

FRONT

PICTURE 1

September, 1992

This pamphlet contains procedures for isolating problems to a FRU, a Symptom-to-FRU Index, and a parts listing for the IBM 3550 Expansion Unit.

This pamphlet is intended to be used with the IBM Personal System/2 *Hardware Maintenance Reference* manual (part number 15F2190, form number S15F-2190-00) and the IBM Personal System/2 *Hardware Maintenance Service* manual (part number 15F2200, form number S15F-2200-00).

Part Number 42G2332

Form Number S42G-2332-00

FRONT_1 Safety Information

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

- General Safety
- Electrical Safety
- Safety Inspection Guide

First Edition (September 1992)

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer or express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time.

It is possible that this publication may contain reference to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Requests for technical information about IBM products should be made to your IBM Authorized Dealer or your IBM Marketing Representative.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Commercial Relations, IBM Corporation, Armonk, NY 10577.

| Copyright International Business Machines Corporation 1992. All rights reserved.

Note to U.S. Government Users -- Documentation related to restricted rights -- Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

FRONT_2 Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights or other legally protectible rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, programs, or services, except those expressly designated by IBM, are the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Commercial Relations, IBM Corporation, Purchase, NY 10577.

Subtopics

FRONT_2.1 Trademarks and Service Marks

FRONT_2.1 Trademarks and Service Marks

The following terms, denoted by an asterisk (*) in this publication, are trademarks of the IBM Corporation in the United States and/or other countries:

Personal System/2
IBM
ThinkPad
PS/2
XGA

CONTENTS Table of Contents

FRONT_1	Safety Information
FRONT_2	Notices
FRONT_2.1	Trademarks and Service Marks
1.0	General Checkout
2.0	Installed Devices List
2.1	Automatic Configuration
2.2	Missing SCSI Device
2.3	Missing non-SCSI device
3.0	Undetermined Problem
4.0	Power Supply
5.0	SCSI Device Setting
6.0	Printer
7.0	External Display
8.0	External Keyboard
9.0	Symptom-to-FRU Index
9.1	Miscellaneous Symptoms
9.2	Numeric Error Codes
10.0	How To Use This Parts Catalog
11.0	System Overview
12.0	Parts
13.0	Common Parts

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.

(*) IBM is a trademark of the International Business Machines Corporation.

Subtopics

- 1.1 Overall Procedures
- 1.2 How to Diagnose Combined FRUs
- 1.3 How to Use Error Messages

1.1 Overall Procedures

1. Test the computer alone, to make sure there is no problem with the computer before testing it with the expansion unit. If there is a problem with the computer, solve it by referring to the information supplied with the computer, then test the computer with the expansion unit.
2. Have the external keyboard, mouse, parallel and serial devices connected to the computer and test the computer. If no problem exists, connect them to the expansion unit and test the expansion unit with the computer installed.
3. When testing the expansion unit, use the Diagnostic Diskette supplied with the computer for the following expansion unit tests.
 - a. System Board Async Port Test

The serial line on the computer is extended to the serial connector of the expansion unit when the computer is installed on the expansion unit. To test the serial connector of the expansion unit, install the wrap plug at the serial connector on the rear of the expansion unit, then run the system board async port test of the computer.

- b. System Board Parallel Port Test

The parallel line on the computer is extended to the parallel connector on the expansion unit when the computer is installed on the expansion unit. To test the parallel connector of the expansion unit, install the wrap plug at the parallel connector on the rear of the expansion unit, then run the system board parallel port test of the computer.

- c. System Status Indicator Test

Test the status indicators on the expansion unit by using the system status indicator test of the computer. The corresponding indicators on the expansion unit turn on and off in the test, except for the power-on indicator. This power-on indicator does not turn off due to hardware restriction.

4. If the user did not bring the computer with the expansion unit, use a properly working computer with the expansion unit.
5. If the diagnostics of the following SCSI devices fail or stop, suspect that the diagnostic programs are down level before replacing SCSI devices.
 - SCSI Tape Drive (error code = 0211XXXX)
 - SCSI CD-ROM Drive (error code = 0215XXXX)
 - SCSI Rewritable Optical Drive (error code = 0217XXXX)

To continue the diagnostics of other devices, remove these SCSI devices from the installed device list before starting diagnostics.

