

FRONT

PICTURE 1

February 1992

This pamphlet contains a Symptom-to-FRU Index, procedures for isolating problems to a FRU, and a parts listing for the IBM Personal System/2 Model 57 SX, Model 57 SLC, and Model M57 SLC.

This pamphlet is intended to be used with the IBM Personal System/2 *Hardware Maintenance Reference* manual (part number 15F2190, form number S15F-2190, SBOF-3989) and the IBM Personal System/2 *Hardware Maintenance Service* manual (part number 15F2200, form number S15F-2200, SBOF-3988).

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FRONT_1 Safety Information

Refer to the *Hardware Service Maintenance General Information* pamphlet for the following information:

- General Safety
- Electrical Safety
- Safety Inspection Guide.

Second Edition (February 1992)

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1.0 General Checkout

The diagnostic tests are intended to test *only* IBM (*) products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

Warning: Drives in the system you are servicing might have been rearranged or the drive startup sequence might have been altered. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

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Subtopics

- 1.1 How to Diagnose Combined FRUs
- 1.2 How to Use Error Messages
- 1.3 How to Disable the Power-On Password

1.1 How to Diagnose Combined FRUs

If an adapter or device consists of more than one FRU, an error code might be caused by any of the FRUs. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change.

1.2 How to Use Error Messages

Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the "Symptom-to-FRU Index" in topic 13.0.

1.3 How to Disable the Power-On Password

To disable the power-on password, move the J18 jumper on the system board to the unused position. (See "Power-On Password" in topic 2.0 for more information.)

+----+
|001|
+----+

- Power-off the system and all external devices.
- Check all cables and power cords.
- Make sure there are no diskettes in the drives.
- Set all display and volume controls to the middle position
- Power-on all external devices.
- Power-on the system.
- Watch the screen for a power-on self-test (POST) error code.

Write down any error codes that are displayed. (You can press Pause when an error code occurs to hold the error code on the screen. Press F1 to continue.)

If the test stops and you cannot continue, go to "Symptom-to-FRU Index" in topic 13.0.

ARE ANY EXTERNAL SCSI DEVICES ATTACHED TO THE SYSTEM?

Yes No

| |
| +----+
| |002|
| +----+
| Continue with Step 005.
|

+----+
|003|
+----+

DID THE POWER-GOOD LIGHT ON ALL OF THE EXTERNAL SCSI DEVICES COME ON?

Yes No

| |
| +----+
| |004|
| +----+
| Go to the external devices service documentation.
|

+----+
|005|
+----+

DID YOU RECEIVE A POST ERROR CODE?

Yes No

| |
| +----+
| |006|
| +----+
| Continue with Step 014.
|

+----+
|007|
+----+

IS THE FIRST POST ERROR CODE WITHIN THE RANGE OF 02080000 190I TO 02410000 190I?

Yes No

| |
| +----+
| |008|
| +----+
| Continue with Step 014.
|

+----+
|009|
+----+

- Restart the system and verify that the "Enable" and "Disable" settings are correct. (For more information, go to "SCSI Device Settings" in topic 4.0.) If you receive a warning on the screen regarding the "Keep" and "Remove" settings, follow the instructions on the screen before continuing.

DID YOU HAVE TO CORRECT ANY OF THE ENABLE AND DISABLE SETTINGS?

Yes No

| |
| +----+
| |010|
| +----+
| Go to "Symptom-to-FRU Index" in topic 13.0. Before replacing any
| SCSI devices, verify there are no duplicate SCSI ID settings.
|


```
|
+----+
|011|
+----+
- Restart the system.
DID THE POST ERROR REMAIN?
Yes No
|
| +----+
| |012|
| +----+
| Continue with Step 014.
|
+----+
|013|
+----+
Go to "Symptom-to-FRU Index" in topic 13.0.
-----

+----+
|014|
+----+
- Press Ctrl+Alt+Del. When the cursor moves to the upper right, press
Ctrl+Alt+Ins and check for the following responses:

1. One or more beeps.

2. Readable instructions on the Main Menu.

DID YOU RECEIVE BOTH RESPONSES?
Yes No
|
| +----+
| |015|
| +----+
| Go to the "Symptom-to-FRU Index" in topic 13.0.
| - or -
| If that does not correct the problem, go to "Undetermined Problem" in
| topic 5.0.
|
+----+
|016|
+----+
DO YOU HAVE AN AUDIO PROBLEM (M57 SLC ONLY)?
Yes No
|
| +----+
| |017|
| +----+
| Continue with Step 019.
|
+----+
|018|
+----+
Go to "M-Audio Capture/Playback Adapter/A" in topic 12.0.
-----

+----+
|019|
+----+
- If you are not at the Main Menu, follow the instructions on the screen
to advance to the Main Menu. Press Ctrl+A and run system checkout.
- If you are unable to advance to the Main Menu, go to "Undetermined
Problem" in topic 5.0.

Notes:

1. If the system has incorrect keyboard responses, go to "Keyboard" in
topic 8.0.
2. If the printer has incorrect printer responses, go to "Printer" in
topic 11.0.
3. If the image on the display is out-of-focus, jittering, rolling,
shifting, or has unreadable characters, go to "Display" in
topic 7.0.
4. If a minimum of 896KB of memory is not active, the diagnostic tests
cannot be loaded.

IS THE LIST OF INSTALLED DEVICES CORRECT?

Note: System memory and the Cached Processor Option are not considered
devices.

Yes No
| |
```

+---+

|020|

+---+

Go to "Installed Devices List" in topic 3.0. If that does not correct the problem, go to "Undetermined Problem" in topic 5.0.

+---+

|021|

+---+

- Run the advanced diagnostic tests.

DID THE TESTS IDENTIFY A FAILURE?

Note: If a test starts but does not complete and you cannot continue, replace the device that was being tested.

