700 A
223, 225,	CC -page 1
226, 227 or 234	CC -page 1
55, 56, 228 or 229	MAP 0600 A
Any other error code	MAP 0900 A

TO RUN ONLINE TESTS 0 - 8.
=====

For more detail see MIM section 2.6.1

- Set the TEST/NORMAL switch to TEST and back to NORMAL.
- Hold down the ALT key, press TEST, and release both.

The word TEST appears in the OIA.

- Key in /n and press ENTER where n is the test number.

One of patterns shown in the MIM section 2.6 should display. TO LEAVE THE TEST,

- Hold down ALT and press TEST.

- Reinstall cards E2 and F2 (ECS & PS) if removed.
 - If the ECS feature is NOT installed take the Y path now.
 - Repeat the failing test, if known, (or use ONLINE TEST 8.)
- Is the test good?

Y N
002
(ENTRY POINT CC)

Are both ECS and PS features (E2 and F2 cards) installed on this machine?

Y N
|
|
|

003

- Exchange ECS logic card E2 (then D2 then C2).
- GO TO MAP 0000, ENTRY POINT BB.

004

- Remove the ECS and PS cards (E2 and F2) if not removed earlier.
 - Write down the settings of the switches on the ECS logic card and verify using Figure 6-14.
 - Now set the switches on the ECS logic card for 'NO PS INSTALLED' (see Figure 6-14).
 - Reinstall the ECS card (E2) and its top card connectors.
 - Run ONLINE TEST 8 (see this MAP page 1.) Each PS symbol should display as a green '1'.
- See MIM Figure 2-7 for correct display. Is the test pattern OK?.

Y N

005

- Exchange logic card E2 (ECS) then D2 then C2.
- GO TO MAP 0000, ENTRY POINT BB.

006

- Set the switches on the ECS card (E2) to their original settings. (See step 004 above)
 - Check these settings and the PS card jumper with MIM Figure 6-14.
 - Check that the Control Unit has the correct features and microcode.
 - Reinstall the F2 logic card (PS) and its top card connectors.
 - Repeat ONLINE TEST 8.
- Is the problem present?

Y N

007

GO TO MAP 0000, ENTRY POINT BB.

008

Are both PS2 and PS4 features installed on this machine? (There will be five pluggable modules on the F2 card if both features present).

Y N

009

- Exchange logic card F2 (PS) then E2 then D2.
- GO TO MAP 0000, ENTRY POINT BB.

010

- It could be a PS card or a PS pluggable module failure.
- If the failing font is known, use Figure 6-14 to isolate the failing module.
 - Otherwise order a new F2 logic card for the PS2 feature, and five new pluggable modules as well.
 - Fit the new modules to the new card.
 - Remove the jumper on the card if it is present.
 - Temporarily install the new F2 card and its top card connectors.
- Has the problem gone?

Y N

011

- Exchange logic card E2 then D2 then C2.
- GO TO MAP 0000, ENTRY POINT BB.

012

- Verify the old PS card as follows.
 - Remove the pluggable modules from the old PS card.
 - Remove the new PS card from the machine and move the five new modules to the old card.
 - Now install the old PS card.
 - Repeat the preceding test.
- Is the problem present?

Y N

013

- One or more of the old PS modules was failing.
- Remove the new modules from the old card (now in the machine), and replace with the old modules one at a time, to locate the failure. Test after each change.
 - Run TEST 8 to verify correct operation. See MIM section 2.6.7 and Figure 2-7.
- GO TO MAP 0000, ENTRY POINT BB.

014

- The PS logic is failing (not one of the pluggable modules).
- Remove the PS card from the machine (that is, the failing card with the good modules installed).
 - Plug the old modules to the new PS card and install.
 - Run TEST 8 to verify correct operation. See MIM section 2.6.7 and Figure 2-7.
 - Return any unused good parts to stock.
- GO TO MAP 0000, ENTRY POINT BB.

015
(ENTRY POINT FF)

Test the operation of the audible alarm as follows:

- Turn the alarm volume control fully clockwise.
 - Run ONLINE TEST 0; see page 1. The alarm should sound once when the test pattern shows.
- If the alarm does NOT sound:
- Switch power OFF .
 - Reseat the A3 logic gate connector.
 - Run ONLINE TEST 0 again; see page 1.

Does the alarm sound?

Y N

- 016
- Probe D2J05.
- Is the UP lamp on?

Y N

- 017
- Disconnect P8 from audible alarm, see Figure 1-2. (Should be accessible from front of box).
 - Probe D2J05.
- Is the UP lamp on?

Y N

- 018
- Switch power OFF .
 - Meter the wiring for a short circuit to ground.
 - If less than 100 ohms, repair the wiring.
 - If not, exchange logic card D2.
- GO TO MAP 0000, ENTRY POINT BB.