1.2 How to Diagnose Combined FRUs

If an adapter or device consists of more than one FRU, an error code can 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.


```
|
|
+----+
| 008 |
+----+
|
| Go to Step 016.
|
+----+
| 009 |
+----+
|
| IS THE FIRST POST ERROR CODE WITHIN THE RANGE OF 02080000 190I TO 02470000
| 190I?
|
| IMPORTANT: If your error code is not in the range or if it is not
| followed by a 190I, answer NO.
|
| Yes No
|
|
+----+
| 010 |
+----+
|
| Go to Step 016.
|
+----+
| 011 |
+----+
|
| - Restart the system program from:
|    The system partition on the hard disk of the computer.
|    The reference diskette or the backup copy of the system partition.
|
| - Ensure that the Enable and Disable settings are correct (see "SCSI
| Device Setting" in topic 5.0). If you receive a warning on the screen
| concerning the "Keep" and "Remove" setting, follow the instructions on
| the screen before continuing.
|
| DID YOU HAVE TO CORRECT ANY OF THE ENABLE AND DISABLE SETTINGS?
|
| Yes No
|
|
+----+
| 012 |
+----+
|
| Go to "Symptom-to-FRU Index" in topic 9.0.
| Before replacing any SCSI device, check that there are no duplicate
| SCSI ID settings.
|
+----+
| 013 |
+----+
|
| - Restart the computer.
|
| DO YOU STILL HAVE THE POST ERROR?
|
| Yes No
|
|
+----+
| 014 |
+----+
|
| To run system checkout, or if you suspect another problem, go to Step
| 016.
|
+----+
| 015 |
+----+
|
| Go to "Symptom-to-FRU Index" in topic 9.0.
|
-----

+----+
| 016 |
+----+
|
| - Set the volume control switch to maximum.
| - Turn off then on the expansion unit. Closely watch the flashing cursor
| in the top-right corner of the screen, press and hold Ctrl + Alt, then
| press Insert. You must do this while the cursor is at the top-right
| corner of the screen. Release the keys.
|
| - Check for the following responses:
|    One or two short beeps
|    Readable instructions or the Main Menu
|
| DID YOU RECEIVE THE BOTH RESPONSES?
|
| Yes No
|
|
+----+
| 017 |
+----+
|
| Go to the "Symptom-to-FRU Index" in topic 9.0.
|   - or -
|
| If the problem is not corrected, go to "Undetermined Problem" in
| topic 3.0 .
|
+----+
| 018 |
+----+
```

- If you are not at the Main Menu, follow the instructions on the screen to advance to the Main Menu.
- If you cannot advance to the Main Menu, go to "Undetermined Problem" in topic 3.0.
- Press **Ctrl + A** and run the system checkout.

Notes:

1. If the external keyboard has incorrect keyboard responses, see "External Keyboard" in topic 8.0.
2. If the printer has incorrect printer responses, see "Printer" in topic 6.0.
3. If the image on the external display is out of focus, jittering, rolling, or has unreadable characters, see "External Display" in topic 7.0.

IS THE LIST OF INSTALLED DEVICES CORRECT?

Yes No

```
|
| |
| +---+
| |019|
| +---+
| Go to "Installed Devices List" in topic 2.0.
| If the problem is not corrected, go to "Undetermined Problem" in
| topic 3.0 .
|
```

```
+---+
```

```
|020|
```

```
+---+
```

- Run the advanced diagnostics tests.

DID THE TESTS IDENTIFY A FAILURE?

Notes:

1. If the test stops and you cannot continue, replace the last device being tested.
2. The following table describes the slot information displayed on the screen. This information is also displayed during the test of the expansion unit when the test is successfully completed. "n" can be any number.

Slot number	Identified device
n	IBM 3550 Expansion Unit
n+1	Built-in SCSI
n+2	Upper slot
n+3	Lower slot

Yes No

```
|
| |
| +---+
| |021|
| +---+
| Go to Step 023.
|
```

```
+---+
```

```
|022|
```

```
+---+
```

Follow the action described on the screen. If the problem is not corrected, go to the "Symptom-to-FRU Index" in topic 9.0.

```
+---+
```

```
|023|
```

```
+---+
```

DID THE POST END WITHOUT AN ERROR?