Yes No

|

+---+

|022|

+---+

Note: If you noticed an error symptom or if you received any POST error codes when the system was powered-on, go to "Symptom-to-FRU Index" in topic 13.0.

You may have an intermittent problem:

- Check for damaged cables or connectors.
- Reseat all adapters, drives, and modules.
- Check the system unit fan for proper operation.
- Start an error log and run the tests multiple times.
- Check the power supply voltages. (See "Power Supply" in topic 6.0).

+---+

|023|

+---+

Follow the action described on the screen. If that does not correct the problem, go to the "Symptom-to-FRU Index" in topic 13.0.

2.0 Power-On Password

To service a system with an active, unknown, power-on password, do the following:

1. Power-off the system.
2. Remove the system unit cover.
3. Move the jumper on system-board connector J18 to connect the center pin and the pin on the opposite end of the connector. J18 is located toward the rear of the system board and to the right of the bus adapter connector.
4. Power-on the system.

The system detects the change and removes the password. You need not move the jumper back to its original position when you are finished.

To reactivate the password, the user must start the system programs, select **Set features** from the Main Menu, then select **Set password and Unattended Start Mode**, and follow the instructions on the screen.

3.0 Installed Devices List

At the start of the customer or advanced diagnostics tests, an installed devices list is displayed. Normally, all adapters and devices installed in a system are listed.

- If an adapter or device that *is not* installed is listed, go to "Undetermined Problem" in topic 5.0.
- If an adapter or device that *is* installed is missing from the list, you have one of the following conditions:
 - The System Partition on the hard disk drive (fixed disk drive) or the Reference Diskette you are using does not contain the code (contained on an option diskette) required to support that device.
 - The SCSI interface on the system board might have failed.
 - The device missing from the list is an unrecognizable drive or adapter.
 - The device missing from the list requires an additional diskette or service manual.
 - The device missing from the list is defective.
 - An adapter is defective.
 - A power supply voltage is incorrect. (See "Power Supply" in topic 6.0).

If the adapter is on the list, run the adapter diagnostic tests.

Subtopics

3.1 Device Type

3.1 Device Type

Warning: A setup configuration other than the default settings might exist on the system. Running Automatic Configuration might alter those settings. Note the current configuration settings (using the **View configuration** option) and verify that the same settings are in place when service is complete. (For more information about configuration, refer to the *Hardware Maintenance Reference* manual.)

Run **Automatic Configuration** and determine which type of device, SCSI or non-SCSI, is missing from the Installed Devices List, then continue. (If both SCSI and non-SCSI devices are missing, go to "Undetermined Problem" in topic 5.0.)

Subtopics

3.1.1 SCSI Devices

3.1.2 Non-SCSI Devices

3.1.1 SCSI Devices

The adapter supporting the missing device might be defective. If more than one SCSI adapter is installed, isolate them one at a time.

1. Power-off the system and disconnect all internal and external SCSI devices from the SCSI adapter (except the default hard disk drive).
2. Terminate the adapter, as required.
3. Power-on the system and run **Automatic Configuration**. If the adapter is not on the Installed Devices List in Advanced Diagnostics, the adapter is defective. If the adapter is on the list, run the adapter diagnostic tests.
4. If the adapter fails the tests, replace it. If the adapter passes the tests, a different adapter might be defective.
5. Reconnect the devices to the adapter, then terminate the adapter, as required.
6. Go to "Undetermined Problem" in topic 5.0 to find the problem.

3.1.2 Non-SCSI Devices

Replace the missing device.

Note: If the number of diskette drives shown on the list is incorrect, an error can occur during the tests. Restart the system, select **View Configuration** from the Set Configuration menu and verify that the drive information is correct, and then continue testing.

4.0 SCSI Device Settings

To verify that the SCSI presence-error-reporting-device "Enable" and "Disable" settings are correct, select **Set and view SCSI device configuration** from the **Set configuration** menu and determine if there are any "presence error reporting" devices listed. The settings must be as follows:

- Devices connected to the system must be set to "Enabled."
- Devices listed but not connected must be set to "Disabled."

Note: Some SCSI devices do not use the enable or disable settings.

Change the settings by pressing the F5 key, then save them by pressing the F10 key.

5.0 Undetermined Problem

Use the following procedure when the diagnostics tests do not identify the failing FRU.

Check the power supply (see "Power Supply" in topic 6.0). If the power supply is operating correctly, return here and continue with the following procedure.

1. Power-off the system.
2. Remove or disconnect one of the following adapters or devices: (Do not isolate FRUs that are known to be good.)

Note: Minimum operating requirements are 1MB of system memory and the default hard disk drive (SCSI ID 6).

- Non-IBM devices
- Modem, printer, mouse, or other external device
- Any adapter (see note below)
- Any type of drive
- Memory module kits
- Bus adapter
- Math coprocessor (if installed)
- Cached processor option (if installed).

3. Power-on the system and run system checkout (see Step 14 on page 3). Do not reconfigure the system. If diagnostics cannot be loaded from the hard disk drive, try and load them from the Reference Diskette. Test only those adapters and devices still attached to the system.
4. If the symptom remains, repeat steps 1 through 3 until you find the failing FRU or until all FRUs have been removed.
5. If all of the FRUs listed have been removed and the problem remains, replace the system board. If the problem still remains, replace the bus adapter.

Note: If the problem goes away when you remove an adapter from the bus adapter, and replacing that adapter does not correct the problem, replace the system board. If the problem remains, replace the bus adapter.

6.0 Power Supply

If the power-on indicator is not on, and if the power-supply fan is not running, check the power cord for proper installation and continuity. Verify that the voltage-select switch is set for the correct voltage.

If these are correct, either the power supply is defective or another component is defective and is causing the power supply to shut off. To verify that the power supply is operating correctly, do the following:

1. Power-off the system and disconnect the system power cord.
2. Remove all power supply connectors from the system board and drives.
3. On the system board, connect your meter to the pins that correspond to P2-4 and P2-6 (see "System Board Connector P2" in topic 6.2). and check for the following conditions:

- When the power switch is On, you should have continuity between the pins.
- When the power switch is Off, you should not have continuity between the pins.

