
IBM 5150, 5155, and 5160 Service Summary

This summary contains a Symptom-to-FRU Part Index for FRU part isolation and a partial parts listing for these machine types.

This Service Summary card is not required to service the 5150, 5155, and 5160. It has been made available as a convenience to the servicer.

Important: If more than one error code is displayed, diagnose the first error code first. The cause of the first error code can cause false error codes to be displayed.

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January 1989

SA38-0036-00

MAP 0100: General Checkout

001

- Check all cables and power cords.
- If you cannot load a diagnostic diskette, go to the Symptom Index.
- Load the advanced diagnostic diskette and check for the following responses:
 1. Memory test
 2. One or two short beeps
 3. First diagnostic menu.

Are all three responses correct?

Yes No

002

Go to the Symptom Index.

003

Is the installed devices list correct?

Yes No

004

Go to Installed Devices.

005

- Run the diagnostic tests.

Are the tests successful?

Yes No

006

Go to the Symptom Index.

007

You may have an intermittent problem.

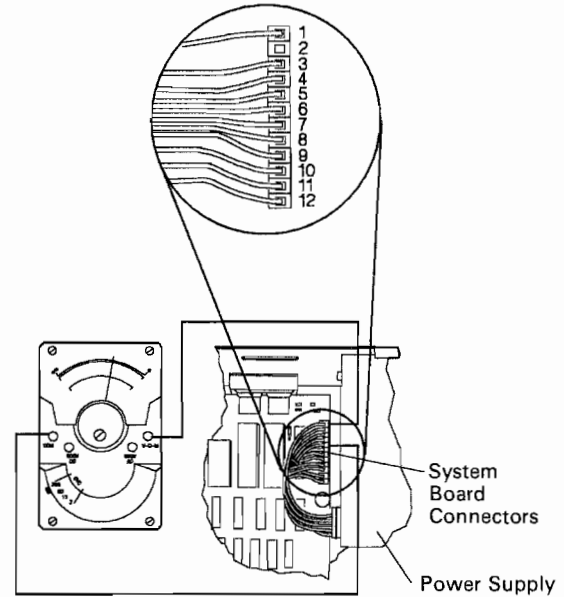
1. Check for damaged cables and connectors.
2. Reseat all adapters, drives, and modules.
3. Start an error log and run the tests multiple times.

Undetermined Problem

1. Power off the system.
2. Remove or disconnect the following adapters and devices one at a time:
 - a. Non-IBM Devices
 - b. External Modem, Printer, or Mouse
 - c. Math Coprocessor
 - d. Any Adapter
 - e. Diskette Drive Cable
 - f. Fixed Disk Cable.
3. Power on the system.
4. Repeat the previous steps until you find the failing adapter or device.

If the power-on indicator for the display is not glowing, then replace the display. If the power supply fan is not running, then replace the power supply. If all adapters and devices have been removed and the problem remains,

check the power supply output voltages. If the output voltages are good, replace the system board.



LEX40155

Figure 1. System Power Supply

Voltage Connectors			
Min V DC	Max V DC	-Lead	+Lead
+4.8	+5.25	5	10
+4.6	+5.5	9	6
+11.5	+12.6	7	3
+10.9	+13.2	4	8

Figure 2. Correct Voltage at Connectors

Memory Error Isolation

This hint is to help diagnose memory and/or parity check errors if memory bank and bit position is not found during either power-on self test (POST) or memory diagnostics.

Read each step of the following instructions before beginning:

1. Set the system unit's power switch to off.
2. Remove all installed memory expansion adapters.
3. Set the system unit's power switch to on. (Ensure the memory size is correctly set.)
4. Repeat the diagnostic test that failed.

Note: If the diagnostic test passes on bare system memory configuration, you may have a memory failure on one of your memory expansion adapters.

5. Set the system unit's power switch to off.
6. Install one memory expansion adapter at a time to test.

7. Set the system unit's power switch to on. (Ensure the memory size is correctly set.)
8. Repeat the diagnostic test that failed.

When a memory error is present and location cannot be isolated, it is best to break down the system's memory in sections to locate the most probable point of origin.

Parity Checks

Parity check 1 indicates a system board parity error. Parity check 2 indicates a memory expansion adapter parity error. If the PC is a 5160, 5155, XT™370, or 4455, go to "Step 1." If the PC is a 5150 or 4450, go to "Step 2."

Step 1

Parity Check 1 (7-Character Code)

The first character of the error code 1, 2, 3, or 4 indicates which bank has failed, and the sixth and seventh characters of the error code indicate which module has failed. For example, 3C000 40 201 error code means bank 3, bit 6, has failed as indicated by the arrow in Figure 3.

Parity Check 2

The first character of the error code indicates which bank on the 64Kb/256Kb memory expansion option has failed. The last two characters indicate which module has failed. For example, 4C00 201 means bank 0, bit P has failed. See Figure 5.

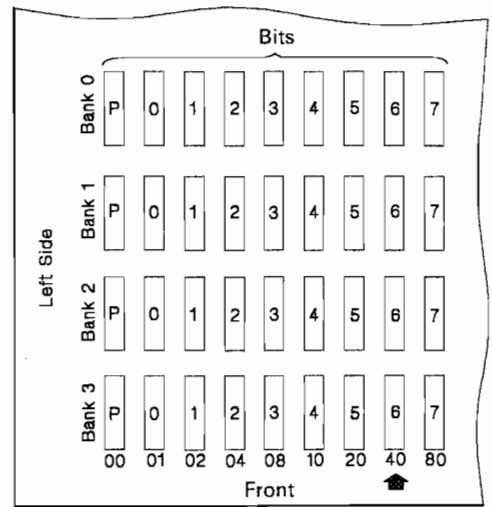
Step 2

Parity Check 1 (4-Character Code) 64Kb/256Kb System Board Only

The first character of the error code 1, 2, 3, or 4 indicates which bank has failed. The third and fourth characters indicate which module has failed. For example, 3040 201 means bank 3, bit 6, has failed, as indicated by the arrow in Figure 4.

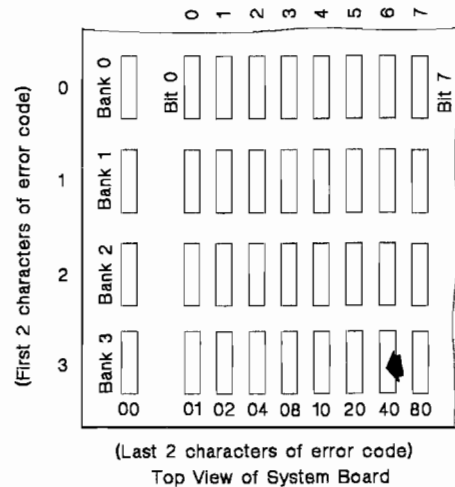
Parity Check 2 64Kb/256Kb System Board Only

Same as parity check 2 in "Step 1."



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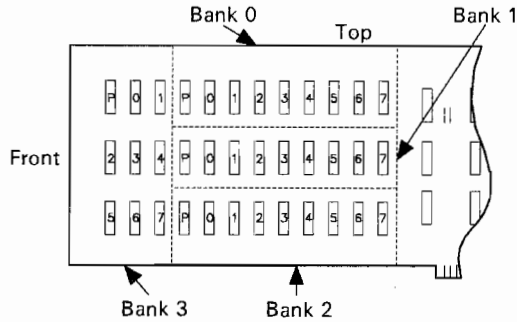
Figure 3. System Board (Top View)



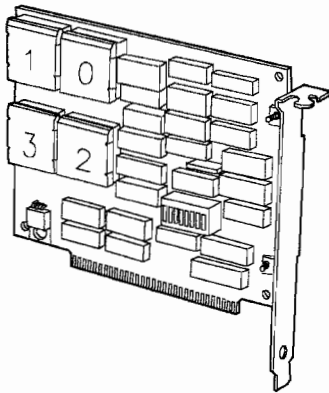
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Figure 4. System Board (Top View)

First Character of Error Code	Type of System Board		Last 2 Characters of the Error Code
	16Kb/64Kb	16Kb/256Kb	
1	Bank 0	N/A	00 = P
2	Bank 1	N/A	01 = 0
3	Bank 2	N/A	02 = 1
4	Bank 3	Bank 0	04 = 2
5	Bank 0	Bank 1	08 = 3
6	Bank 1	Bank 2	10 = 4
7	Bank 2	Bank 3	20 = 5
8	Bank 3	Bank 0	40 = 6
9	Bank 0	Bank 1	80 = 7



LEX43113



LEX43129

Figure 5. 256Kb Memory Expansion Adapter

MAP 0110: Printer Isolation

001

Make sure the printer is properly connected and powered on.

Did the printer self test work correctly?

Yes No

002

Replace or repair the printer.

003

Did the parallel port pass the diagnostic test with the wrap plug installed?

Yes No

004

Replace the system board or parallel adapter.

005

Replace the printer cable, and then repair or replace the printer.

Installed Devices

If an adapter or device is missing from the installed devices list, replace that adapter or device.

If an adapter is shown on the installed devices list and is not present in the system, remove the adapter from the list. If the error remains, replace the system board.

Symptom Index

The Symptom Index lists error symptoms and the causes that could be responsible. The most likely cause is listed first. Use this index to help you decide which FRUs you should have available when servicing the system.

Important: To determine what is actually failing, always begin with "MAP 0000: Start" in the appropriate *Hardware Maintenance Service* (HMS) manual, if you are using the advanced diagnostic diskette.

If the system displays an error message and gives an incorrect audio response, the most likely causes are those listed for the error message. An X in an error message can be any number.

Symptom/Error	Possible Causes
No beep or continuous beep or repeating short beep	<ul style="list-style-type: none"> • Power Supply • System Board • Diskette Drive* <p>*Defective options can create abnormal demands on the power supply or system board. Remove options and check for a change in symptom. Also check externally attached devices.</p>
1 long and 1 short beep	<ul style="list-style-type: none"> • System Board • Power Supply
1 long and 2 short beeps	<ul style="list-style-type: none"> • Monochrome Display/Parallel Printer Adapter • Color/Graphics Monitor Adapter • System Board • Power Supply
1 short beep and a blank or incorrect display	<ul style="list-style-type: none"> • Monochrome Display/Parallel Printer Adapter or • Color/Graphics Monitor Adapter • Power Supply
1 short beep and Personal Computer BASIC statement	<ul style="list-style-type: none"> • Diskette Drive • Diskette Signal Cable • Diskette Drive Adapter • System Board • Power Supply
02X Power	<ul style="list-style-type: none"> • Power Supply • Diskette Drive* • System Board • Diskette Signal Cable <p>*Defective options can create abnormal demands on the power supply or system board. Remove options and check for a change in symptom. Also check externally attached features.</p>
1XX System Board	<ul style="list-style-type: none"> • System Board <p>Note: Error message 199 does not mean a hardware failure exists. It means something is wrong with the system unit configuration. Verify that switch settings match installed devices.</p>

20X or XXXX20X Memory	<ul style="list-style-type: none"> • Memory Module (decode error message for exact location) • System Board • 32Kb Memory Option • 64Kb Memory Option • 64Kb/256Kb Memory Option <p>Note: Verify system board switch settings for correct memory size.</p>
30X or XXX30X Keyboard	<ul style="list-style-type: none"> • Keyboard • System Board
4XX Display (Monochrome)	<ul style="list-style-type: none"> • Monochrome Display/Parallel Printer Adapter • System Board • Power Supply
5XX Display (Color/Graphics)	<ul style="list-style-type: none"> • Color/Graphics Monitor Adapter • Light Pen (OEM)
6XX Diskette	<ul style="list-style-type: none"> • Diskette Drive • Diskette Drive Adapter • Diskette Signal Cable • System Board • Power Supply <p>Note: A 608 error message indicates a problem with your advanced diagnostic diskette. Use your backup advanced diagnostic diskette.</p>
9XX Parallel Printer Adapter	<ul style="list-style-type: none"> • Parallel Printer Adapter • System Board • Power Supply
7XX Math Coprocessor	<ul style="list-style-type: none"> • Math Coprocessor • System Board • Power Supply <p>Note: The FRU consists of new 8087 and 8088 Modules, and these are always replaced as a set.</p>
110X Asynchronous Communications Adapter	<ul style="list-style-type: none"> • Asynchronous Communications Adapter • Power Supply • System Board <p>Note: ASYNC card uses 12V. Check for 12V DC at the power supply.</p>

<p>120X Alternate Asynchronous Communications Adapter</p>	<ul style="list-style-type: none"> • Alternate Asynchronous Communications Adapter • Power Supply • System Board <p>Note: ASYNC card uses 12V. Check for 12V DC at the power supply.</p>
<p>130X Game Control</p>	<ul style="list-style-type: none"> • Game Control Adapter • System Board • Power Supply <p>Note: Customer joysticks may be defective.</p>
<p>140X Printer</p>	<ul style="list-style-type: none"> • Parallel Printer Adapter or Monochrome Display/Parallel Printer Adapter (whichever adapter printer is connected to) • Printer Attachment Cable • System Board • Power Supply
<p>15XX SDLC Communications Adapter</p>	<ul style="list-style-type: none"> • SDLC Communications Adapter • IBM Communications Adapter Cable • Power Supply • System Board <p>Note: SDLC card uses 12V. Check for 12V DC at the power supply.</p>
<p>1608 1604</p>	<ul style="list-style-type: none"> • Display Station Emulation Adapter • System Twinaxial Network Problem
<p>1664 1658 1654 1652 1644 1634 1624</p>	<ul style="list-style-type: none"> • Display Station Emulation Adapter
<p>1668 1662</p>	<ul style="list-style-type: none"> • Interrupt level switches set wrong. • Display Station Emulation Adapter
<p>1674</p>	<ul style="list-style-type: none"> • Station address switches set wrong. • Display Station Emulation Adapter
<p>1688 1684</p>	<ul style="list-style-type: none"> • Feature not installed. • Device address switches set wrong. • Display Station Emulation Adapter

17XX Fixed Disk Drive	<ul style="list-style-type: none"> • Fixed Disk Drive • Fixed Disk Drive Adapter • Fixed Disk Cable • Power Supply • Expansion Unit Cable
18XX Expansion Unit	<ul style="list-style-type: none"> • Extender Card • Receiver Card • Expansion Board • Power Supply • Fixed Disk Drive • Expansion Unit Cable
20XX Binary Synchronous Communications Adapter (BSC)	<ul style="list-style-type: none"> • BSC Communications Adapter • IBM Communications Adapter Cable • Power Supply • System Board <p>Note: BSC card uses 12V. Check for 12V DC at the power supply.</p>
21XX Alternate Binary Synchronous Communications Adapter (BSC)	<ul style="list-style-type: none"> • BSC Communications Adapter • IBM Communications Adapter Cable • Power Supply • System Board <p>Note: BSC card uses 12V. Check for 12V DC at the power supply.</p>
23XX Plasma Monitor Adapter	<ul style="list-style-type: none"> • Plasma Monitor Adapter
24XX Enhanced Graphics Adapter	<ul style="list-style-type: none"> • Enhanced Graphics Adapter • System Board
2601 to 2675 or 2681 or 2695	<ul style="list-style-type: none"> • PC/370-M Card (Memory Card)
2677 to 2680 or 2682 or 2694 or 2697	<ul style="list-style-type: none"> • PC/370-P Card (Processor Card)
2698 Diskette Error	<ul style="list-style-type: none"> • Floppy Diskette • Diskette Drive • Diskette Drive Adapter • Diskette Drive Signal Cable
2701 to 2719	<ul style="list-style-type: none"> • PC/3277 Emulation Card
28XX 3278/79 Emulation	<ul style="list-style-type: none"> • 3278/79 Emulation Card • DFCA Card