Yes No

```
|
| |
| +---+
| |024|
| +---+
| If you noticed an error symptom or if you received any POST error
| codes when the computer power was turned on, go to "Symptom-to-FRU
| Index" in topic 9.0
| - or -
| If the problem is not corrected, go to "Undetermined Problem" in
| topic 3.0 .
|
```

```
+---+
```

| 025 |
+---+

You may have an intermittent problem:

- Check for damaged cables or connectors.
 - Reseat all adapters and devices in the expansion unit.
 - Start an error log and run the tests a number of times.
 - Check the power supply fan in the expansion unit and make sure it is working properly.
 - Check the power supply voltages (see "Power Supply" in topic 4.0).
-

2.0 Installed Devices List

At the start of the customer or advanced diagnostic tests, an installed devices list is displayed. Normally, all the adapters and devices that are installed are listed.

- If the list contains an adapter or device that is not installed, go to "Undetermined Problem" in topic 3.0.
- If an adapter or device is missing from the list, you have one of the following conditions:
 - The System Partition on the computer 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 the device.

Copy the option diskette of the missing device to the system partition of the computer hard disk drive or to the Reference Diskette.

- The SCSI interface on the system board of the expansion unit might have failed.
- The device missing from the list is not recognized as a device or adapter.
- The device missing from the list requires an additional diskette. (See the device service manual.)
- The device missing from the list is defective.
- An adapter is defective.
- A power supply voltage is not correct (see "Power Supply" in topic 4.0).

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

Subtopics

- 2.1 Automatic Configuration
- 2.2 Missing SCSI Device
- 2.3 Missing non-SCSI device

2.1 Automatic Configuration

Warning: A customized setup configuration (other than the default settings) might have been set on the computer you are servicing. Running Automatic Configuration might alter those settings. Note the current configuration settings (using the **View configuration** or **Set and view SCSI device configuration** option) and verify that the same settings are in place when service is completed. (For more information about configuration, see the computer *Hardware Maintenance Reference* manual.)

2.2 Missing SCSI Device

The expansion unit features a built-in SCSI controller. This built-in SCSI controller is recognized as an SCSI adapter, as well as an optional SCSI adapter card.

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

1. Turn off the expansion unit and disconnect all internal and external SCSI devices from the expansion unit.
2. Terminate the adapter, as required.

Note: The built-in SCSI controller includes an active terminator. This terminator automatically terminates the adapter when an external SCSI device is attached.

Warning: See "Automatic Configuration" in topic 2.1 before continuing.

3. Turn on the expansion unit and run Automatic Configuration.
 - If the adapter is not on the Installed Device List in advanced diagnostics, the adapter or the expansion unit 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 installed adapter might be defective.

Note: If the built-in SCSI controller is not on the Installed Device List, replace the system board of the expansion unit.

5. Reconnect the devices to the expansion unit, then terminate the adapter, as required.
6. Go to "Undetermined Problem" in topic 3.0.

2.3 Missing non-SCSI device

If a non-SCSI device is missing from the list, replace the missing device.

If more than one non-SCSI device is missing, isolate them one at a time until you find the device causing the failure.

3.0 Undetermined Problem

Use the following procedure when the diagnostic tests do not identify the failing adapter or device.

Check the power supply (see "Power Supply" in topic 4.0).

If the power supply is operating correctly, return here and continue with the following procedure.

1. Turn off the expansion unit.
2. Remove or disconnect one of the following adapters or devices. (Do not isolate adapters or devices that are known to be good.)
 - a. Non-IBM devices
 - b. Modem, printer, mouse, external keyboard, external display, numeric keypad, or other external devices
 - c. Any adapter (see note on this page)
 - d. SCSI device
3. Turn on the expansion unit and run system checkout (see Step 016 in topic 1.3). Do not reconfigure the system. If diagnostic tests cannot be loaded from the computer hard disk drive, load and run the tests from the Reference Diskette. Test only those adapters and devices still attached to the expansion unit.
4. If the symptom remains, repeat steps 1 through 3 until you find the failing adapter or device or until all adapters or devices have been removed.
5. If all adapters or devices listed have been removed and the problem remains, replace the system board of the expansion unit.

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 of the expansion unit.

4.0 Power Supply

If the "power good" light is not on and if the power-supply fan is not running, check the power cord for continuity and proper installation.

If the power cord is not the problem, 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. Turn off the expansion unit and disconnect the expansion unit power cord.
2. Remove all power supply connectors (power supply connector P1, P2 and drive connector 1) from the system board of the expansion unit and SCSI device.
3. On power supply connector P2, short-circuit pin 4 to pin 6 and short-circuit pin 7 to 8.
4. Connect the expansion unit power cord.
5. Check the power supply voltages using the figures on the next page.