If either of these conditions is not present, replace the control panel assembly (includes the power switch).

If the power switch is working properly, remove your meter from P2 and continue with the following:

4. On connector P2, short pin 4 to pin 6 (see "System Board Connector P2" in topic 6.2).
5. Connect the system power cord.
6. Check the power supply voltages using the following figures.

Subtopics

- 6.1 System Board Connector P1
- 6.2 System Board Connector P2
- 6.3 Drive Connectors 1 - 4

6.1 System Board Connector P1

PICTURE 2

Pin	Signal	V dc Min.	V dc Max.
1, 2	+5 volts	+4.8	+5.25
3, 4	Ground		

6.2 System Board Connector P2

PICTURE 3

Pin	Signal	V dc Min.	V dc Max.
1, 2	+12 volts	+9	+15
3	Power Good		
4	On/Off Signal		
5	-12 volts	-9	-15
6	Ground		
7	-5 volts	-4.8	-5.25

6.3 Drive Connectors 1 - 4

PICTURE 4

Pin	Signal	V dc Min.	V dc Max.
1	+12 volts	+9	+15
2, 3	Ground		
4	+5 volts	+4.8	+5.25

If any of the voltages are not correct, replace the power supply. If all voltages are correct, the power supply is functioning properly. Another system component might be causing the power supply to shut off. Return to the procedure that sent you here and continue. (If you have completed that procedure, go to "Undetermined Problem" in topic 5.0.)

7.0 Display

If the screen is rolling, replace the display assembly. If that does not correct the problem, replace FRUs in the following order until the problem goes away.

- Display adapter (if used)
- System board
- Bus adapter (if display adapter is used).

If the screen is not rolling, do the following to run the display self-test:

1. Power-off the system unit and display.
2. Disconnect the display signal cable.
3. Power-on the display.
4. Turn the contrast to its maximum position.
5. Turn the brightness control to the center detent position.

Check for the following conditions:

- The screen should be white or light gray, with a black margin as described below:
 - 8503, 8504, 8512, 8513, 8514, 8515:** 2-20 mm (0.08-0.79 in.) wide on one or both sides
 - 8506:** 2-50 mm (0.08-1.97 in.) wide on the top, bottom, or both
 - 8507, 8508:** 2-20 mm (0.08-0.79 in.) wide on the top, bottom, or both.
- The contrast and brightness controls should vary the screen intensity.

If the display does not meet these conditions, replace the display. If it meets the conditions, replace FRUs, in the following order, until the problem goes away.

Note: Certain adapter failures can cause video problems. Before replacing any FRUs, remove any option adapters to see if the problem disappears.

- Display adapter (if used)
- System board
- Bus adapter (if display adapter is used)
- Display.

9.0 *Cached Processor Option*

Systems with a cached processor option installed have a P1 label attached to the system serial number. If a cached processor option is installed in the system you are servicing, use the following procedure *before* you replace the system board.

Subtopics

9.1 FRU Isolation Procedure

9.1 FRU Isolation Procedure

```
+----+
|001|
+----+
```

Note: Version 1.22 or a later version of the system programs support the cached processor option.

IS THE ERROR CODE A 000169XX OR A 0129XXXX?

Yes No

```
|
|
| +----+
| |002|
| +----+
| Go to "Symptom-to-FRU Index" in topic 13.0.
|
|
```

```
+----+
|003|
+----+
```

- Power-off the computer and all attached devices.
- Disconnect the computer power cord from the electrical outlet.
- If you have not already done so, remove the floor stand and the system cover.
- If the speaker is located above the cached processor option, move the speaker bracket assembly out of the way.

IS A MATH COPROCESSOR INSTALLED?

Yes No

```
|
|
| +----+
| |004|
| +----+
| Go to Step 008.
|
|
```

```
+----+
|005|
+----+
```

- Remove the math coprocessor.
- Connect the computer power cord and power-on the computer.

DID THE PROBLEM REMAIN? (DISREGARD A CONFIGURATION ERROR CAUSED BY REMOVING THE MATH COPROCESSOR.)

Yes No

```
|
|
| +----+
| |006|
| +----+
| Replace the math coprocessor. If that does not fix the problem,
| replace FRUs in the following order:
|
|  Cached processor option
|  System board.
|
|
```

```
+----+
|007|
+----+
```

- Power-off the computer.
- Disconnect the computer power cord from the electrical outlet, then continue with Step 008.

```
+----+
|008|
+----+
```

- Remove the cached processor option.
- Connect the computer power cord and power-on the computer.

DID THE PROBLEM REMAIN? (DISREGARD THE 169 CONFIGURATION ERROR CODE CAUSED BY REMOVING THE CACHED PROCESSOR OPTION.)

Yes No

```
|
|
| +----+
| |009|
| +----+
| Replace the cached processor option. If the problem remains, replace
| the system board. If you still have a problem, go to "Undetermined
| Problem" in topic 5.0.
|
|
```

```
+----+
|010|
```

+---+

The cached processor option is not the cause of the problem. Test the system without the option to determine the problem. (If you are instructed to replace the system board, do so.)

10.0 Memory

Use the following procedure when you suspect a problem with system memory. Power-off the system before you remove or replace parts.

Notes:

1. The amount of usable memory will be less than the amount of installed memory. (The system software and some functions, such as video and SCSI, use some of the memory space.) The difference between the usable memory and the installed memory is most noticeable when the installed memory is greater than 12MB.
2. The customer diagnostics will deallocate defective memory. After you replace defective memory, run the advanced diagnostic memory test to restore the memory to the system configuration.

A 000110XX error indicates a system-board parity-check error.