- 019
- Switch power OFF .
 - Exchange the alarm FRU.
- GO TO MAP 0000, ENTRY POINT BB.

- 020
- Run ONLINE TEST 0 again; see page 1.
- Does the DOWN lamp pulse on?

Y N

- 021
- Disconnect P8 (Figure 1-2).
 - Run ONLINE TEST 0 again; see page 1.
- Does the DOWN lamp pulse on?

Y N

- 022
- Exchange logic card D2.
- GO TO MAP 0000, ENTRY POINT BB.

- 023
- Switch power OFF .
 - Exchange the alarm FRU.
- GO TO MAP 0000, ENTRY POINT BB.

- 024
- Switch power OFF and remove the power cord from the mainline power socket.
 - Verify continuity of the connections in the table below.

ALARM CONNECTOR	Through	LOGIC GATE
P8-1	A3D02	A2D03 (5 Vdc)
P8-3	A3D08	A2D08 (0 Vdc)
P8-4	A3D05	D2J05 (ALARM)

- Also check continuity from the alarm potentiometer to pins A1 and A3 on the alarm card (Figure 6-8).
 - Verify the potentiometer.
 - Repair or exchange any failing FRU.
 - If no failure found, exchange the Alarm FRU.
- GO TO MAP 0000, ENTRY POINT BB.

- 025
- The audible alarm is operating correctly.

(ENTRY POINT GG)

If the Security Keylock is NOT installed, take the Y path now.

Test the operation of the Security Keylock as follows:

- Set the TEST/NORMAL switch to NORMAL.
 - Check that the security key is turned fully clockwise.
 - Now turn the key fully counterclockwise. The symbol X₀ should appear in the operator information area and the screen above the separator line should become blank except for the cursor.
 - Turn the key fully clockwise. The X₀ symbol should disappear and the display should return.
- Did all occur as expected?

Y N

- 026
- Turn the security key fully clockwise.
 - Use a logic probe to check the following pins:

D2G03 should be UP - Keylock
D2J04 should be DOWN-Keylock installed

Are they correct?

Y N

- 027
- Switch power OFF .
 - Check the switch and its associated wiring.
 - See Figure 6-8.
 - Exchange the failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

028

- Turn the Security Key fully counterclockwise.
- Use a logic probe to check the following pins:

C2G03 should be DOWN - Keylock.
C2J04 should be DOWN-Keylock installed.

Are they correct?

Y N

029

- Switch power OFF .
- Check the switch and its associated wiring.
- See Figure 6-8.
- Repair or exchange failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

030

- Exchange logic card D2.
- GO TO MAP 0000, ENTRY POINT BB.

031

(ENTRY POINT DD)

If the Selector Pen feature is NOT installed, take the Y path now.

- If logic card G4 (selector pen) was removed earlier, Switch power OFF and reinstall it.

Test the operation of the Selector Pen as follows:

- Run ONLINE TEST 0 (see page 1).
- Set the brightness control to an acceptable level.
- Press the pen against the white ?SEL PEN field in line 2.

The field changes to >SEL PEN.

- Press the pen against the blue >SEL PEN field in line 3.

The field changes to ?SEL PEN.

- If X-f appears in the indicator row, press RESET and retry.

Did all occur as expected?

Y N

032

- Turn the Brightness control to mid position.
 - Press the light pen tip (do not point it at the screen).
- The blue characters should become bright (they may only flash) but the red and green should not change.

Does this occur?

Y N

033

- Meter TP 'J' on the amplifier card. See Figure 6-10.
- Check using table below.
- Use brightness potentiometer mounting plate as meter ground.

PEN TIP.	EXPECTED VOLTAGE.
RELEASED	0 Vdc - 0.2 Vdc
PRESSED	1.0 Vdc - 1.5 Vdc

Are the voltages correct?

Y N

034

- Meter the light pen switch voltages. The table below shows the expected voltages.

PEN TIP	YELLOW G5B12	WHITE G5D11
RELEASED	1.8 Vdc	0 Vdc
PRESSED	0 Vdc	2.2 Vdc

Are the voltages correct?

Y N

035

- Open up the selector pen.
- Verify the continuity of the 3 connections to the light pen switch. See Figure 6-13.
 - (1) SWITCH n/o (yellow) G5B12
 - (2) SWITCH n/c (white) G5D11
 - (3) SWITCH common G5D08 (coaxial cable shield)
- Verify correct operation of the switch.

NOTE: the separate ground connector on the selector pen cable is only connected to a cable shield.

- Isolate to wiring or selector pen. If no problem found, exchange selector pen logic card G4.
- GO TO MAP 0000, ENTRY POINT BB.

036

- Switch power OFF .
- Check continuity of blue bright-up signal from TP 'J' on the amplifier card to P18-3 through to C2U02. See Figure 6-7.
- Check for short to ground.

Is connection good?

Y N

037

- Repair or exchange failing FRU.
- GO TO MAP 0000, ENTRY POINT BB.

038

- Switch power ON .
 - Run ONLINE TEST 0; see page 1.
- Are blue characters always bright (not controlled by the brightness control)?

Y N

039

- Switch power OFF [X].
 - Disconnect wire 3 from P18 on the amplifier card.
 - Switch power ON [O].
 - Wait until the image appears.
 - Run ONLINE TEST 0; see page 1.
 - Decrease the brightness.
- Are the blue characters now always bright?

Y N

040

- Switch power OFF [X].
 - Exchange the amplifier card.
- GO TO MAP 0000, ENTRY POINT BB.

041

- Probe C2505 and press the selector pen tip. The DOWN light should come on and remain on as long as the tip is pressed.

Does this occur?

Y N

042

- Exchange logic card G4 (then the selector pen).
- GO TO MAP 0000, ENTRY POINT BB.

043

- Exchange logic card C2.
- GO TO MAP 0000, ENTRY POINT BB.

044

- Meter the voltage at TP 'J' on the amplifier card. Press and release the selector pen tip.
- Is the voltage always between 1.0 V dc and 1.5 V dc?

Y N

045

- Switch power OFF [X].
 - Exchange the amplifier card.
- GO TO MAP 0000, ENTRY POINT BB.

046

- Exchange logic card C2.
- GO TO MAP 0000, ENTRY POINT BB.

047

(ENTRY POINT HH)

Do the blue characters change in brightness as the brightness control is turned?

Y N

048

- Probe video card TP 'BG' (Blue Grid). See Figure 6-9.
 - Turn the brightness control from minimum to maximum.
- The voltage measured should change (approximately) from -70 V dc to -20 V dc.

Does this occur?

Y N

Q R S

049

- Meter the amplifier card test point 'K'.
- Expect +12 V (± 1.5 Vdc).
Is the voltage good?

Y N

050

GO TO MAP 0600, ENTRY POINT EE.

051

- Switch power OFF [X].
 - Check the continuity of the Blue Grid supply: P17B-1 to P15-3 to TP 'BG' to P13-12.
 - Check for short to ground. See Figure 6-7.
 - Isolate to one of:
 - (a) Wiring
 - (b) Video card
 - (c) Amplifier card.
- GO TO MAP 0000, ENTRY POINT BB.

052

- Switch power OFF [X].
 - Exchange the video card then the CRT.
- GO TO MAP 0000, ENTRY POINT BB.

053

- Switch power OFF [X].
 - Exchange the amplifier card.
- GO TO MAP 0000, ENTRY POINT BB.

054

- Press the light pen tip (do NOT point it at the screen). White bars appear through all characters on lines 2 and 3 of the test pattern.
 - Set the brightness control to an acceptable level.
 - Press the pen against the white ?SEL PEN. field in line 2. The field changes to >SEL PEN.
 - Press the pen against the blue >SEL PEN field in line 3. The field changes to ?SEL PEN.
 - If X-f appears in the indicator row, press RESET and retry.
- Did all occur as expected?

Y N

055

NOTE: The light pen tip for Model 2 is P/N 2570128 (large lens) and for Model 3 1742655.

- See Figure 6-13 throughout these tests.
 - Switch power OFF [X].
 - Disconnect the selector pen logic gate connector G5.
 - Switch power ON [O].
 - Meter the following pins: G5D10 (+12 V) and G5B08 (-12 V). Use G5D08 as GND.
- Are the voltages present?

Y N

7 6 6
T U V

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MAP 0800-5

056

- See Figure 6-10.
 - Meter the amplifier card test points M (+12 V dc) and N (-12 V dc).
- Are both voltages present?

Y N

057

- Switch power OFF .
 - There must be a convergence problem.
- See Figure 1-2 and Figure 6-16 to check wiring.
- GO TO MAP 0000, ENTRY POINT BB.

058

- Switch power OFF .
- Reset the logic gate A5 connector and P18 on the amplifier card and check the +12 V and -12 V wiring. (See Figure 6-16)

Has the problem gone?

Y N

059

- One (or both) of the fused resistors on the amplifier card has failed. This will have been caused by an overload or short circuit on the +/-12 V supplies to the amplifier card.

CAUTION

Do not insert a new amplifier card until the cause of the overload has been repaired.

- Switch power OFF .
 - Look for a short circuit in the +12 V and -12 V wiring from the amplifier card to the selector pen card. (See Figure 6-16.)
 - Repair any problem found. If there is no wiring problem, exchange the selector pen logic card (G4).
 - Exchange the amplifier card.
- GO TO MAP 0000, ENTRY POINT BB.

060

GO TO MAP 0000, ENTRY POINT BB.

061

- Reinstall the selector pen and card (G4) if removed.
- Have you seen any of the following error codes on the screen or in the error log for the display: 44, 61 or 222 ? (See MIM section 2.6.3)

Y N

062

- Probe C2S05 and press the selector pen tip. The DOWN light should come on and remain on as long as the pen tip is pressed.

Does this occur?

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

063

- Use your probe to verify the conditions shown in the table below.

PIN ON LOGIC GATE	SEL. PEN SWITCH	
	PRESSED	RELEASED
G5B12 yellow	DOWN	---
G5D11 white	UP	DOWN

G5D08 is ground

Are they correct?

Y N

064

- Exchange the selector pen then logic card G4.
- GO TO MAP 0000, ENTRY POINT BB.

065

- Exchange the selector pen logic card G4 (then C2 then D2).
- GO TO MAP 0000, ENTRY POINT BB.

066

- Run ONLINE TEST 0; see page 1.
- Probe C2S05 and use the pen to select each of the 4 pen-detectable fields in the test pattern.
- Each time, press and hold the pen against the screen at the correct position. The DOWN light will come on and remain on until the field is sensed. (The white bars should also disappear.)

NOTE: If X-f appears in the indicator row, press RESET and retry. The red SEL PEN field and the blue &SEL PEN field will normally cause X-f to appear. Were all 4 of the fields sensed correctly?

Y N

067

- Probe the back of the selector pen connector (G5) and check voltages as in the table below.

PIN ON LOGIC GATE	VOLTAGES AND TOLERANCES
G5D10 (red)	+12 Vdc $\pm 1.5V$
G5D13 (black)	-6.2 Vdc $\pm 0.6V$
G5B08	-12 Vdc $\pm 1.5V$

Use G5D08 as ground

Are they correct?

Y N

068

Is only the -6.2 V wrong?

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

Y N

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069
•Use Figure 6-16 to trace the +12 and -12 Volt supplies to the selector pen card (G4).
•Isolate to cables, connectors or amplifier card.
GO TO MAP 0000, ENTRY POINT BB.

070
•Exchange logic card G4 (then C2 then D2).
GO TO MAP 0000, ENTRY POINT BB.

071
•Set the TEST/NORMAL switch to NORMAL and enter TEST 0.
•Probe G5D12 (selector pen signal). It should be UP.
•Set brightness control to maximum. The DOWN light should also light when the pen is pointed at any characters on the screen.
Does this occur?
Y N

072
•Switch power OFF .
•Check the selector pen lens is clean and exchange or clean if necessary. If no problem found, exchange the selector pen then logic card G4.
GO TO MAP 0000, ENTRY POINT BB.

073
•Exchange the selector pen logic card G4.
GO TO MAP 0000, ENTRY POINT BB.

074
•Exchange logic card D2 (then G4 then C2).
GO TO MAP 0000, ENTRY POINT BB.

075
•Exchange logic card G4 (then D2 then C2).
GO TO MAP 0000, ENTRY POINT BB.

076
The Selector Pen appears to be working correctly.
GO TO MAP 0000, ENTRY POINT BB.

077
(ENTRY POINT EE)

If the MHS or MSR feature is NOT installed, take the Y path now.
•If logic card G2 (MRC) was removed earlier, Switch power OFF and reinstall it.
Test the operation of the MHS/MSR as follows:
•Run ONLINE TEST 0 (see page 1).
•Move the cursor to the first position in the fifth line (line below the test pattern).
•Read the MSR test card.
The cursor should move, the green light turn ON and X-f show in the OIA.
If the red (reader) light turns ON, press RESET and retry.
Did all occur as expected?
Y N

078
Has the customer used the PDG and the Customer Replacement Procedures Manual (shipped with the MSR/MHS unit)?
Y N

079
•Do the tests recommended in the Customer Replacement Procedures Manual (Form No GA24-3663).
Did you find the problem?
Y N

080
•Switch power OFF .
•See Figure 6-13. Verify all the connections in the cable from logic gate G3 to the MSR/MHS connector. Also verify the ground connection.
Is there a problem?
Y N

081
•Exchange logic card G2 then D2.
GO TO MAP 0000, ENTRY POINT BB.

082
•Repair or exchange the cable. Verify correct operation.
GO TO MAP 0000, ENTRY POINT BB.

083
GO TO MAP 0000, ENTRY POINT BB.

084
•Switch power OFF .
The customer did not find the problem.
•See Figure 6-13. Verify all the connections in the cable from logic gate G3 to the MSR/MHS connector. Also verify the ground connection.
Is there a problem?
Y N

085
•Exchange logic card G2 then D2.
GO TO MAP 0000, ENTRY POINT BB.

086

•Repair or exchange the cable.
GO TO MAP 0000, ENTRY POINT BB.

087

Do all 3 indicator lights on the 3279 bezel, function correctly?

Y N

088

(ENTRY POINT JJ)

•See Figure 6-8 to check voltages and continuity to the LED card.
•If all 3 lights are off, check the 5 V supply to the LED card pin 7.
•Switch power OFF .
•Repair or exchange the failing FRU.
GO TO MAP 0000, ENTRY POINT BB.

089

•Perform the tests described in OFFLINE TEST MODE 3 MIM section 2.5.3.

Are all the tests good?

Y N

090

•Exchange logic cards as recommended in MIM section 2.5.3.
GO TO MAP 0000, ENTRY POINT BB.

091

There does not seem to be a problem.

•Ask the customer if the problem is intermittent.

Is it?

Y N

092

•If the ECS feature (logic card E2) is not installed, take the N path now.
•Ask the customer if there is an ECS (7-color and highlighting) failure or PS (Programmed symbols) failure.
Is there an ECS or PS failure?

Y N

093

•Inspect the error log (MIM section 2.6.3) and ask the customer to show you the problem.
GO TO MAP 0000, ENTRY POINT BB.

094

•Switch power OFF .
•Verify the settings of the 8 switches on the ECS logic card (E2). See Figure 6-14.
•If the PS logic card (F2) is installed, check the jumper. The jumper should only be present if this is a PS2 feature card (no pluggable modules installed).
GO TO MAP 0000, ENTRY POINT BB.

095

There is an intermittent problem.
GO TO MAP 0000, ENTRY POINT BB.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0100	BB	1	007
0800	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	004	0000	A
3	040	0700	A
3	038	0800	A
3	053	0800	GG

001
 (ENTRY POINT A)
 Does the indicator row on the screen display any error indicator other than an error code?
 Y N

002
 Does the indicator row, on the screen, display an error code?
 Y N

003
 Is the TEST/NORMAL switch in the NORMAL position?
 Y N

004
 •Put switch in NORMAL position.
 GO TO MAP 0000, ENTRY POINT A.

005
 Is the security keylock turned fully clockwise? (Use the Y path if there is no security keylock feature).
 Y N

006
 Turn the switch clockwise.
 GO TO MAP 0000, ENTRY POINT BB.

007
 (ENTRY POINT BB)
 Are other displays connected to the same Control Unit operating normally?
 Y N

008
 •See the Control Unit MIM to isolate the failure.

009
 •Use the ERROR LOG to determine if this terminal has had errors that cause the Control Unit to disable the terminal. (See MIM section 2.6.3).
 Does the error log contain any of the error codes given in MIM section 2.6.8?
 ? Take the N path if you don't know.
 Y N

010
 •Switch power OFF then to ON .
 Does the READY SYMBOL appear in the Operator Information area?
 Y N

E
1

SYSTEM INDICATED FAILURE

PAGE 2 OF 3

G H

MAP 0900-2

011

If this display does NOT use a Switch Control Unit, take the N path now.

- Disconnect the Switch Control Unit and connect the coaxial cable directly to the display.
- Switch power OFF then to ON .

Does the READY SYMBOL appear in the OIA ?

Y N

012

(The following is a test of the coaxial device cable from the display. Signals on the cable will not affect test.)

- Switch power OFF .
- Disconnect the coaxial cable from the terminal.
- Measure the resistance from the center pin of the connector on the cable to the outer case of the connector.
- Use Rx10 range.

Is resistance between 1.8k ohms and 2.6k ohms?

Y N

013

Resistance higher than 2.6k ohms indicates an open cable, bad cable connector or failure at the Control Unit. (Cable resistance is 30 ohms/1000 feet).

- Repair or exchange - See Control Unit MIM.

GO TO MAP 0000, ENTRY POINT BB.

014

(The following is a test from the coaxial connector on the terminal connector to card C2).

- Test the resistance from the center contact of the connector on the terminal to the outer case of the connector. Do not use the frame of the terminal.
- Use Rx1 range.

Does resistance measure between 0 and 3 ohms?

Y N

015

- Reseat the C2 logic card.
- Verify the continuity, location and seating of the coaxial cable (conductor and shield) from the coaxial cable socket to the logic gate. See Figure 6-13. Repair or exchange the cable as necessary.
- If no problem is found exchange the C2 card.

GO TO MAP 0000, ENTRY POINT BB.

016

- Disconnect logic card C2. Repeat the last test (step 014).

Does the meter show an open circuit?

Y N

017

The internal wiring from the logic gate to the external coaxial device cable connector is failing.

- Repair or exchange it.

GO TO MAP 0000, ENTRY POINT BB.

018

- Exchange C2 card.

Is the problem still present?

Y N

019

GO TO MAP 0000, ENTRY POINT BB.

020

- Exchange logic cards D2 then B2.

Is the problem still present?

Y N

021

GO TO MAP 0000, ENTRY POINT BB.

022

(ENTRY POINT DD)

Has the terminal LOGGED OFF because of errors?

(see ERROR LOG codes, MIM section 2.6.8, for log off codes)

Y N

023

- Switch power OFF .

Does this terminal contain feature cards?

Y N

024

- Inspect the coaxial cable ground, the internal coaxial cable and the logic board strips for failures.

GO TO MAP 0000, ENTRY POINT BB.

025

- Remove the feature cards one at a time and test each time.
- Exchange the card removed when the problem goes away.

GO TO MAP 0000, ENTRY POINT BB.

026

(ENTRY POINT CC)

Is there an error code 77 or 204 ?

Y N

027

Is the error code associated with a feature or the convergence logic card (B2)? (See MIM section 2.6.8 for codes).

Y N

028

- Verify coaxial cable connectors, cable and seating of C2 card.
- If errors remain, exchange C2 card.

GO TO MAP 0000, ENTRY POINT BB.

3
F G H

3 3
J K

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MAP 0900-2

029

- If the feature causing error is identified exchange that card.
- If the feature is not identified or this terminal does not have features, exchange C2 card.

Is the problem still present?

Y N

030

GO TO MAP 0000, ENTRY POINT BB.

031

- Exchange D2 card.

 GO TO MAP 0000, ENTRY POINT BB.

032

- Exchange logic cards D2 then C2.

 GO TO MAP 0000, ENTRY POINT BB.

033

The Switch Control Unit is failing.
GO TO MAP 0000, ENTRY POINT BB.

034

- Exchange logic cards C2 then D2.

 GO TO MAP 0000, ENTRY POINT BB.

035

GO TO PAGE 2, STEP 026, ENTRY POINT CC.

036

Is error code other than 41, 42, 210 or

212 ?

Y N

037

- Remove any feature cards present. (E2, F2, G2, G4)

Is problem still present?

Y N

038

GO TO MAP 0800, ENTRY POINT A.

039

- Disconnect keyboard cable from terminal.

Is problem still present?

Y N

040

GO TO MAP 0700, ENTRY POINT A.

041

- Exchange logic card C2 then D2.
- Reconnect keyboard cable to terminal.

 GO TO MAP 0000, ENTRY POINT BB.

042

GO TO PAGE 2, STEP 022, ENTRY POINT DD.

043

Is the symbol X_{0-n} present in the Operator Information Area?

Y N

044

Does either X-f or X_{i#?} appear in the Operator Information Area when you attempt to enter the convergence routine? (Online Test 7)

Y N

045

- Go to MIM Appendix A to find the meaning of the symbol(s) displayed and to take action.

GO TO MAP 0000, ENTRY POINT BB.

046

Does X-f appear?

Y N

047

- X_{i#?} appears...Reset logic card B2.

 Has the problem gone?

Y N

048

- Exchange logic card B2.

 Has the problem gone now?

Y N

049

- Exchange logic card C2 then D2.
- Reinstall the original B2 logic card.

GO TO MAP 0000, ENTRY POINT BB.

050

- Go to MIM section 5.3.5 to set up convergence.

 GO TO MAP 0000, ENTRY POINT BB.

051

GO TO MAP 0000, ENTRY POINT BB.

052

Another operator on the same Control Unit is probably using the convergence routine.

- Press RESET and wait a few minutes before repeating.

053

GO TO MAP 0800, ENTRY POINT GG.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0200	BB	3	026

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
5	057	0000	BB
2	014	0500	A
2	012	0700	EE

001
(ENTRY POINT A)

- Switch power OFF .
- Wait at least 10 seconds.
- Switch power ON .
- If the fault appears on the 3279 display as well as the attached video devices, return to the General Failure Index to determine the correct MAP entry point.

(ENTRY POINT AA)

- Ask the customer to detach any attached video devices.
- Note the settings of the VIDEO CONTROL and SYNC POLARITY switches (on the rear panel).
- Set the VIDEO CONTROL switch to NORMAL or ENHANCE.
- Check that the 3279 is connected to a control unit.
- Set the TEST/NORMAL switch to NORMAL.
- Set the oo/oooo switch to oooo.
- Turn the BRIGHTNESS knob fully clockwise.
- Wait at least 1 minute or until an image appears on the 3279 screen.
- Turn the BRIGHTNESS knob until the screen brightness is acceptable.
- Hold down the ALT key, press the TEST key, release both.

Does "TEST" appear in the Operator Information Area (OIA)?

Y N

002

Is the separator line visible?

Y N

003

Is the video control switch set to TEST?

Y N

004

- Check that the wiring of the VIDEO CONTROL switch is not reversed.
- See Figure 6-13.

Is wiring OK?

Y N

005

- Wire the switch correctly.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

006

- Exchange logic card C2.
- Has the problem gone?

Y N

007

- Inspect the cable in position C4.
- Inspect the VIDEO CONTROL switch.
- Exchange any failing FRU.
- GO TO PAGE 5, STEP 057,
- ENTRY POINT FF.

008

- GO TO PAGE 5, STEP 057,
- ENTRY POINT FF.

009

- Set the VIDEO CONTROL switch to NORMAL or ENHANCE.
- GO TO PAGE 1, STEP 001,
- ENTRY POINT A.

010

- Verify that the control unit is connected and working.
- Go to the General Failure Index (MAP 0000 page 3).

011

- Press the '/' key.
- Does a '/' appear on the screen?

Y N

012

- GO TO MAP 0700, ENTRY POINT EE.

013

- Press ENTER .
- The pattern shown in Figure 2-4 (Online Test 0) should display.
- Are the COLORS correct? (Ignore any other differences.)

Y N

014

- GO TO MAP 0500, ENTRY POINT A.

015

- Observe the SIGNAL TEST lamp located on the rear panel.
- Is it off?

Y N

016

- Lamp is on.
- GO TO PAGE 3, STEP 026,
- ENTRY POINT BB.

017

- Set the VIDEO CONTROL switch to TEST.
- Observe the SIGNAL TEST lamp.
- Is it on?

Y N

018

- GO TO PAGE 3, STEP 026,
- ENTRY POINT BB.

019

- Compare the picture on the 3279 screen with Figure 2-4.
- Video signals normally sent to the monitor are now displayed on the 3279 screen.
- Check the image for missing or wrong colors.

Are the colors OK?

Y N

020

- Exchange logic card C2.
- GO TO PAGE 5, STEP 057,
- ENTRY POINT FF.

021

- Check the image for distortion.
- Is the image OK?

Y N

022

- Set the VIDEO CONTROL switch to NORMAL.
- Is the image OK?

Y N

023

- Return to the General Failure Index to determine correct MAP entry point.

024

- Exchange logic card C2.
- GO TO PAGE 5, STEP 057,
- ENTRY POINT FF.

025

- GO TO PAGE 4, STEP 039,
- ENTRY POINT CC.

026
(ENTRY POINT BB)

- Switch power OFF .
- Remove cable connector in position C4.
- Remove logic card C2.
- Measure resistance between C4D05 and C4D08, and between C4D04 and C4D08.

Are both open-circuit?

Y N

027

- Use delete tool (PN 452626) to delete connections on card side of the board at C4D04.
- Also delete wiring at C4D05.
- Reinstall logic card C2 and top-card connectors.
- Reinstall connector in position C4.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

028

- Reinstall logic card C2 and top-card connectors.
- Switch power ON .
- Set meter to 6Vdc range.
- Measure voltage between C4D05(+) and C4D08(-).

Does meter indicate between 2.6 and 3.2

Vdc?

Y N

029

- Exchange logic card C2.
- Reinstall connector in location C4.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

030

- Switch power OFF .
- Reinstall connector in location C4.
- Disconnect SYNC TEST lamp at connector J34 (behind rear panel).
- Measure voltage between pin 1 (+) and pin 4 (-).

(NOTE: blank plug is at pin 2.)

- Switch power ON .
- Set VIDEO CONTROL switch to TEST.

Does meter indicate between 2.0 and 3.0

Vdc?

Y N

031

- Switch power OFF .
- Reinstall connector J34.
- Remove the cable connector from position C4.
- Check the wiring between connector C4 and the video output RPQ switches and indicator.

(See Figure 6-13).

Is the wiring OK?

Y N

032

- Repair/exchange cable.
- Reinstall connector in position C4.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

033

- Exchange logic card C2.
- Reinstall connector in position C4.
- Reinstall connector J34.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

034

- Set the VIDEO CONTROL switch to NORMAL.

Does meter indicate less than 0.5 Vdc?

Y N

035

- Check the VIDEO CONTROL switch and wiring to connector C4.

Are switch and wiring OK?

Y N

036

- Repair/exchange failing FRU.
- Reinstall connector J34.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

037

- Exchange logic card C2.
- Reinstall connector J34.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

038

- Check connector J34/P34 is not damaged.
- Inspect/exchange the cable in position C4.
- If the cable is OK, exchange SIGNAL TEST lamp assembly.
- Reinstall connector J34.