Power Supply Connector P1

PICTURE 2

Pin	Signal	V dc Min.	V dc Max.
1, 2, 3, 4	+5 volts	+4.8	+5.25
5, 6, 7, 8, 10	Ground		
9	+20 volts	+19.0	+21.0

Power Supply Connector P2

PICTURE 3

Pin	Signal	V dc Min.	V dc Max.
1, 2	+12 volts	+11.52	+12.6
3	Power Good	+4.0	+5.25
4	On/Off Signal		
5	-12 volts	-10.92	-13.2
6, 7	Ground		
8	Global Signal		

Drive Connector 1

PICTURE 4

Pin	Signal	V dc Min.	V dc Max.
1	+12 volts	+11.52	+12.6
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 working properly. Another expansion unit 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 3.0.)

5.0 SCSI Device Setting

To verify that 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 expansion unit must be set to "Enable"
- Devices listed but not connected must be set to "Disable"

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

Change the setting by pressing **F5**, then save them by pressing **F10**.

6.0 Printer

Test the printer by connecting it to the computer before testing it on the expansion unit.

1. Make sure the printer is properly connected and the power is turned 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, connect a wrap plug on the parallel connector on the rear of the expansion unit and run the advanced diagnostic tests to determine which FRU failed.

If the advanced diagnostic tests (with the wrap plug connected) did not detect a failure, replace the printer cable.

If the problem is not corrected, do one of the following:

- If the printer is attached to the parallel connector of the expansion unit, replace the system board of the expansion unit.
- If the printer is attached to the parallel connector on the adapter, replace the FRUs in the following order, until the problem goes away:
 1. Adapter
 2. System board of the expansion unit
 3. Printer cable to the adapter

7.0 External Display

If the screen is rolling, replace the external display.

If the problem is not corrected, replace FRUs in the following order until the problem goes away:

1. Display adapter installed (if used)
2. System board of the expansion unit

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

1. Turn off the expansion unit and the external display.
2. Disconnect the external display signal cable from the expansion unit.
3. Turn on the external display.
4. Turn the contrast control 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, 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 screen contrast and brightness controls should vary the screen intensity.

If the external display does not meet these specifications, replace the external display.

If the external display meets these specifications, replace FRU in the following order until the problem goes away:

Note: Remove any option adapters before replacing the display adapter, so see if the problem disappears.

1. Display adapter (if used)
2. System board of the expansion unit
3. External display

Note: The IBM ThinkPad (*) 700 PS/2* with a monochrome display does not support AVE (Auxiliary Video Extension).

(*) Trademark of the International Business Machines Corporation.

8.0 External Keyboard

Notes:

1. If a mouse or other pointing device is attached, remove it and see if the error symptom goes away. If the symptom goes away, the mouse or other pointing device is defective.
2. The computer keyboard does not work when an external keyboard is connected.

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

- Turn off the expansion unit.
- Disconnect the keyboard cable from the external keyboard.
- Turn on the expansion unit and check the keyboard cable connector for the following voltages. All voltages have a $\pm 5\%$ tolerance.

PICTURE 5

ARE ALL VOLTAGES CORRECT?

Yes No

| |
| |
| +---+
| |002|
| +---+
| Possible failing FRUs are:
| 1. Keyboard cable
| 2. System board of the expansion unit
|

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

Replace the external keyboard.

9.0 Symptom-to-FRU Index

The Symptom-to-FRU Index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with "General Checkout" in topic 1.0. This index also can be used to help you decide which FRUs to have available when servicing the expansion unit.

If you cannot correct the problem using this index, go to "Undetermined Problem" in topic 3.0.

IMPORTANT:

1. Before replacing any SCSI devices, verify that there are no duplicate SCSI ID settings.
2. If you have both an error message and an incorrect audio response, diagnose the error message first.
3. If you cannot run the advanced diagnostic tests, but did receive a POST error message, diagnose the POST error message.
4. If you did not receive an error message, look for a description of your error symptoms in the first part of this index.
5. Check all power supply voltages before you replace the system board of the expansion unit. (See "Power Supply" in topic 4.0.)
6. If an error message is not listed, there is a device installed that requires an additional diskette or service manual. Refer to the diskette or the service manual for that device.

How to Read POST Error Messages

Note: The expansion unit features a built-in SCSI controller. This built-in SCSI controller is recognized as an SCSI adapter, as well as an optional SCSI adapter card.

POST error messages are displayed on the screen as 3, 4, 5, or 8 digits. The error messages that can be displayed as shorter POST messages are highlighted in this Symptom-to-FRU Index. Some digits will represent different information for SCSI errors than for non-SCSI errors.

The following example shows which digits display the shorter POST error messages and defines the SCSI information in an eight-digit error message.

PICTURE 6

Each SCSI device must be set to a different SCSI ID. Duplicate SCSI ID settings can generate a false error message. Use the SCSI ID to determine whether the error message is coming from an internal or external device.

In the following index, an "X" in an error message can be any number.

Subtopics

- 9.1 Miscellaneous Symptoms
- 9.2 Numeric Error Codes

9.1 Miscellaneous Symptoms

Symptom/Error	FRU/Action
Program-load error during remote IPL from the file service. Displayed on upper or lower half of the LCD.	Network Adapter
External display screen changes colors.	External Display External Display Adapter (if used) System Board of expansion unit
One or more keys do not work on the external keyboard and the expansion unit is otherwise functional. (See "External Keyboard" in topic 8.0.)	External Keyboard Keyboard Cable System Board of expansion unit
Power-good light does not turn on and fan runs.	System Board of expansion unit Power Supply
Power-good light does not turn on, fan does not run, and expansion unit is not functional. (See "Undetermined Problem" in topic 3.0.)	Power Supply System Board of expansion unit
Intermittent Failures. (See "Undetermined Problem" in topic 3.0.)	Power Supply System Board of expansion unit Any Device or Adapter
Expansion Unit cannot be turned off.	System Board of expansion unit Power Supply
LED for hard disk drive stays on.	SCSI Hard Disk Drive System Board of expansion unit
LED for hard disk drive is not working, but the expansion unit is completely functional.	System Board of expansion unit

9.2 Numeric Error Codes

In the following index, an "X" in an error message can be any number.

Symptom/Error	FRU/Action
000113XX	Any Adapter System Board of expansion unit Any Drive
000114XX	Any Adapter
00016300, 00016400, 00016500 (If setting configuration does not solve the problem, see "Installed Devices List" in topic 2.0 .)	Set Configuration/Features System Board of expansion unit
000166XX	Any Adapter
00017400 (If Automatic Configuration does not solve the problem, run Advanced Diagnostic.)	Set Configuration/Features Any Device System Board of expansion unit
0001XXXX (Not listed above.)	System Board of expansion unit Any Adapter
00030700	External Keyboard Keyboard Cable
00030X00 (not listed above)	Keyboard System Board of expansion unit Keyboard Cable
000401XX	System Board of expansion unit
00110200, 00110600	System Board of expansion unit Any Serial Device
00110700	Communication Cable System Board of expansion unit
0011XX00 (not listed above) Check the power supply voltages before replacing the system board of the expansion unit. (See "Power Supply" in topic 4.0 .)	System Board of expansion unit
00120700	Communication Cable Dual Async Adapter/A
0012XX00 (not listed above)	Dual Async Adapter/A System Board of expansion unit Any Serial Device
0014XX00 (See "Printer" in topic 6.0 before replacing any FRUs.)	Printer System Board of expansion unit
00186XXX	Set Configuration/Features Battery
0018XXXX (not listed above)	System Board of expansion unit
00240100 (See "External Display" in topic 7.0 before replacing any FRUs.)	External Display System Board of expansion unit
00241000	System Board of expansion unit
00860100, 00860200	Pointing Device System Board of expansion unit
00860300	System Board of expansion unit
00860400	System Board of expansion unit Pointing Device (Mouse)