Remove memory module kits, one at a time, until the problem goes away. When this happens, either the system board or the memory module kit you last removed is defective. Install a known-good kit of the same type into the same connector.

If the problem goes away, the memory module kit you replaced is defective. If the problem remains, the system board is defective. If the problem remains after all memory module kits have been removed, replace the system board.

A 00020XXX or a 00021XXX error indicates a failing system-board memory module kit; a 000225XX or 000226XX error indicates that a memory module kit is the wrong type or is installed in the wrong slot. If the error message does not indicate the location of the failing kit, follow the procedure for a 000110XX error.

Subtopics

10.1 Interleaved Memory Configurations

10.1 Interleaved Memory Configurations

The memory controller supports interleaved memory when memory module kits of the same size and speed are installed as shown in the following table.

MEM 1	MEM 2	MEM 3
2MB	Empty	Empty
2MB	2MB	Empty
2MB	2MB	2MB*
4MB	4MB	Empty
4MB	4MB	4MB*
* The memory in MEM 3 does not operate as interleaved memory.		

During the memory tests, an "i" will appear next to the test when an interleaved memory configuration is being tested.

Note: Interleaved memory is not supported when memory is disabled.

11.0 Printer

1. Make sure the printer is properly connected and powered-on.
2. Run the printer self-test.

If the printer self-test does not run correctly, the problem is in the printer. Refer to the printer service manual.

If the printer self-test runs correctly, install a wrap plug on the parallel port and run the advanced diagnostic tests to determine which FRU failed.

If the advanced diagnostic tests (with the wrap plug installed) do not detect a failure, replace the printer cable. If that does not correct the problem, do one of the following:

1. If the printer is attached to the parallel port on the system board, replace the system board.
2. If the printer is attached to the parallel port on an adapter, replace FRUs, in the following order, until the problem goes away.
 - Adapter
 - System board
 - Bus adapter.

12.0 M-Audio Capture/Playback Adapter/A

Use the following procedure when you suspect a problem with the M-Audio Capture/Playback Adapter/A (ACPA/A). To diagnose the problem, you must run the ACPA/A diagnostics.

Subtopics

12.1 Using the ACPA/A Diagnostics

12.1 Using the ACPA/A Diagnostics

Insert the diskette containing the ACPA/A diagnostics into drive A: and start the system. When the ACPA/A diagnostics logo screen appears, press Enter. Select F1 to run the basic diagnostics. These diagnostics test all functions of the card except for microphone input.

If you suspect a problem with the input from a microphone, use the advanced diagnostics to test the microphone input. This test and the other advanced diagnostics tests are described below.

Note: If this testing does not find the problem, go to the "Symptom-to-FRU Index" in topic 13.0.

Subtopics

12.1.1 ACPA/A Advanced Diagnostics

12.1.1 ACPA/A Advanced Diagnostics

To access the advanced diagnostics, select F2. The diagnostics consists of the following:

Audio Output Tone (Tone): Select this item from the main menu to test the right and left audio output channels of the control panel assembly. The test allows you to choose the frequency and amplitude of the tone. To start the oscillator, select **Oscillator Start** or press Alt+O. To change the frequency and amplitude of the tone, select **Change Oscillator Values** or press Alt+V.

Microphone Input Loop (Loop): Select this item from the main menu to test the microphone input from the audio card and control panel assembly. To start the test, select **Mike into R and L Out** or press Alt+Z.

Microphone Gain Toggle (Toggle): Select this item to toggle between the high and low gain settings on the audio card. To toggle between the settings, select **Mike Gain** or press Alt+M.

13.1 No-Beep Symptoms

Symptom/Error	FRU/Action
No beep, power-on light does not light, and fan does not run. (See "Undetermined Problem" in topic 5.0 before replacing any FRUs.)	Power Supply Control Panel Assembly System Board Any device or adapter Bus Adapter
No beep, fan runs, and 000215XX is displayed. (See "Memory" in topic 10.0 before replacing any FRUs.)	Memory Module Kit System Board
No beep, fan runs, power-on indicator is on, and system stops during POST with a message displayed. (See "Undetermined Problem" in topic 5.0 before replacing any FRUs.)	System Board Power Supply
No beep and the system is otherwise functional. (For M57 SLC, make sure volume control is not set too low)	Control Panel Assembly System Board Audio Cable (M57 SLC) Interposer Card (M57 SLC)
No beep, fan runs, power-on indicator is on, and system stops during POST with no message displayed. (See "Undetermined Problem" in topic 5.0 before replacing any FRUs.)	System Board Any device or adapter Bus Adapter

13.2 Beep Symptoms

Symptom/Error	FRU/Action
One long and one short beep. (See "Display" in topic 7.0 before replacing any FRUs.)	Display Adapter (if used) System Board Bus Adapter
One long and two short beeps. (See "Display" in topic 7.0 before replacing any FRUs.)	Display Adapter (if used) System Board Adapter Video Memory Bus Adapter ACPA/A
One or two beeps and a blank or unreadable display, or a blinking cursor. (See "Display" in topic 7.0 before replacing any FRUs.)	Display Adapter (if used) System Board Adapter Video Memory Display Bus Adapter ACPA/A
Continuous beep.	System Board
Repeating short beeps.	Keyboard (Stuck Key) System Board ACPA/A

13.3 Audio Symptoms (Model M57 SLC)

Symptom/Error	FRU/Action
Front microphone and front headphone inoperative and rear microphone, rear headphone, and system beeps are working properly.	Control Panel Assembly Cable (system board to control panel assembly)
Front microphone, front headphone, and system beeps inoperative and rear microphone and rear headphone are working properly.	Control Panel Assembly Cable (system board to control panel assembly) Interposer Card
Distorted or missing audio from control panel assembly line outputs or headphone jack.	ACPA/A
Front microphone inoperative and rear microphone works properly.	Control Panel Assembly ACPA/A Cable (ACPA/A to control panel assembly)
Rear microphone inoperative.	ACPA/A Microphone
Audio from CD-ROM does not play to the front speaker, but plays to Line Output.	Control Panel Assembly ACPA/A Cable (ACPA/A to control panel assembly)
Audio from CD-ROM does not play to the front speaker or to Line Output.	CD-ROM Cable (CD-ROM to ACPA/A)