GO TO PAGE 5, STEP 057,

ENTRY POINT FF.

039
(ENTRY POINT CC)

- Check the video signals as follows:
- Set the TEST/NORMAL switch to TEST (green characters fill the screen).
- Jumper D2Y02 to D2Y08 (on C4/D4 top-card connector) to force reverse video.
- Set meter to 6Vdc range and negative lead to any D08.
- Use pointed probe on positive lead to probe the inner contact of each BNC video socket in turn.
- Green video should be 1.1 to 1.4 Vdc.
- Red and blue video should be less than 0.5 Vdc.
- Press CONTROL O B (alpha keys) - see Figure 2-3. The test pattern turns blue.
- Check again:
- Blue video should now be 1.1 to 1.4 Vdc.
- Red and green video should be less than 0.5 Vdc.
- Press CONTROL C
- Press CONTROL O I (alpha keys) - see Figure 2-3. The test pattern turns red.
- Check again:
- Red video should now be 1.1 to 1.4 Vdc.
- Green and blue video should be less than 0.5 Vdc.

Are all voltages correct?

Y N

040

- Remove cable in position C4.
- Use meter to check video signals at pins C4B05(red), C4B06(green) and C4B07(blue).
- Follow the same procedure as in the previous step.

Are all voltages now correct?

Y N

041

- Remove jumper D2Y02 to D2Y08.
 - Reinstall cable in position C4.
 - Exchange logic card C2.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

042

- Remove jumper D2Y02 to D2Y08.
 - Inspect cable removed from C4 for breaks or shorts in the 3 coaxial video cables.
 - Exchange any failing FRU.
 - Reinstall cable in position C4.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

043

- Remove jumper D2Y02 to D2Y08.
- Set SYNC POLARITY switch to '+'.
- Measure voltage at SYNC output socket (black).

Is the voltage between 1.5 Vdc and 2.0 Vdc?

Y N

044

- Without removing the connector from position C4, measure the voltage at C4B04.
- Is the voltage between 1.5 Vdc and 2.0 Vdc?

Y N

045

- Remove the cable from position C4.
- Measure resistance between B02 and D08 on the free end of the cable.
- With the SYNC POLARITY switch set to '+', resistance should be about 0 ohms.
- With the SYNC POLARITY switch set to '-', meter should indicate an open circuit.

Is all correct?

Y N

046

- Inspect the cable assembly in position C4 and the SYNC POLARITY switch.
 - Exchange any failing FRU.
 - Reinstall cable in position C4.
 - Exchange any failing FRU.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

047

- Exchange logic card C2.
 - Reinstall cable in position C4.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

048

- Inspect/exchange the cable in position C4.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

049

- Set SYNC POLARITY switch to '-'.
- Measure voltage at SYNC output socket.

Is the voltage between 0 Vdc and 0.4 Vdc?

Y N

050

- Inspect wiring of SYNC POLARITY switch. (See Figure 6-13)
 - Repair or Exchange any failing FRU.
- GO TO PAGE 5, STEP 057,
ENTRY POINT FF.

051

(ENTRY POINT EE)

- Remove cable from position C4.
- Set the TEST/NORMAL switch to NORMAL and back to TEST.
- Press CONTROL O B (Alpha keys, see Figure 2-3).

Does the character pattern turn blue?

Y N

052

- Exchange logic card C2.
 - Reinstall cable in position C4.
- GO TO STEP 057,
ENTRY POINT FF.

053

- Install a jumper between C4D04 and C4D08,
and a jumper between C4D02 and C4D08.
 - Observe the image on the 3279 screen.
- Does a faint green image appear with the
blue?

Y N

054

- Remove jumpers.
 - Exchange logic card C2.
 - Reinstall cable in position C4.
- GO TO STEP 057,
ENTRY POINT FF.

055

- Remove jumpers.
 - Measure resistance between D04 and D08 on
the free end of the connector.
- With the VIDEO CONTROL switch set to
ENHANCE the resistance should be
approximately 0 ohms.
- With the VIDEO CONTROL switch set to
NORMAL the connection should be
open-circuit.

Is all correct?

Y N

056

- Inspect cable and VIDEO CONTROL switch.
 - Exchange any failing FRU.
 - Reinstall cable in position C4.
- GO TO STEP 057,
ENTRY POINT FF.

057

- Reinstall cable in position C4.
 - Exchange logic card C2.
- GO TO STEP 057,
ENTRY POINT FF.

(ENTRY POINT FF)

- Perform VIDEO OUTPUT checkout procedure
in PDG.
 - Return VIDEO CONTROL and SIGNAL POLARITY
switches to their original settings.
- GO TO MAP 0000, ENTRY POINT BB.

SY33-0069-3

(Part 2)

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