IBM 3550 Expansion Unit Model 002 HMS
Numeric Error Codes

0096XX00	SCSI Adapter (with cache) Any SCSI Device System Board of expansion unit
0100XXXX	Multiprotocol Adapter/A System Board of expansion unit
0106XXXX	Ethernet Network Adapter/A System Board of expansion unit
0107XXXX	5.25-inch External Diskette Drive 5.25-inch Diskette Drive Adapter/A
0112XXXX	SCSI Adapter (without cache) System Board of expansion unit Any SCSI Device
0137XXXX	System Board of expansion unit
0152XXXX	XGA Display Adapter/A Video-Memory Module System Board of expansion unit
0166XXXX, 0167XXXX (For diagnostic information, refer to the Token-Ring Network Adapter/A service information.)	Token-Ring Network Adapter/A System Board of expansion unit
0210XXXA (60MB) 0210XXXB (80MB) 0210XXXC (120MB) 0210XXXD (160MB) 0210XXXE (320MB) 0210XXXF (400MB) 0210XXXG (40MB) 0210XXXH (1GB) 0210XXXI (108MB) 0210XXXJ (216MB) 0210XXXU (Size undetermined) (If the failing device is an external device, go to the external devices service pamphlet.)	SCSI Hard Disk Drive System Board of expansion unit SCSI Adapter (if used) SCSI Cable
0211XXXX (If the failing device is an external device, go to the external devices service pamphlet.)	SCSI Tape Drive System Board of expansion unit SCSI Adapter (if used) SCSI Cable
0215XXXX (If the failing device is an external device, go to the external devices service pamphlet.)	SCSI CD-ROM Drive System Board of expansion unit SCSI Adapter (if used) SCSI Cable
0217XXXX (If the failing device is an external device, go to the external devices service pamphlet.)	SCSI Rewritable Optical Drive System Board of expansion unit SCSI Adapter (if used) SCSI Cable
0243XXXX	XGA-2 Display Adapter/A System Board of expansion unit
0260XXXX	System Board of expansion unit Any SCSI Device
1998009X	Restore System Partition

10.0 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 particular 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 dots) □ □ Detail part of a one-dot subassembly
- (Two dots) □ □ Subassembly of a one-dot subassembly

11.0 System Overview

PICTURE 7

12.0 Parts

1	Display Stand	49G2664
2	Main Cover	49G2657
	<input type="checkbox"/> Front Panel ASM	
	<input type="checkbox"/> Rear Panel	
	<input type="checkbox"/> Left and Right Side Guide ASM	
	<input type="checkbox"/> Release Mechanism	
	<input type="checkbox"/> Docking Cover	
3	System Board	49G2667
	<input type="checkbox"/> System Board-Main	
	<input type="checkbox"/> System Board-Sub	
	<input type="checkbox"/> Board ASM, LED	
	<input type="checkbox"/> Wire ASM, LED/Power/Micro Sensor	
	<input type="checkbox"/> Device Cable, Internal SCSI 50 pin	
4	Docking Frame	49G2666
	<input type="checkbox"/> Power Switch Control Actuator	
	<input type="checkbox"/> Cable ASM, VGA	
5	Power Supply	49G2668
6	Base Frame	49G2658
	<input type="checkbox"/> Left and Right Rails	
	<input type="checkbox"/> Cover, LED Board	
	<input type="checkbox"/> Guide, Card	
	<input type="checkbox"/> Guide, Adapter Bracket	
	<input type="checkbox"/> Slider, Stopper Lock	
	<input type="checkbox"/> Spring, Slider	
	<input type="checkbox"/> Two Thumb Screws	
	<input type="checkbox"/> Four Foot Rubbers	
7	Backup Battery, Lithium	49G2661
	MISC Parts Group	49G2665

13.0 Common Parts

SCSI Hard Disk Drive

40MB Drive	56F8866
60MB Drive	6128296
80MB Drive	56F8854
108MB Drive	95F4748
216MB Drive	95F4749
120MB Drive	6128298
160MB Drive	56F8851
320MB Drive	85F0011
400MB Drive	85F0012
1GB Drive	92F0089
Terminator in-line (for 320/400MB)	92F0142
EMC Bezel and Spring Shield (for 92F0089)	92F0255
SCSI Adapter (with cache)	85F0000
SCSI Adapter (without cache)	85F0002
Terminator, External (for 85F0000)	33F8464
Terminator, Internal (for 85F0000)	34F0025
Terminator, Internal (for 85F0002)	57F2870

CD-ROM Drive

PS/2 CD-ROM Drive	81F7930
Terminator Kit (for 81F7930)	59F3530
Cleaning Kit (for 81F7930)	59F3562
<input type="checkbox"/> Cleaning Disk	
<input type="checkbox"/> Test Disk	
<input type="checkbox"/> CD Caddy	
PS/2 CD-ROM-II Drive	92F0084
Terminator Kit (for 92F0084)	92F0082
Media Kit (no cleaning necessary, for 92F0084)	31F4232
<input type="checkbox"/> Test Disk	
<input type="checkbox"/> CD Caddy	
Generic CD-ROM parts:	
Drive Bezel Assembly (for 81F7930 and 92F0084)	85F0008
CD Caddy	22F9419
Rail Kit	34F0041
Headphones	53F3610