13.4 Miscellaneous Symptoms

Symptom/Error	FRU/Action
Program loads from the hard disk drive or a non-system disk or disk error (with the Reference Diskette in drive A).	Diskette Drive System Board Power Supply Reference Diskette
Display screen changes colors.	Display System Board Adapter Video Memory
The System Partition has been updated and the Diskette and F1 error prompt appears on the screen.	Verify an operating system has been loaded onto the primary fixed disk drive.
One or more keys do not work and the system is otherwise functional. (See "Keyboard" in topic 8.0 before replacing any FRUs.)	Keyboard Keyboard Cable System Board
Power-on light does not light, fan runs, and system is functional.	Control Panel Assembly
Power-on light does not light, fan runs, and system is not functional.	System Board
Intermittent Failures. (See "Undetermined Problem" in topic 5.0 before replacing any FRUs.)	Power Supply System Fans Any device or adapter
System cannot be powered-off.	Control Panel Assembly System Board Power Supply
LED for hard disk drive stays on.	Hard Disk Drive System Board
LED for hard disk drive not working, but system is completely functional.	Control Panel Assembly System Board
Unable to start Reference Diskette.	Diskette Drive System Board Diskette Drive Cable Reference Diskette

13.5 Numeric Error Codes

Symptom/Error	FRU/Action
00010200, 00010300, 00010400, 00010700	System Board
00010800	System Board Any Adapter Bus Adapter
000110000 (See "Memory" in topic 10.0 before replacing any FRUs.)	Memory Module Kit System Board
000113XX	Any Adapter System Board Any Drive
000114XX	Any Adapter Bus Adapter
000118XX	Memory Module Kit
00016100	Battery System Board Bus Adapter
00016300, 00016400, 00016500 (If setting configuration does not solve the problem, see "Installed Devices List" in topic 3.0.)	Set Configuration/Features System Board
000166XX	Any Adapter
000169XX Processor configuration error. (Verify that the processor configuration information is correct before replacing any FRUs.)	Cached Processor Option System Board
000171XX	Battery System Board Bus Adapter
000172XX	System Board
00017300 (Verify that the "Enable," "Disable" settings are correct before replacing any FRUs. See "SCSI Device Settings" in topic 4.0.)	Any Device System Board Bus Adapter
00017400 (If Automatic Configuration does not solve the problem, run Advanced Diagnostics.)	Set Configuration/Features
00018100 (The system requires a hard disk drive with a SCSI ID of 6, LUN 0; or a network adapter for a remote IPL. Neither of these were detected.)	Set Auto Configuration Network Adapter Hard Disk Drive System Board
00019400	System Board Memory Module Kit
0001XXXX (not listed above)	System Board Any Adapter Bus Adapter
0002XXXX (See "Memory" in topic 10.0 before replacing any FRUs.)	Memory Module Kit System Board
00030X00	Keyboard System Board Keyboard Cable

00040100	System Board
00060100	Defective Diskette System Board
00060200	Defective Diskette
00060400 Unsupported drive or cable.	Diskette Drive System Board Diskette Drive Cable
000662XX Wrong drive type installed.	Diskette Drive System Board Diskette Drive Cable
0006XXXX (not listed above)	Diskette Drive System Board Diskette Drive Cable
0007XXXX	Math Coprocessor System Board
00110200, 00110600	System Board Any serial device
00110700	Communications Cable System Board
0011XX00 (not listed above) Check the power supply voltages before replacing the system board. (See "Power Supply" in topic 6.0.)	System Board
001207XX	Communications Cable Dual Async Adapter/A
0012XXXX (not listed above)	Dual Async Adapter/A System Board Any Serial Device
00129020 (Disk cache error)	Cached processor option (if used) System Board
0014XX00 (See "Printer" in topic 11.0 before replacing any FRUs.)	Printer System Board
00180300	System Board
00240100 (See "Display" in topic 7.0 before replacing any FRUs.)	Display System Board Adapter Video Memory
00241000	System Board
0037XXXX (See "Undetermined Problem" in topic 5.0 before replacing any FRUs.)	System Board Hard Disk Drive Hard Disk Drive Cable
004611XX, 004630XX	Multiport/2 Interface Board Multiport/2 Adapter
004612XX, 004613XX, 004640XX, 004641XX	Memory Module Package Multiport/2 Adapter
00465000	Multiport Interface Cable
0046XXXX	Multiport/2 Adapter Multiport/2 Interface Board Memory Module Package
0074XXXX	Display Adapter 8514/A System Board Bus Adapter
0075XXXX (See "Display" in topic 7.0 before replacing any FRUs.)	Display Adapter (if used) System Board Adapter Video Memory Display

IBM PS/2 Model 57 SX, 57 SLC, M57 SLC HMS
Numeric Error Codes

00860100, 00860200	Pointing Device (Mouse) System Board
00860300	System Board
00860400	System Board Pointing Device (Mouse)
0096XXXX	SCSI Adapter (with Cache) Any SCSI Device System Board
010007XX	Communications Cable Multiprotocol Adapter/A
0100XXXX (not listed above)	Multiprotocol Adapter/A System Board Bus Adapter
0101XXXX (not listed above)	Modem Adapter/A System Board Any Serial Device
0107XXXX	5.25-inch External Diskette Drive 5.25-inch Diskette Drive Adapter/A
0112XXXX	SCSI Adapter (without Cache). Any SCSI Device
0129XXXX	Cached Processor Option (if used) System Board
0137XXXX	System Board
0141XXXX	Realtime Interface Coprocesor Portmaster (*) Adapter/A
01471000	System Board
0147XXXX	System Board Adapter Video Memory
0148XXXX	System Board Adapter Video Memory
0152XXXX	XGA (*) Display Adapter/A Adapter Video Memory System Board
0164XXXX	120MB Internal Tape Drive Diskette Cable System Board
016500XX	6157 Tape Attachment Adapter
016520XX	6157 Streaming Tape Drive
016540XX	6157 Streaming Tape Drive 6157 Tape Attachment Adapter
0166XXXX, 0167XXXX (For diagnostic information refer to the Token-Ring Network Adapter/A service Information.)	Token-Ring Network Adapter/A System Board Bus Adapter
0200XXXX	Image Adapter/A Adapter Video Memory System Board
0208XXXX (Verify there are no duplicate SCSI ID settings.)	Any SCSI Device
0210XXXA (60MB)	SCSI Hard Disk Drive