29XX Color Printer	<ul style="list-style-type: none"> • Parallel Printer Adapter or Monochrome Display/Parallel Printer Adapter (whichever adapter printer is connected to) • Printer Attachment Cable • System Board • Power Supply
30XX Network Adapter	<ul style="list-style-type: none"> • Network Adapter • System Board • Network Translator • Power Supply • Coaxial Cable
31XX Alternate Network Adapter	<ul style="list-style-type: none"> • Network Adapter • System Board • Network Translator • Power Supply • Coaxial Cable
32XX Display Adapter Card	<ul style="list-style-type: none"> • Display Adapter Card • Programmed Symbols Adapter Card • All-Points-Addressable Adapter Card • Top Card Connector
All Other 35XX Numbers Except 3500	<ul style="list-style-type: none"> • Adapter
3504	<ul style="list-style-type: none"> • Adapter connected on the twinaxial cable during offline test. • Adapter
3508	<ul style="list-style-type: none"> • Work station address in use by another work station. • Diagnostic diskette from another IBM PC was used. • Adapter
3509, 3599	<ul style="list-style-type: none"> • Diagnostic program failing (recreate adapter integrated diagnostic diskette on blank diskette)
3540	<ul style="list-style-type: none"> • Work station address invalid, not configured at the controller. • Twinaxial cable not connected or is failing. • Diagnostic diskette from another IBM PC was used. • Adapter
3588 Enhanced Display Station Emulation Adapter	<ul style="list-style-type: none"> • Feature not installed. • Device I/O address switches set incorrectly. • Adapter

36XX GPIB Adapter (General Purpose Interface Bus)	<ul style="list-style-type: none"> • GPIB Adapter • System Board
38XX Data Acquisition	<ul style="list-style-type: none"> • Data Acquisition and Control Adapter • System Board
39XX Professional Graphics Controller	<ul style="list-style-type: none"> • Professional Graphics Adapter • System Board
44XX Display Attachment Unit	<ul style="list-style-type: none"> • 5278 Display Attachment Unit and 5279 Display • 5378 Display Attachment Unit and 5379 Display
(3270 PC/G and GX XT™ BASED)	<ul style="list-style-type: none"> • Display Adapter Card
45XX IEEE Interface Adapter Card	<ul style="list-style-type: none"> • IEEE Interface Adapter Card (IEEE-488)
56XX Financial Communication System	<ul style="list-style-type: none"> • FCS Input Option • FCS Output Option • FCS Security Option
71XX Voice Communications Adapter	<ul style="list-style-type: none"> • Voice Communication Adapter • Voice Communication Cable • System Board • Power Supply

Parts Listing

Part Number	Machine Type	Description
8529238	1	16Kb/64Kb System Board
8654213	1	64Kb/256Kb System Board
8529155	1	Power Supply
8529142	1	16Kb (for 16Kb/64Kb System Board) RAM Module
8529247	2	Power Supply
8529275	2	10Mb Fixed Disk Drive
6489907	2	20Mb Fixed Disk Drive
6489914	2	Fixed Disk Adapter
8654417	3	Power Supply
8285978	3	360Kb Diskette Drive
8654422	3	Keyboard Assembly
8529297	1, 2	Keyboard Assembly
8529206	1, 2	320Kb/360Kb Diskette Drive Assembly
8654215	1, 2	Enhanced Graphics Adapter (w/o Memory Card)
8529148	1, 2	Monochrome Display and Printer
8529254	2, 3	64Kb/256Kb System Board
8529211	1, 2, 3	64Kb (5150 = 64Kb/256Kb System Board) RAM Module
8529152	1, 2, 3	Diskette Drive Adapter
8654401	1, 2, 3	64Kb/256Kb Memory Expansion Option
8665792	1, 2, 3	Distributed Function Communication Adapter
1 = 5150		
2 = 5160		
3 = 5155		

Displays

Part Number	Machine Type	Description
8529171	5151	Monochrome Display
8529227	5153	Color Display
6321035	5154	Enhanced Color Display
6931932	5272	Color Display

Printers

Part Number	Machine Type	Description
6412641	4201	Proprinter
8529246	5152	Matrix Printer
6323469	5182	Color Printer

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