Rewritable Option Drives

3.5-Inch 127MB Rewritable Optical Drive	85F0015
Objective Lens Cleaning Cartridge (for 85F0015)	85F0043
Prism Lens Cleaning Cartridge (for 85F0015)	85F0054
Optical Drive Bezel Kit	49G2678

Options and Adapters

300/1200/2400 Modem Adapter/A	65X1253
Communications Cable (for 65X1253)	94X1540
Baseband Card	72X8102
Baseband Cable	72X8107
Broadband Card	72X8106
3270 Connection	74F3464
IBM PS/2 Adapter/A for Ethernet Networks	64F0217
IBM PS/2 Adapter/A for Ethernet Twisted-Pair Networks	92F0046
XGA (*) Display Adapter/A	96F7654
Dual Async Adapter/A	34F0008
Pageprinter Adapter	75X8213
Multiprotocol Adapter/A	90X8995
Token-Ring Busmaster Adapter/A	74F4149
Printer Accessory Kit	1183003
Token-Ring Network Adapter/A	83X7488
Token-Ring Adapter/A RPL Module	83X9180
Token-Ring 16/4 Adapter/A (with RPL Module)	74F9415
Token-Ring 16/4 Busmaster Adapter/A	74F4149
5.25-Inch External Diskette Adapter/A (1.2MB or 360KB)	15F7996

Keyboard Cable and Mouse

Keyboard Cable	72X8537
Mouse	61X8923
<input type="checkbox"/> Mouse Ball and Pop-Off Retainer	33F8461
<input type="checkbox"/> Mouse Ball and Twist-Off Retainer	33F8462
Miniature Mouse	95F5723

Space-Saving Keyboards (84/85 Key)

Canadian French	1396046
Latin-American Spanish	1396047

Common Parts

U.S. English	1393290
Cable Assembly, External	1393082

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	1391404
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 (EMEA use only)	1396790
U.S. English	1392090
Yugoslavian	1393669

Host-Connected Keyboards (122 Key)

Austrian/German	1396902
Belgian	1396903
Canadian French	1397051
Cyrillic	1396916
Danish	1396904
Dutch	1396905
French	1396990
Greek	1396917
Icelandic	1396941
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 (EMEA use only)	1397025
U.S. English	1397050
Yugoslavian	1396920

Tools and Miscellaneous

Tri-Connector Wrap Plug	72X8546
Ethernet Wrap Plug	85F0036
Ethernet T-Connector	84F8207
50-ohm BNC Terminator (two required)	85F0037
Wrap Plug	59X4115
Wrap Plug (for Token-Ring Network Adapter/A)	6165899
Plastic Envelope (For Wrap Plug)	6138013
Data Migration Facility	61X8936
Key Cap Removal (keyboard) Tool	6110464
Video Memory Removal Tool	79X5893
Video Memory Insertion Tool	07F2518

Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316

Common Parts

Norwegian	95F5467
Spanish	95F6315
Spanish Speaking	95F6315
Swedish/Finish	95F5468
Swiss/French	95F5711
Swiss/German	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

8503 Monochrome Display (With Tilt / Swivel Stand)

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

8506 Monochrome Display (With Tilt / Swivel Stand)

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

8507 Monochrome Display (With Tilt / Swivel Stand)

110/120 or 220/240 V ac (Universal Model)	6247808
---	---------

8512 Color Display (Without Tilt / Swivel Stand)

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

8513 Color Display (With Tilt / Swivel Stand)

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

8514 Color Display (Without Tilt / Swivel Stand)

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

8515 Color Display (With Tilt / Swivel Stand)

Model 001 (90/137 V ac, U.S. and Canada) With Tilt / Swivel and Packaging Set	38F3911
Model 002 (90/265 V ac, Universal voltage) With Tilt / Swivel and packaging set	38F3912
Model A01 (90 V ac) With Tilt / Swivel and Packaging Set	38F3913
Shipping material:	16F0188
<input type="checkbox"/> Box	
<input type="checkbox"/> Front Cushion	
<input type="checkbox"/> Rear Cushion	
Power cable, 1.8 (6 ft), U.S.	38F3968

8516 Color Display

Model 001	44F9759
Model 002	70F9129
Model 003	70F9132

8518 Color Display

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

Supplemental Parts:

Corporation.