IBM PS/2 Model 57 SX, 57 SLC, M57 SLC HMS
 Numeric Error Codes

0210XXXB (80MB)	SCSI Hard Disk Drive
0210XXXC (120MB)	SCSI Hard Disk Drive
0210XXXD (160MB)	SCSI Hard Disk Drive
0210XXXE (320MB)	SCSI Hard Disk Drive
0210XXXF (400MB)	SCSI Hard Disk Drive
0210XXXU (Size undetermined)	SCSI Hard Disk Drive
(If the failing device is an	SCSI Hard Disk Drive
external device, go to the	SCSI Adapter (if used)
external devices service	System Board
pamphlet.)	SCSI Cable

0215XXXX	SCSI CD-ROM Drive
(If the failing device is an	SCSI Cable
external device, go to the	SCSI Adapter (if used)
external devices service	
pamphlet.)	

I999XXXX	Default Hard Disk Drive
(See "I999XXXX Error Codes" in	SCSI Adapter (if used)
topic 13.6 before replacing any	System Board
FRU's.)	

(*) Trademark of the International Business Machines Corporation.

13.6 I999XXXX Error Codes

You are here because the system has an I999XXXX error code displayed. Most of these errors can be corrected without replacing any FRUs. These errors can be caused by any of the following conditions:

- Invalid startup sequence (default drive 6 is not in the startup sequence)
- Operating system not found in startup sequence
- System Partition not found on default drive
- Hardware failure

Find your error symptom in the table below. Before you replace any FRUs, verify that the selectable startup sequence is valid (see 13.6).

Symptom/Error	FRU / Action
I999001X,I999002X I999003X,I999004X I999005X,I999006X I999007X (The actions for these errors are valid only when running the system from the Hard Disk Drive.)	Update the System Programs using the Reference Diskette. (See "Updating the System Programs")
I99900X1,I99900X2 I99900X3,I99900X4 I99900X6,I99900X7 I99900X8 (The actions for these errors are valid only when running the system from the Reference Diskette.)	Restart the system from the Reference Diskette.
I99900X5 (Reference Diskette recovery prevented)	Power-off the system, toggle the power-on password jumper, then power-on the system.
I9990302 (No operating system found on default drive 6.)	Install an operating system.
I9990303 The initial machine load (IML) code did not load from the System Partition.	Update the System Programs from the Reference Diskette. (See "Updating the System Programs").
I9990304 (No startup device with the ASCII console.)	Restart the system with a diskette containing an operating system.
I9990401 (Unauthorized access. Clear the power-on password before replacing any FRUs.)	System Board
I9990401,I9990602 I9990302,I9990600 I9990607,I9990609	System Board

Verifying the Selectable Startup Sequence

- Start the system from the Reference Diskette and select **Set Features** from the Main Menu.
- Select **Set Startup Sequence** and see if the default hard disk drive (drive 6) is in the startup sequence. If you receive an error message, follow the instructions on the screen, then return here.
- If the default drive is in the startup sequence, exit from the screen and the Main Menu, then go to step 2 under "Testing the Default Hard Disk Drive." If the default drive is not in the startup sequence, follow the instructions on the screen, then go to "Testing the Default Hard Disk Drive."

Testing the Default Hard Disk Drive

- Power-off the system, remove the Reference Diskette, then power-on the system. If the Diskette and F1 error prompt appears on the screen, this means no operating system was found. Go to step 2. If the "Not OK" symbol appears on the screen, the system programs failed to load. Go to "Updating the System Programs."

14.0 How to Use This Parts Catalog

INDEX REFERENCE NUMBERS: Refer to the illustrations for the index reference numbers that are listed in the left margin of the parts listing.

SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.

AR: (As Required) indicates that the quantity is not the same for all machines.

R: (Restricted) indicates that the part has a restricted availability.

INDENTURE: The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

Indenture Relationship of Parts

- (No dot) Main Assembly
- (One dot) □ Detail parts of a main assembly
- (One dot) □ Subassembly of the main assembly
- (Two dot) □ □ Detail part of a one-dot
 subassembly
- (Two dot) □ □ Subassembly of a one-dot
 subassembly

15.0 System Overview

PICTURE 6

16.0 Parts

Index System Unit

1	Top Cover Assembly (without lock)	85F0085	
2	Rear Panel Cover	92F0035	
3	Power Supply (197 Watt)	92F0058	
4	System Board (57 SX)	84F7994	
4	System Board (57 SLC, M57 SLC)	85F0298	
	Memory Module Kits		
	2MB (70ns)	92F0102	
	4MB (70ns)	92F0105	
	8MB (70ns)	64F3606	
5	Frame Assembly (R)		
	Type 1 (57 SX, 57 SLC)	10G3965	
	Type 2 (M57 SLC)	92F0040	
6	Hard Disk Drive		
	(see Hard Disk Drive)		
7	Diskette Drive		
	(see Diskette Drive)		
8	Drive Tray for 3.5-Inch Drive (Bays 1,2,3)		85F0097
9	5.25-Inch Bay Drive Guides (2)	92F0014	
10	Front Adapter Support Guide	92F0042	
11	Bus Adapter with Battery		
	Type 1 (57 SX, 57 SLC)	85F0056	
	Type 2 (M57 SLC)	92F0114	
	Battery (3 V Lithium)	33F8354	
12	Control Panel Assembly (57 SX,57 SLC)		
	(with speaker, power switch, and cable)		92F0002
12	Control Panel Assembly (M57 SLC)		
	Control Panel Assembly		
	(with speaker and power switch)	92F0109	
	Cable to System Board	92F0111	
	Interposer (for connector P2)	92F0110	
	Cable to ACPA/A	92F0113	
13	3.5-Inch Blank Bezel (Bay 4)	85F0092	
	Bezel Insert for 85F0092	85F0095	
14	5.25-Inch Louvered Bezel (Bay 3)	85F0094	
	Bezel Insert for 85F0094	85F0096	
15	5.25-Inch Blank Bezel (Bay 2)	85F0091	
15	3.5-Inch Diskette Drive Bezel (Bay 2,3)		84F0003
15	5.25-Inch Diskette Drive Bezel (Bay 2,3)		64F4125
15	CD-ROM Drive Bezel (Bay 2,3)	64F4102	
16	3.5-Inch Diskette Drive Bezel (Bay 1)	85F0093	
17	Retainer Plate	85F0098	
18	Cover Lock	92F0003	
19	Model 57 SX Front Logo (R)	92F0037	
19	Model 57 SLC Front Logo (R)	92F0136	
19	Model M57 SLC Front Logo (R)	92F0137	
	Miscellaneous Parts Kit	92F0015	
	Pedestal	92F0000	

Diskette Drive

1.44MB	Diskette Drive/Tray Assembly	85F0050	
2.88MB	Diskette Drive/Tray Assembly	64F4148	
	Diskette Drive Signal Cable	85F0089	
	5.25-Inch Diskette Drive:		
	360KB External (4869-001)	72X6759	
	360KB External (4869-501)	72X6768	
	360KB External (4869-002)	15X7993	
	1.2MB External (4869-502)	15X7994	
	1.2MB Internal Drive	64F4102	
	Rail Kit (for 64F4102)	85F0041	
	<input type="checkbox"/> Left and Right Rails		
	<input type="checkbox"/> Four Screws		

Hard Disk Drive

60MB	Hard Disk Drive (SCSI)	6128296	
80MB	Hard Disk Drive (SCSI)	56F8854	
120MB	Hard Disk Drive (SCSI)	6128298	
160MB	Hard Disk Drive (SCSI)	56F8851	
320MB	Hard Disk Drive (SCSI)	85F0011	
400MB	Hard Disk Drive (SCSI)	85F0012	
	Hard Disk Drive Cable (57 SX, 57 SLC)	92F0036	
	Hard Disk Drive Cable (M57 SLC)	96F7649	
	Hard Disk Slide	96F7775	

CD-ROM

	Internal CD-ROM Drive	81F7930	
	Terminator Kit (for 81F7930)	59F3530	
	Internal CD-ROM II Drive	92F0084	

Parts

Terminator Kit (for 92F0084)	92F0082
Rail Kit (for 81F7930 and 92F0084)	85F0009
<input type="checkbox"/> Left and Right Rails	
<input type="checkbox"/> Four Screws	
Drive Bezel Assembly (for 81F7930 and 92F0084)	85F0008
Headphones	59F3655
Cleaning Kit	59F3562
<input type="checkbox"/> Cleaning Disk	
<input type="checkbox"/> Test Disk	
<input type="checkbox"/> Disc Caddy	

Processor Option

Cached Processor Option (with IBM386 SLC)	92F0078
Use with system board 84F7994 (A P1 label is attached near the system unit serial number)	

Note: When you replace the system board in a system with a Cached Processor Option, remove the math coprocessor socket from the 11x11 connector on the new system board.

Options and Adapters

300/1200 Modem Adapter/A	34F0006
Communications Cable (for 34F0006)	8285985
300/1200/2400 Modem Adapter/A	65X1253
Communications Cable (for 65X1253)	94X1540
3270 Connection	74F3464
6157 Tape Adapter	92X1459
Ethernet Network Adapter/A	64F0217
Baseband Card	72X8102
Baseband Cable	72X8107
Broadband Card	72X8106
Image Adapter/A	07F2508
Video-Memory Module, 512K (for 07F2508)	07F4401
Video-Memory Module, 1MB (for 07F2508)	07F4402
M-Audio Capture/Playback Adapter/A (ACPA/A)	95F1256
XGA Display Adapter/A	96F7654
Video-Memory Module (for 96F7654)	75X5894
Dual Async Adapter/A	34F0008
Pageprinter Adapter	75X8213
Realtime Interface Coprocessor	
Portmaster Adapter/A	53F2603
<input type="checkbox"/> 512KB Memory Module Package	53F2656
<input type="checkbox"/> 1MB Memory Module Package	53F2660
<input type="checkbox"/> 2MB Memory Module Package	53F2664
<input type="checkbox"/> RS232 Interface Board	53F2612
<input type="checkbox"/> RS422 Interface Board	53F2615
Multiprotocol Adapter/A	90X8995
Printer Accessory Kit	1183003
Token-Ring Network Adapter/A	83X7488
Token-Ring Adapter/A RPL Module	83X9180
Token-Ring 16/4 Adapter/A RPL Module	74F9415
Token-Ring 16/4 Busmaster Adapter/A	74F4149
Realtime Interface Coprocessor	
Multiport/2	09F1888
<input type="checkbox"/> 8-port RS232-C Electrical Interface Board	91F7974
<input type="checkbox"/> 4-port RS232-C Electrical Interface Board	91F7976
<input type="checkbox"/> 4+4-port RS232-C RS422-A Electrical Interface Board	91F7966
<input type="checkbox"/> 512KB Memory Module Package Multiprotocol Interface Cable (for 09F1888)	16F2267
Screen Reader Keypad	1393515
Screen Reader Keypad Cable	72X8537
Card Kits	
<input type="checkbox"/> High Speed for 3118 System (AR)	65X1900
<input type="checkbox"/> High Speed for 3117 System (AR)	65X1920

Options and Adapters (continued)

SCSI Adapter (with cache) (AR)	85F0000
SCSI Adapter (without cache) (AR)	85F0002
SCSI Internal Cable	64F4127
Terminator, External (for 85F0000)	33F8464
Terminator, Internal (for 85F0000)	34F0025
Terminator, Internal (for 85F0002)	57F2870
5.25-inch Drive Diskette Adapter/A (360KB/1.2MB)	15F7996

Keyboard Cable and Mouse

Keyboard Cable	72X8537
Mouse	61X8923
Mouse Ball and Pop-Off Retainer	33F8461
Mouse Ball and Twist-Off Retainer	33F8462

Enhanced Keyboards (101/102 Key)

Arabic	1391490
Belgian	1391414
Canadian French	1392011
Cyrillic	1393866
Danish	1391407
Dutch	1391511
French	1391402
German	1391403
Greek	1393285
Hebrew	1391408
Italian	1393395
Latin American Spanish	1392015
Norwegian	1391409
Portuguese	1391410
Russian/Cyrillic	1395622
Spanish	1391405
Swedish/Finish	1391411
Swiss	1391412
Swiss/French	1395881
Swiss/German	1395882
Turkish	1393286
U.K. English	1391406
U.S. English (E/ME/A use only)	1396790
U.S. English	1392090
Yugoslavian	1393669

Space-Saving Keyboards (84/85 Key)

Canadian French	1396046
Spanish/Latin	1396047
U.S. English	1393290
Cable Assembly, External	1393082

Host-Connected Keyboards (122 Key)

Austrian/German	1396902
Belgian	1396903
Canadian French	1397051
Cyrillic	1396916
Danish	1396904
Dutch	1396905
French	1396990
Greek	1396917
Iceland	1396919
Italian	1396908
Latin American Spanish	1397052
Norwegian	1396909
Portuguese	1396910
Spanish	1396911
Swedish/Finish	1396906
Swiss/French	1396912
Swiss/German	1396913
Turkish	1396921
U.K. English	1396914
U.S. English (E/ME/A use only)	1397025
U.S. English	1397050
Yugoslavian	1396920

8503 Monochrome Display (with Tilt /Swivel Stand)

110/120 Vac	68X3045
220/240 Vac (Northern Hemisphere)	68X3046
220/240 Vac (Southern Hemisphere)	72X7878
Tilt /Swivel Stand	68X3061

8506 Monochrome Display (with Tilt /Swivel Stand)

110/125 Vac (US/Canada)	39F8087
110/125 or 200/240 Vac (Northern Hemisphere)	39F8088
110/125 or 220/240 Vac (Southern Hemisphere)	39F8089

8507 Monochrome Display (with Tilt /Swivel Stand)

110/120 or 220/240 Vac (Universal Model)	6247808
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8508 Monochrome Display (with Tilt /Swivel Stand)

110/125 Vac (US/Canada)	6247838
110/125 or 200/240 Vac (Northern Hemisphere)	39F8067
110/125 or 220/240 Vac (Southern Hemisphere)	39F8068

8512 Color Display (without Tilt /Swivel Stand)

110/120 Vac	61X8924
220/240 Vac (Northern Hemisphere)	61X8928
220/240 Vac (Southern Hemisphere)	61X8927
Tilt /Swivel Stand	61X8925

8513 Color Display (with Tilt /Swivel Stand)

110/120 Vac	68X3088
220/240 Vac (Northern Hemisphere)	72X7870
220/240 Vac (Southern Hemisphere)	72X7877
Tilt /Swivel Stand	68X3061

8514 Color Display (without Tilt /Swivel Stand)

110/120 Vac	75X5945
220/240 Vac (Northern Hemisphere)	75X5946
220/240 Vac (Southern Hemisphere)	75X5947
Tilt /Swivel Stand	75X5907

8515 Color Display (with Tilt /Swivel Stand)

Model 001 (90/137 Vac (U.S. and Canada) with Tilt /Swivel and packaging set	38F3911
Model 002 (90/265 Vac, Universal voltage) with Tilt /Swivel and packaging set	38F3912
Model A01 (90 Vac) with Tilt /Swivel and packaging set	38F3913
Shipping carton	16F0188
Power cable, 1.8 (6 ft), U.S.	38F3968

8516 Color Display

Model 001	44F9759
Model 002	70F9129
Model 002	70F9132

8518 Color Display

Refer to the 8518 Hardware Maintenance
Service for part and service information.

Tools and Miscellaneous

Tri-Connector Wrap Plug	72X8546
Ethernet Wrap Plug	85F0036
Ethernet T-Connector	84F8207
50-ohm BNC Terminator (2 required)	85F0037
Wrap Plug	59X4115
Wrap Plug (for Token-Ring Network Adapter/A	6165899
Wrap Plug (for Realtime Interface Co-Processor Multiport/2) 78-pin	16F2478
Wrap Plug (for Multiport Interface Cable) Direct Connect 25-pin, ports 0 and 1	6425494
Wrap Plug (for Multiport Interface Cable) Direct Connect 25-pin, ports 2 through 7	09F1799
Plastic Envelope (For Wrap Plug)	6138013
Data Migration Facility	61X8936
Key Cap Removal (keyboard) Tool	6110464
Fixed-Disk-Drive Removal Tool	64F4126
Video Memory Removal Tool	79X5893
Video Memory Insertion Tool	07F2518
Shipping Carton	74F3571

Power Cords

PICTURE 7

Warning: Use the power cord certified for your country.

Notes:

Notes: