



Hardware Maintenance Service

6139795

Hardware Maintenance Service for the:

IBM Personal Computer

IBM Personal Computer XT

IBM *Portable* Personal Computer

IBM Personal Computer AT®

The Hardware Maintenance Library for Personal Computer systems is made up of two manuals; the *Hardware Maintenance Service* manual and the *Hardware Maintenance Reference* manual. Together, they provide the information needed to isolate and repair problems on a variety of IBM Personal Computer products.

This manual provides all necessary information for a trained service representative to diagnose a failing system. It contains switch and jumper settings, maintenance analysis procedures, a parts catalog, and the Advanced Diagnostics diskette. Wrap plugs and terminating plugs are not included.

The *Hardware Maintenance Reference* manual is a general reference manual designed to supplement this manual. It provides removal, replacement, and adjustment procedures, as well as introductory information about the Advanced Diagnostic tests.

The Color Printer, Graphics Printer/Compact Printer, and PC Network service manuals are designed to be used with the Hardware Maintenance Library.



Hardware Maintenance Service

Revised Edition (March 1986)

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 of 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.

Products are not stocked at the address below. Requests for copies of this publication and for technical information about IBM Personal Computer products should be made to your authorized IBM Personal Computer dealer, IBM Product Center, or your IBM Marketing Representative.

The following paragraph applies only to the United States and Puerto Rico: A Reader's Comment Form is provided at the back of this publication. If the form has been removed, address comments to: IBM Corporation, Personal Computer, P.O. Box 1328-C, Boca Raton, Florida 33429-1328. IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligations whatever.

© Copyright International Business Machines Corporation 1981, 1986

Place this page in front of the FCC statement which is in the front of your *Hardware Maintenance Service* manual.

The following FCC statement applies to the:

- *IBM Binary Synchronous Communications Adapter*
- *IBM Synchronous Data Link Control Adapter*
- *IBM General Purpose Interface Bus Adapter*
- *IBM Data Acquisition and Control Adapter*
- *IBM PC Network Adapter*

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Notes:

Federal Communications Commission

Radio Frequency Interference Statement

Warning: The equipment described herein has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of the FCC rules. Only peripherals (computer input/output devices, terminals printers, etc.) certified to comply with the Class B limits may be attached to the computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception. If peripherals not offered by IBM are used with the equipment, it is suggested to use shielded grounded cables with in-line filters if necessary.

CAUTION

The products described herein are equipped with a grounded plug for the user's safety. It is to be used in conjunction with a properly grounded receptacle to avoid electrical shock.

Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards not covered by this inspection guide.

If any unsafe conditions are present, a determination must be made on how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power: primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, a damaged CRT face or bulging capacitor can cause serious injury.

- Mechanical hazards, loose or missing hardware can cause serious injury.

This safety inspection guide consists of a series of steps presented in a checklist. Begin the checks with the power off and the power cord removed from the electrical outlet.

We recommend all non-IBM devices and attachments be removed from the unit before you conduct the safety inspection.

Reference Literature:

- *Guide to Operations* manual.
- Any applicable safety publications.

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power off the system. Disconnect the power cord from the electrical outlet.
3. Check the power cord for the following:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - b. The cord set should be the appropriate molded type as specified in the parts catalog of this manual.
 - c. Insulation must not be frayed or worn.
4. Remove the back panel from the system unit (if applicable).
5. Remove the cover mounting screws, and remove the cover.
6. Check for any obvious non-IBM alterations. Use good judgement as to the safety of any non-IBM alterations.
7. Check inside the unit for any obvious unsafe conditions, such as: metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables. Ensure the voltage specified on the voltage tag, or switch position (back

panel of the machine) matches the voltage of the power receptacle. If in doubt, verify the voltage at the power receptacle.

9. Examine the power supply and verify the following:

- a. Nonremovable fasteners in the power-supply cover have not been removed or tampered with.
- b. The grommet is installed where the internal power cables come through the frame of the power supply.

10. Check for the following labels on all systems:

- "Caution: Hazardous Area. Do Not Remove This Cover. Trained Service People Only. No Serviceable Components Inside"

or



- Hazardous voltage inside. Do not open.

11. In systems using a battery, check for the following labels:

- "BATTERY WARNING: Do not dispose of battery unit in fire or water. See instruction for disposal in the battery installation instructions."

or



- Replace only with P/N XXXXXXXX. Use of a different battery could result in ignition or explosion of battery. Order replacement from IBM authorized dealer.

12. Visually check the condition of the battery (if applicable) and ensure the battery has a safety hazard label attached.

13. Machines manufactured May 1986 or later, weighing in excess of 18 Kg. (41.8 lbs), must be labeled with the weight of the system unit.

How to Use this Maintenance Library

This Hardware Maintenance library consists of three major diagnostic tools; a two-part set of diagnostic manuals and Advanced Diagnostics diskettes.

The *Hardware Maintenance Reference* manual describes diagnostic procedures and their use, field replaceable unit (FRU) removal and replacement procedures, and provides general information about the systems. Once the reader has become familiar with its content, the *Hardware Maintenance Reference* manual is no longer required on each service call. It can be kept in a convenient place and used as needed.

The *Hardware Maintenance Service* manual contains all necessary information to diagnose a failing system. Maintenance analysis procedures (MAPs), jumper positions, switch settings, and the parts catalog are in this manual.

Additional options may require updates to the manuals. The *Hardware Maintenance Reference* manual provides an area in the back of the manual to file the updates. Each section of the *Hardware Maintenance Service* manual (with the exception of the MAPs) has a designated update area. The MAPs are sequenced by number and can be updated accordingly.

The Advanced Diagnostics diskette is designed to be used with the MAPs to:

- Test each area of the system
- Isolate problems to specific areas of the system through the use of error codes
- Verify correct installation and operation of the system.

Other functions of the Advanced Diagnostics diskette are described in the *Hardware Maintenance Reference* manual.

Preface

This manual provides the information needed to diagnose and repair IBM Personal Computer products. Readers should have received training on IBM Personal Computer products and be familiar with the Triplett Model 310 Multimeter¹ or equivalent.

The manual is divided into two major categories; system specific information and Personal Computer family diagnostic MAPs.

The system specific information is identified by the system name and organized as follows:

"START" is the entry point for all diagnostic procedures.

"JUMPERS AND SWITCH SETTINGS" contains jumper positions and switch settings for the system unit and supported options.

"PARTS CATALOG" contains illustrations and part numbers of field replaceable units (FRUs).

Step-by-step instructions to isolate failing FRUs are located in the **"DIAGNOSTIC MAPs"** section.

Related repair information can be found in the *Hardware Maintenance Reference* manual. Operating instructions are in the *Guide to Operations* manual. Detailed hardware and interface information is in the *Technical Reference* manual.

The term "Reference manual" as used in this manual, refers to the *Hardware Maintenance Reference* manual.

¹ Manufactured by the Triplett Corporation, Bluffton, Ohio 45817

Notes:

MAP 0000: Start (PC, XT, Portable PC)

This is the entry point for maintenance analysis procedures (MAPs). The MAPs will help you determine the failing field replaceable unit (FRU).

The Advanced Diagnostics program is intended to test *only* IBM products. Non-IBM products, prototype cards, and modified options can give false errors and invalid system responses.

All voltages in the MAPs are positive unless otherwise specified.

001

Before you begin:

1. Power off the system.
2. Ensure all connectors are installed correctly.
3. Ensure all jumpers and switches are set correctly.

Note: Ensure the Portable Personal Computer 115/230 Vac selector switch is set for the voltage available at the outlet.

- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

IS THE POWER SUPPLY FAN RUNNING?

Yes No

002

Go to Step 045 in this MAP.

003

- Listen carefully for any audio responses during the power-on self test (POST).

DID YOU HEAR ONE SHORT BEEP AT THE END OF THE POST?

Yes No

(Step 004 continues)

004

Go to Step 006 in this MAP.

005

Go to Step 010 in this MAP.

006

(From Step 004 in this MAP)

DID THE MESSAGE (RESUME = "F1" KEY) APPEAR ON THE SCREEN?

Yes No

007

Go to Step 052 in this MAP.

008

- Make a note of any error messages on the screen.
- Press the **F1** key to continue.

DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY WHEN THE F1 KEY WAS PRESSED?

Yes No

009

Go to "MAP 0300: Keyboard Start."

010

(From Step 005 in this MAP)

DOES THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

011

Go to Step 053 in this MAP.

012

- Select **0** (SYSTEM CHECKOUT).

Note: Depending upon the options installed in the system, questions about attached devices may appear on the screen. Press **Y** or **N** as required, then **Enter**.

(Step 012 continues)

012 (continued)

DOES THE INSTALLED DEVICES MENU APPEAR?

Yes No

013

Go to Step 037 in this MAP.

014

- Compare the list to the options installed *inside* the system.

Note: The Installed Devices list displays only those devices supported by this manual. If a device is missing from the list and is not supported by this manual, press **Y (IS THE INSTALLED DEVICES LIST CORRECT?)** then **Enter** to continue the diagnostic tests. Go to Step 025 in this MAP.

DOES THE INSTALLED DEVICES LIST CORRECTLY IDENTIFY THE DEVICES INSTALLED INSIDE THE SYSTEM?

Yes No

015

Go to Step 017 in this MAP.

016

Go to Step 025 in this MAP.

017

(From Step 015 in this MAP)

Follow the instructions on the screen and attempt to correct the Installed Devices list.

Note: A 199 error indicates you answered "No" to the question about the Installed Devices list. Disregard the error.

COULD YOU CORRECT THE INSTALLED DEVICES LIST?

Yes No

(Step 018 continues)

018

Go to Step 020 in this MAP.

019

Go to Step 025 in this MAP.

020

(From Step 018 in this MAP)

**IS THE OPTION MISSING FROM THE INSTALLED
DEVICES LIST?**

Yes No

021

Press **Y (IS THE INSTALLED DEVICES LIST
CORRECT?)** then **Enter** to continue the diagnostic tests.
Go to Step 025 in this MAP.

022

- Make sure all switches and jumpers are set correctly for the missing option. Be sure to check the system board switches as well as the option's switches and jumper positions.

ARE THE SWITCHES AND JUMPERS SET CORRECTLY?

Yes No

023

Reset any incorrect jumper or switch settings. Go to Step 001 in this MAP to verify system operation.

024

Go to the appropriate MAP for the missing device.

Note: If you are unable to find the MAP that corresponds to the device, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

025

(From Steps 014, 016, 019, and 021 in this MAP)

- Follow the instructions on the screen to run the tests on all devices. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

026

Go to Step 028 in this MAP.

027

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

028

(From Step 026 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

029

Go to "MAP 0020: Power Start."

030**DID YOU NOTICE ANY FAILURE SYMPTOMS?**

Yes No

031

Go to Step 033 in this MAP.

032

Go to Step 053 in this MAP.

033

(From Step 031 in this MAP)

DID THE CUSTOMER PROVIDE A SYMPTOM?

Yes No

034

Go to Step 036 in this MAP.

035

Go to the MAP for the suspected failing device.

036

(From Step 034 in this MAP)

The Advanced Diagnostic tests have finished without detecting an error.

- If you are still experiencing a problem:
 - Check all switch settings.
 - Check all jumper positions.
 - Check all cables and connectors for proper installation.
 - Run the Advanced Diagnostic tests on all devices. Use the **(RUN TESTS ONE TIME)** option. If you receive an error, go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."
 - If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.
-

037

(From Step 013 in this MAP)

DID YOU RECEIVE AN ERROR MESSAGE INDICATING A DISKETTE READ ERROR?

Yes No

038

Go to Step 040 in this MAP.

039

Go to "MAP 0600: Diskette Drive Start."

040

(From Step 038 in this MAP)

IS A MATH COPROCESSOR INSTALLED IN THE SYSTEM?

Yes No

041

Go to "MAP 0300: Keyboard Start."

042

- Power off the system and remove the math coprocessor.
- Power on the system.
- Select **0** (SYSTEM CHECKOUT).

DOES THE INSTALLED DEVICES MENU APPEAR?

Yes No

043

Reinstall the math coprocessor, then go to "MAP 0300: Keyboard Start."

044

- Replace the math coprocessor and the 8088 processor. If that does not correct the problem, replace the system board.

045

(From Step 002 in this MAP)

IS THE POWER CORD PLUGGED INTO A FUNCTIONING, PROPERLY GROUNDED ELECTRICAL OUTLET?

Yes No

046

- Attach the system to a functioning, properly grounded electrical outlet. Return to Step 001 in this MAP to verify system operation.

047

- Power off the system.
- Disconnect the power cord from the electrical outlet then from the system unit.
- Check the system unit power cord for continuity.

DOES THE POWER CORD HAVE CONTINUITY?

Yes No

048

Replace the power cord.

049

- Reconnect the power cord.
- Power on the system.
- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at the system board power supply connector, Figure 1.

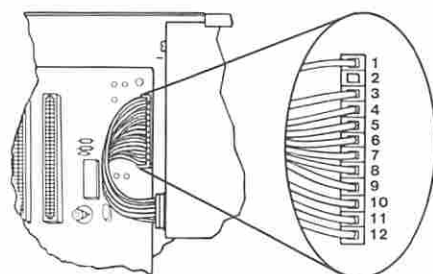


Figure 1. System Board Power Connectors

049 (continued)

IS THE VOLTAGE 2.4 TO 5.2 VDC BETWEEN
PINS 1 AND 5?

Yes No

050

Go to "MAP 0020: Power Start."

051

Replace the power supply.

(From Step 007 in this MAP)

Refer to the following figure and go to the MAP indicated or take the action described.

Note: If you received an error message and incorrect audio response, use the error message as the POST Error Symptom.

POST Error Symptom:	Action:
No Beep and:	
Blank Display	MAP 0020: Power Start
Unreadable Display	MAP 0020: Power Start
Blinking Cursor	MAP 0020: Power Start
Parity Check Message	MAP 0200: Memory Start
1XX Error	MAP 0100: System Board Start
Machine Functioning Properly	MAP 0020: Power Start
1 Long and 1 Short Beep	Replace System Board
1 Long and 2 Short Beeps	Go to Step 054 in this MAP
1 Long and 3 Short Beeps	Go to Step 054 in this MAP
2 Short Beeps and:	
Blank or Unreadable Display	Go to Step 054 in this MAP
Distorted Image on Display	Go to Step 054 in this MAP
1XX Error	MAP 0100: System Board Start
XXXXX XX 201 Error	MAP 0200: Memory Start
XXXX 201 Error	MAP 0200: Memory Start
301 Error	MAP 0300: Keyboard Start
XX301 Error	MAP 0300: Keyboard Start
601 Error	MAP 0600: Diskette Drive Start
17XX Error	MAP 1700: Fixed Disk Drive Start
30XX Error	MAP 3000: PC Network
31XX Error	MAP 3100: Alt. PC Network
C8000 ROM Error	Replace Fixed Disk Drive Adapter
CC000 ROM Error	MAP 3000: PC Network
ROM Error	Replace System Board
FXXXX ROM Error	Replace System Board
Continuous Beep	MAP 0020: Power Start
Repeating Short Beeps	MAP 0020: Power Start
Any Errors Not Shown Above	Go to Step 062 in this MAP

Figure 2. POST Errors

053

(From Steps 011 and 032 in this MAP)

Refer to the following figure and go to the MAP indicated or take the action described.

Note: If you received an error message and incorrect audio response, use the error message as the symptom.

Symptom:	Action:
Incorrect Memory Size Displayed	MAP 0200: Memory Start
Incorrect Colors on Display	Go to Step 054 in this MAP
No High Intensity on Display	Go to Step 054 in this MAP
Missing, Broken or Incorrect Characters on Display	Go to Step 054 in this MAP
Distorted Image on Display	Go to Step 054 in this MAP
Blank Display	Go to Step 054 in this MAP
Unreadable Display	Go to Step 054 in this MAP
Flashing Cursor Only	Go to Step 057 in this MAP
BASIC Screen Appears	MAP 0600: Diskette Drive Start
Loads Program from Fixed Disk	MAP 0600: Diskette Drive Start
Disk Boot Failure	MAP 0600: Diskette Drive Start
Loads Program from Remote Station	MAP 0600: Diskette Drive Start
PARITY CHECK Error	MAP 0200: Memory Start
Keyboard Problem	MAP 0300: Keyboard Start
Cannot Finish Diagnostic Tests	MAP 0020: Power Start
Printer Problems	Refer to the Service Manual for the Printer
Network Problems	Refer to the Service Manual for the Network

Figure 3. Failure Symptoms

054

(From Steps 052 and 053 in this MAP)

IS AN ENHANCED GRAPHICS ADAPTER INSTALLED?

Yes No

055

Go to the MAP for the failing display adapter.

056

Go to "MAP 2400: Enhanced Graphics Adapter."

057

(From Step 053 in this MAP)

IS A MATH COPROCESSOR INSTALLED?

Yes No

058

Go to "MAP 0600: Diskette Drive Start."

059

- Power off the system.
- Remove the math coprocessor from the system board.
- Power on the system.

DID THE FAILING SYMPTOM REMAIN?

Yes No

060

Replace the math coprocessor and the 8088 processor.

061

Reinstall the math coprocessor, then go to "MAP 0600: Diskette Drive Start."

062

(From Step 052 in this MAP)

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

Notes:

JUMPERS AND SWITCH SETTINGS

Option Compatibility	3
BIOS ROM Identification	3
Using the Switch Charts	4
System Board (Diskette Drives, Displays, Coprocessor, and POST Loop)	5
System Board (Memory)	6
Memory Adapter Switch Sets	11
Extender Card Switch Settings	19
Cluster Adapter	20
Station Address	20
Remote Initial Program Load	22
Adapter Number	22
Enhanced Graphics Adapter (EGA)	23
PC Network Adapter	25
Asynchronous Communications Adapter	26
Binary Synchronous Communications (BSC) Adapter	27
Data Acquisition and Control (DAC) Adapter	28
Analog Output Range	28
Analog Input Range	29
Adapter Number	29
Interrupt Request (IRQ) Level	30
General Purpose Interface Bus (GPIB) Adapter	31
Adapter Number	31
Interrupt Request (IRQ) Level	32
Interrupt Acknowledge (INT ACK) Level	33
Direct-Memory Access (DMA) Channel	33
Professional Graphics Controller	34
Voice Communications Adapter	35

Notes:

Option Compatibility

Certain option adapters conflict when used in the same system. The following adapters should not be installed together in your system unit:

- Synchronous Data Link Control (SDLC) adapter.
- Alternate Binary Synchronous Communications (Alt. BSC) adapter.

BIOS ROM Identification

To determine the date of the BIOS ROM module, run the following BASIC program. Type the program exactly as shown.

```
10 DEF SEG=&HF000
20 FOR X=&HFFF5 TO &HFFFF
30 PRINT CHR$(PEEK(X));
40 NEXT
RUN
```

The date that is displayed is the date of your BIOS ROM module.

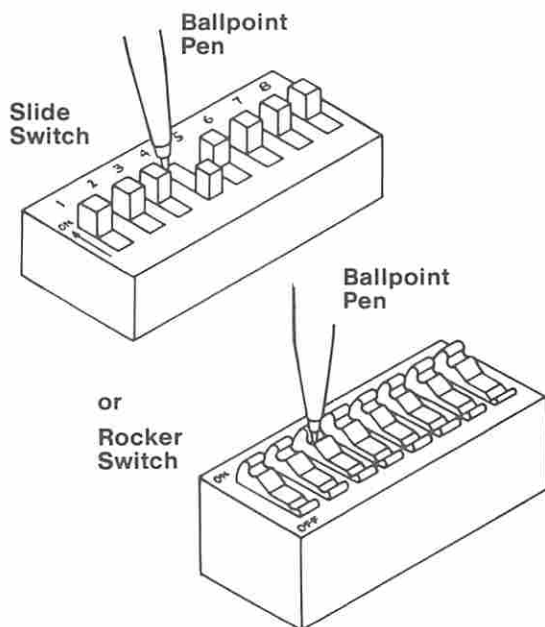
Using the Switch Charts

The following legend applies to the charts in this section.

Symbol	Meaning
*	Not Used by this Application
↑	On/Closed Position Of A Switch
↓	Off/Open Position Of A Switch
N/A	Not Allowed Or Not Applicable

Note: For some options, the customer must supply information for correct setting of jumpers or switches.

To set a rocker switch, press the rocker down to the desired position; to set a slide switch, slide the lug of the switch to the desired position.



System Board (Diskette Drives, Displays, Coprocessor, and POST Loop)

Function	System Board Switches		
	PC		PCXT & Portable
	Sw. Block 1	Sw. Block 2	Sw. Block 1
	12345678	12345678	12345678
0-Diskette Drives	↑*****↑↑	*****	N/A
1-Diskette Drive	↓*****↑↑	*****	*****↑↑
2-Diskette Drives	↓*****↓↑	*****	*****↓↑
3-Diskette Drives	N/A	N/A	*****↓↑
4-Diskette Drives	N/A	N/A	*****↓↓
No Display Adapter	****↑↑**	N/A	****↑↑**
Enhanced Graphics Adapter (Primary: See Note 1)	****↑↑**	N/A	****↑↑**
Color/Graphics Adapter (40 X 25 Primary)	****↓↑**	N/A	****↓↑**
Color/Graphics Adapter (80 X 25 Primary)	****↑↓**	N/A	****↑↓**
Professional Graphics Controller (Primary)	N/A	N/A	****↑↓**
Monochrome/Printer Adapter (Primary: See Note 2)	****↓↓**	N/A	****↓↓**
Math Coprocessor Installed	*↓*****	N/A	*↓*****
Math Coprocessor Not Installed	*↑*****	N/A	*↑*****
POST Loop (Allows Continuous Running)	N/A	N/A	↑*****
No POST Loop (Normal Operation)	N/A	N/A	↓*****
Notes: 1) If the Enhanced Graphics Adapter (EGA) is installed with another display adapter, set the system board switches as shown for the EGA. 2) The IBM Monochrome Display and Printer Adapter is not supported in the Portable Personal Computer.			

System Board (Memory)

PC XT With 256/640K System Board (Note 1)	
Total Memory (Note 2)	System Board Switch Settings
	12345678
256K	**↑↑****
512K	**↓↑****
576K	**↑↓****
640K	**↓↓****
<p>Note 1: The system board's identifier is located on its left edge.</p> <p>Note 2: Memory adapters are not supported on 256/640K system boards.</p>	

Portable Personal Computer					
Total Memory	System Board Switch Settings	256K Card Or 64/256K Option With 256K (See Note)	64/256K Option With 192K (See Note)	64/256K Option With 128K (See Note)	64/256K Option With 64K (See Note)
	12345678	12345678	12345678	12345678	12345678
256K	**↓↓****	N/A	N/A	N/A	N/A
320K	**↓↓****	N/A	N/A	N/A	↑↑↑↑↓↓↓
384K	**↓↓****	N/A	N/A	↑↑↑↑↓↓↓	N/A
448K	**↓↓****	N/A	↑↑↑↑↓↓↓	N/A	N/A
512K	**↓↓****	↑↑↑↑↓↓↓	N/A	N/A	N/A
576K	**↓↓****	↑↑↑↑↓↓↓	N/A	N/A	↓↑↑↑↓↓↓
640K	**↓↓****	↑↑↑↑↓↓↓	N/A	↓↑↑↑↓↓↓	N/A
<p>Note: The 64/256KB Memory Expansion Option and the 256KB Memory Expansion Option are the only memory options supported in the IBM <i>Portable</i> Personal Computer.</p>					

To use the following chart, first find the column under "System Board Type" that matches your system. Follow this column down to the switch settings for the total amount of memory in your system. Set the system board switches to match those in the chart. Then go to the "Switch Set" listed and set the switches on the memory adapters in your system. These sets of memory adapter switch settings start on page 11.

Note: If memory above 544K is to be installed on a 16/64KB system board, the BIOS ROM must be dated 10/27/82 or later. See "BIOS ROM Identification."

Total Memory	System Board Switch-Settings & Adapter Switch Sets	System Board Type (Note)		
		PC		PC XT
		16K-64K	64K-256K	64K-256K
		12345678	12345678	12345678
16K	Switch 1	**↑↑****	N/A	N/A
	Switch 2	↑↑↑↑↓↓↓	N/A	N/A
	Set	N/A	N/A	N/A
32K	Switch 1	**↓↑****	N/A	N/A
	Switch 2	↑↑↑↑↓↓↓	N/A	N/A
	Set	N/A	N/A	N/A
48K	Switch 1	**↓****	N/A	N/A
	Switch 2	↑↑↑↑↓↓↓	N/A	N/A
	Set	N/A	N/A	N/A
64K	Switch 1	**↓****	**↓****	N/A
	Switch 2	↑↑↑↑↓↓↓	↑↑↑↑↓↓↓	N/A
	Set	N/A	N/A	N/A
Note: The system board's identifier is located on its left edge.				

(Part 1 of 4)

Total Memory	System Board Switch Settings & Adapter Switch Sets	System Board Type		
		PC		PC XT
		16K-64K	64K-256K	64K-256K
		12345678	12345678	12345678
96K	Switch 1	**↓****	N/A	N/A
	Switch 2	↓↑↑↑↓	N/A	N/A
	Set	1	N/A	N/A
128K	Switch 1	**↓****	**↓****	**↑****
	Switch 2	↑↓↑↑↓	↑↓↑↑↓	N/A
	Set	3	N/A	N/A
160K	Switch 1	**↓****	N/A	N/A
	Switch 2	↓↑↑↑↓	N/A	N/A
	Set	5	N/A	N/A
192K	Switch 1	**↓****	**↓****	**↑****
	Switch 2	↑↑↑↑↓	↑↑↑↑↓	N/A
	Set	7	N/A	N/A
224K	Switch 1	**↓****	N/A	N/A
	Switch 2	↓↑↑↑↓	N/A	N/A
	Set	9	N/A	N/A
256K	Switch 1	**↓****	**↓****	**↓****
	Switch 2	↑↓↑↑↓	↑↓↑↑↓	N/A
	Set	11	N/A	N/A
288K	Switch 1	**↓****	**↓****	**↓****
	Switch 2	↓↓↑↑↓	↓↓↑↑↓	N/A
	Set	13	2	2

(Part 2 of 4)

Total Memory	System Board Switch Settings & Adapter Switch Sets	System Board Type		
		PC		PC XT
		16K-64K	64K-256K	64K-256K
		12345678	12345678	12345678
320K	Switch 1	**↓↓****	**↓↓****	**↓↓****
	Switch 2	↑↑↑↓↑↓↑↓	↑↑↑↓↑↓↑↓	N/A
	Set	15	4	4
352K	Switch 1	**↓↓****	**↓↓****	**↓↓****
	Switch 2	↓↑↑↑↓↑↓	↓↑↑↑↓↑↓	N/A
	Set	17	6	6
384K	Switch 1	**↓↓****	**↓↓****	**↓↓****
	Switch 2	↑↑↑↓↑↓↑↓	↑↑↑↓↑↓↑↓	N/A
	Set	19	8	8
416K	Switch 1	**↓↓****	**↓↓****	**↓↓****
	Switch 2	↓↑↑↑↓↑↓	↓↑↑↑↓↑↓	N/A
	Set	21	10	10
448K	Switch 1	**↓↓****	**↓↓****	**↓↓****
	Switch 2	↑↑↑↓↑↓↑↓	↑↑↑↓↑↓↑↓	N/A
	Set	23	12	12

(Part 3 of 4)

Total Memory	System Board Switch Settings & Adapter Switch Sets	System Board Type		
		PC		PC XT
		16K-64K	64K-256K	64K-256K
		12345678	12345678	12345678
480K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	N/A
	Set	25	14	14
512K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↑ ↓ ↓ ↓ ↓ ↓ ↓ ↓	↑ ↓ ↓ ↓ ↓ ↓ ↓ ↓	N/A
	Set	26	16	16
544K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	N/A
	Set	27	18	18
576K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↑ ↑ ↑ ↑ ↓ ↓ ↓ ↓	↑ ↑ ↑ ↑ ↓ ↓ ↓ ↓	N/A
	Set	28	20	20
608K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↓ ↑ ↑ ↑ ↓ ↓ ↓ ↓	↓ ↑ ↑ ↑ ↓ ↓ ↓ ↓	N/A
	Set	29	22	22
640K	Switch 1	** ↓ ↓ *****	** ↓ ↓ *****	** ↓ ↓ *****
	Switch 2	↑ ↑ ↑ ↑ ↓ ↓ ↓ ↓	↑ ↑ ↑ ↑ ↓ ↓ ↓ ↓	N/A
	Set	30	24	24

(Part 4 of 4)

Memory Adapter Switch Sets

Listed below are the switch settings for all allowed memory adapter configurations. Once you have set the system board switches, find the correct switch set for your system under the "Memory Adapter Switch Sets" column; then identify the row of switch settings for your adapter configuration.

Memory Adapter Switch Sets	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 1	N/A	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑
Set 2	N/A	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑↑
Set 3	N/A	N/A	N/A	↑↑↑↓↑↓	N/A	N/A
	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑ ↑↑↑↓↑↑↑↑
Set 4	N/A	N/A	N/A	↑↓↑↑↑↓	N/A	N/A
	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↓↑↑↑↑

(Part 1 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 5	N/A	N/A	N/A	↑↑↑↓↑↓↑↓	N/A	↑↑↑↑↑↑↑↑
	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑	↑↑↓↑↑↑↑↑
	N/A	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑ ↑↑↑↓↑↑↑↑ ↑↑↓↑↑↑↑↑
Set 6	N/A	N/A	N/A	↑↓↑↑↑↓↑↓	N/A	↑↓↑↓↑↑↑↑
	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑↑	↑↓↑↓↑↑↑↑
	N/A	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↑↑↓↑↑ ↑↓↑↓↑↑↑↑
Set 7	N/A	N/A	N/A	↑↑↑↓↑↓↑↓	↑↑↓↑↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑ ↑↑↓↑↑↑↑↑	N/A
	N/A	N/A	N/A	↑↑↑↓↑↓↑↓	N/A	↑↑↓↑↑↑↑↑ ↑↑↓↑↓↑↑↑
	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑↑	↑↑↓↑↑↑↑↑ ↑↑↓↑↓↑↑↑
	N/A	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	N/A

(Part 2 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 8	N/A	N/A	N/A	↑↑↑↑↑↓	↑↑↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	↑↑↑↑↑↑ ↑↑↑↑↑↑	N/A
	N/A	N/A	N/A	↑↑↑↑↑↓	N/A	↑↑↑↑↑↑ ↑↑↑↑↑↑
	N/A	N/A	N/A	N/A	↑↑↑↑↑↑	↑↑↑↑↑↑ ↑↑↑↑↑↑
	N/A	N/A	↑↑↑↑↑↓	N/A	N/A	N/A
Set 9	N/A	N/A	N/A	↑↑↑↑↑↓	↑↑↑↑↑↑	↑↑↑↑↑↑
	N/A	N/A	N/A	N/A	↑↑↑↑↑↑ ↑↑↑↑↑↑	↑↑↑↑↑↑
	N/A	N/A	↑↑↑↑↑↓	N/A	N/A	↑↑↑↑↑↑
Set 10	N/A	N/A	N/A	↑↑↑↑↑↓	↑↑↑↑↑↑	↑↑↑↑↑↑
	N/A	N/A	N/A	N/A	↑↑↑↑↑↑ ↑↑↑↑↑↑	↑↑↑↑↑↑
	N/A	N/A	↑↑↑↑↑↓	N/A	N/A	↑↑↑↑↑↑

(Part 3 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 11	N/A	↑↑↑↓↑↑↓	N/A	N/A	N/A	N/A
	N/A	N/A	↑↑↑↓↑↑↓	N/A	↑↑↓↑↑↑↑	N/A
	N/A	N/A	N/A	↑↑↑↓↑↑↓	↑↑↑↑↑↑↑ ↑↑↓↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	↑↑↑↓↑↑↑ ↑↑↑↑↑↑↑ ↑↑↓↑↑↑↑	N/A
	N/A	N/A	↑↑↑↓↑↑↓	N/A	N/A	↑↑↓↑↑↑↑ ↑↑↓↑↑↑↑
Set 12	N/A	↑↑↑↑↑↑↓	N/A	N/A	N/A	N/A
	N/A	N/A	↑↑↑↑↑↑↓	N/A	↑↑↓↑↑↑↑	N/A
	N/A	N/A	N/A	↑↑↑↑↑↓	↑↑↓↑↑↑↑ ↑↑↓↑↑↑↑	N/A
	N/A	N/A	N/A	N/A	↑↓↑↑↑↑↑ ↑↑↓↑↑↑↑ ↑↑↓↑↑↑↑	N/A
	N/A	N/A	↑↑↑↑↑↓	N/A	N/A	↑↓↑↑↑↑↑ ↑↓↑↑↑↑↑

(Part 4 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 13	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	↑↓↑↑↑↑↑↑
	N/A	N/A	↑↑↑↓↑↓↑↓	N/A	↑↑↓↑↑↑↑↑	↑↑↑↑↑↑↑↑
Set 14	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	↑↓↑↑↑↑↑↑
	N/A	N/A	↑↑↑↑↑↓↑↓	N/A	↑↓↑↑↑↑↑↑	↑↓↑↑↑↑↑↑
Set 15	N/A	N/A	↑↑↑↓↑↓↑↓	N/A	↑↑↓↑↑↑↑↑ ↑↓↑↑↑↑↑↑	N/A
	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	↑↑↑↑↑↑↑↑	N/A
	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↑↑↓↑↑
	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	N/A	N/A
Set 16	N/A	N/A	↑↓↑↑↑↓↑↓	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↑↑↑↑↑	N/A
	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	↑↓↑↑↑↑↑↑	N/A
	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↓↑↑↑↑
	↑↑↑↑↑↓↑↑	N/A	N/A	N/A	N/A	N/A
Set 17	N/A	↑↑↑↓↑↓↑↓	N/A	N/A	↑↓↑↑↑↑↑↑	↑↓↑↓↑↑↑↑
	↑↑↑↓↑↓↑↓	N/A	N/A	N/A	N/A	↑↓↑↓↑↑↑↑

(Part 5 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 18	N/A	↑↑↑↑↓↑↓	N/A	N/A	↑↓↑↓↑↑↑↑	↓↑↑↑↑↑↑↑
	↑↑↑↑↓↑↑	N/A	N/A	N/A	N/A	↓↑↑↑↑↑↑↑
Set 19	N/A	↑↑↑↑↓↑↓	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↓↑↑↑↑	N/A
	↑↑↑↑↓↑↑	N/A	N/A	↑↓↑↓↑↓↑↓	N/A	N/A
	↑↑↑↑↓↑↑	N/A	N/A	N/A	↑↓↑↓↑↑↑↑	N/A
	↑↑↑↑↓↑↑	N/A	N/A	N/A	N/A	↑↓↑↓↑↑↑↑ ↑↓↑↓↑↑↑↑
Set 20	N/A	↑↑↑↑↓↑↓	N/A	N/A	↑↓↑↓↑↑↑↑ ↓↑↑↑↑↑↑↑	N/A
	↑↑↑↑↓↑↑	N/A	N/A	↓↑↑↑↑↓↑↓	N/A	N/A
	↑↑↑↑↓↑↑	N/A	N/A	N/A	↓↑↑↑↑↑↑↑	N/A
	↑↑↑↑↓↑↑	N/A	N/A	N/A	N/A	↓↑↑↑↑↑↑↑ ↓↑↑↑↓↑↑↑
Set 21	↑↑↑↑↓↑↑	N/A	N/A	↑↓↑↓↑↓↑↓	N/A	↑↓↑↑↑↑↑↑
	↑↑↑↑↓↑↑	N/A	N/A	N/A	↑↓↑↓↑↑↑↑	↑↓↑↑↑↑↑↑
Set 22	↑↓↑↑↓↑↑	N/A	N/A	↓↑↑↑↑↓↑↓	N/A	↓↑↑↓↑↑↑↑
	↑↓↑↑↓↑↑	N/A	N/A	N/A	↓↑↑↑↑↑↑↑	↓↑↑↓↑↑↑↑

(Part 6 of 8)

Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 23	↑↑↑↓↑↑↑↑	N/A	N/A	↑↑↑↓↑↑↑↓	↑↓↑↑↑↑↑↑	N/A
	↑↑↑↓↑↑↑↑	N/A	N/A	N/A	↑↓↑↑↑↑↑↑ ↑↓↑↑↑↑↑↑	N/A
	↑↑↑↓↑↑↑↑	N/A	↓↑↑↓↑↑↑↓	N/A	N/A	N/A
Set 24	↑↑↑↑↑↑↑↑	N/A	N/A	↓↑↑↑↑↑↓↓	↑↓↑↓↑↑↑↑	N/A
	↑↑↑↑↑↑↑↑	N/A	N/A	N/A	↓↑↑↑↑↑↑↑ ↓↑↑↓↑↑↑↑	N/A
	↑↑↑↑↑↑↑↑	N/A	↓↑↑↑↑↑↓↓	N/A	N/A	N/A
Set 25	↑↑↑↓↑↑↑↑	N/A	↑↑↑↓↑↑↓↓	N/A	N/A	↑↓↑↓↑↑↑↑
Set 26	↑↑↑↓↑↑↑↑	N/A	↑↑↑↓↑↑↓↓	N/A	↑↓↑↓↑↑↑↑	N/A
	↑↑↑↓↑↑↑↑	↑↑↑↓↑↑↓↓	N/A	N/A	N/A	N/A
Set 27	↑↑↑↓↑↑↑↑	↑↑↑↓↑↑↓↓	N/A	N/A	N/A	↓↑↑↑↑↑↑↑
Set 28	↑↑↑↓↑↑↑↑	↑↑↑↓↑↑↓↓	N/A	N/A	↓↑↑↑↑↑↑↑	N/A
	↑↑↑↓↑↑↑↑	N/A	N/A	N/A	N/A	N/A
	↑↑↑↓↑↑↑↑					

(Part 7 of 8)

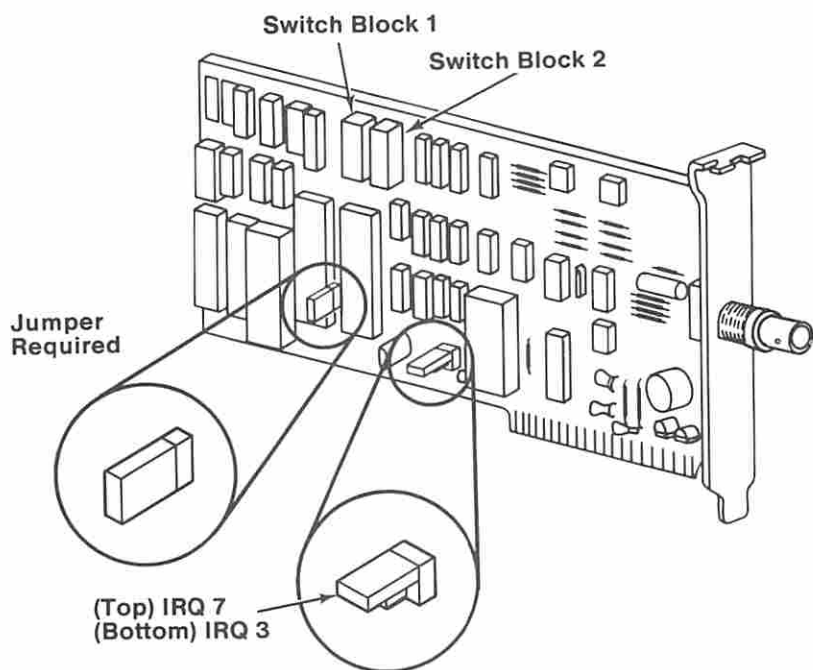
Adapter Memory Switch Set	256K Card or 64/256K Option W/256K	64/256K Option W/192K	64/256K Option W/128K	64/256K Option W/64K	64K Option	32K Option
	12345678	12345678	12345678	12345678	12345678	12345678
Set 29	↑↑↑↓↑↓↑↑	N/A	N/A	N/A	N/A	↓↑↑↓↑↑↑↑
	↑↓↑↓↑↓↑↑					
Set 30	↑↑↑↓↑↓↑↑	N/A	N/A	N/A	↓↑↑↓↑↑↑↑	N/A
	↑↓↑↓↑↓↑↑					
	↑↑↑↓↑↓↑↑	N/A	N/A	↓↑↑↓↑↓↑↓	N/A	N/A
	↑↓↑↓↑↓↑↑					

(Part 8 of 8)

Extender Card Switch Settings

System Memory	Extender Card Switch Block	Memory Segment
	1 2 3 4	
16K to 64K	↑↑↑↓	1
96K to 128K	↑↑↓↑	2
160K to 192K	↑↑↓↓	3
224K to 256K	↑↓↑↑	4
288K to 320K	↑↓↑↓	5
352K to 384K	↑↓↓↑	6
416K to 448K	↑↓↓↓	7
480K to 512K	↓↑↑↑	8
544K to 576K	↓↑↑↓	9
608K to 640K	↓↑↓↑	A

Cluster Adapter



Station Address

Station Address	Switch Block 1	Station Address	Switch Block 1	Station Address	Switch Block 1
	12345678		12345678		12345678
0	↓↓↓↓↓↓↓*	6	↑↑↑↓↓↓*	12	↓↓↑↑↓↓*
1	↑↓↓↓↓↓*	7	↑↑↑↓↓↓*	13	↑↑↑↓↓↓*
2	↓↑↓↓↓↓*	8	↓↓↓↑↓↓*	14	↓↑↑↑↓↓*
3	↑↑↑↓↓↓*	9	↑↑↑↓↓↓*	15	↑↑↑↑↓↓*
4	↓↓↑↑↓↓*	10	↓↑↑↓↓↓*	16	↓↓↓↑↑↓*
5	↑↑↑↑↓↓*	11	↑↑↑↑↓↓*	17	↑↑↓↑↑↓*

(Part 1 of 2)

Station Address	Switch Block 1	Station Address	Switch Block 1	Station Address	Switch Block 1
	12345678		12345678		12345678
18	↓↑↓↑↓↑↓*	34	↓↑↓↑↓↑↓*	50	↓↑↓↑↓↑↓*
19	↑↑↓↑↓↑↓*	35	↑↑↓↑↓↑↓*	51	↑↑↓↑↓↑↓*
20	↓↑↓↑↓↑↓*	36	↓↑↓↑↓↑↓*	52	↓↑↓↑↓↑↓*
21	↑↑↓↑↓↑↓*	37	↑↑↓↑↓↑↓*	53	↑↑↓↑↓↑↓*
22	↓↑↓↑↓↑↓*	38	↓↑↓↑↓↑↓*	54	↓↑↓↑↓↑↓*
23	↑↑↓↑↓↑↓*	39	↑↑↓↑↓↑↓*	55	↑↑↓↑↓↑↓*
24	↓↑↓↑↓↑↓*	40	↓↑↓↑↓↑↓*	56	↓↑↓↑↓↑↓*
25	↑↑↓↑↓↑↓*	41	↑↑↓↑↓↑↓*	57	↑↑↓↑↓↑↓*
26	↓↑↓↑↓↑↓*	42	↓↑↓↑↓↑↓*	58	↓↑↓↑↓↑↓*
27	↑↑↓↑↓↑↓*	43	↑↑↓↑↓↑↓*	59	↑↑↓↑↓↑↓*
28	↓↑↓↑↓↑↓*	44	↓↑↓↑↓↑↓*	60	↓↑↓↑↓↑↓*
29	↑↑↓↑↓↑↓*	45	↑↑↓↑↓↑↓*	61	↑↑↓↑↓↑↓*
30	↓↑↓↑↓↑↓*	46	↓↑↓↑↓↑↓*	62	↓↑↓↑↓↑↓*
31	↑↑↓↑↓↑↓*	47	↑↑↓↑↓↑↓*	63	↑↑↓↑↓↑↓*
32	↓↑↓↑↓↑↓*	48	↓↑↓↑↓↑↓*		
33	↑↑↓↑↓↑↓*	49	↑↑↓↑↓↑↓*		

(Part 2 of 2)

Notes:

1. Switches 1 through 6 of Switch Block 1 are for station addresses 0 to 63.
2. Position 7 of Switch Block 1 is always set to the Off position.
3. Position 8 of Switch Block 1 is the Remote Initial Program Load (RIPL) switch (see the next figure).

Remote Initial Program Load

When switch 8 is On, the Personal Computer will request a Remote Initial Program Load (RIPL) from another station in the Cluster. This delays the POST by 30 seconds. The recommended setting is Remote IPL Off.

Condition	Switch Block 1
	12345678
Remote IPL On	*****↓↑
Remote IPL Off	*****↓↓

Note: Position 7 of Switch Block 1 is always set to the Off position.

Adapter Number

The following figure shows the setting of switches 1 through 4 of Switch Block 2 for adapters 1 through 4.

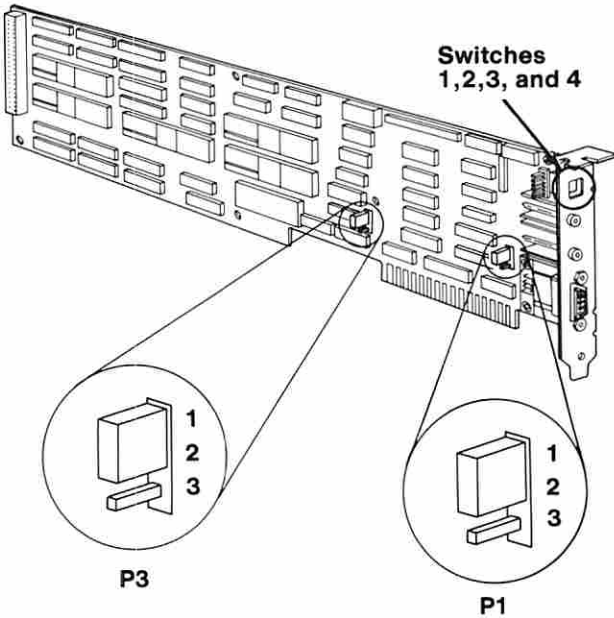
Switches 5 through 8 of Switch Block 2 are always set to the Off position.

Condition	Switch Block 2
	12345678
Select Adapter 1:	↑↓↓↓↓↓↓↓
Select Adapter 2:	↓↑↓↓↓↓↓↓
Select Adapter 3:	↓↓↑↓↓↓↓↓
Select Adapter 4:	↓↓↓↑↓↓↓↓

Note: If only one Cluster Adapter is installed in an IBM Personal Computer, it must be set as adapter 1. Each additional adapter must have a different Cluster Adapter number.

Enhanced Graphics Adapter (EGA)

Warning: Damage to the graphics adapter, the display, or both may result if these jumpers are not in the correct position.



Type of Display	P1	P3
IBM Color Display or IBM Monochrome Display	2 and 3	1 and 2
IBM Enhanced Color Display	1 and 2	1 and 2

If an EGA is the only display adapter installed, or an EGA and a Monochrome Display and Printer Adapter are installed in the system, refer to Figure 1 to set the EGA switches.

If an EGA is installed with a Color/Graphics Monitor Adapter, refer to Figure 2 to set the EGA Switches.

Type of Display Attached to the Enhanced Graphics Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
No Display	N/A	↓↑↑↑
Monochrome Display	↓↑↑↓	N/A
Color Display (40 X 25 Mode)	↑↑↓↑	↑↑↑↑
Color Display (80 X 25 Mode)	↓↑↑↑	↓↑↑↑
Enhanced Color Display (Normal Color Mode)	↑↑↑↓	↑↑↑↑
Enhanced Color Display (Enhanced Color Mode)	↓↑↑↓	↓↑↑↑

Figure 1

Type of Display Attached to the Color/Graphics Monitor Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
Color Display (40 X 25 Mode)	↑↑↓↓	↑↑↓↑
Color Display (80 X 25 Mode)	↓↑↑↓	↓↑↑↑
No Display (80 X 25 Mode)	↓↑↑↓	N/A

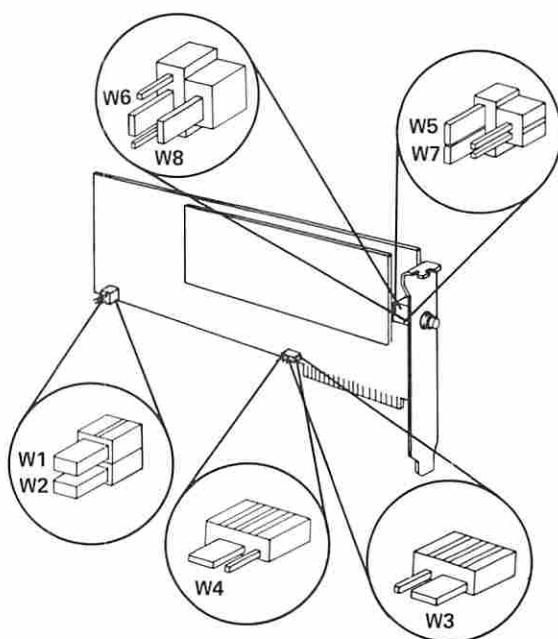
Figure 2

Notes:

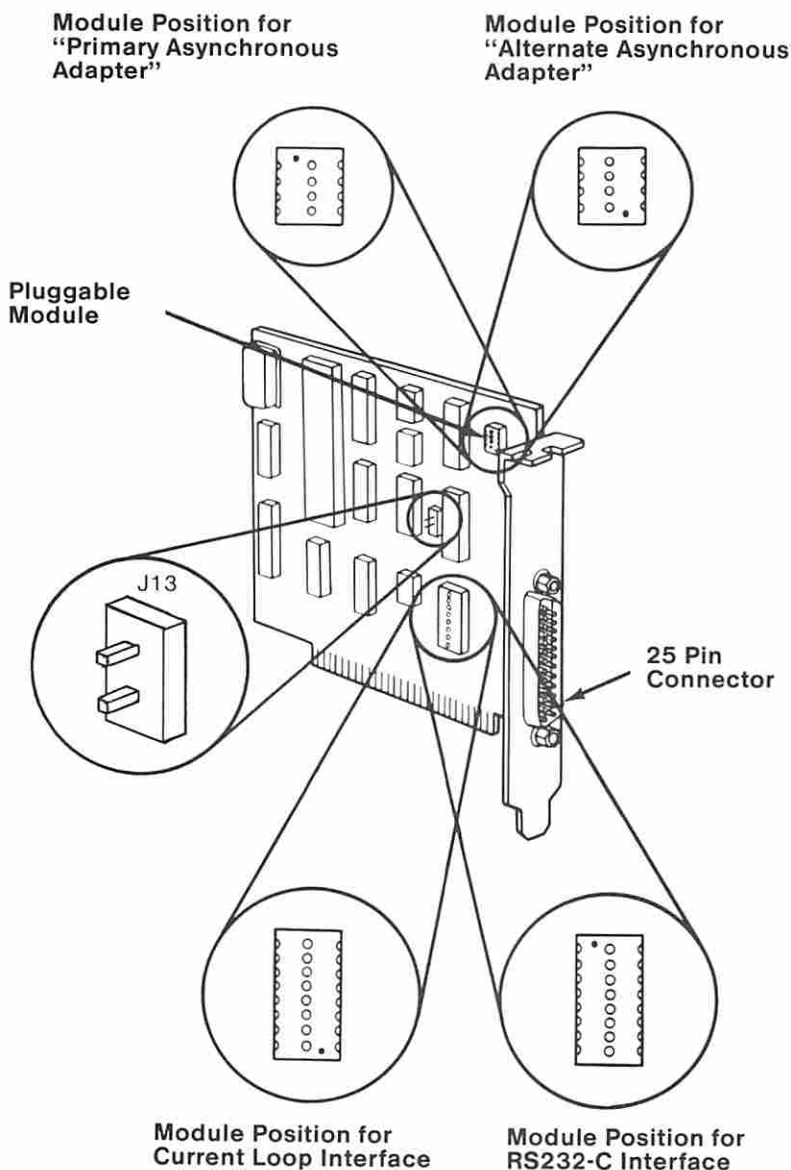
1. Mode selection can be changed by programming.
2. A maximum of two displays can be attached to the system, one color display and one monochrome display.

PC Network Adapter

Jumper Position (See figure)	Function
W1	Automatic Remote Program Load (RPL)
W2	Not Used
W3	Sets Adapter to use Interrupt Level 2
W4	Sets Adapter to use Interrupt Level 3
W5 & W7	Sets Adapter as Alternate Adapter
W6	Sets Adapter as Primary Adapter
W8	Enables ROM on Adapter (See Note)
Note: Do not enable the ROM on more than one adapter.	

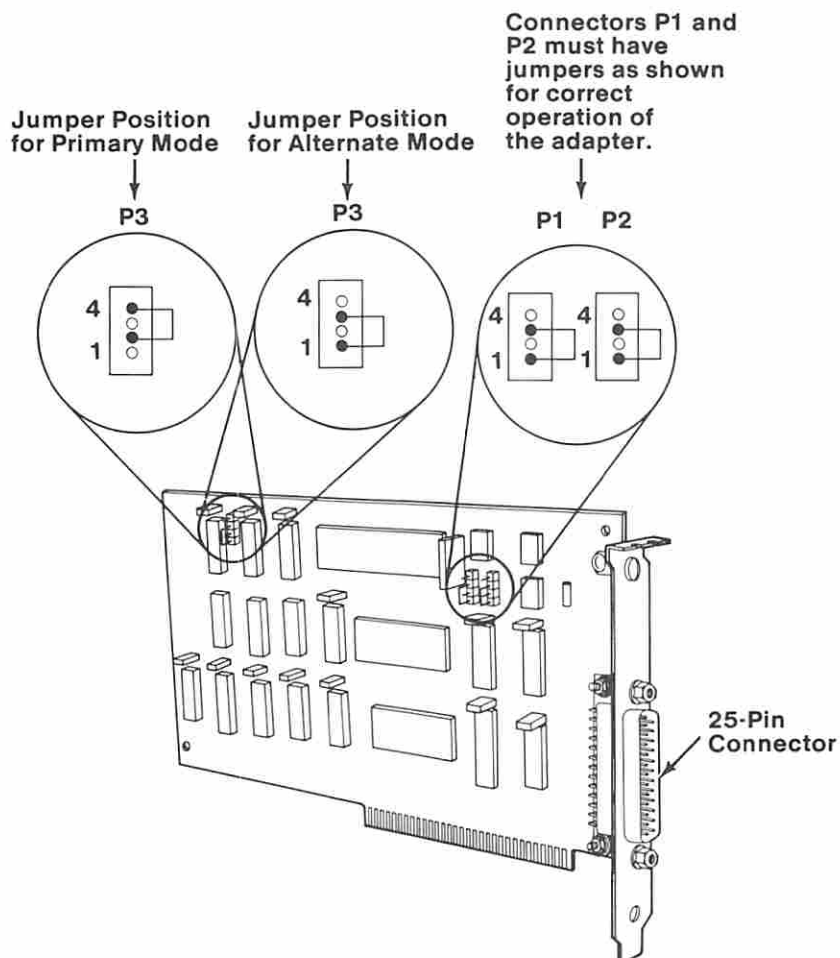


Asynchronous Communications Adapter

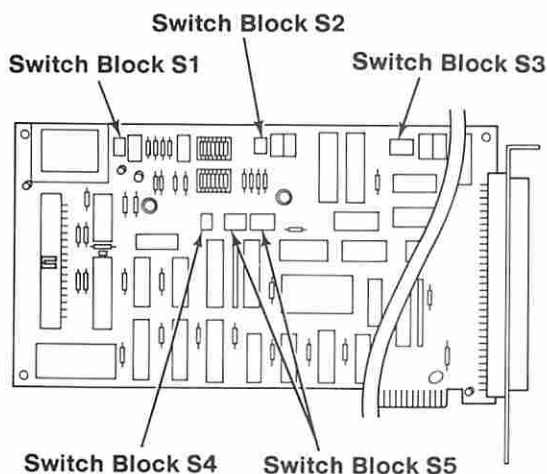


Note: A jumper must be installed on J13 if the adapter is installed in slot 8 of an IBM Personal Computer XT.

Binary Synchronous Communications (BSC) Adapter



Data Acquisition and Control (DAC) Adapter



Analog Output Range

Analog Output Range (D/A) Channel 0	Switch Block S1
	1 2
-5 to +5 Volts	↑↑
-10 to +10 Volts	↓↑
0 to +10 Volts	↑↓

Analog Output Range (D/A) Channel 1	Switch Block S2
	1 2
-5 to +5 Volts	↑↑
-10 to +10 Volts	↓↑
0 to +10 Volts	↑↓

Note: Only the switch settings shown may be used.

Analog Input Range

Analog Input Range (A/D)	Switch Block S3
	1 2 3 4
-5 to +5 Volts	↓ ↓ ↑ ↑
-10 to +10 Volts	↓ ↑ ↓ ↑
0 to +10 Volts	↓ ↓ ↑ ↓

Note: Only the switch settings shown may be used.

Adapter Number

Adapter Number (Note)	Switch Block S4
	1 2
0	↓↓
1	↑↓
2	↓↑
3	↑↑
Note: Each DAC adapter installed in a system must have its own adapter number.	

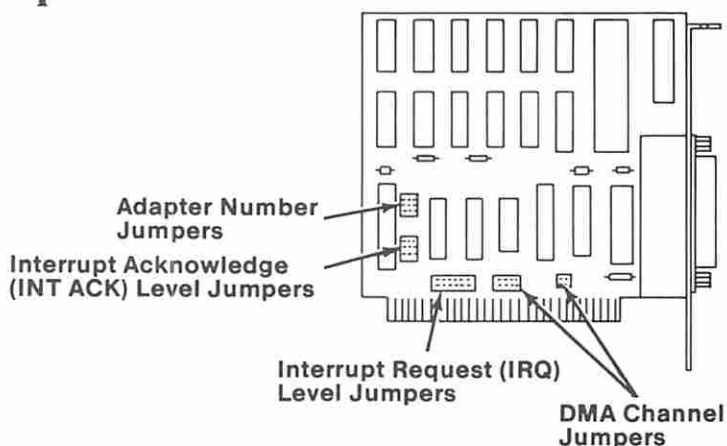
Note: Only the switch settings shown may be used.

Interrupt Request (IRQ) Level

IRQ Level	Switch Block S5									
	1	2	3	4	5	1	2	3	4	5
7	↓	↓	↓	↓	↓	↓	↓	↓	↑	↑
6	↓	↓	↓	↓	↓	↓	↑	↑	↓	↓
5	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
4	↓	↓	↑	↑	↓	↓	↓	↓	↓	↓
3	↑	↑	↓	↓	↓	↓	↓	↓	↓	↓
Note: The DAC adapter can share its IRQ level with other adapters that can use shared interrupts.										

Note: Only the switch settings shown may be used.

General Purpose Interface Bus (GPIB) Adapter









Adapter Number

Each GPIB adapter installed in the same system must have its own adapter number.

Adapter Number	Jumper Positions
0	
1	
2	
3	
4	
5	
6	
7	







Interrupt Request (IRQ) Level

The GPIB adapter can share its IRQ level with other adapters that use shared interrupts. All adapters sharing an IRQ level must be installed in the same unit.




Interrupt Request Level	Jumper Positions
7	
6	
5	
4	
3	
2	

Interrupt Acknowledge (INT ACK) Level

The interrupt acknowledge (INT ACK) and interrupt request (IRQ) levels must be the same.

INT ACK level	Jumper positions
7	
6	
5	
4	
3	
2	

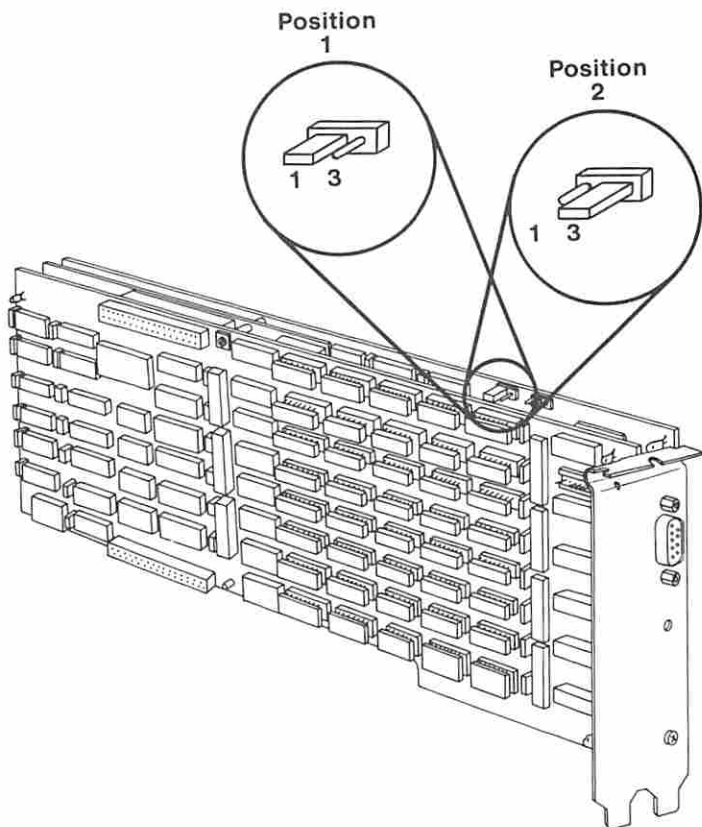
Direct-Memory Access (DMA) Channel

DMA channel	Jumper positions
1	
2	
3	

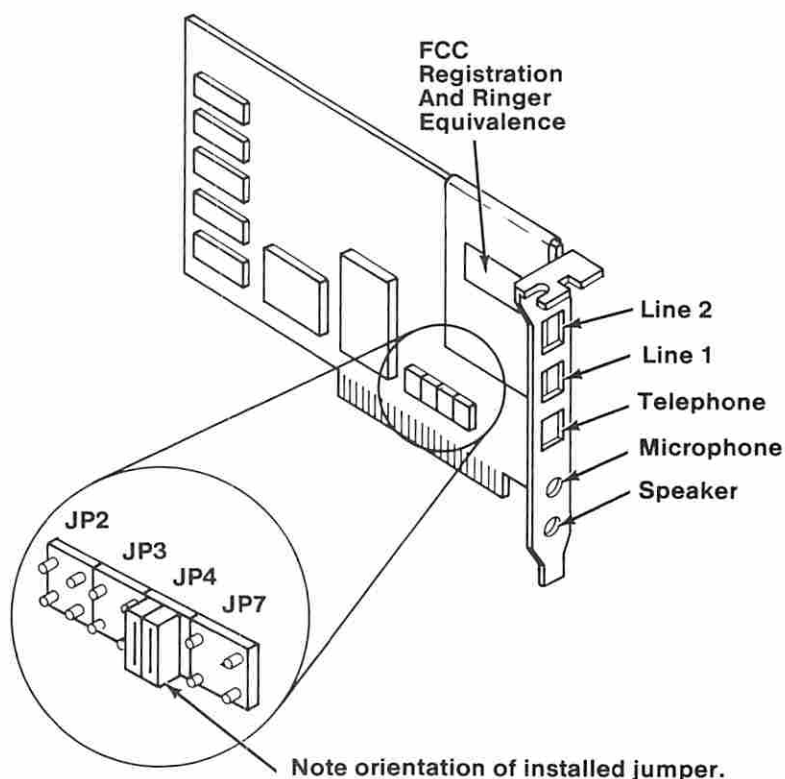
Professional Graphics Controller

If an IBM Color/Graphics Monitor Adapter is installed in the system, the emulator jumper must be in position 2.

When the jumper is installed in position 1, the Professional Graphics Controller can emulate an IBM Color/Graphics Monitor Adapter.



Voice Communications Adapter



Note: The jumper block is usually set to position JP4. It must be installed at an interrupt level that does not conflict with other options.

IRQ Level	Jumper Position
2	JP2
3	JP3
4	JP4
7	JP7

Notes:

Switch Supplements

File any jumper and switch supplements behind this page. Enter the name of the supplement and the date it was filed.

NAME

DATE

20 MByte Fixed Discdrive Adaptor

'MARCH 15 1986'

NAME

DATE

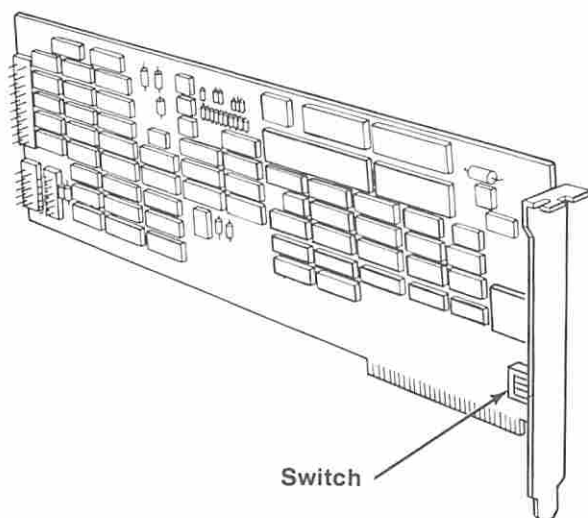
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Switches (PC, XT, Portable PC)

20MB Fixed Disk Drive Adapter

Switch Supplement for XT

20MB Fixed Disk Drive Adapter



Size	Fixed Disk Drive Type	Drive C	Drive D
20MB	Type 2	Switches	
		1 2 ↓ ↑	3 4 ↓ ↑
	Type 13	1 2 ↓ ↓	3 4 ↓ ↓
	Type 16	1 2 ↑ ↓	3 4 ↑ ↓
Note: Types 2, 13, and 16 have the type marked on the label on top of the drive.			

PARTS CATALOG

How To Use This Parts Catalog	3
Visual Index	5
Assembly 1. System Unit - Exterior (5150)	7
Assembly 2. System Unit - Exterior (5160)	8
Assembly 3. System Unit - Exterior (5155)	9
Assembly 4. System Unit - Interior (5150)	10
Assembly 5. System Unit - Interior (5160)	12
Assembly 6. System Unit - Interior (5155)	14
Assembly 7. Full High Diskette Drive Type 1	16
Assembly 8. Full High Diskette Drive Type 1	18
Assembly 9. Full High Diskette Drive Type 2	20
Assembly 10. Full High Diskette Drive Type 2	22
Assembly 11. Full High Diskette Drive Type 3	24
Assembly 12. Full High Diskette Drive Type 3	26
Assembly 13. Half High Diskette Drive	28
Assembly 14. Diskette Drive Portable PC	30
Assembly 15. Fixed Disk Drive	31
Assembly 16. Internal Options and Adapters	32
Assembly 17. Expansion Unit - Exterior (5161)	35
Assembly 18. Expansion Unit - Interior (5161)	36
Assembly 19. Monochrome Display (5151)	38
Assembly 20. Color Display (5153)	40
Assembly 21. Enhanced Color Display (5154)	42
Assembly 22. Professional Graphics Display (5175)	44
Assembly 23. Keyboard (83-Key for 5150 and 5160) ...	46
Assembly 24. Keyboard (83-Key for 5155)	47
Assembly 25. Keybutton Kits (83-Key)	48
Assembly 26. Keybuttons (83-Key)	50
Assembly 27. Keyboard (101/102-Key)	52
Assembly 28. Keybutton Kits (101/102-Key)	53
Assembly 29. Keybuttons (101/102-Key)	54
Assembly 30. Power Cords	56
Assembly 31. Miscellaneous	58



How To Use This Parts Catalog

1. **Similar Parts** - If two parts are similar, they may be listed in the same list. Similar parts are referred to by one index number but are distinguished by the part number and description.
2. **NS** - When this indication appears in the ASM - INDEX column, it denotes a part not shown in the figure. This designation is generally used for miscellaneous parts packets.
3. **R** - This entry in the Units column indicates the part has a restricted availability.
4. **AR** - As Required (AR) in the Units column denotes that the units per assembly may vary based upon system configuration.
5. **Indenture** - The indenture is marked by a series of dots located before the part description. The indenture indicates the relationships of a part to the next higher assembly.

Example of a Parts List

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 -	1234567		Main Assembly
- 1	1234568	1	• Subassembly
- 2	1234569	1	• Subassembly, US
- 2	1234566	1	• Subassembly, Non-US
- 3	1234565	R	•• Detailed Part Restricted
- 4	1234564	1	• Subassembly
			•• Detailed Part
			•• Detailed Part
			•• Detailed Part
- NS	1234563	1	• Subassembly Not Shown
			•• Detailed Part
			•• Detailed Part
- 5	1234562	AR	• Subassembly - Use as Required

How to Use the Visual Index

Visual Index



Expansion Unit (5161)
Assembly 17 and 18
Pages 35 and 36



Displays
Assembly 19, 20, 21, and 22
Pages 39, 40, 42, and 44



Keyboard (83-Key 5150 & 5160)
Assembly 23, 25, and 26
Pages 46, 48, 49, and 50



Keyboard (83-Key 5155)
Assembly 24, 25, and 26
Pages 47 through 50



Keyboard (101/102-Key)
Assembly 27, 28, and 29
Pages 52, 53, and 54

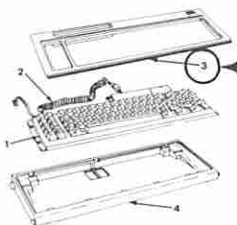


Power Cords
Assembly 30
Page 56

Note: Miscellaneous Hardware can be found on page 58

1. Turn to the visual index and locate, by illustration, the assembly containing the part.

Assembly 24. Keyboard (83-Key for 5155)



ASH - INDEX	PART NUMBER	UNITS	DESCRIPTION
24	8654422	1	Keyboard Assembly w/cable, US
-	8654432	1	Keyboard Assembly w/cable, French
-	8654429	1	Keyboard Assembly w/cable, German
-	8654431	1	Keyboard Assembly w/cable, Italian
-	8654430	1	Keyboard Assembly w/cable, Spanish
-	8654428	1	Keyboard Assembly w/cable, UK
-	4586161	1	Keyboard Assembly, US
-	8654437	1	Keyboard Assembly, French
-	8654434	1	Keyboard Assembly, German
-	8654436	1	Keyboard Assembly, Italian
-	8654435	1	Keyboard Assembly, Spanish
-	8654433	1	Keyboard Assembly, UK
- 3	8654425	1	Top Cover
-	9654421	1	Bottom Cover
			** Pin Support (Qty 2) ** Spring (Qty 2) ** Cup Plunger (Qty 2) ** Pin Support (Qty 2) ** Spring Plunger (Qty 2) ** Pad (Qty 5) ** Screw, Flathead (Qty 2)

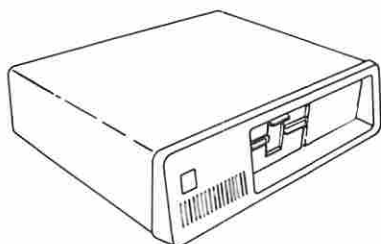
2. Turn to the page for that assembly and locate the part visually.

3. Using the index number shown with the part, refer to the accompanying listing to obtain the part number.

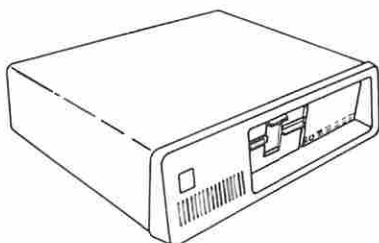
March 15, 1986

Parts (PC, XT, Portable PC) 47

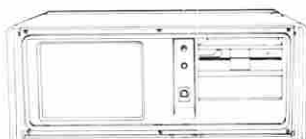
Visual Index



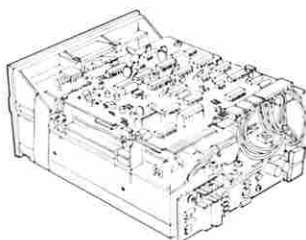
System Unit (5150)
Assembly 1 and 4
Pages 7 and 10



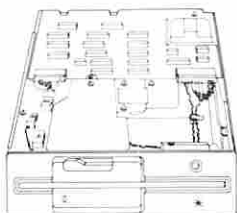
System Unit (5160)
Assembly 2 and 5
Pages 8 and 12



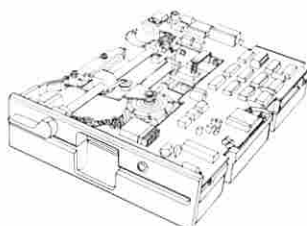
System Unit (5155)
Assembly 3 and 6
Pages 9 and 14



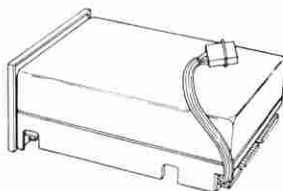
Full-High Diskette Drives
Assembly 7, 8, 9, 10, 11, and 12
Pages 16 through 26



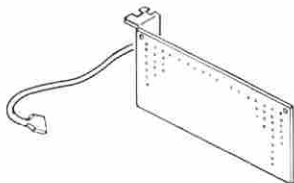
Half-High Diskette Drive
Assembly 13
Page 28



Diskette Drive Portable PC
Assembly 14
Page 30

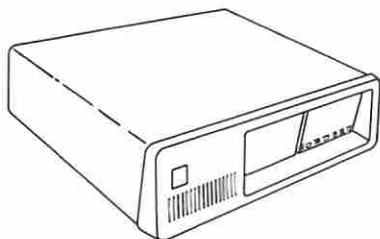


Fixed Disk Drives
Assembly 15
Page 31

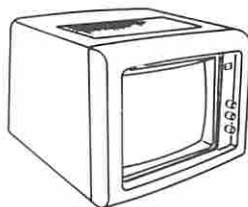


Internal Options and Adapters
Assembly 16
Page 32

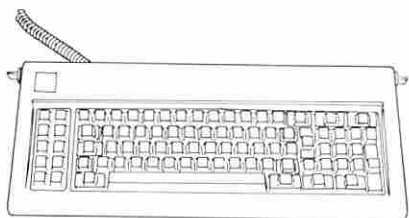
Visual Index



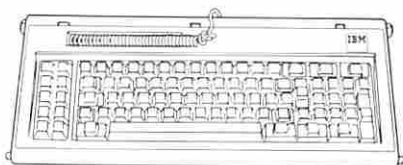
Expansion Unit (5161)
Assembly 17 and 18
Pages 35 and 36



Displays
Assembly 19, 20, 21, and 22
Pages 38, 40, 42, and 44



Keyboard (83-Key 5150 & 5160)
Assembly 23, 25, and 26
Pages 46, 48, 49, and 50



Keyboard (83-Key 5155)
Assembly 24, 25, and 26
Pages 47 through 50



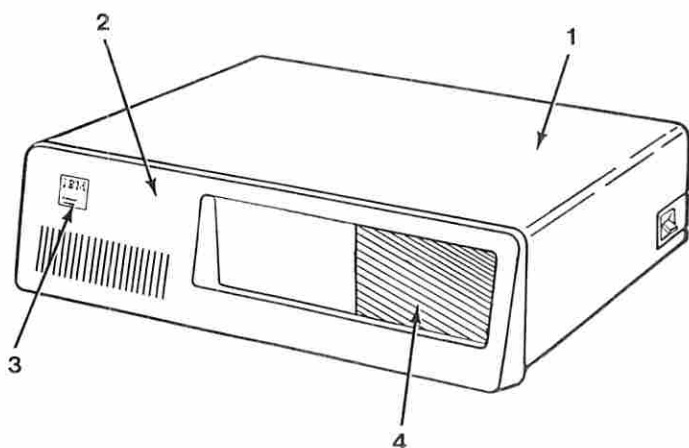
Keyboard (101/102-Key)
Assembly 27, 28, and 29
Pages 52, 53, and 54



Power Cords
Assembly 30
Page 56

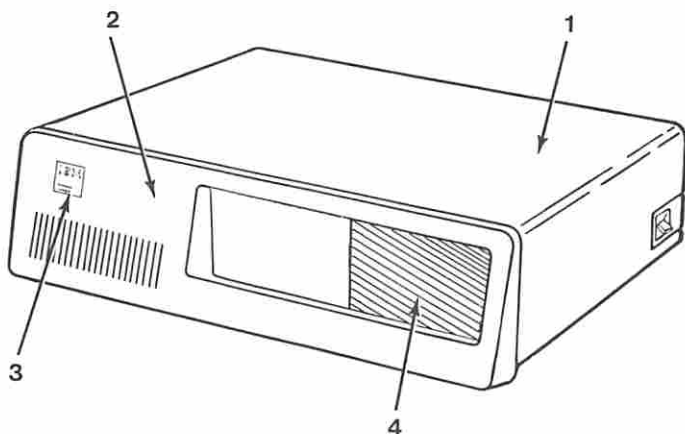
Note: Miscellaneous Hardware can be found on page 58.

Assembly 1. System Unit - Exterior (5150)



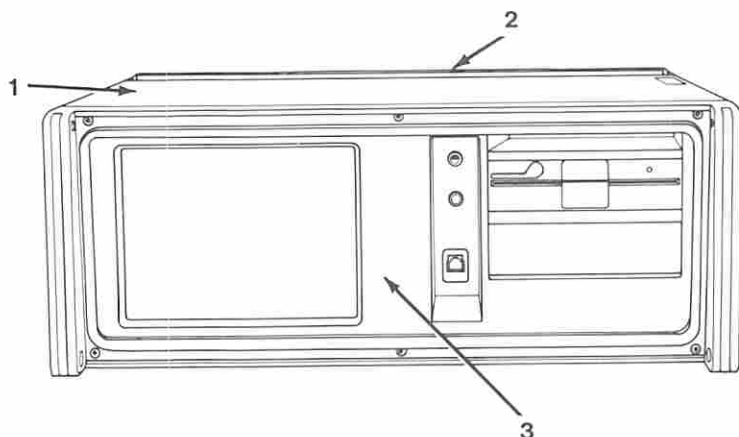
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 - 1	8529162	1	Top Cover (No Bezel)
- 2	8529163	1	Bezel Assembly
- 3	8529164	R	• Logo/Label Kit (US Only)
- 3	8529283	R	• Logo/Label Kit (Non-US Only)
			• Front Name Plate
			• Rear Name Plate
			• FCC Label
- 4	8529204	AR	Disk Cover Plate
- NS			Power Cord (See Power Cord Parts List)

Assembly 2. System Unit - Exterior (5160)



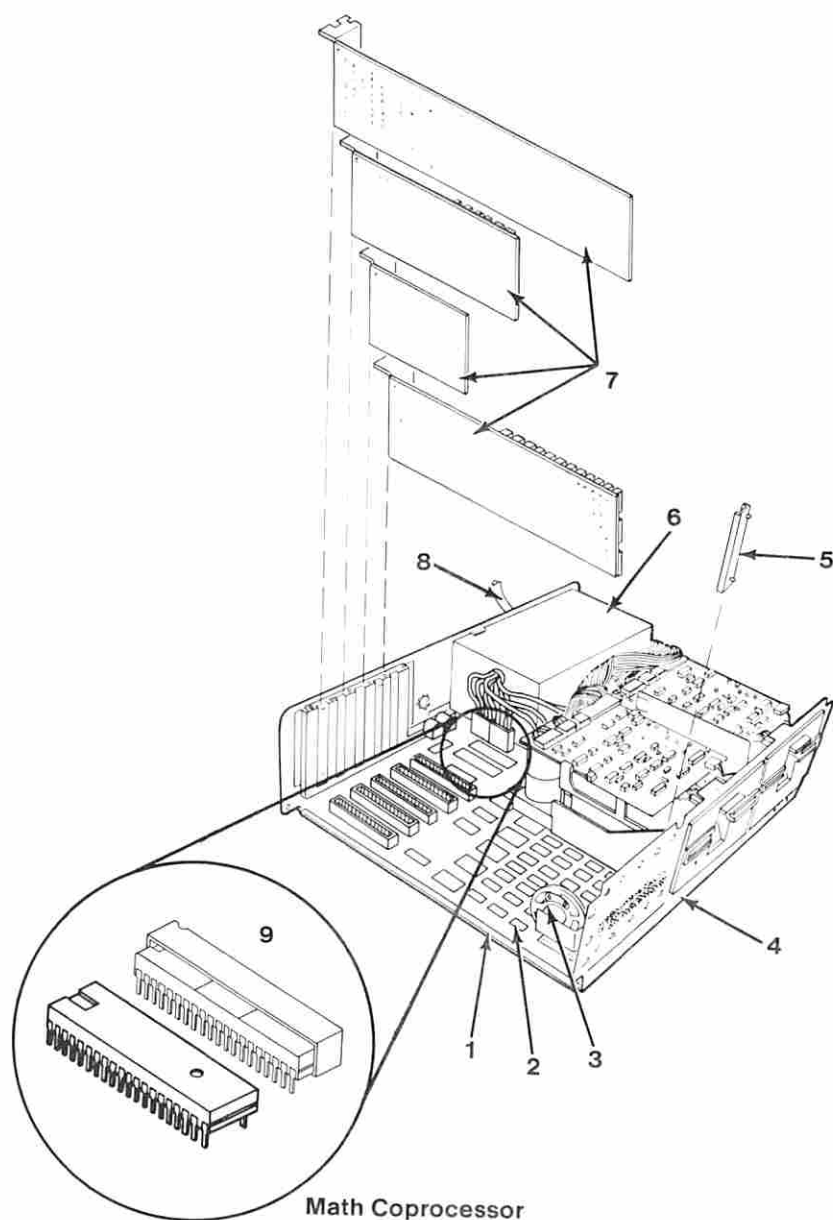
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
2 -	8285980		Cover Assembly (5160)
- 1	8529162	1	• Top Cover (No Bezel)
- 2	8285163	1	• Bezel Assembly (5160)
- 3	8529164	R	• Logo/Label Kit (US Only)
- 3	8529283	R	• Logo/Label Kit (Non-US Only)
			•• Front Name Plate
			•• Rear Name Plate
			•• FCC Label
- 4	8529204	AR	Disk Cover Plate
- NS			Power Cord (See Power Cord Parts List)
- NS	6937077		Shipping Carton, System Unit

Assembly 3. System Unit - Exterior (5155)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
3 -	8654414		Cover Assembly
- 1			• Cover
- 2			• Handle Assembly
- 3	8654413	1	• Panel Assembly
- NS	8654440	1	• Panel Assembly Kit
			•• Panel Assembly (Rear Access)
			•• Panel Retainer Kit
- NS	8654439	1	• Cover and Handle Hardware Kit
			•• Foam Pad
			•• Washer, Friction (Qty 2)
			•• Nut, Stud (Qty 2)
			•• Screw, Shoulder M4 (Qty 2)
- NS	8654445	R	• IBM Label
- NS	8654418	1	Carrying Case
- NS			Power Cord (See Power Cord Parts List)

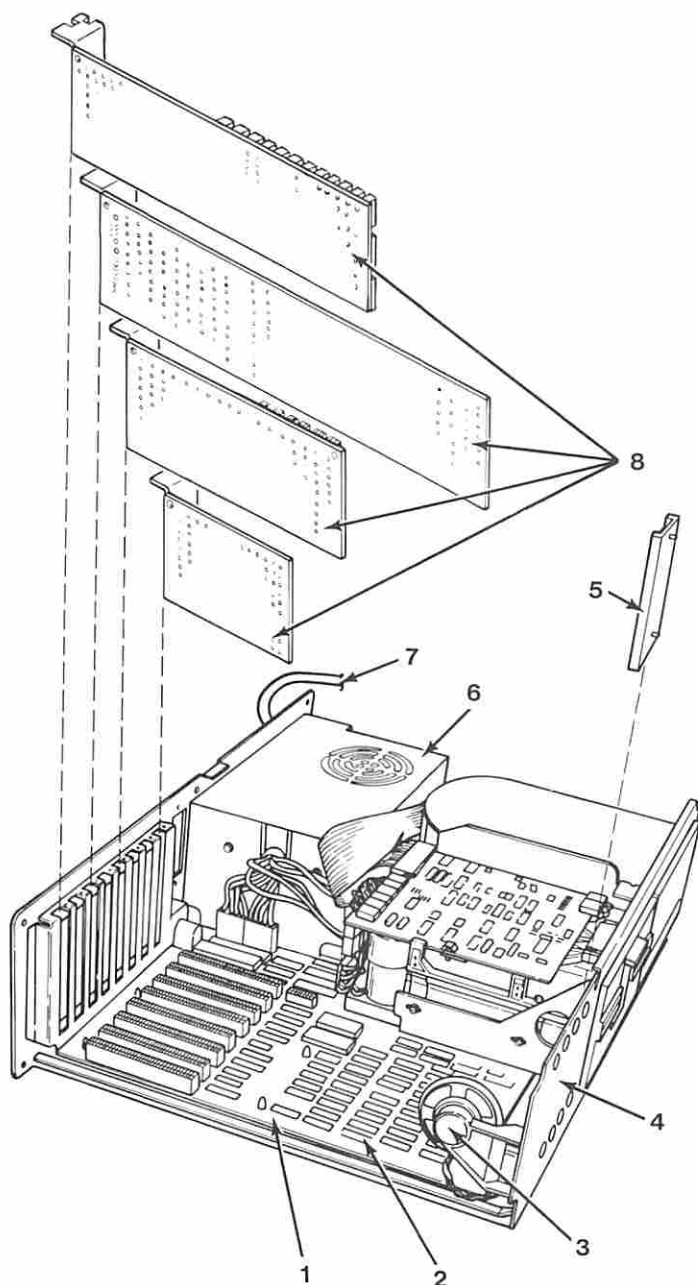
Assembly 4. System Unit - Interior (5150)



System Unit - Interior (5150)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
4 - 1	8529205	1	System Board 16KB-64KB CPU (US Only)
- 1	8654207	1	System Board 16KB-64KB CPU (Non-US Only)
- 1	8529238	1	System Board 16KB-64KB CPU (Populated to 64K)
- 2	8529142	AR	• 16KB Memory Module
- 1	8654213	1	System Board 64KB-256KB CPU
- 2	8529211	AR	• 64KB Memory Module
- 3	8529143	1	Speaker and Cable
- 4	8529161	1	Base Assembly (Frame)
- 5	8529156	1	Card Support Bracket
- 6	8529155	1	Power Supply, 120 Volt
- 6	8654269	1	Power Supply, 220/240 Volt
- 7			See Internal Options and Adapters
- 8			Power Cord (See Power Cord Parts List)
- 9			See Internal Options and Adapters
- NS	8529165	AR	Miscellaneous Parts Kit
			• Screw, System Cover (Qty 5)
			• Clip, Bezel (Qty 5)
			• Clip, Blank Bezel (Qty 2)
			• Spring, Keyboard Foot (Qty 2)
			• Foot Pad, Keyboard (Qty 10)
			• Foot Pad, System Unit (Qty 5)
			• System Board Support (Qty 1)
			• Screw, Flange (Qty 10)

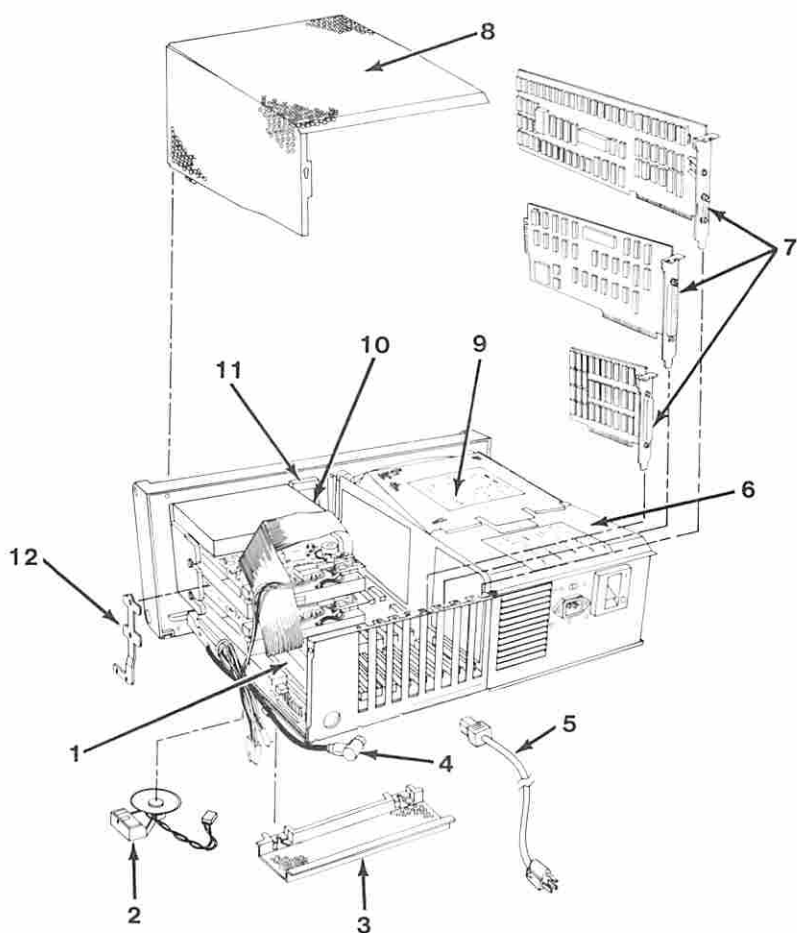
Assembly 5. System Unit - Interior (5160)



System Unit - Interior (5160)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
5 - 1	8529254	1	System Board 64KB-256KB CPU (Populated to 128K)
- 2	8529211	AR	• 64KB Memory Module
- 1	6489906	1	System Board 256KB-640KB CPU
- 2	6480008	AR	• 256KB Memory Module
- 2	8529211	AR	• 64KB Memory Module
- 3	8529143	1	Speaker and Cable
- 4	8529248	R	Base Assembly (Frame)
- 5	8529156	1	Card Support Bracket
- 6	8529247	1	Power Supply, 120 Volt
- 6	8654269	1	Power Supply, 220/240 Volt
- 7			Power Cord (See Power Cord Parts List)
- 8			See Internal Options and Adapters
- NS	8529165	AR	Miscellaneous Parts Kit • Screw, System Cover (Qty 5) • Clip, Bezel (Qty 5) • Clip, Blank Bezel (Qty 2) • Spring, Keyboard Foot (Qty 2) • Foot Pad, Keyboard (Qty 10) • Foot Pad, System Unit (Qty 5) • System Board Support (Qty 1) • Screw, Flange (Qty 10)

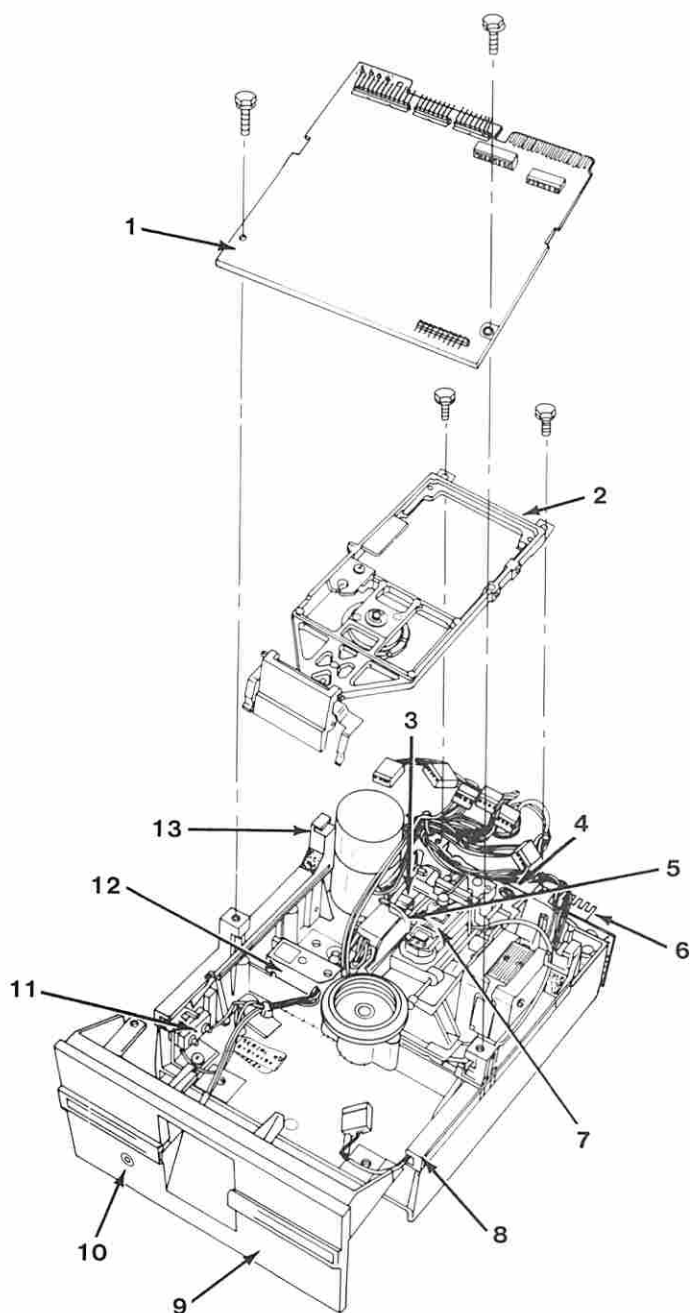
Assembly 6. System Unit - Interior (5155)



System Unit - Interior (5155)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
6 - 1	8529254	1	System Board 64KB-256KB CPU (Populated to 128K)
- NS	8529211	AR	• 64KB Memory Module
- 2	8529143	1	Speaker and Cable
- 3	8654452	1	Cable Raceway
- 4	8654427	1	Cable, Keyboard, Internal System
- 5			Power Cord (See Power Cord Parts List)
- 6	8654417	1	Power Supply (Includes Fan and Information Label)
- NS	8654444	1	• Fan, Power Supply
- 7			See Internal Options and Adapters
- 8	8654415	1	Shield
- 9	8654419	1	Display Assembly
	8285975	R	• High Voltage Transformer
	8285976	R	• Yoke
- 10	8654451	1	Shield, Keyboard, Internal System
- 11	8285977	R	Brightness/Contrast Assembly
- 12	8654421	1	Diskette Ground Bracket
- NS	8654441	1	Display Assembly Hardware Kit • Knob, Brightness • Knob, Contrast
- NS	8654438	1	Front Panel Hardware Kit • Foot Assembly (Qty 2) • Panel, Bumper • Screw, Plastite (Qty 2) • Panel, Keyboard Connector • Blank Insert, Diskette Drive • Screw, attach Shroud M-4 (Qty 6) • Strip, Wear, Front Panel (Qty 2) • Screw, Controls to Panel (Qty 2)
- NS	8654442	1	System Hardware Kit • System Board Supports • Screws, Skt. Head 3.5mm x 8 (Qty 16) • Bumper, Card (Qty 3) • Screw, Plastite 8-18 (Qty 6) • Mounting Screws, Diskette (Qty 4) • Attachment Card, Blank Insert • Glide, Chassis (Qty 2) • Bracket, Planar Ground • Spacer, Diskette Drive (Qty 3) • Screw, Special Bristol (Qty 7)

Assembly 7. Full High Diskette Drive Type 1

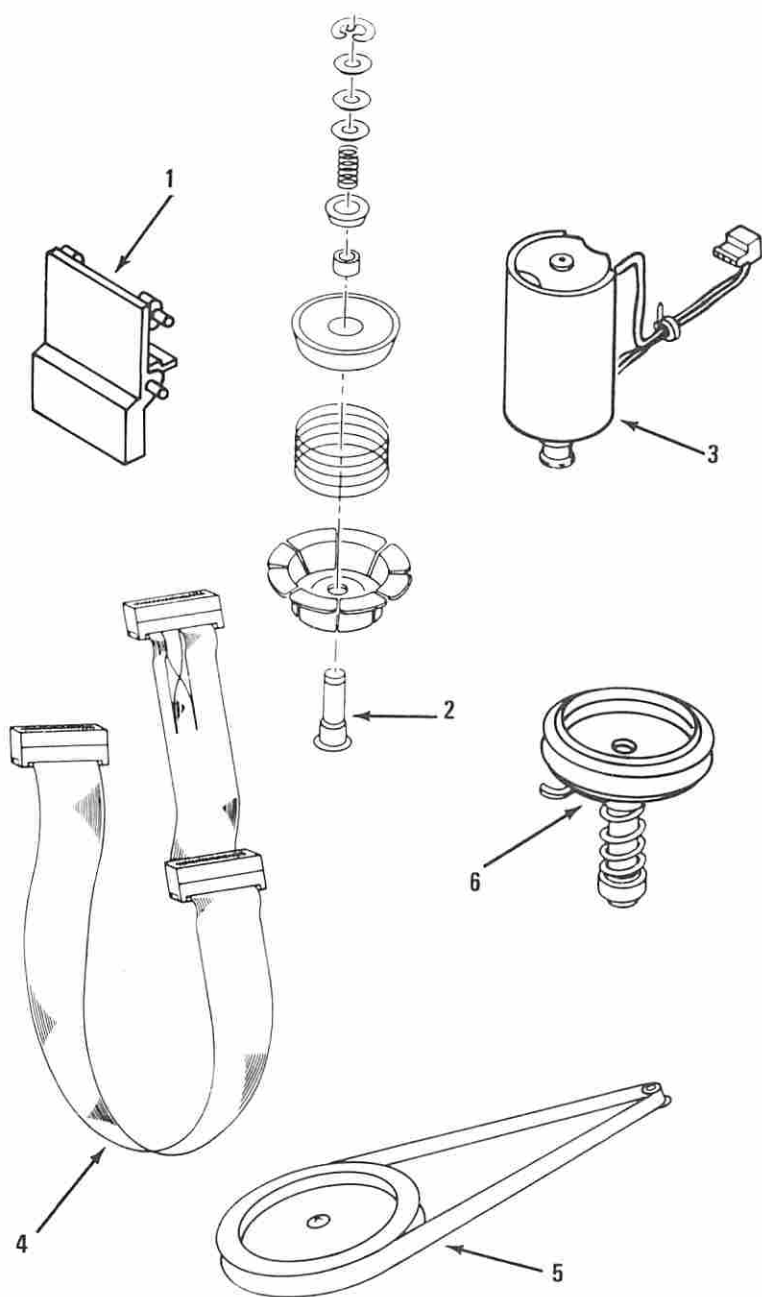


Diskette Drive - Type 1

Use only in drives that have an A, B, or nothing in front of the serial number. The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
7 -	8529153		Diskette Drive Assembly, Single-Sided
-	8529206		Diskette Drive Assembly, Double-Sided
- 1	8529226	1	• Logic Board with Shield
- 2	8529267	1	• Cone Lever Assembly
			•• Cone Lever Arm
			•• Cone Assembly
			•• Mounting Clips
			•• Latch Assembly
- 3	8529224	R	• Track 0 Switch
- 4	8529266	R	• Track 0 Stop
- 5	8529265	R	• SSR Upper Arm
- 6	8529256	1	• Servo Board
- 7	8529264	R	• Module SSR/160KB
- 7	8529210	R	• Module DSR/320KB
- 8	8529261	1	• Guide, Right
- 9	8529293	1	• Front Panel
- 10	8529258	1	• LED Assembly
- 11	8529225	1	• Write Protect Switch
- 12	8529257	R	• Index Assembly
- 13	8529262	1	• Guide, Left

Assembly 8. Full High Diskette Drive Type 1

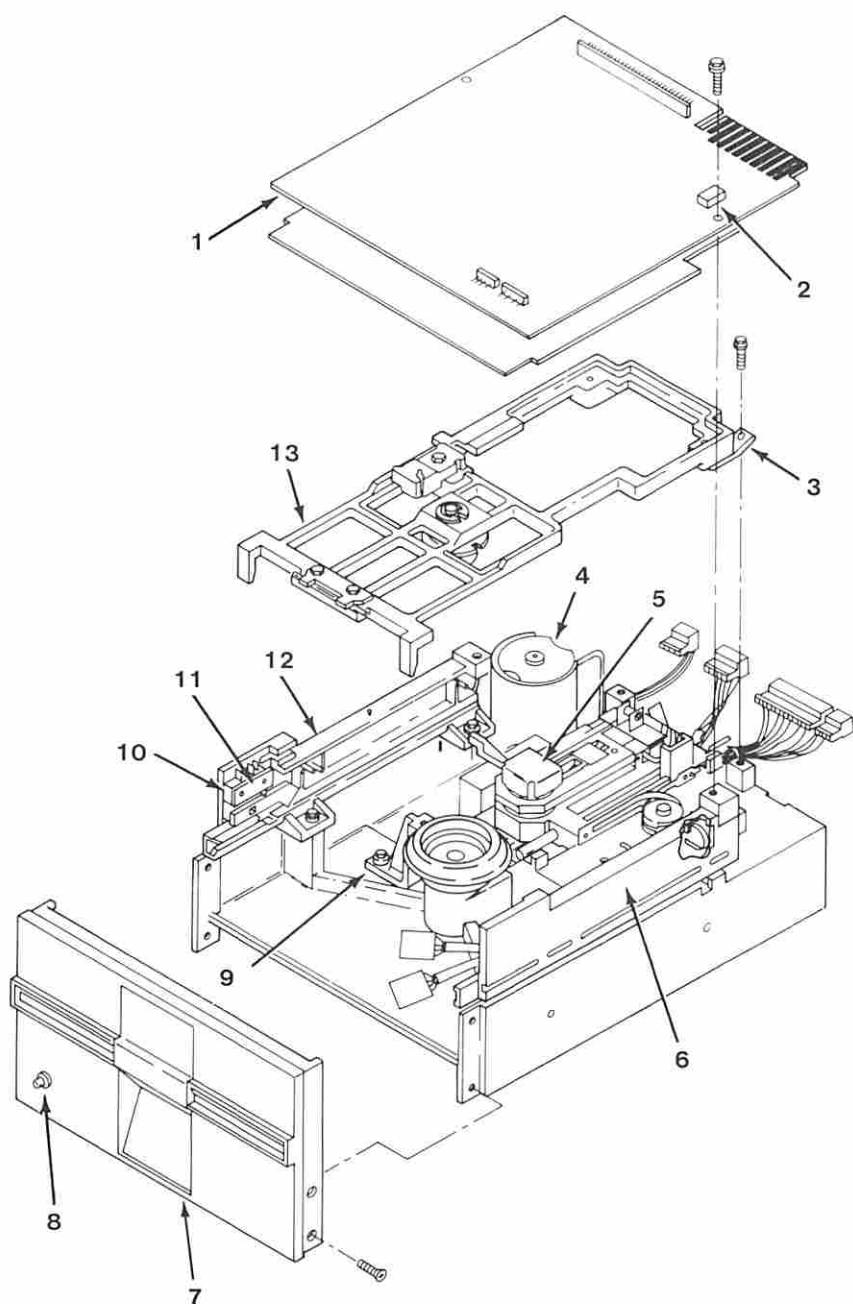


Diskette Drive - Type 1

Use only in drives that have an A, B, or nothing in front of the serial number. The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
8 - 1	8529260	1	Latch Assembly
- 2	8529259	1	Cone
- 3	8529223	1	Diskette Drive Motor
- 4	8529159	1	Signal Cable
- 5	8529154	1	Diskette Drive Belt
- 6	8529263	1	Spindle Assembly <ul style="list-style-type: none"> • Spindle • Bearings • Spring • Sleeve
- NS	8529294	AR	Miscellaneous Parts Kit <ul style="list-style-type: none"> • Servo Board Spacer • Cone Shaft E Ring • Cone Shaft Washers • Front Panel Bushings • Drive Motor Shouldered Washer • Track 0 Adjustment Switch Screw • Track 0 Adjustment Switch Screw E • Carrier Eccentric Stud • Carrier Eccentric Stud E Ring

Assembly 9. Full High Diskette Drive Type 2

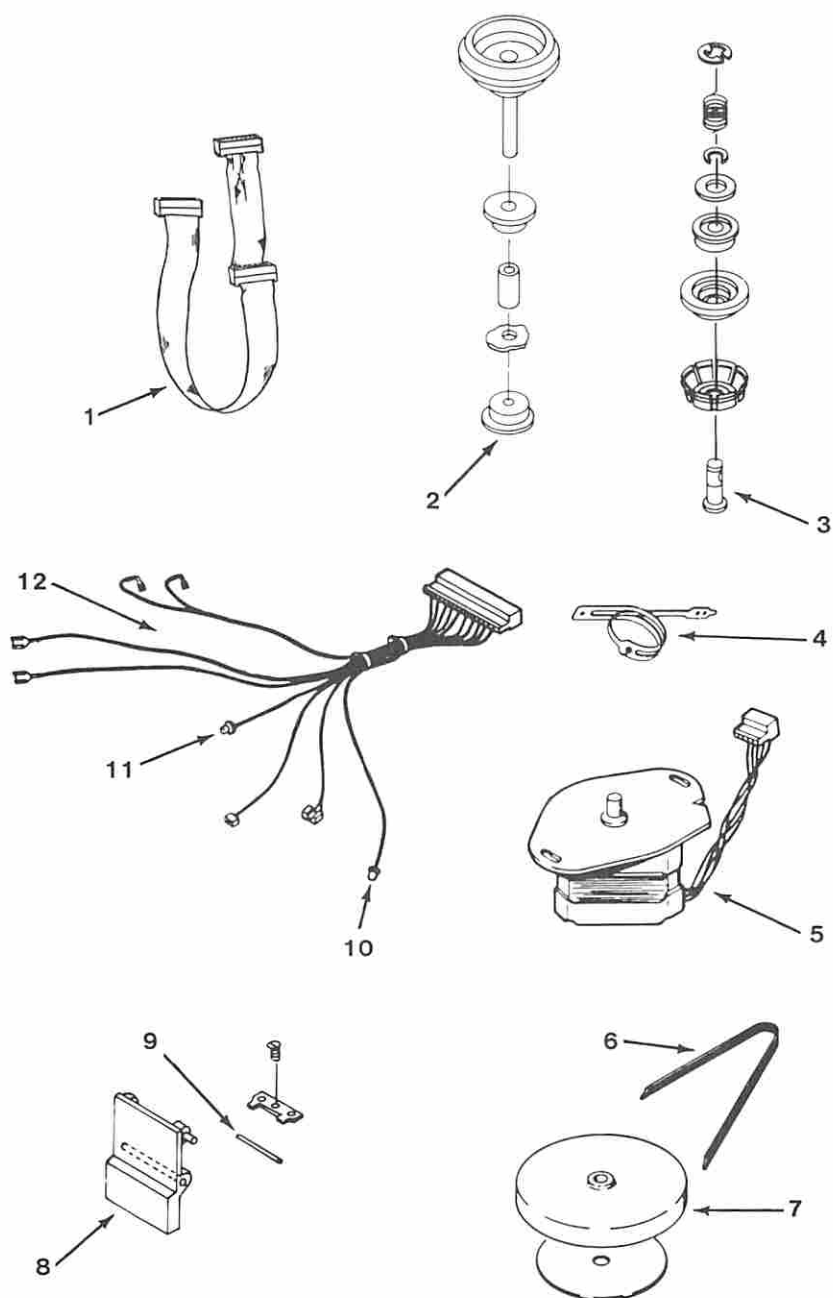


Diskette Drive - Type 2

Use only in drives that have a D in front of the serial number.
The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
9 -	8529206		Diskette Drive Assembly, Double-Sided
- 1	8654241	1	• Logic Board
- 2	8654252	R	•• Shunt, DIP
- 3	8654261	1	• Leaf Spring
- 4	8654240	1	• Drive Motor
- 5	8654239	R	• Module DSR/320KB
- 6	8654245	1	• Guide, Right
- 7	8654254	1	• Front Panel
- 8	8654249	1	• LED Assembly
- 9	8654255	R	• Index Housing (Lower)
- 10	8654250	1	• Write Protect Switch
- 11	8654260	1	• Nut Plate, Write Protect
- 12	8654244	1	• Guide, Left
- 13	8654243	1	• Cone Lever Arm Assembly
- NS	8654259	AR	• Miscellaneous Parts Kit
			•• Screws
			•• Washers
			•• Set Screws
			•• Pin Clamps

Assembly 10. Full High Diskette Drive Type 2

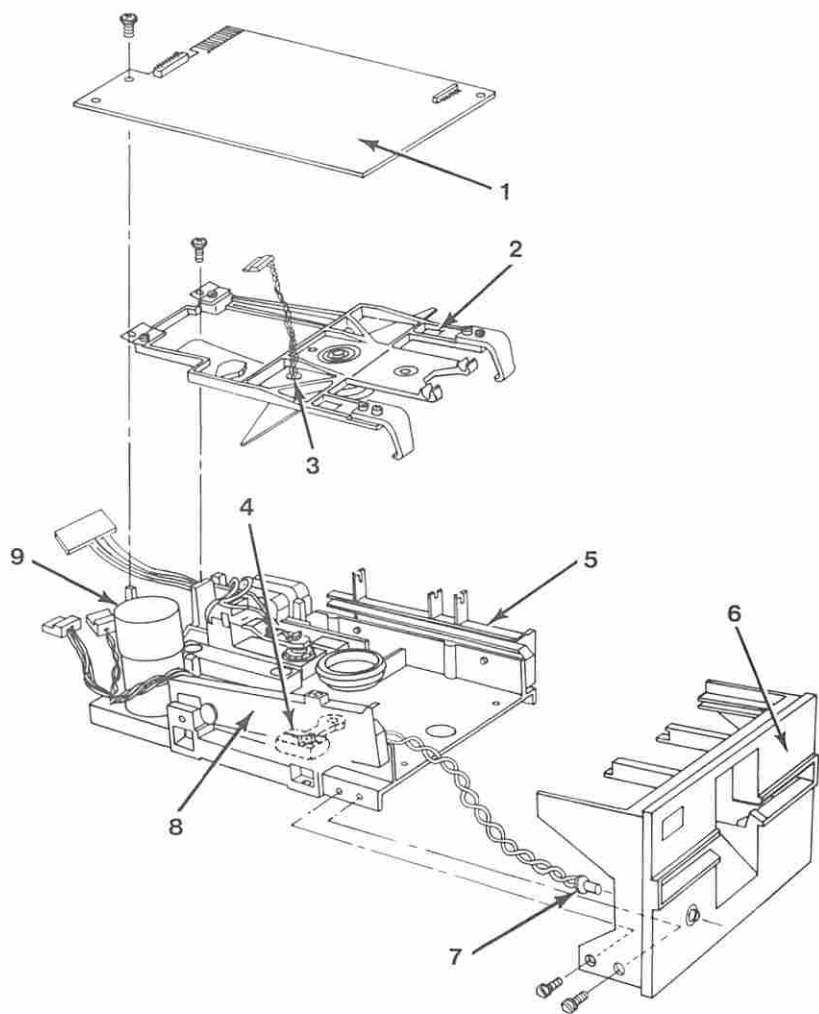


Diskette Drive - Type 2

Use only in drives that have a D in front of the serial number.
The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
10 - 1	8529159	1	Signal Cable, Diskette Drive
- 2	8654256	1	Spindle Assembly <ul style="list-style-type: none"> • Bearings • Washer • Spindle
- 3	8654258	1	Cone Assembly <ul style="list-style-type: none"> • Retaining Clip • Washer, Special • Spring • Washer • Clip • Bearing • Insert • Cone • Cone Shaft
- 4	8654238	R	Band, Head
- 5	8654237	R	Stepper Assembly, Motor
- 6	8654251	1	Belt, Diskette Drive
- 7	8654257	1	Pulley Kit <ul style="list-style-type: none"> • Pulley • Disk, Strobe
- 8	8654242	1	Latch
- 9	8654262	1	Latch Pin
- 10	8654248	1	Index Sensor, Lower
- 11	8654247	R	Index Sensor, Upper
- 12	8654253	R	Index Harness

Assembly 11. Full High Diskette Drive Type 3

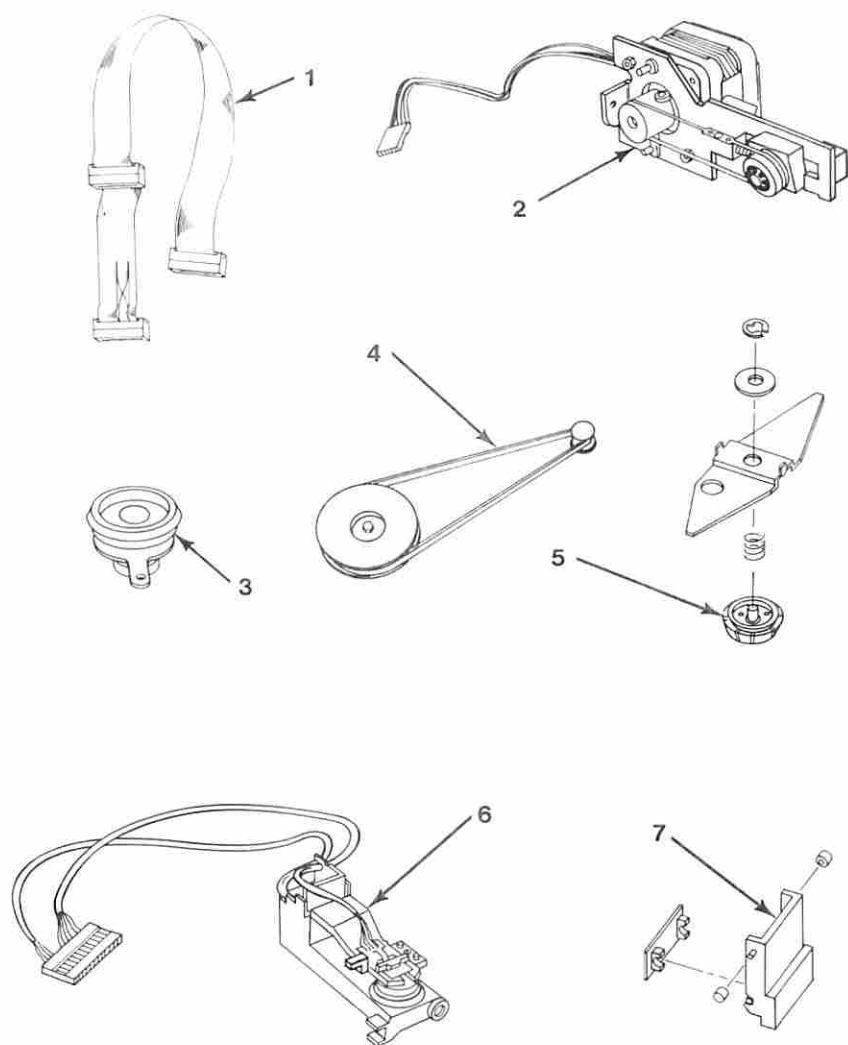


Diskette Drive - Type 3

Use only in drives that have an E in front of the serial number.
The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
11 -	8529206	1	Diskette Drive, Double-Sided
- 1	1696630	1	• Logic Board with Shield
- 2	1696623	1	• Cone Lever Arm
- 3	1696633	1	• Index LED
- 4	1696628	1	• Index Assembly
- 5	1696637	1	• Diskette Guide, Right
- 6	1696622	1	• Front Panel
- 7	1696629	1	• LED Assembly
- 8	1696624	1	• Left Diskette Guide and Write Protect Sensor Assembly
- 9	1696632	1	• Drive Motor
- NS	1696627	AR	• Miscellaneous Parts Kit
			•• Guide Spring
			•• Rollers (Qty 2)
			•• Washers, assorted (Qty 3)
			•• LED Mtg. Kit
			•• E-Clip
			•• Screws, assorted (Qty 6)
			•• Rod Holder (Qty 2)
			•• Clamp, Band
			•• Cable Tie

Assembly 12. Full High Diskette Drive Type 3

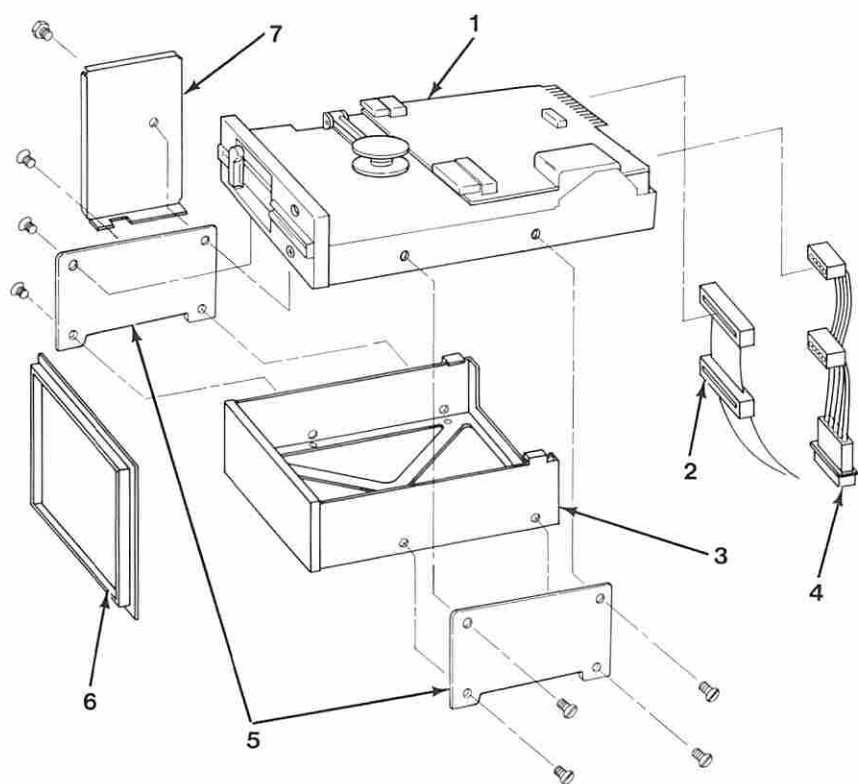


Diskette Drive - Type 3

Use only in drives that have an E in front of the serial number.
The serial number is visible from the top of the drive.

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
12 - 1	8529159	1	Signal Cable
- 2	1696620	1	Stepper Motor Assembly
- 3	1696638	1	Spindle Assembly
- 4	1696625	1	Belt, Diskette Drive
- 5	1696639	1	Cone Assembly
- 6	1696631	1	Module DSR/Double-Sided
- 7	1696621	1	Latch Assembly

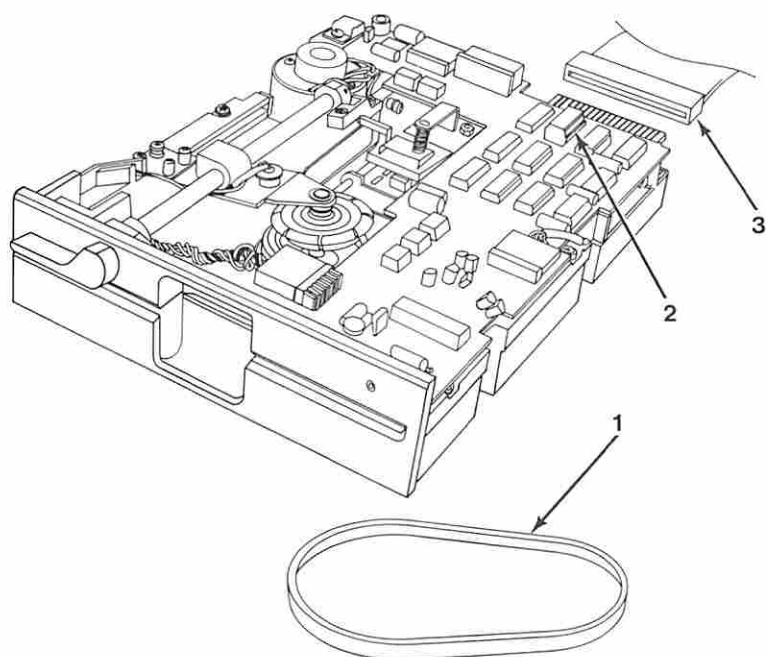
Assembly 13. Half High Diskette Drive



Half High Diskette Drive

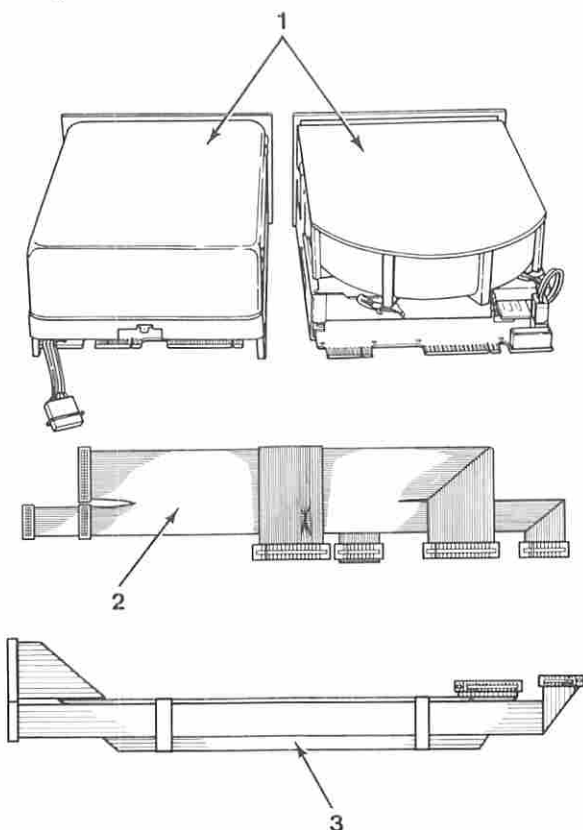
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
13 - 1	6489910	1	Diskette Drive Assembly, Double-Sided
- NS	6489918	AR	• Terminating Resistor
- 2	6489950	1	Signal Cable, Diskette Drive
- 3	6489901	AR	Blank Bezel Assembly
- 4	6489909	1	Power Supply Extension Cable
- 5	6489904	2	Mounting Plate, Right or Left
- 6	6489902	1	Molding, Bezel
- 7	6489905	1	Mounting Bracket
- NS	6489915	AR	Miscellaneous Hardware Kit
			• Hex Head Screw 3mm x 6mm (Qty 1)
			• Flat-head Screw 3mm x 6mm (Qty 1)

Assembly 14. Diskette Drive Portable PC



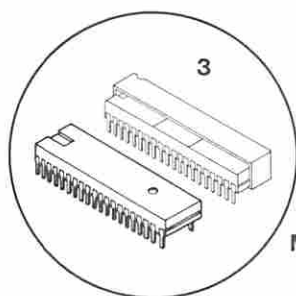
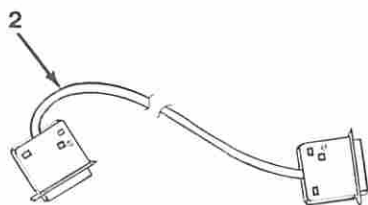
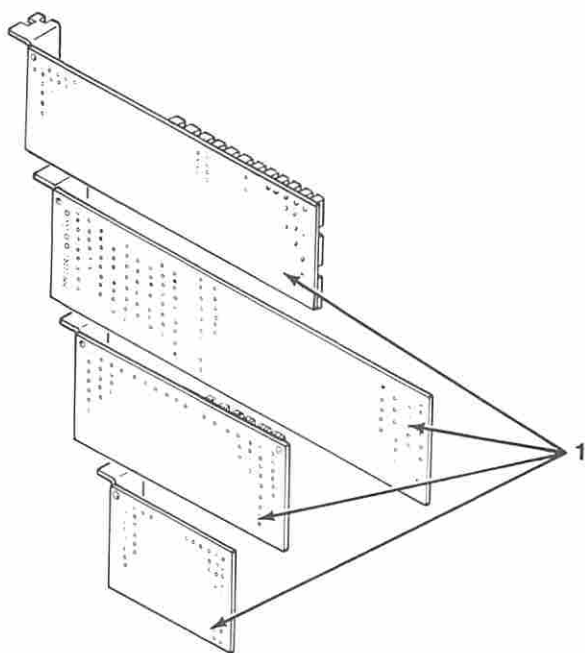
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
14 -	8285978	AR	Diskette Drive Assembly
- 1	8285979	1	• Belt, Diskette Drive
- 2	8285972	1	• Terminating Resistor
- 3	8654420	1	Signal Cable, Diskette Drive

Assembly 15. Fixed Disk Drive



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
15 - 1	8529275	AR	Fixed Disk Drive, 10MB
- 1	6489907	AR	Fixed Disk Drive, 20MB
- 2	8529271	AR	Data/Control Cable (For 10MB Drives)
- 3	6480086	AR	Data Control Cable (For 20MB Drives)

Assembly 16. Internal Options and Adapters



Math Coprocessor

Internal Options and Adapters - Part 1 of 2

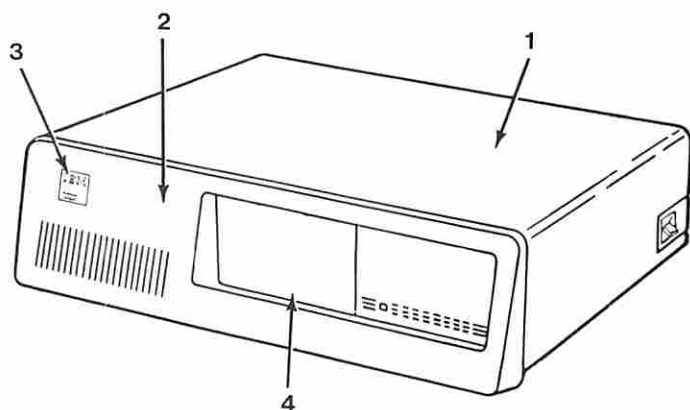
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
16 - 1	8529212	AR	64/256KB Memory Expansion Option (Does Not Include Memory Modules)
- NS	8529211	AR	• 64KB Memory Module
- 1	6134136	AR	256KB Memory Expansion Option (Includes Modules)
- NS	6134137	4	• 64KB Memory Module (32-Pin) (Includes Module Puller)
- 1	8529150	AR	Asynchronous Communications Adapter
- 1	8286098	AR	Binary Synchronous Communications (BSC) Adapter
- 1	6323472	AR	Cluster Adapter
- NS	6323575	AR	Cluster Cable Kit
- 1	8286097	AR	Color/Graphics Monitor Adapter
- 2	8529274	AR	Communications Adapter Cable
- 1	6181768	AR	Data Acquisition Adapter
- 1	8529152	1	Diskette Drive Adapter
- 1	8654215	AR	Enhanced Graphics Adapter (Memory expansion card not included)
- NS	6323468	AR	• Graphics Memory Expansion Card (Memory modules not included)
- NS	8654219	24	•• Graphics Memory Module (Qty 1)
- 1	8529252	AR	Extender Card
- 1	8529269	AR	Fixed Disk Adapter
- 1	6489914	AR	Fixed Disk Drive Adapter, 20MB
- 1	8529151	AR	Game Control Adapter
- 1	6181770	AR	GPIO Adapter
- 3	8529147	AR	Math Coprocessor and 8088 Processor (Must be installed as a set)
- 1	8529148	AR	Monochrome Display and Printer Adapter
- 1	8286171	AR	PC Network Adapter
- NS	8286172	AR	PC Network Adapter Cable
- 1	8529149	AR	Printer Adapter
- 2	8529214	AR	Printer Cable
- NS	6181765	AR	Professional Graphics Controller
	6323412	R	• Miscellaneous Hardware Kit
	6133787	R	• Controller Processor Card
	6133790	R	•• 8088 Processor
	6133791	R	•• 32KB ROM
	6133792	R	•• 32KB ROM
	6323410	R	•• Digital-Analog Converter
	6133788	R	• Controller Emulator Card
	6133789	R	• Controller Memory Card
- NS	6181772	40	•• Professional Graphics Memory Module (Qty 1)

- Continued on next page -

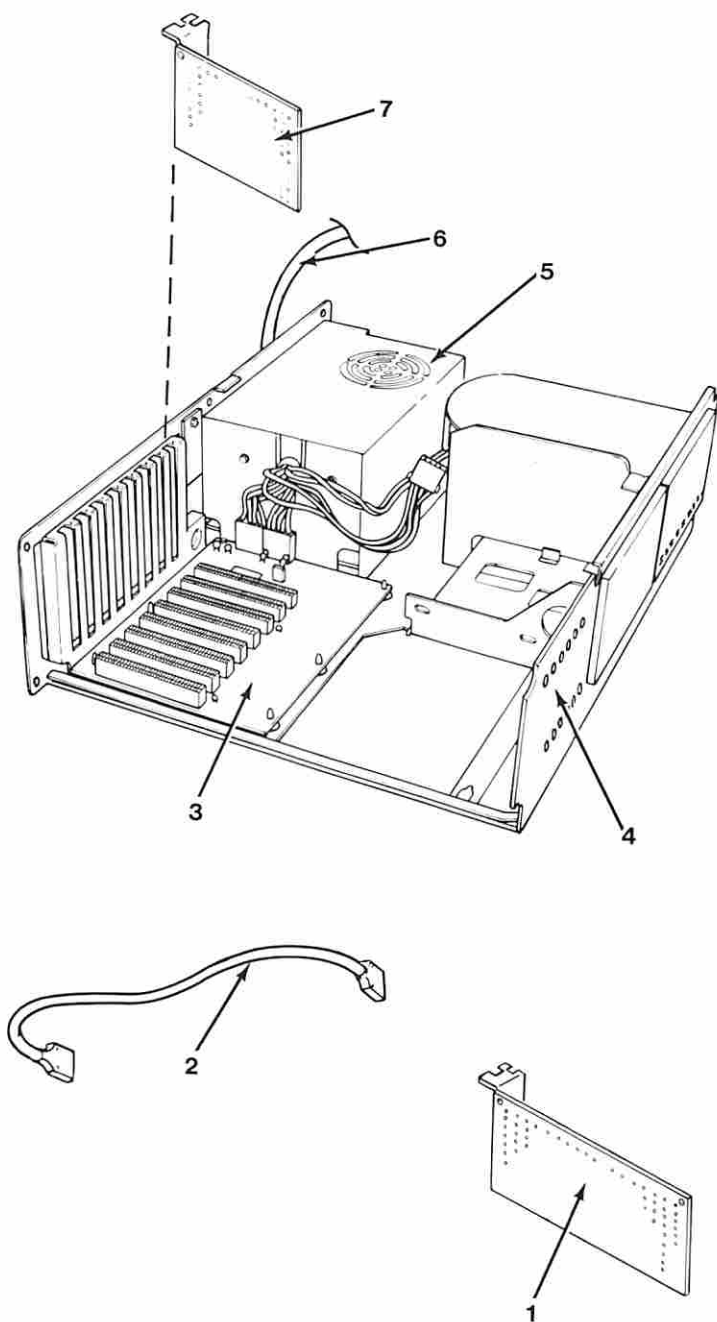
Internal Options and Adapters - Part 2 of 2

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
6 - 1	8529213	AR	Prototype Card
- 1	8529251	AR	Receiver Card (Expansion Unit)
- 1	8286099	AR	Synchronous Data Link Control (SDLC) Communications Adapter
- 1	2684438	AR	Voice Communications Adapter
- NS	2684462	AR	Notched Black Telephone Cable, for Voice Communications Adapter
- NS	2684487	AR	Notched White Telephone Cable, for Voice Communications Adapter
- NS	2684509	AR	Tabbed Black Telephone Cable, for Voice Communications Adapter
- NS	2684514	AR	Tabbed White Telephone Cable, for Voice Communications Adapter

Assembly 17. Expansion Unit - Exterior (5161)



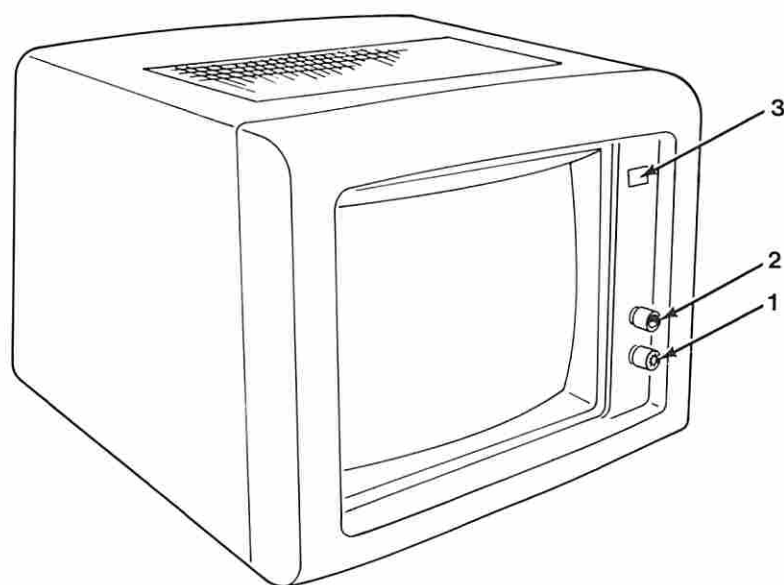
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
17 - 1	8529162	1	Top Cover, w/o Bezel
- 2	8529163	1	Bezel Assembly
- 3	8529164	R	Logo/Label Kit (US Only)
- 3	8529283	R	Logo/Label Kit (Non-US Only)
			• Front Name Plate
			• Rear Name Plate
			• FCC Label
- 4	8529204	AR	Disk Cover Plate



Expansion Unit - Interior (5161)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
18 - 1	8529252	1	Extender Card (System Unit)
- 2	8529253	1	Expansion Unit Cable
- 3	8529250	1	Expansion Board
- 4	8529248	R	Base Assembly Frame
- 5	8529247	1	Power Supply, 120 Volt
- 5	8654269	1	Power Supply, 220/240 Volt
- 6			Power Cord (See Power Cord Parts List)
- 7	8529251	1	Receiver Card (Expansion Unit)

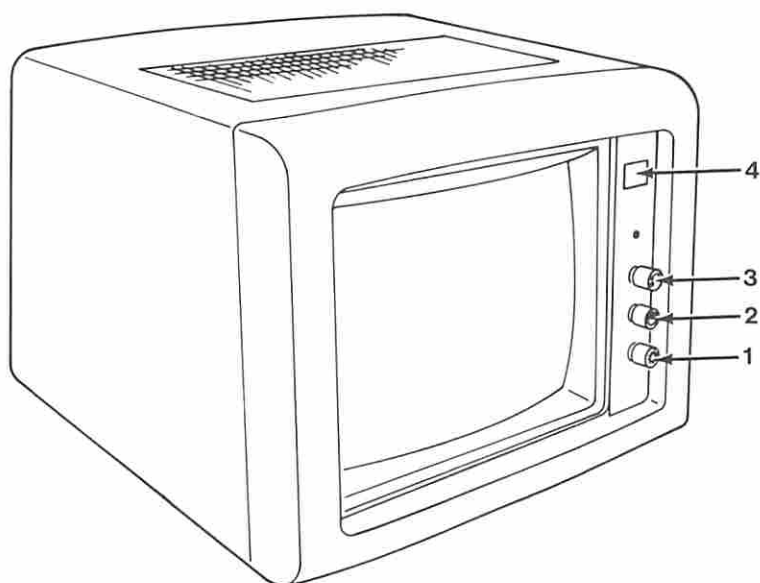
Assembly 19. Monochrome Display (5151)



Monochrome Display (5151)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
19 -	8529171		Display Assembly, 120 Volt
-	8529209		Display Assembly, 220/240 Volt
- 1	8529177	1	• Knob, Brightness
- 2	8529178	1	• Knob, Contrast
- 3	8529179	R	• Logo/Label Kit, 120 Volt
- 3	8654205	R	• Logo/Label Kit, 220/240 Volt
			.. Name Plate, Front
			.. Label, Caution
			.. Name Plate, Rear
			.. Label, FCC
- NS	8529229	R	• Panel, Front
- NS	8529230	R	• Cover, Back
- NS	8529231	R	• Plug, Upper Cover
- NS	8529232	R	• Foot
- NS	8529176	R	• Holder, Power Cord
- NS	8529173	R	• Signal Cable
- NS	8529235	R	• Transformer, 120 Volt
- NS	8654206	R	• Transformer, 220/240 Volt
- NS	8529237	R	• Support, Control
- NS	8529236	R	• Support, Transformer
- NS	8529175	R	• Fuse, 0.75 Amp, 120 Volt
- NS	8654204	R	• Fuse, 0.5 Amp, 220/240 Volt
- NS	8529233	R	• Analog Card
- NS	8529234	R	• PC Card
- NS	8529174	R	• Power Cord, 120 Volt
- NS	8654203	R	• Power Cord, 220/240 Volt
- NS	8529180	R	• Display Miscellaneous Hardware Kit
			.. Screw, CRT Mounting
			.. Screw, Transformer
			.. Support, CRT Mounting
			.. Bracket, CRT to Front Panel
			.. Transformer Support, Front Panel
			.. Screw, Rubber Bushing, Display
			.. Nut, Rubber Bushing, Display
			.. Screw, Cable Restraint, Display
			.. Star Washer, Display
- NS	6937013	AR	Shipping Carton
- NS	6448524	AR	Shipping Cushion, Left
- NS	6448525	AR	Shipping Cushion, Right
- NS	6937056	AR	Shipping Bag

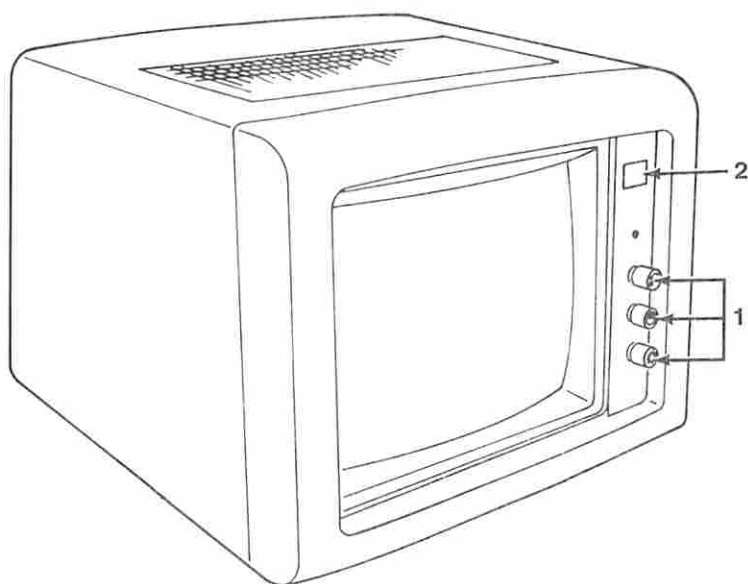
Assembly 20. Color Display (5153)



Color Display (5153)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
20 -	8529227		Display Assembly
-	8654214		Display Assembly (Model-002)
- 1	8529287	1	• Knob, Brightness
- 2	8529288	1	• Knob, Contrast
- 3	8529289	1	• Knob, Power On/Off
- 4	8529339	R	• Logo/Label Kit
- NS	8529285	R	• Cover, Front, Includes Top, Bottom, and Power Supply Brackets
- NS	8529286	R	• Cover, Rear
- NS	8529323	R	• P.C. Board
			• Flyback Transformer
			• Focus Pack
			• Horizontal Drive Transistor
			• Chassis
- NS	8654222	R	• P.C. Board/Flyback Transformer Control Assembly (Model-002)
- NS	8654275	R	• Degaussing Coil
- NS	8529338	R	• Control Assembly
- NS	8654224	R	• Control Assembly (Model-002)
- NS	8654276	R	• Indicator, Power-On
- NS	8529291	R	• Power Supply Assembly
- NS	8654221	R	• Power Supply Assembly (Model-002)
- NS	8529290	R	• CRT and Yoke
- NS	8529324	R	• CRT Board and Shield Cable
- NS	8529334	R	• Signal Cable
- NS	8529336	R	• Power Receptacle/Line Filter Assembly
- NS	8654223	R	• Power Receptacle/Line Filter Assembly (Model-002)
- NS	8529335	R	• Vertical Size Pot Shaft Extension
- NS	8529337	R	• Vertical Hold Pot Shaft Extension
- NS	8529327	R	• Miscellaneous Hardware Kit
			• Shield, Driver Board
			• Retainers, Driver Board Shield
			• Strain Relief, Signal Cord
			• Screws, Power Supply
			• Screws, CRT Mounting
			• Screws, Control Assembly
			• Screws, P.C. Board Chassis Mounting
			• Screws and Washers, Rear Cover
			• Plugs, Cover Screw
			• Wire Ties, Degaussing Coil
- NS	6937192	R	Packing Material Kit
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS			Power Cord (See Power Cord Parts List)

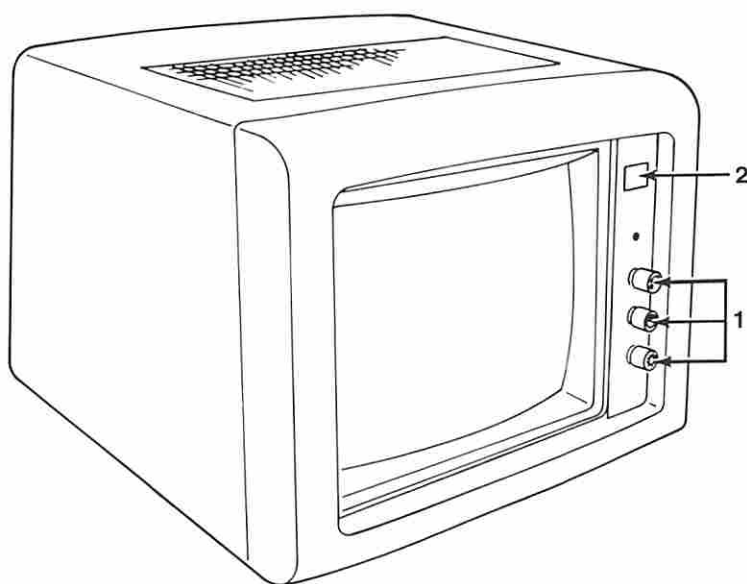
Assembly 21. Enhanced Color Display (5154)



Enhanced Color Display (5154)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
21 -	6321035		Display Assembly, Model 001
	6321049		Display Assembly, Model 002
	6321036		Display Assembly, Model 003
- 1	6321056	1	• Knob and Cover Cap Kit .. Knob, On/Off (Qty 1) .. Knob, Contrast (Qty 1) .. Knob, Brightness (Qty 1) .. Cap, Cover (Qty 2) .. Knob, Rear (Qty 2)
- 2	6321061	R	• Logo and Label Kit .. Logo, Back .. Labels, Bottom Cover Warning (Five Languages)
- NS	6323319	1	• Rubber Feet Kit .. Rubber Feet (Qty 4) .. Washers (Qty 4) .. Screws (Qty 4)
- NS	6321050	R	• Cover, Front
- NS	6321051	R	• Cover, Rear
- NS	6321052	R	• Main P.C. Board Assembly/Chassis/CRT Drive Card
- NS	6321053	R	• Power Supply with Cover
- NS	6321054	R	• Video Amp. Assembly/RGB Cable and Connector
- NS	6321055	R	• Control Assembly, Front
- NS	6321057	R	• Indicator, Power-On
- NS	6321058	R	• Rear Control Panel Assembly/Strain Relief
- NS	6321059	R	• Signal Cable
- NS	6135903	R	• Degaussing Coil
- NS	6321064	R	• Miscellaneous Hardware Kit .. Washers, CRT Rubber Mounting (Qty 4) .. Shield, Plastic Drive Board (Qty 1) .. Retainers, Plastic Shield (Qty 2)
- NS	6321060	R	• Model 001/Model 002 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6321063	R	• Model 003 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag

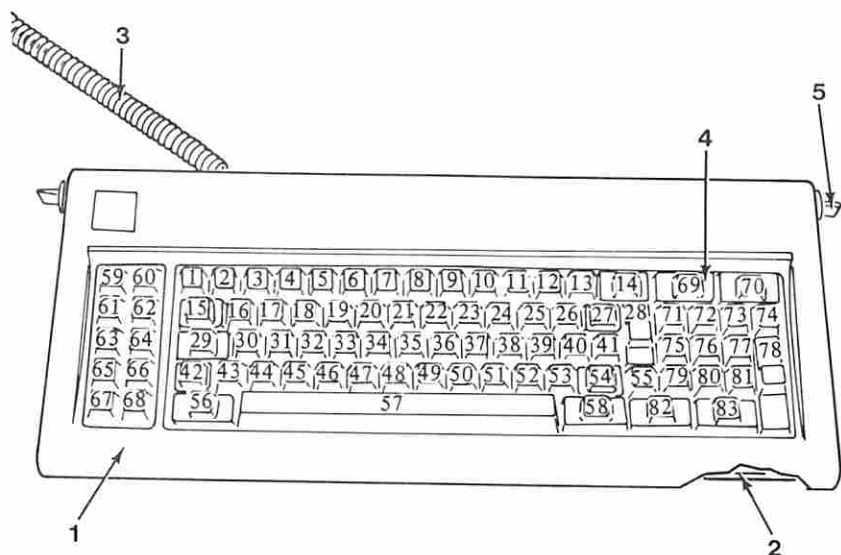
Assembly 22. Professional Graphics Display (5175)



Professional Graphics Display (5175)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
22 -	6181764		Display Assembly, Domestic US
-	6181766	R	Display Assembly, Northern Hemisphere
-	6181767	R	Display Assembly, Southern Hemisphere
- 1	6133993	1	• Knob and Cover Cap Kit .. Cover Caps (Qty 2) .. Knob Set, Front (Qty 3)
- 2	6133997	R	• Logo & Label Kit .. Name Plate, Front IBM .. Name Plate, Rear IBM .. Labels, Warning Bottom Cover
- NS	6321050	R	• Cover, Front
- NS	6321051	R	• Cover, Rear
- NS	6133989	R	• Main PCB Assembly/Chassis/ CRT Drive Card
- NS	6133990	R	• Power Supply with Cover
- NS	6133991	R	• Video AMP Assembly/RGB Cable and Connector
- NS	6133992	R	• Control Assembly, Front
- NS	6321057	R	• Indicator, Power-On
- NS	6133994	R	• Signal Cable
- NS	6133995	R	• CRT & Deflection Yoke Assembly with Wires/Tubes, Warning Labels (GND Band) (Northern Hemisphere)
- NS	6133996	R	• CRT & Deflection Yoke Assembly with Wires/Tubes, Warning Labels (GND Band) (Southern Hemisphere)
- NS	6323319	1	• Rubber Feet Kit
- NS	6321064	R	• Miscellaneous Hardware Kit .. Washers, CRT Mounting Rubber .. Shield, Plastic Board .. Shield Retainers, Plastic Type
- NS	6133998	R	• Rating Label, Model 002
- NS	6133999	R	• Rating Label, Model 003
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS			Power Cord (See Power Cord Parts List)

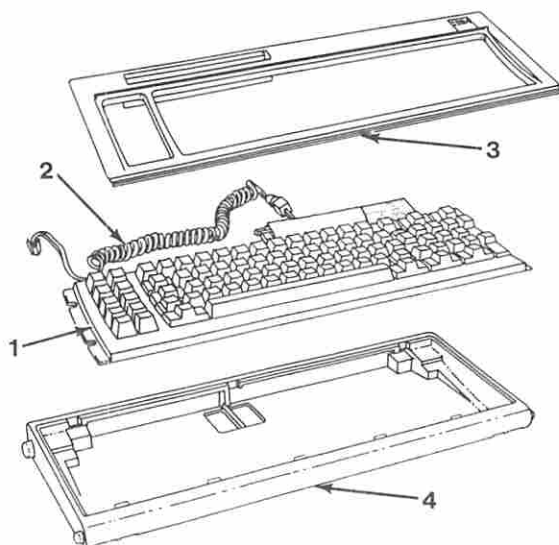
Assembly 23. Keyboard (83-Key for 5150 and 5160)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
23 -	8529297	1	Keyboard Assembly, US
- 1	8529170	1	• Cover Assembly
- 2	8529169	1	• Base Assembly
- 3	8529168	1	• Cable Assembly
- 4	4584656	1	• Keypad Assembly, US
- 4	8529239	R	• Keypad Assembly, France
- 4	8529240	R	• Keypad Assembly, Germany
- 4	8529241	R	• Keypad Assembly, Italy
- 4	8529242	R	• Keypad Assembly, Spain
- 4	8529243	R	• Keypad Assembly, UK
- 5	8529157	1	• Adjustable Foot

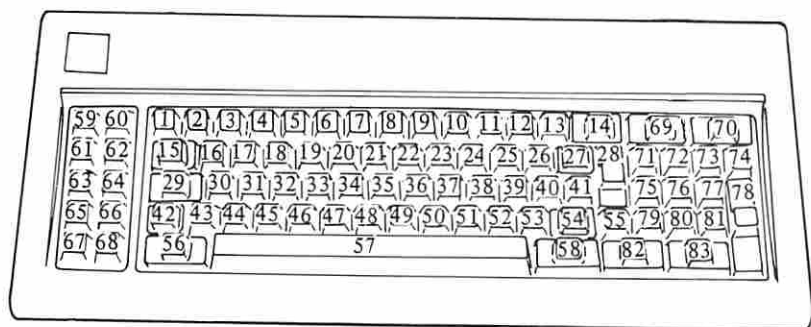
Note: Adjustable foot spring is included in the Miscellaneous Parts Kit for the system unit.

Assembly 24. Keyboard (83-Key for 5155)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
24 -	8654422	1	Keyboard Assembly w/cable, US
-	8654432	R	Keyboard Assembly w/cable, French
-	8654429	R	Keyboard Assembly w/cable, German
-	8654431	R	Keyboard Assembly w/cable, Italian
-	8654430	R	Keyboard Assembly w/cable, Spanish
-	8654428	R	Keyboard Assembly w/cable, UK
- 1	4586161	1	• Keypad Assembly, US
- 1	8654437	1	• Keypad Assembly, French
- 1	8654434	1	• Keypad Assembly, German
- 1	8654436	1	• Keypad Assembly, Italian
- 1	8654435	1	• Keypad Assembly, Spanish
- 1	8654433	1	• Keypad Assembly, UK
- 2	8654426	1	• Cable Assembly
- 3	8654425	1	• Top Cover
- 4	8654424	1	• Bottom Cover
- NS	8654443	1	• Misc Parts Kit, Keyboard
			.. Foot Support (Qty 2)
			.. Cup, Spring (Qty 2)
			.. Spring (Qty 2)
			.. Cup Plunger (Qty 2)
			.. Pin, Support (Qty 2)
			.. Spring, Plunger (Qty 2)
			.. Pad (Qty 5)
			.. Screw, Plastite (Qty 2)

Assembly 25. Keybutton Kits (83-Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
25 -	4584657	1	Keybutton Kit, US *
-	8654270	1	Keybutton Kit, France **
-	8654271	1	Keybutton Kit, Germany **
-	8654272	1	Keybutton Kit, Italy **
-	8654273	1	Keybutton Kit, Spain **
-	8654274	1	Keybutton Kit, UK **

* Complete set of keybuttons as listed on the page 51.

** Kit contains only the keybuttons listed for the specified country group on the next page.

Keybutton Kit Contents by Country

Country Group Italy	
Key Loca- tion	Descrip- tion
3	"/2
4	£/3
7	&/6
8	//7
9	|/8
10	)|9
11	=/0
12	?/!
13	"/;
26	ê/è
27	*/+
39	@/ô
40	#/à
41	\$/ù
43	>/<
51	:/.
52	:/.
53*	_/-

Country Group U.K.	
Key Loca- tion	Descrip- tion
3	"/2
4	£/3
40	@/!
41	~/#

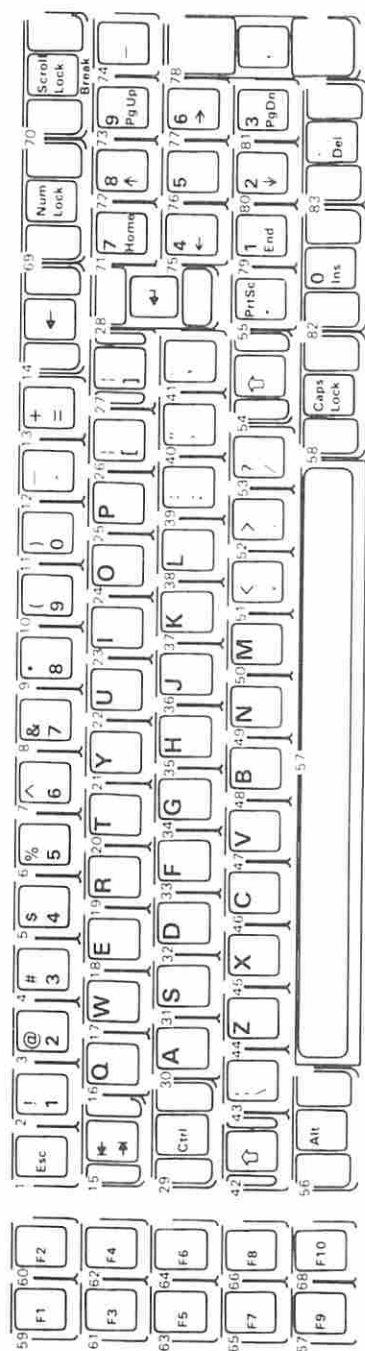
Country Group France	
Key Loca- tion	Descrip- tion
2	1/&
3	2/é
4	3/''
5	4/'
6	5/()
7	6/§
8	7/è
9	8/!
10	9/ç
11	0/â
12	°/()
13*	_/-
16*	A
17*	Z
26	"/~
27	*/\$
30*	Q
39*	M
40	%/ù
41	£/µ
43	>/<
44*	W
50	?/.
51	:/;
52	//:
53*	+ / =

Country Group Germany	
Key Loca- tion	Descrip- tion
3	"/2
4	\$/3
7	&/6
8	//7
9	|/8
10	)|9
11	=/0
12	?/ß
13	"/'
21	Z
26	Ü
27	*/+
39	Ö
40	A
41	^/#
43	>/<
44	Y
51	:/.
52	:/.
53*	_/-

Country Group Spain	
Key Loca- tion	Descrip- tion
2	1/1
3	2/2
7	6/6
26	"/'
27	"/\
39	Ñ
40*	:/;
41	Ç
43	>/<
51	?/.
52	!/.
53*	"/'
55	PrtSci/^

*Not included in kit. For reference only. Order from U.S. keyboard.

Assembly 26. Keybuttons (83-Key)



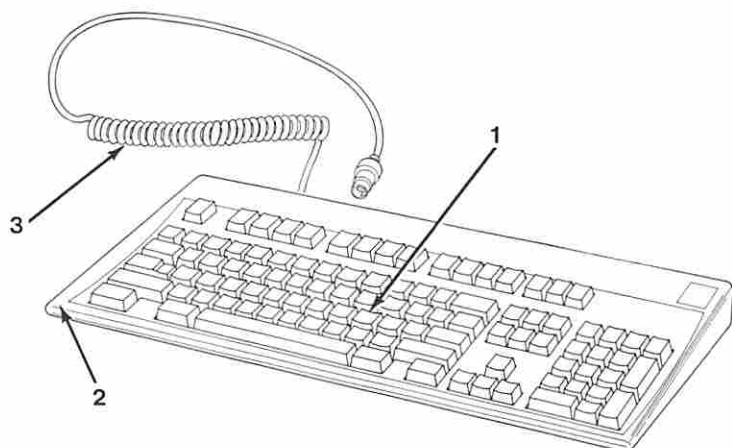
Note: Nomenclature is on both the top and front face of keybuttons as shown. The number to the upper left designates the button position.

Keybuttons (83-Key)

KEY LOCATION	PART NUMBER	DESCRIPTION	KEY LOCATION	PART NUMBER	DESCRIPTION
1	4584714	Esc	43	5997221	|/\
2	1761460	!/1	44	2658860	Z
3	1642308	@/2	45	2658861	X
4	1642309	#/3	46	2658862	C
5	1642342	\$/4	47	2658863	V
6	1642343	%/5	48	2658864	B
7	4496183	^/6	49	2658865	N
8	2658824	ε/7	50	2658866	M
9	2658825	* /8	51	1864026	</,
10	2658826	(/9	52	1864027	>/.
11	2658827	)/0	53	2658869	?//
12	1761515	/-	54	2658870	☆
13	2658829	+/=	55	4584718	* /PrtSc
14	1643315	←	56	1643330	Alt
15	1643316	|←/→|	57	N/A	Space Bar
16	2658832	Q	58	4584719	Caps Lock
17	2658833	W	59	4584720	F1
18	2658834	E	60	4584721	F2
19	2658835	R	61	4584722	F3
20	2658836	T	62	4584723	F4
21	2658837	Y	63	4584724	F5
22	2658838	U	64	4584725	F6
23	2658839	I	65	4584726	F7
24	2658840	O	66	4584727	F8
25	2658841	P	67	4584728	F9
26	4585286	{/[	68	4584729	F10
27	4585288	} /]	69	4584730	Num Lock
28	5184235	←	70	4584731	Scroll Lock
29	4584717	Ctrl	71	4584732	7/Home
30	2658846	A	72	4584733	8/↑
31	2658847	S	73	4584734	9/PgUp
32	2658848	D	74	1761511	- (Minus)
33	2658849	F	75	4584735	4/←
34	2658850	G	76	2658892	5
35	2658851	H	77	4584736	6/→
36	2658852	J	78	1761513	+ (Plus)
37	2658853	K	79	4584737	1/End
38	2658854	L	80	4584738	2/↑
39	2658855	:/;	81	4584739	3/PgDn
40	4584779	" / '	82	4584740	0/Ins
41	1642306	~/`	83	4584741	./Del
42	2658858	⏏			

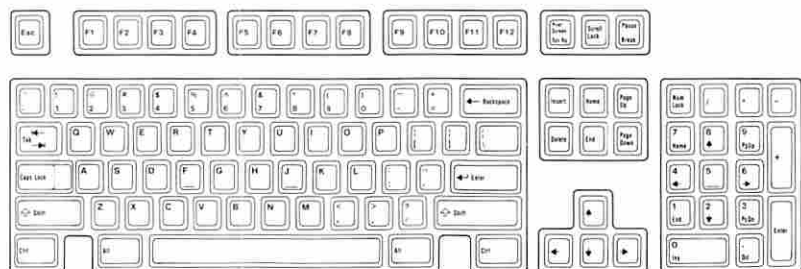
Part numbers for complete keybutton sets are on page 48.

Assembly 27. Keyboard (101/102-Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
27 -	1390290		Keyboard (w/o cable), US
-	1390292		Keyboard (w/o cable), France
-	1390293		Keyboard (w/o cable), Germany
-	1390294		Keyboard (w/o cable), Italy
-	1390295		Keyboard (w/o cable), Spain
-	1390291		Keyboard (w/o cable), UK
- 1	6447039	R	• Keypad Assembly, US
- 1	6447041	R	• Keypad Assembly, France
- 1	6447042	R	• Keypad Assembly, Germany
- 1	6447043	R	• Keypad Assembly, Italy
- 1	6447044	R	• Keypad Assembly, Spain
- 1	6447040	R	• Keypad Assembly, UK
- NS	6447052	R	• Circuit Board Assembly
- 2	1390296	R	• Cover Assembly
- NS	6447054	2	• Foot, Adjustable (Qty 2)
- NS	6447056	AR	• Miscellaneous Parts Kit
			• Screws (Qty 5)
			• Nut
			• Lock Washer
- 3	6447051		Cable Assembly, External
- NS	6110464		Tool (key cap removal)

Assembly 28. Keybutton Kits (101/102-Key)

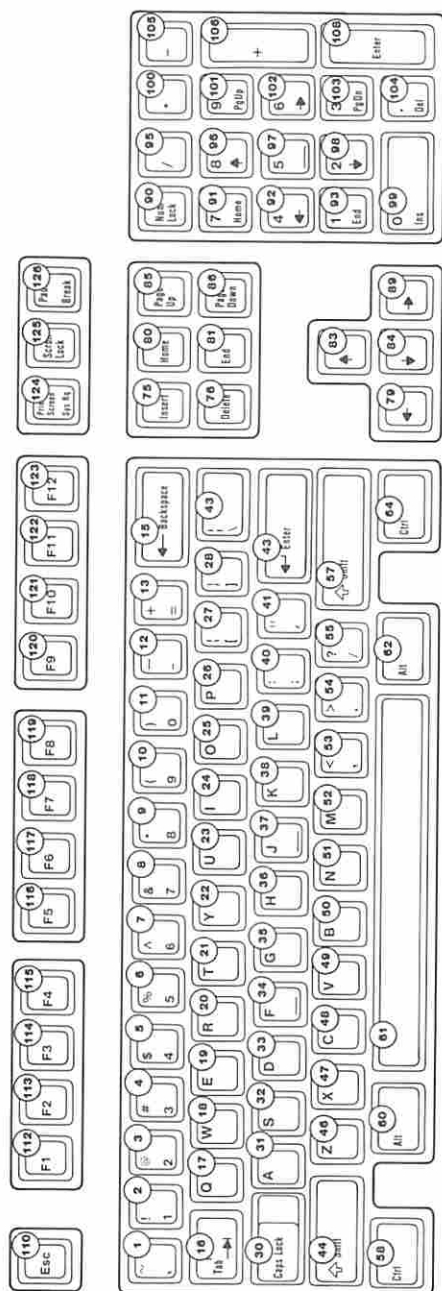


ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
28 -	6447045	1	Keybutton Kit, US **
-	6447047	R	Keybutton Kit, France **
-	6447048	R	Keybutton Kit, Germany **
-	6447049	R	Keybutton Kit, Italy **
-	6447050	R	Keybutton Kit, Spain **
-	6447046	R	Keybutton Kit, UK **

** Complete set of keybuttons as listed on the page 55.

** Complete set of keybuttons for the specified country.

Assembly 29. Keybuttons (101/102-Key)

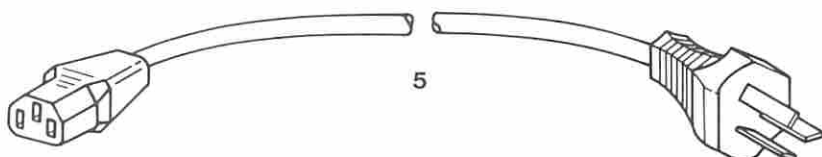
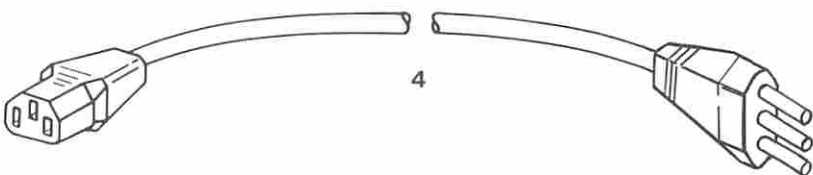
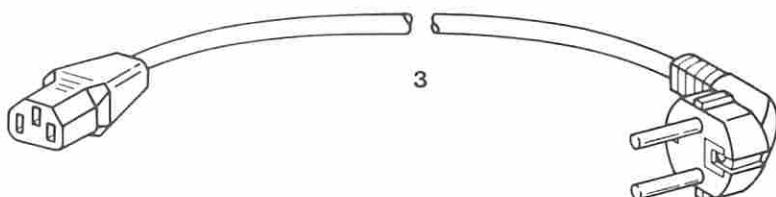
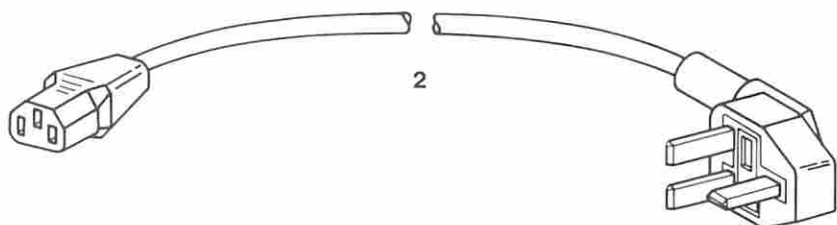
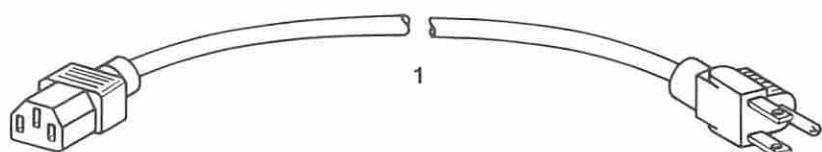


101/102-Key Keybutton Part Numbers

KEY LOCATION	PART NUMBER	DESCRIPTION	KEY LOCATION	PART NUMBER	DESCRIPTION
1	8502190	~/	55	1387688	?//
2	1387262	!/1	57	1386320	⌫
3	1386780	@/2	58	1385413	Ctrl
4	1387281	#/3	60	1385539	Alt
5	1387282	\$/4	61	N/A	Space Bar
6	1387283	%/5	62	1385539	Alt
7	1387261	^/6	64	1385413	Ctrl
8	1386785	ε/7	75	1386653	Insert
9	1386786	* /8	76	1386654	Delete
10	1386787	(/9	79	8502367	←
11	1386788	) /0	80	1386655	Home
12	8502201	/ -	81	1386656	End
13	8502202	+/=	83	8502380	↑
15	1385816	←	84	8502381	↓
16	1385797	|←/→|	85	1386657	Page Up
17	8502203	Q	86	1386658	Page Down
18	8502204	W	89	8502371	→
19	8502205	E	90	1386659	Num Lock
20	8502206	R	91	1386660	7/Home
21	8502207	T	92	1386661	4/←
22	8502208	Y	93	1386662	1/End
23	8502209	U	95	1386663	/
24	8502210	I	96	1386664	8/↑
25	8502211	O	97	1386699	5
26	8502212	P	98	1386665	2/↓
27	1385707	{/|	99	1386695	0/Ins
28	1385708	/|}	100	1386666	*
29	1386611	|/ \	101	1386667	9/PgUp
30	1385798	Caps Lock	102	1386668	6/→
31	8502215	A	103	1386669	3/PgDn
32	8502216	S	104	1386670	./Del
33	8502217	D	105	1386671	- (minus)
34	8502218	F	106	1386321	+ (plus)
35	8502219	G	108	1386322	Enter
36	8502220	H	110	1386672	Esc
37	8502221	J	112	1386673	F1
38	8502222	K	113	1386674	F2
39	8502223	L	114	1386675	F3
40	8502224	;/ :	115	1386676	F4
41	8502225	"/ i	116	1445836	F5
43	1386612	↵	117	1445837	F6
44	1386694	⌂	118	1445838	F7
46	8502228	Z	119	1445839	F8
47	8502229	X	120	1386677	F9
48	8502230	C	121	1386678	F10
49	8502231	V	122	1386679	F11
50	8502232	B	123	1386680	F11
51	8502233	N	124	1386681	PrtSc
52	8502234	M	125	1386682	Scroll Lock
53	6111301	</,	126	1386683	Pause
54	6111302	>/.			

Part numbers for complete keybutton sets are on page 53.

Assembly 30. Power Cords



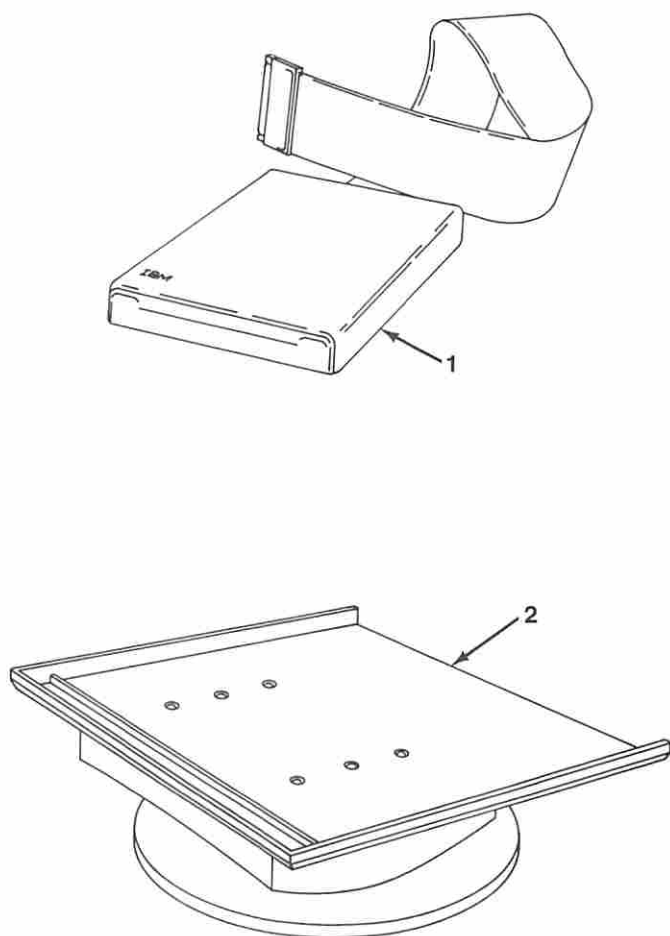
Power Cords

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
30 - 1	8529158	1	Power Cord, US Power Cord, Venezuela Power Cord, Colombia
- 2	8529341	1	Power Cord, UK Power Cord, Hong Kong Power Cord, Singapore
- 3	8529281	1	Power Cord, Germany Power Cord, France Power Cord, Spain
- 4	8529282	1	Power Cord, Italy
- 5	8529284	1	Power Cord, Australia Power Cord, New Zealand

Warning:

Use only the proper Power Cord certified for your country.

Assembly 31. Miscellaneous



Miscellaneous

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
31 - 1	6181769	1	Data Acquisition Distribution Panel
- 2	8286199	1	Display Stand
	8286200	R	• Platter, Bottom
	8286201	R	• Platter, Top
	8286202	R	• Skirt, Back
- NS	8529228	AR	Printer Adapter Wrap Plug
- NS	8529280	AR	Communications Adapter Wrap Plug
- NS	6323481	AR	Cluster Terminating Plug
- NS	6323712	AR	Data Acquisition Wrap Plug
- NS	6138013	AR	Plastic Envelope, Wrap Plug

Notes:

MAP 0000: Start (AT)

This is the entry point for all IBM PERSONAL COMPUTER AT® MAPs. The MAPs will help you determine the failing field replaceable unit (FRU).

The Advanced Diagnostics program is intended to test *only* IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

All voltages in the MAPs are positive unless otherwise shown.

001

Before you begin:

1. Power off the system.
 2. Ensure all connectors are installed correctly.
 3. Ensure any jumpers or switches are set correctly.
 4. Ensure the 115/230 Vac selector switch is set for the voltage available at the outlet.
 5. Verify the options are correctly set by running the Setup program. After running the Setup program (or if you cannot run the Setup program) continue with Step 001.
- Insert the Advanced Diagnostics diskette into drive A.
 - Power on the system.

IS THE POWER SUPPLY FAN RUNNING?

Yes	No
-----	----

--	--

|	002 Go to Step 058 in this MAP.
--	------------------------------------

003

- Listen carefully for any audio responses during the power-on self test (POST).

DID YOU HEAR ONE SHORT BEEP AT THE END OF THE POST?

Yes	No
-----	----

--	--

(Step 004 continues)

004

Go to Step 006 in this MAP.

005

Go to Step 034 in this MAP.

006

(From Step 004 in this MAP)

DID YOU RECEIVE A 16X ERROR?

Yes No

007

Go to Step 011 in this MAP.

008

DID YOU RECEIVE A 161 ERROR?

Yes No

009

Go to Step 016 in this MAP.

010

Go to "MAP 0100: System Board Start."

011

(From Step 007 in this MAP)

DID THE MESSAGE (RESUME = "F1" KEY) APPEAR ON THE SCREEN?

Yes No

012

Go to Step 073 in this MAP.

013

- Make a note of any error messages on the screen.
- Press the **F1** key to continue.

DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY WHEN THE F1 KEY WAS PRESSED?

Yes No

(Step 014 continues)

014

Go to "MAP 0300: Keyboard Start."

015

Go to Step 034 in this MAP.

016

(From Step 009 in this MAP)

- Make a note of any error messages on the screen.
- Press the **F1** key.

**DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY
WHEN THE F1 KEY WAS PRESSED?**

Yes No

017

Go to "MAP 0300: Keyboard Start."

018

Note: If you receive the message (SYSTEM OPTIONS
NOT SET), press **Enter**.

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

019

Go to "MAP 0600: Diskette Drive Start."

020

- Press **4 (SETUP)**.
- Follow the instructions on the screen to run the Setup program.

**DID YOU RECEIVE A 16X ERROR AFTER RUNNING THE
SETUP PROGRAM?**

Yes No

021

Go to Step 034 in this MAP.

(Step 022 continues)

022

DID YOU RECEIVE ANY ERRORS IN ADDITION TO THE 16X ERROR?

Yes No

023

Go to Step 025 in this MAP.

024

- Diagnose any errors other than a 16X first.

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

025

(From Step 023 in this MAP)

- Press **F1**. When the Advanced Diagnostics menu appears, select **0 (SYSTEM CHECKOUT)**.
- Follow the instructions on the screen and run all diagnostic tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR?

Yes No

026

Go to Step 028 in this MAP.

027

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

028

(From Step 026 in this MAP)

**DID THE SYSTEM CHECKOUT MENU APPEAR AT THE
END OF TESTING?****Yes No****029**

Go to "MAP 0020: Power Start."

030**DID YOU NOTICE ANY FAILURE SYMPTOMS?****Yes No****031**

Go to Step 033 in this MAP.

032Go to Step 074 in this MAP.

033

(From Step 031 in this MAP)

The Advanced Diagnostic tests have finished without detecting a failure.

- If you are still experiencing a failure:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.
 - Run the Advanced Diagnostic tests on all devices. Use the **(RUN TESTS ONE TIME)** option. If you receive an error, go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."
 - If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.
-

034

(From Steps 005, 015, and 021 in this MAP)

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

035

Go to Step 074 in this MAP.

036

- Select **0 (SYSTEM CHECKOUT)**.

Note: Depending upon the options installed in the system, questions about attached devices may appear on the screen. Press **Y** or **N** as required, then **Enter**.

(Step 036 continues)

036 (continued)

DID THE INSTALLED DEVICES MENU APPEAR?

Yes No

037

Go to Step 065 in this MAP.

038

- Compare the list to the options installed *inside* the system.

Note: The Installed Devices list displays only those devices supported by this manual. If a device is missing from the list and is not supported by this manual, press **Y (IS THE INSTALLED DEVICES LIST CORRECT?)** then **Enter** to continue the diagnostic tests. Go to Step 049 in this MAP.

DOES THE INSTALLED DEVICES LIST CORRECTLY IDENTIFY THE DEVICES INSTALLED INSIDE THE SYSTEM?

Yes No

039

Go to Step 041 in this MAP.

040

Go to Step 049 in this MAP.

041

(From Step 039 in this MAP)

Follow the instructions on the screen and attempt to correct the Installed Devices list.

Note: A 199 error indicates you answered "No" to the question about the Installed Devices list. Disregard the error.

COULD YOU CORRECT THE INSTALLED DEVICES LIST?

Yes No

(Step 042 continues)

042

Go to Step 044 in this MAP.

043

Go to Step 049 in this MAP.

044

(From Step 042 in this MAP)

IS THE OPTION MISSING FROM THE INSTALLED DEVICES LIST?

Yes No

045

Press **Y** (**IS THE INSTALLED DEVICES LIST CORRECT?**) then **Enter** to continue the diagnostic tests.
Go to Step 049 in this MAP.

046

- Make sure all switches and jumpers are correctly set for the missing option. Be sure to check the system board video switch as well as the option switches and jumper positions.

ARE THE SWITCHES AND JUMPERS SET CORRECTLY?

Yes No

047

Reset any incorrect jumper or switch settings. Go to Step 001 in this MAP to verify system operation.

048

Go to the appropriate MAP for the missing device.

049

(From Steps 038, 040, 043, and 045 in this MAP)

- Follow the instructions on the screen to run the tests one time. Select the options you want to test, or press **Enter** to run all tests.

Note: If you received a 199 error or you have an undetermined problem, run all tests.

(Step 049 continues)

049 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

050

Go to Step 052 in this MAP.

051

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

052

(From Step 050 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

053

Go to "MAP 0020: Power Start."

054

DID YOU NOTICE ANY FAILURE SYMPTOMS?

Yes No

055

Go to Step 057 in this MAP.

056

Go to Step 074 in this MAP.

057

(From Step 055 in this MAP)

The Advanced Diagnostic tests have finished without detecting a failure.

- If you are still experiencing a failure:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.
 - If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.
-

058

(From Step 002 in this MAP)

IS THE POWER CORD PLUGGED INTO A FUNCTIONING, PROPERLY GROUNDED ELECTRICAL OUTLET?

Yes No

059

- Attach the system to a functioning, properly grounded electrical outlet. Return to Step 001 in this MAP to verify system operation.

060

- Power off the system.
- Disconnect the power cord from the electrical outlet then from the system unit.
- Check the system unit power cord for continuity.

DOES THE POWER CORD HAVE CONTINUITY?

Yes No

061

(Step 061 continues)

061 (continued)

Replace the power cord.

062

- Reconnect the power cord.
- Power on the system.
- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at power supply connector P8.

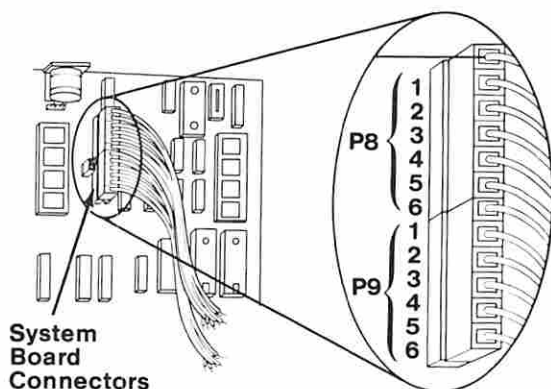


Figure 1. System Board Power Connector

IS THE VOLTAGE 2.4 TO 5.2 VDC?

Yes No

063

Go to "MAP 0020: Power Start."

064

Replace the power supply.

065

(From Step 037 in this MAP)

DID YOU RECEIVE AN ERROR MESSAGE INDICATING A DISKETTE DRIVE READ ERROR?

Yes No

066

Go to Step 068 in this MAP.

(Step 067 continues)

067

Go to "MAP 0600: Diskette Drive Start."

068

(From Step 066 in this MAP)

IS A MATH COPROCESSOR INSTALLED IN THE SYSTEM?

Yes No

|
|
069

Go to "MAP 0300: Keyboard Start."

070

- Power off the system and remove the math coprocessor.
- Power on the system.
- Select **0 (SYSTEM CHECKOUT)**.

Note: Depending upon the options installed in the system, questions about attached devices may appear on the screen. Press **Y** or **N** as required, then **Enter**.

DID THE INSTALLED DEVICES MENU APPEAR?

Yes No

|
071

Reinstall the math coprocessor and go to "MAP 0300: Keyboard Start."

072

- Replace the math coprocessor. If that does not correct the problem replace the system board.
-

073

(From Step 012 in this MAP)

Find your error in the following figure and take the action indicated.

Note: If an error message and incorrect audio response occur, take the action indicated for the error message.

POST Error:	Action:
No Beep and:	
Blank Display.....	MAP 0020: Power Start
Blinking Cursor.....	MAP 0020: Power Start
Unreadable Display.....	MAP 0020: Power Start
Machine Functioning Properly.....	MAP 0020: Power Start
1XX Error.....	MAP 0100: System Board Start
1 Long and 1 Short Beep.....	Replace System Board
1 Long and 2 Short Beeps.....	Go to Step 075 in this MAP
1 Long and 3 Short Beeps.....	Go to Step 075 in this MAP
2 Short Beeps and:	
Blank or Unreadable Display.....	Go to Step 075 in this MAP
Distorted Display Image.....	Go to Step 075 in this MAP
1XX Error.....	MAP 0100: System Board Start
XXXXXXX XXXX 201 Error.....	MAP 0200: Memory Start
30X Error.....	MAP 0300: Keyboard Start
XX30X Error.....	MAP 0300: Keyboard Start
601 Error.....	MAP 0600: Diskette Drive Start
17XX Error.....	MAP 1700: Fixed Disk Drive Start
30XX Error.....	MAP 3000: PC Network
31XX Error.....	MAP 3100: Alt. PC Network
C8000 ROM Error.....	Replace Fixed Disk Drive Adapter
IO ROM CC0000.....	MAP 3000: PC Network
ROM Error.....	Replace System Board
IO ROM XXXXXX (IO Adapter Failure).....	MAP 0020: Power Start
Continuous Beep.....	MAP 0020: Power Start
Repeating Short Beeps.....	MAP 0020: Power Start
Any Errors Not Shown Above.....	Go to Step 083 in this MAP

Figure 2. POST Errors

(From Steps 032, 035, and 056 in this MAP)

Find your error in the following figure and take the action indicated.

Symptom:	Action:
Incorrect Memory Size Displayed During the POST.....	MAP 0200: Memory Start
Display Problems:	
Incorrect Colors	Go to Step 075 in this MAP
No High Intensity	Go to Step 075 in this MAP
Missing, Broken, or Incorrect Characters.....	Go to Step 075 in this MAP
Blank Display (Dark)	Go to Step 075 in this MAP
Blank Display (Bright).....	Go to Step 075 in this MAP
Distorted Image	Go to Step 075 in this MAP
Unreadable Display.....	Go to Step 075 in this MAP
Other Display Problems	Go to Step 075 in this MAP
Flashing Cursor Only.....	Go to Step 078 in this MAP
BASIC Screen Appears	MAP 0600: Diskette Drive Start
Loads Program from Fixed Disk.....	MAP 0600: Diskette Drive Start
Loads Program from Remote Station.....	MAP 0600: Diskette Drive Start
Diskette Boot Failure	MAP 0600: Diskette Drive Start
PARITY CHECK.....	MAP 0200: Memory Start
Keyboard Problem	MAP 0300: Keyboard Start
Cannot Finish Diagnostic Tests	MAP 0020: Power Start
Printer Problems.....	Refer to the Service Manual for the Printer.
Network Problems	Refer to the Service Manual for the Network.

Figure 3. Failure Symptoms

075

(From Steps 073 and 074 in this MAP)

IS AN ENHANCED GRAPHICS ADAPTER INSTALLED?

Yes No

076

Refer to the MAP for the failing display adapter.

077

Go to "MAP 2400: Enhanced Graphics Adapter."

078

(From Step 074 in this MAP)

IS A MATH COPROCESSOR INSTALLED?

Yes No

079

Go to "MAP 0600: Diskette Drive Start."

080

- Power off the system.
- Remove the math coprocessor from the system board.
- Power on the system.

DID THE FAILING SYMPTOM REMAIN?

Yes No

081

Replace the math coprocessor.

082

Reinstall the math coprocessor, then go to "MAP 0600: Diskette Drive Start."

083

(From Step 073 in this MAP)

Go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

JUMPERS AND SWITCH SETTINGS

System Setup	3
Option Compatibility	5
BIOS ROM Identification	5
Terminating Resistors and Switches	6
Diskette Drive	6
Fixed Disk Drive	7
Power Supply Voltage Selector Switch	8
Using the Switch Charts	9
System-Board Display Switch	10
Memory Expansion Options	11
Base Memory	11
Expansion Memory	11
Cluster Adapter	23
Station Address	23
Remote Initial Program Load	25
Adapter Number	25
Enhanced Graphics Adapter (EGA)	26
PC Network Adapter	28
Serial/Parallel Adapter	29
Binary Synchronous Communications (BSC) Adapter ...	30
Data Acquisition and Control (DAC) Adapter	31
Analog Output Range	31
Analog Input Range	32
Adapter Number	32
Interrupt Request (IRQ) Level	33
General Purpose Interface Bus (GPIB) Adapter	34
Adapter Number	34
Interrupt Request (IRQ) Level	35
Interrupt Acknowledge (INT ACK) Level	36
Direct-Memory Access (DMA) Channel	36
Professional Graphics Controller	37
Voice Communications Adapter	38

Notes:

System Setup

The Setup program is on the Advanced Diagnostics diskette. You need to know what options are installed in the system unit to run the Setup program.

1. Make a list of the option adapters installed in the system.
2. Determine the type of drives installed.
 - Fixed Disk Drive: An identification label is on the front of the drive.
 - Diskette Drive: The bezel of a double-sided (360K) diskette drive has an asterisk; the bezel of a high-capacity (1.2M) diskette drive is not marked.
3. Ensure that all jumpers and switches are set correctly.

Note: If you receive an error code, troubleshoot any error indications other than 16X first. If the only error code you receive is 16X, and you cannot correct the Setup program using the instructions on the following page, go to "MAP 0000: Start (AT)."

System Setup

1. Insert the Advanced Diagnostics diskette into diskette drive A.
2. Power on the system.
3. When the Advanced Diagnostics menu appears, select option **4 (SETUP)** and verify that the options are correctly set.

The Setup program will prompt you for the following information:

Time	Set or change the time.
Date	Set or change the date.
Diskette Drives	Select the number and type (high capacity or double sided) installed.
Fixed Disk Drives	Select the number and type of drives installed.
Memory	Select the amount of base and expansion memory installed.
Display	Set the primary display if two display adapters are installed. Select the mode (40 or 80 column) if a color display is installed.

Option Compatibility

Certain option adapters conflict with each other when used in the same system.

1. The following adapters should not be installed together in the system unit:
 - Synchronous Data Link Control (SDLC) Adapter.
 - Alternate Binary Synchronous Communications (Alt BSC) Adapter.
2. Only one 128KB Memory Expansion Option **or** one 128KB/640KB Memory Expansion Option can be installed in the system.

BIOS ROM Identification

To determine the date of the BIOS ROM module, run the following BASIC program. Type the program exactly as shown.

```
10 DEF SEG=&HF000
20 FOR X=&HFFF5 TO &HFFFF
30 PRINT CHR$(PEEK(X));
40 NEXT
RUN
```

The date that is displayed is the date of your BIOS ROM module.

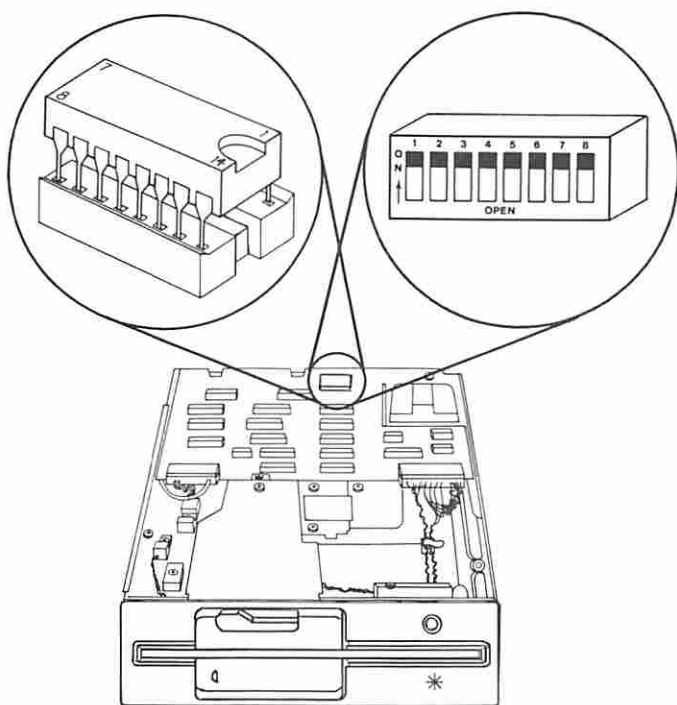
Terminating Resistors and Switches

Diskette Drive

A diskette drive may have a terminating resistor or terminating switch.

- **Terminating Resistor** - A terminating resistor **must** be installed in diskette drive A. Diskette drive B should not have a terminating resistor installed.
- **Terminating Switch** - If a diskette drive is equipped with a terminating switch instead of the terminating resistor, set all switches on diskette drive A to the On position. Set all switches on diskette drive B to the Off position.

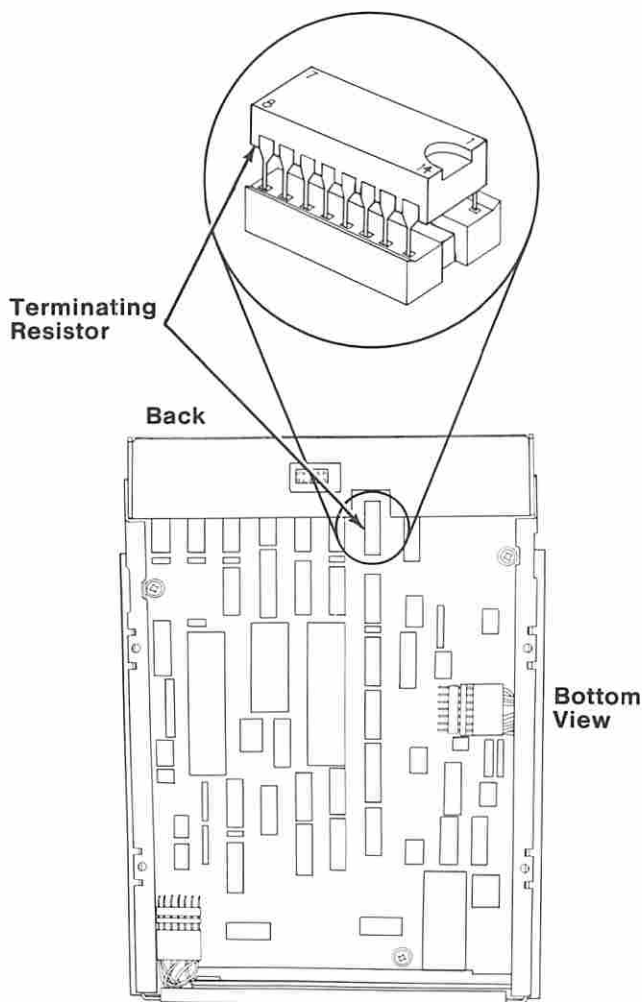
Note: The terminating resistor may appear in a different location on the drive. If so, an identifying label will be attached to the terminating resistor.



Fixed Disk Drive

- The terminating resistor must be installed on fixed disk drive C.
- In a system unit with two fixed disk drives, remove the terminating resistor from fixed disk drive D.

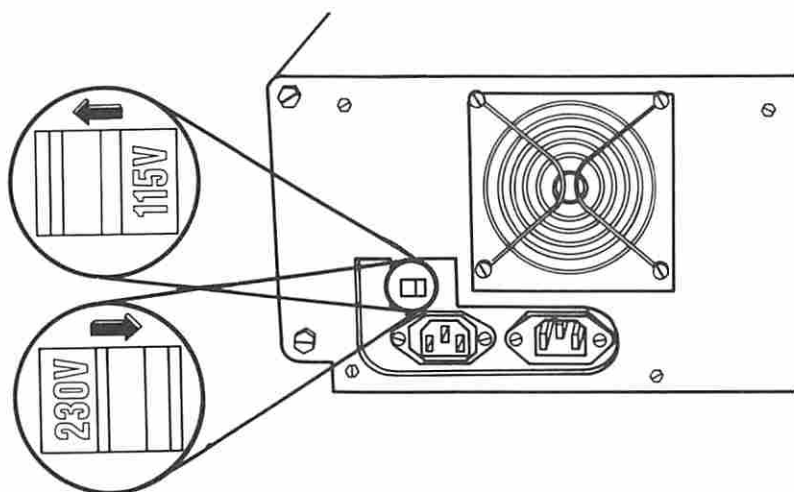
Note: The terminating resistor may appear in a different location on the drive. If so, an identifying label will be attached to the terminating resistor.



Power Supply Voltage Selector Switch

The voltage selector switch is located at the rear of the system unit power supply. It must be set for the voltage present at the electrical outlet.

Switch Position	Voltage Range
115 Vac	110 to 125 Vac
230 Vac	200 to 240 Vac



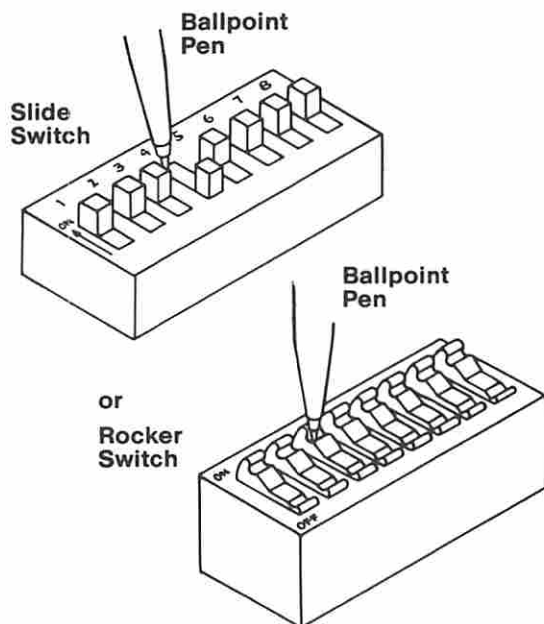
Using the Switch Charts

The following legend applies to the charts in this section.

Symbol	Meaning
*	Not Used by this Application
↑	On/Closed Position of a Switch
↓	Off/Open Position of a Switch
N/A	Not Allowed or Not Applicable

Note: For some options, the customer must supply information for correct setting of jumpers or switches.

To set a rocker switch, press the rocker down to the desired position; to set a slide switch, slide the lug of the switch to the desired position.



System-Board Display Switch

If your primary display adapter is a:

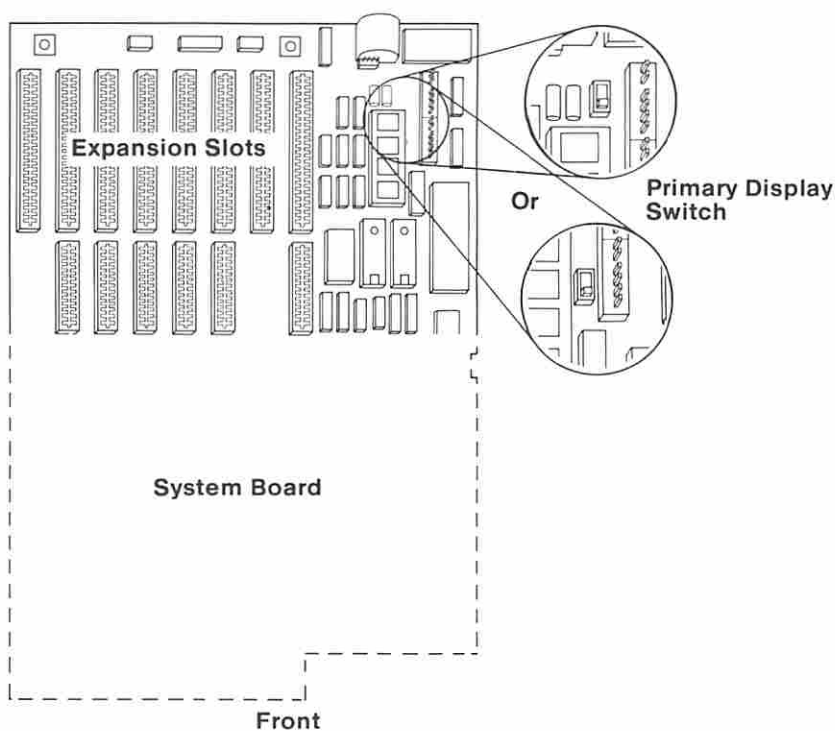
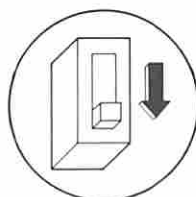
- Monochrome Display and Printer Adapter - Set the display switch to the rear of the system.
- Color display adapter - Set the display switch to the front of the system.

Monochrome Display



Primary Display Switch

Color Display



Memory Expansion Options

Base Memory

If you have a 128KB/640KB memory option with *only* 128K installed, set the switches as shown below.

128KB/640KB w/1 28K Installed
12345678
↑↑↑↓↑↓↑↓

The 128KB Memory Expansion Option has no switch settings.

Expansion Memory

If you are installing a new memory expansion option refer to the "Memory Switches Quick Reference" in this section. To check installed memory expansion option switch settings continue with the following procedure.

One installed memory expansion option must have a switch setting that matches switch Set 1. Start with Set 1 and find the memory expansion option with switch settings matching one of the switch settings provided. If you have additional memory options to check, answer the question below the switch settings to determine which Set to go to next.

Note: If at any time you are unable to match the switch settings, you have an option with the switches improperly set. Set the switches on one of the options you have not already checked to match the switch settings provided, then answer the question to continue.

When each memory option matches a switch setting, you have finished the procedure.

Note: A fully populated 128KB/640KB Memory Expansion Option has 128K of base memory and 512K of expansion memory. Count only the expansion memory when answering the questions.

Set 1

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↑↓↑↑↑↓	↑↑↑↓↑↑↑↑	↑↑↑↓↑↑↓↓	↑↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 2.

2048K Go to Set 5.

Set 2

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↑↓↑↑↑↓	↑↑↑↓↑↑↑↑	↑↑↑↓↑↑↓↓	↑↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 3.

2048K Go to Set 6.

Set 3

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↓↑↑↑↓	↑↑↓↑↑↑↑	↑↑↓↑↑↓↓	↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 4.

2048K Go to Set 7.

Set 4

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↓↑↓↑↑↓	↑↑↓↑↓↑↑↑	↑↑↓↑↓↓↓	↑↑↓↑↓↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 5.

2048K Go to Set 8.

Set 5

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↓↑↑↑↓	↑↑↓↑↑↑↑	↑↑↓↑↑↑↓	↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 6.

2048K Go to Set 9.

Set 6

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↑↓↑↑↑↓	↑↑↓↑↑↑↑	↑↑↓↑↑↑↓	↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 7.

2048K Go to Set 10.

Set 7

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↑↑↑↓	↑↓↑↑↑↑↑	↑↓↑↑↓↑↓	↑↓↑↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 8.

2048K Go to Set 11.

Set 8

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↑↓↑↓	↑↓↑↑↓↑↑	↑↓↑↑↓↑↓	↑↓↑↑↓↑↑

How much expansion memory is installed on this option?

512K Go to Set 9.

2048K Go to Set 12.

Set 9

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↓↑↑↓	↑↓↑↓↑↑↑	↑↓↑↓↑↓↓	↑↓↑↓↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 10.

2048K Go to Set 13.

Set 10

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↓↑↑↓	↑↓↑↓↑↑↑	↑↓↑↓↑↓↓	↑↓↑↓↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 11.

2048K Go to Set 14.

Set 11

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↑↑↑↓	↑↓↑↑↑↑↑	↑↓↑↑↓↑↓	↑↓↑↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 12.

2048K Go to Set 15.

Set 12

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↓↑↑↓	↑↓↑↓↑↑↑	↑↓↑↓↓↑↓	↑↓↑↓↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 13.

2048K Go to Set 16.

Set 13

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↓↑↑↑↓	↑↓↑↓↑↑↑↑	↑↓↑↓↑↑↓	↑↓↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 14.

2048K Go to Set 17.

Set 14

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↑↓↑↓↑↑↑↓	↑↓↑↓↑↑↑↑	↑↓↑↓↑↓↑↓	↑↓↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 15.

2048K Go to Set 18.

Set 15

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↑↑↑↑↓	↓↑↑↑↑↑↑	↓↑↑↑↓↑↓	↓↑↑↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 16.

2048K Go to Set 19.

Set 16

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↑↑↓↑↑↓	↓↑↑↑↓↑↑↑	↓↑↑↑↓↑↓	↓↑↑↑↓↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 17.

2048K Go to Set 20.

Set 17

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↑↓↑↑↑↓	↓↑↑↓↑↑↑↑	↓↑↑↓↑↑↓↑	↓↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 18.

2048K Go to Set 21.

Set 18

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↑↓↑↑↑↓	↓↑↑↓↑↑↑↑	↓↑↑↓↑↑↓↑	↓↑↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 19.

2048K Additional memory expansion options cannot be installed.

Set 19

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↓↑↑↑↓	↓↑↓↑↑↑↑	↓↑↓↑↓↑↓	↓↑↓↑↑↑↑

How much expansion memory is installed on this option?

512K Go to Set 20.

2048K Additional memory expansion options cannot be installed.

Set 20

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↓↑↓↑↓	↓↑↓↑↓↑↑	↓↑↓↑↓↑↓	↓↑↓↑↓↑↑

How much expansion memory is installed on this option?

512K Go to Set 21.

2048K Additional memory expansion options cannot be installed.

Set 21

Find the memory option that matches one of the switch settings below.

128KB/640KB	512KB		512KB/2MB
	Bank 0	Bank 1	
12345678	12345678	12345678	12345678
↓↑↓↑↑↑↓	↓↑↓↑↑↑↑	↓↑↓↑↑↑↓	↓↑↓↑↑↑↑

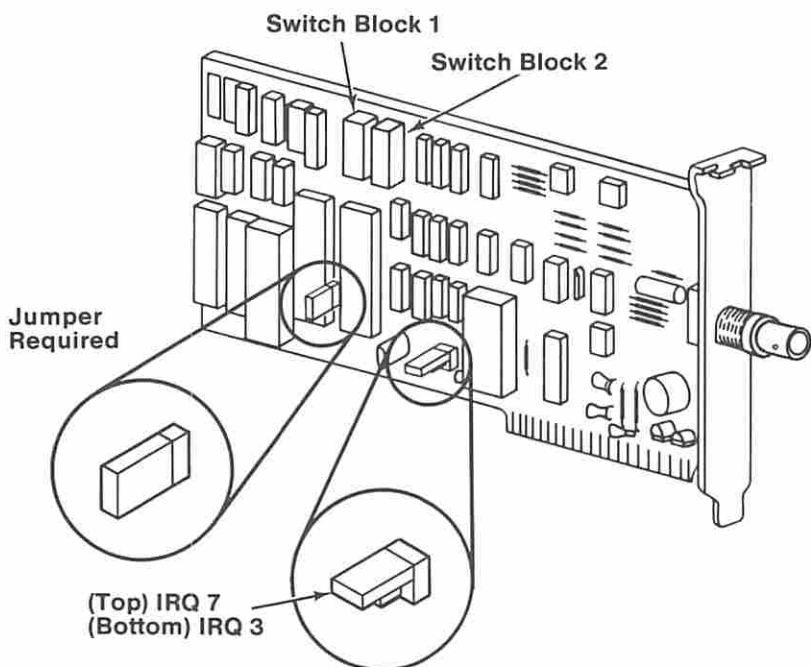
Additional memory expansion options cannot be installed.

Memory Switch Quick Reference

Use the following figure when installing a new memory expansion option. Any memory expansion options currently installed in the system must be functioning and have the switches set properly.

Total Amount of Memory Currently Installed	Set Switches According to:
512 or 640	Set 1
1024 or 1152	Set 2
1536 or 1664	Set 3
2048 or 2176	Set 4
2560 or 2688	Set 5
3072 or 3200	Set 6
3584 or 3712	Set 7
4096 or 4224	Set 8
4608 or 4736	Set 9
5120 or 5248	Set 10
5632 or 5760	Set 11
6144 or 6272	Set 12
6656 or 6784	Set 13
7168 or 7296	Set 14
7680 or 7808	Set 15
8192 or 8320	Set 16
8704 or 8832	Set 17
9216 or 9344	Set 18
9728 or 9956	Set 19
10240 or 10368	Set 20
10752 or 10880	Set 21

Cluster Adapter



Station Address

Station Address	Switch Block 1
	12345678
0	↓↓↓↓↓↓↓*
1	↑↓↓↓↓↓↓*
2	↓↑↓↓↓↓↓*
3	↑↑↓↓↓↓↓*
4	↓↓↑↓↓↓↓*
5	↑↑↑↓↓↓↓*

Station Address	Switch Block 1
	12345678
6	↓↑↑↓↓↓↓*
7	↑↑↑↓↓↓↓*
8	↓↓↓↑↓↓↓*
9	↑↑↓↑↓↓↓*
10	↓↑↑↑↓↓↓*
11	↑↑↑↑↓↓↓*

Station Address	Switch Block 1
	12345678
12	↓↑↑↑↓↓↓*
13	↑↑↑↑↓↓↓*
14	↓↑↑↑↓↓↓*
15	↑↑↑↑↓↓↓*
16	↓↓↓↑↑↓↓*
17	↑↑↓↑↑↓↓*

(Part 1 of 2)

Station Address	Switch Block 1
	12345678
18	↓↑↓↑↓↑↓*
19	↑↑↓↑↓↑↓*
20	↓↑↓↑↓↑↓*
21	↑↑↓↑↓↑↓*
22	↓↑↓↑↓↑↓*
23	↑↑↑↑↓↑↓*
24	↓↑↓↑↓↑↓*
25	↑↑↓↑↓↑↓*
26	↓↑↓↑↓↑↓*
27	↑↑↓↑↓↑↓*
28	↓↑↑↑↓↑↓*
29	↑↑↑↑↓↑↓*
30	↓↑↑↑↓↑↓*
31	↑↑↑↑↓↑↓*
32	↓↑↓↑↓↑↓*
33	↑↑↓↑↓↑↓*

Station Address	Switch Block 1
	12345678
34	↓↑↓↑↓↑↓*
35	↑↑↓↑↓↑↓*
36	↓↑↓↑↓↑↓*
37	↑↑↓↑↓↑↓*
38	↓↑↓↑↓↑↓*
39	↑↑↑↑↓↑↓*
40	↓↑↓↑↓↑↓*
41	↑↑↓↑↓↑↓*
42	↓↑↓↑↓↑↓*
43	↑↑↓↑↓↑↓*
44	↓↑↑↑↓↑↓*
45	↑↑↓↑↓↑↓*
46	↓↑↑↑↓↑↓*
47	↑↑↑↑↓↑↓*
48	↓↑↓↑↓↑↓*
49	↑↑↓↑↓↑↓*

Station Address	Switch Block 1
	12345678
50	↓↑↓↑↓↑↓*
51	↑↑↓↑↓↑↓*
52	↓↑↓↑↓↑↓*
53	↑↑↓↑↓↑↓*
54	↓↑↓↑↓↑↓*
55	↑↑↑↑↓↑↓*
56	↓↑↓↑↓↑↓*
57	↑↑↓↑↓↑↓*
58	↓↑↓↑↓↑↓*
59	↑↑↓↑↓↑↓*
60	↓↑↑↑↓↑↓*
61	↑↑↑↑↓↑↓*
62	↓↑↑↑↓↑↓*
63	↑↑↑↑↓↑↓*

(Part 2 of 2)

Notes:

1. Switches 1 through 6 of Switch Block 1 are for station addresses 0 to 63.
2. Position 7 of Switch Block 1 is always set to the Off position.
3. Position 8 of Switch Block 1 is the Remote Initial Program Load (RIPL) switch (see the next figure).

Remote Initial Program Load

When switch 8 is On, the Personal Computer will request a Remote Initial Program Load (RIPL) from another station in the Cluster. This delays the POST by 30 seconds. The recommended setting is Remote IPL Off.

Condition	Switch Block 1 (See Note)
	12345678
Remote IPL On	*****↑
Remote IPL Off	*****↓

Note: Position 7 of Switch Block 1 is always set to Off.

Adapter Number

The following figure shows the setting of switches 1 through 4 of Switch Block 2 for adapters 1 through 4.

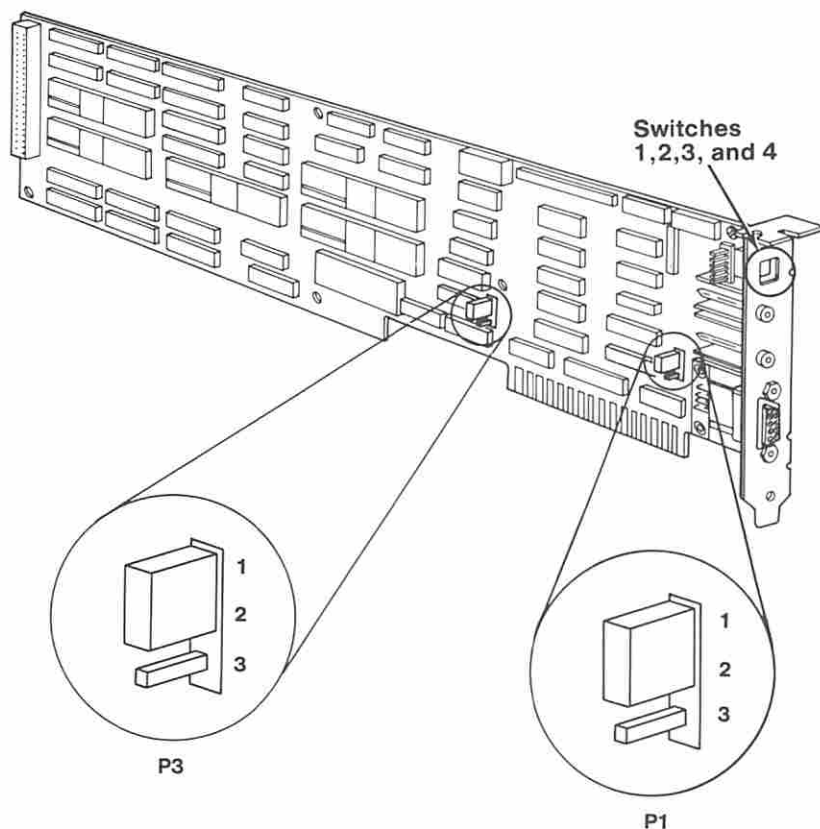
Switches 5 through 8 of Switch Block 2 are always set to the Off position.

Condition	Switch Block 2
	12345678
Select Adapter 1:	↑↓↓↓↓↓↓
Select Adapter 2:	↓↑↓↓↓↓
Select Adapter 3:	↓↓↑↓↓↓
Select Adapter 4:	↓↓↓↑↓↓

Note: If only one Cluster Adapter is installed in an IBM Personal Computer, it must be set as adapter 1. Each additional adapter must have a different Cluster Adapter number.

Enhanced Graphics Adapter (EGA)

Warning: Damage to the graphics adapter, the display, or both may result if these jumpers are not in the correct position.



Display	P1	P3
IBM Color Display or IBM Monochrome Display	2 & 3	1 & 2
IBM Enhanced Color Display	1 & 2	1 & 2

If an EGA is the only display adapter installed, or an EGA is installed with a Monochrome Display and Printer Adapter, refer to Figure 1 to set the EGA switches.

If an EGA is installed with a Color/Graphics Monitor Adapter, refer to Figure 2 to set the EGA Switches.

Type of Display Attached to the Enhanced Graphics Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
No Display	N/A	↓↑↑↑
Monochrome Display	↓↑↓↓	N/A
Color Display (40 X 25 Mode)	↑↑↓↑	↑↑↑↑
Color Display (80 X 25 Mode)	↓↑↓↑	↓↑↑↑
Enhanced Color Display (Normal Color Mode)	↑↑↑↓	↑↑↑↑
Enhanced Color Display (Enhanced Color Mode)	↓↑↓↓	↓↑↑↑

Figure 1

Type of Display Attached to the Color/Graphics Monitor Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
Color Display (40 X 25 Mode)	↑↑↓↓	↑↑↑↑
Color Display (80 X 25 Mode)	↓↑↓↓	↓↑↑↑
No Display	↓↑↓↓	N/A

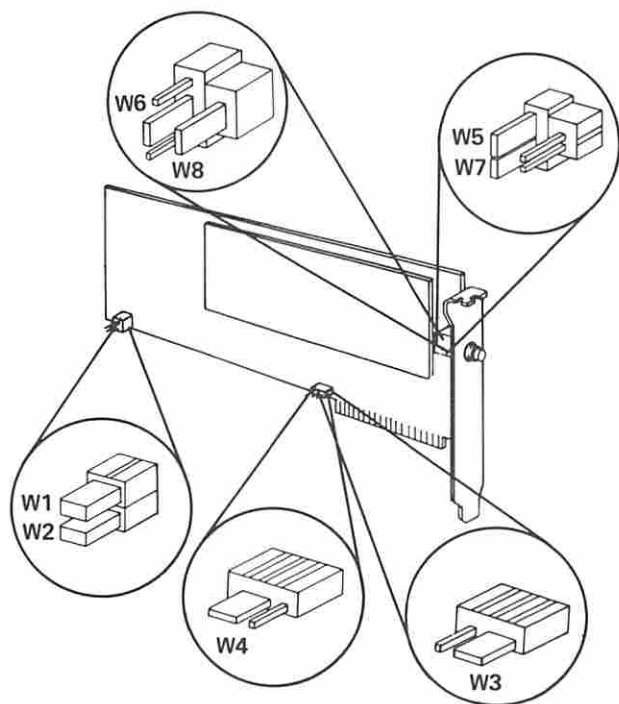
Figure 2

Notes:

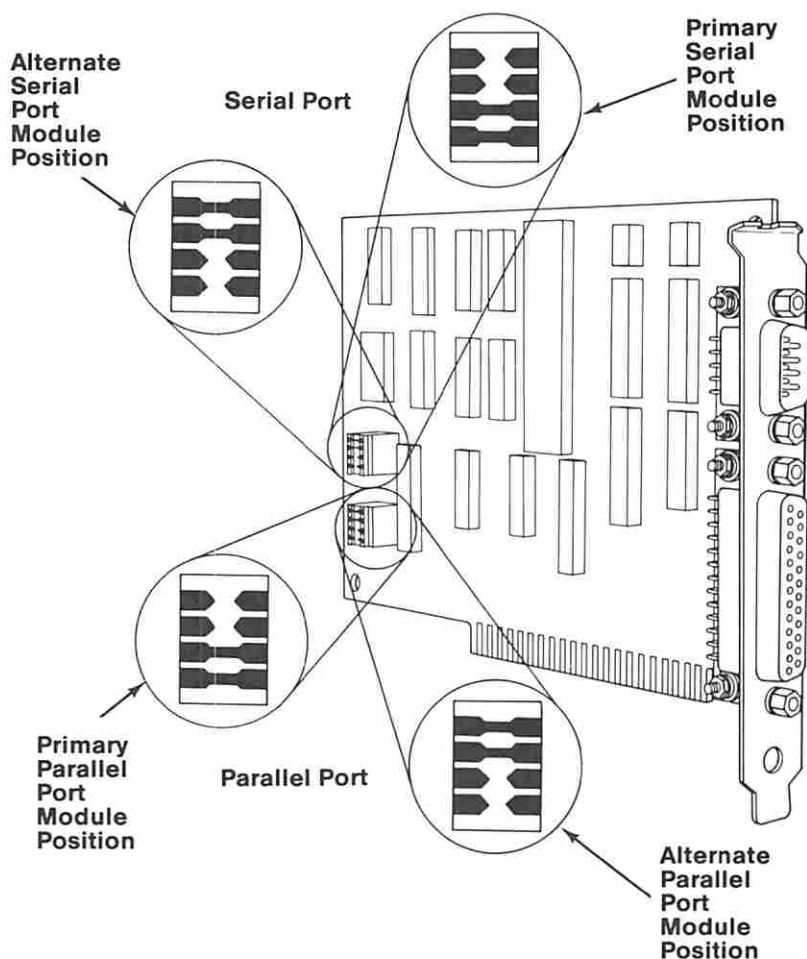
1. Mode selection can be changed by programming.
2. A maximum of two displays can be attached to the system, one color display and one monochrome display.

PC Network Adapter

Jumper Position (See figure)	Function
W1	Automatic Remote Program Load (RPL)
W2	Not Used
W3	Sets Adapter to use Interrupt Level 2
W4	Sets Adapter to use Interrupt Level 3
W5 & W7	Sets Adapter as Alternate Adapter
W6	Sets Adapter as Primary Adapter
W8	Enables ROM on Adapter (See Note)
Note: Do not enable the ROM on more than one adapter.	

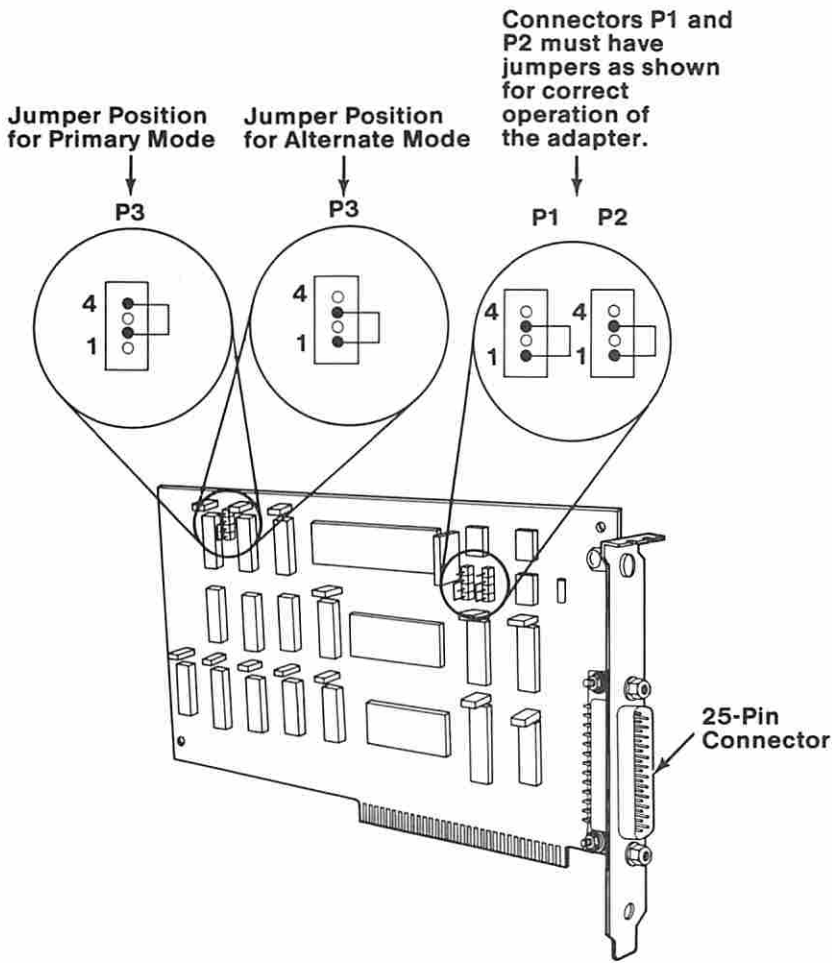


Serial/Parallel Adapter

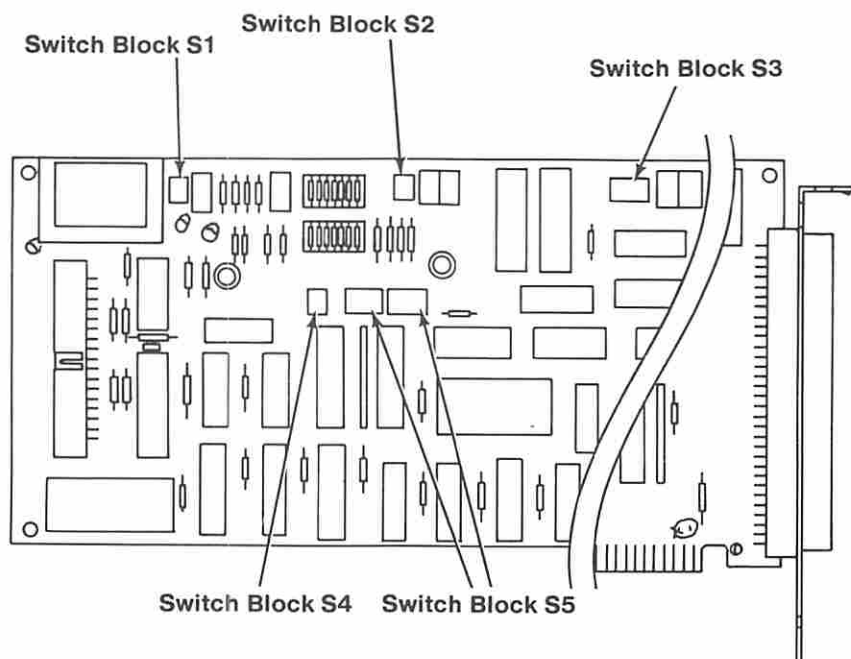


Note: If a Monochrome Display and Printer Adapter is installed in the same system as a Serial/Parallel Adapter, the parallel port of the primary Serial/Parallel Adapter defaults to the alternate mode.

Binary Synchronous Communications (BSC) Adapter



Data Acquisition and Control (DAC) Adapter



Analog Output Range

Analog Output Range (D/A) Channel 0	Switch Block S1	Analog Output Range (D/A) Channel 1	Switch Block S2
	1 2		1 2
- 5 to + 5 Volts	↑ ↑	- 5 to + 5 Volts	↑ ↑
-10 to +10 Volts	↓ ↑	-10 to +10 Volts	↓ ↑
0 to +10 Volts	↑ ↓	0 to +10 Volts	↑ ↓

Note: Only the switch settings shown may be used.

Analog Input Range

Analog Input Range (A/D)	Switch Block S3
	1 2 3 4
- 5 to +5 Volts	↓ ↓ ↑ ↑
-10 to +10 Volts	↓ ↑ ↓ ↑
0 to +10 Volts	↓ ↓ ↑ ↓

Note: Only the switch settings shown may be used.

Adapter Number

Adapter Number	Switch Block S4
	1 2
0	↓ ↓
1	↑ ↓
2	↓ ↑
3	↑ ↑
Note: Each DAC adapter installed in a system must have its own adapter number.	

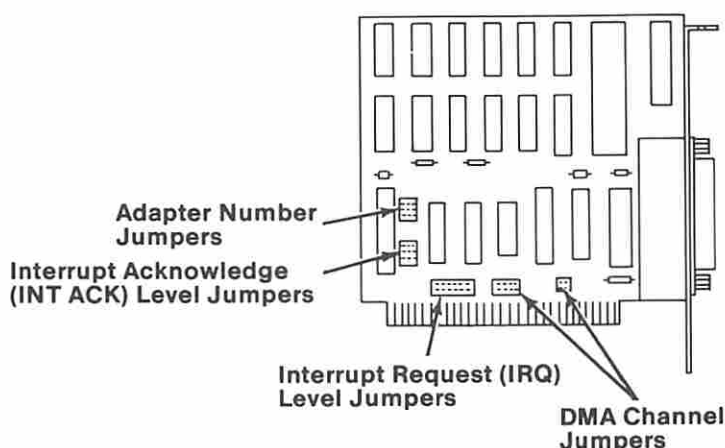
Note: Only the switch settings shown may be used.

Interrupt Request (IRQ) Level

IRQ Level	Switch Block S5									
	1	2	3	4	5	1	2	3	4	5
7	↓	↓	↓	↓	↓	↓	↓	↓	↑	↑
6	↓	↓	↓	↓	↓	↓	↑	↑	↓	↓
5	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
4	↓	↓	↑	↑	↓	↓	↓	↓	↓	↓
3	↑	↑	↓	↓	↓	↓	↓	↓	↓	↓
Note: The DAC adapter can share its IRQ level with other adapters that can use shared interrupts.										

Note: Only the switch settings shown may be used.

General Purpose Interface Bus (GPIB) Adapter









Adapter Number

Each GPIB adapter installed in a system must have its own adapter number.

Adapter Number	Jumper Positions
0	
1	
2	
3	
4	
5	
6	
7	







Interrupt Request (IRQ) Level

The GPIB adapter can share its IRQ level with other adapters that use shared interrupts. All adapters sharing an IRQ level must be installed in the same unit.




Interrupt Request Level	Jumper Positions
7	
6	
5	
4	
3	
2	

Interrupt Acknowledge (INT ACK) Level

The interrupt acknowledge (INT ACK) and interrupt request (IRQ) levels must be the same.

INT ACK level	Jumper positions
7	
6	
5	
4	
3	
2	

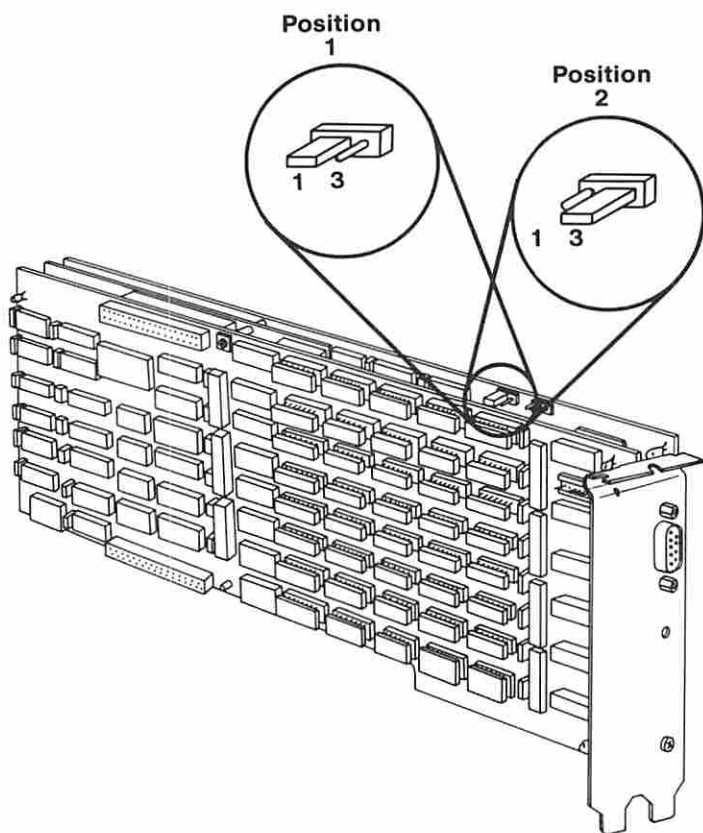
Direct-Memory Access (DMA) Channel

DMA channel	Jumper positions
1	
2	
3	

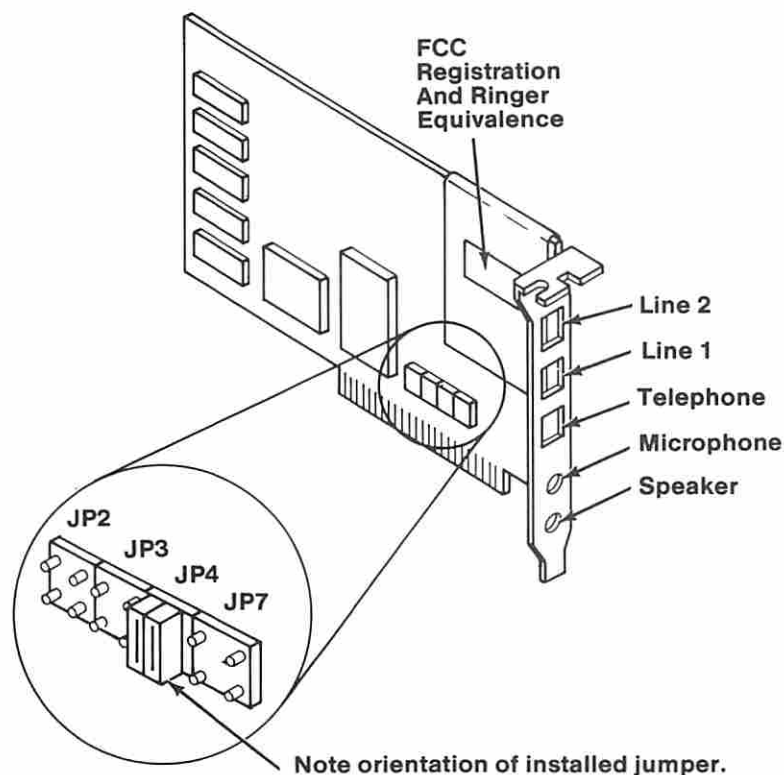
Professional Graphics Controller

If an IBM Color/Graphics Monitor Adapter is installed in the system, the emulator jumper must be installed in position 2.

When the jumper is installed in position 1, the Professional Graphics Controller can emulate an IBM Color/Graphics Monitor Adapter.



Voice Communications Adapter



Note: The jumper block is usually set to position JP4. It must be installed at an interrupt level that does not conflict with other options.

IRQ Level	Jumper Position
2	JP2
3	JP3
4	JP4
7	JP7

PARTS CATALOG

Limited Warranty - IBM Service Parts	3
How To Use This Parts Catalog	4
Visual Index	6
Assembly 1. System Unit - Exterior (5170)	7
Assembly 2. System Unit - Interior (5170)	8
Assembly 3. Diskette Drives (5-1/4 Inch)	10
Assembly 4. Fixed Disk Drives	11
Assembly 5. Internal Options and Adapters	12
Assembly 6. Monochrome Display (5151)	14
Assembly 7. Color Display (5153)	16
Assembly 8. Enhanced Color Display (5154)	18
Assembly 9. Professional Graphics Display (5175)	20
Assembly 10. Keyboard (84-Key)	22
Assembly 11. Keybutton Kits (84-Key)	23
Assembly 12. Keybuttons (84 Key)	24
Assembly 13. Keyboard (101/102 Key)	26
Assembly 14. Keybutton Kits (101/102 Key)	27
Assembly 15. Keybuttons (101/102-Key Keyboard) ...	28
Assembly 16. Power Cords	30
Assembly 17. Miscellaneous	32

Notes:

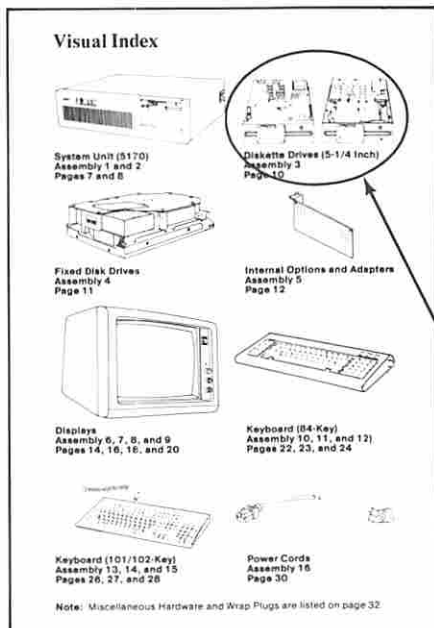
How To Use This Parts Catalog

1. **Similar Parts** - If two parts are similar, they may be listed in the same list. Similar parts are referenced by one index number but are distinguished by the part number and description.
2. **NS** - When this indication appears in the ASM-INDEX column, it denotes a part not shown in the assembly. This designation is generally used for miscellaneous parts packets.
3. **R** - This entry in the Units column indicates the part has a restricted availability.
4. **AR** - As Required (AR) in the Units column denotes that the units per assembly may vary based upon system configuration.
5. **Indenture** - The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationships of a part to the next higher assembly.

Example of a Parts List

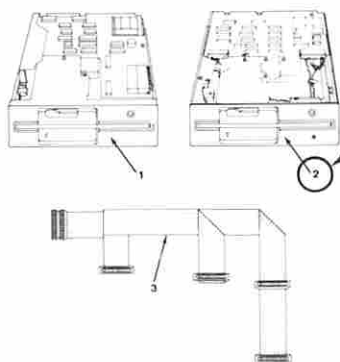
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 -	1234567		Main Assembly
- 1	1234568	1	• Subassembly
- 2	1234569	1	• Subassembly, US
- 2	1234566	1	• Subassembly, Non-US
- 3	1234565	R	• Detailed Part Restricted
- 4	1234564	1	• Subassembly
			• Detailed Part
			• Detailed Part
			• Detailed Part
- NS	1234563	1	• Subassembly Not Shown
			• Detailed Part
			• Detailed Part
- 5	1234562	AR	• Subassembly - Use as Required

How to Use the Visual Index



1. Turn to the visual index and locate, by illustration, the assembly containing the part.

Figure 3. Diskette Drives (5-1/4 Inch)

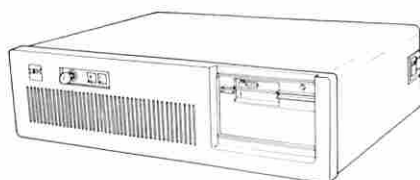


2. Turn to the page for that assembly and locate the part visually.

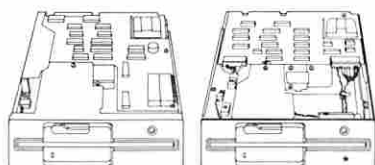
FIGURE INDEX	PART NUMBER	UNITS	DESCRIPTION
3 - 1	8286130	AR	Diskette Drive, High Capacity
2	8286131	AR	Diskette Drive, Double Sided
3	8286132	1	Signal Cable, 100-pin, 100-pin, and 100-pin
4	8286133	1	Diskette Drive

3. Using the index number shown with the part, refer to the accompanying listing to obtain the part number.

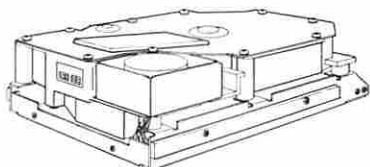
Visual Index



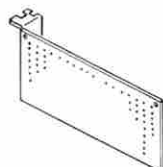
System Unit (5170)
Assembly 1 and 2
Pages 7 and 8



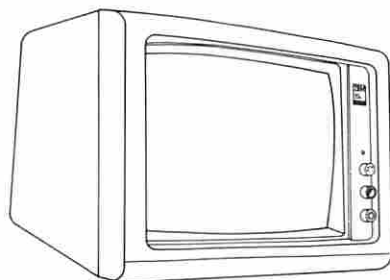
Diskette Drives (5-1/4 Inch)
Assembly 3
Page 10



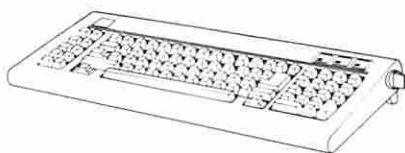
Fixed Disk Drives
Assembly 4
Page 11



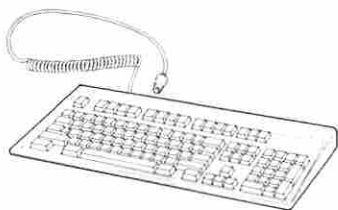
Internal Options and Adapters
Assembly 5
Page 12



Displays
Assembly 6, 7, 8, and 9
Pages 14, 16, 18, and 20



Keyboard (84-Key)
Assembly 10, 11, and 12
Pages 22, 23, and 24



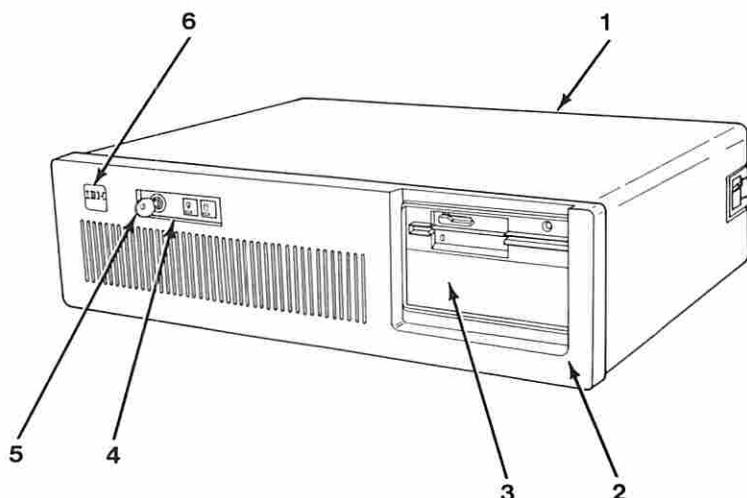
Keyboard (101/102-Key)
Assembly 13, 14, and 15
Pages 26, 27, and 28



Power Cords
Assembly 16
Page 30

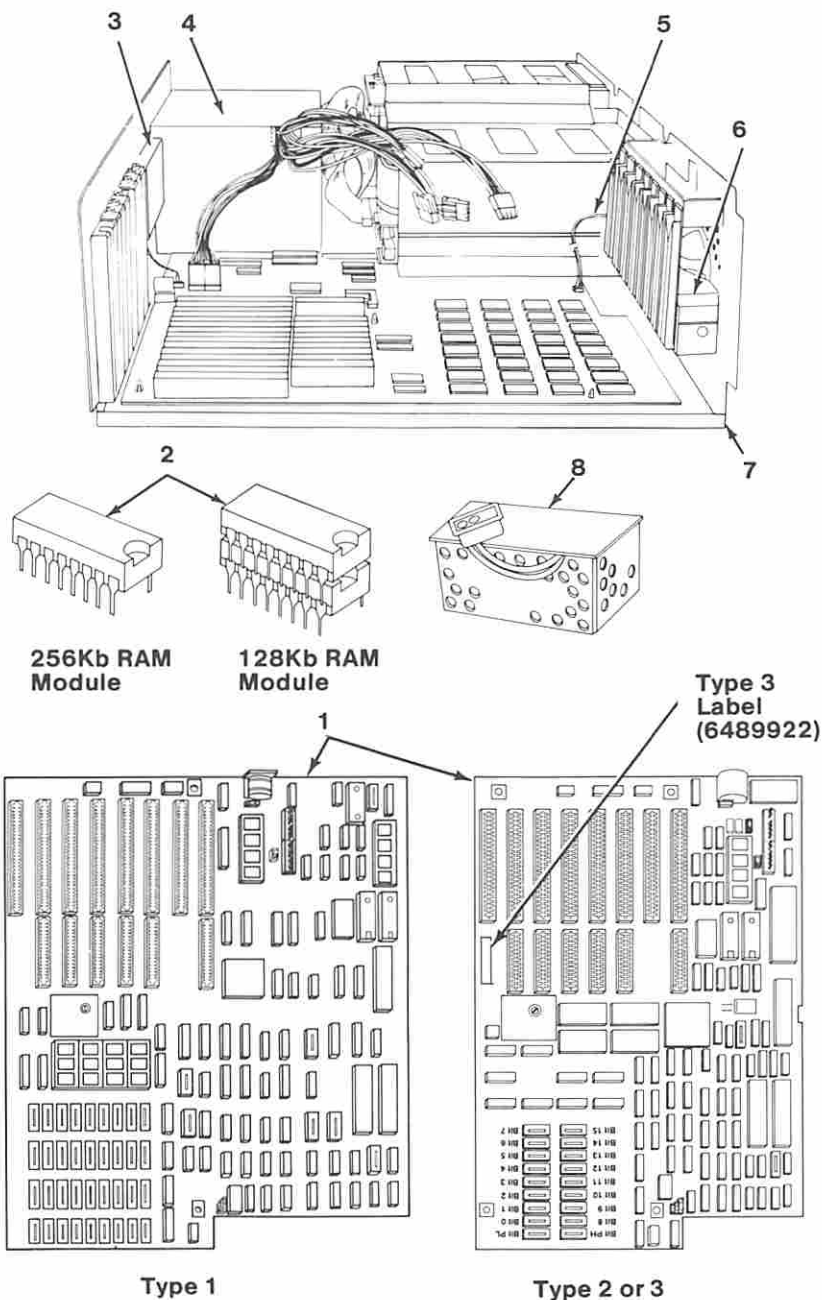
Note: Miscellaneous Hardware and Wrap Plugs are listed on page 32.

Assembly 1. System Unit - Exterior (5170)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 - 1	8286119	1	Cover
- 2	8286134	1	Front Bezel
- 3	8286114	AR	Blank Bezel
- 4	8286133	1	Control Panel Assembly
- 5	8286117	1	• Key Lock Assembly
- NS	8286169	1	Back Panel
- 6	8286137	R	AT Label/Logo Kit
			• Nameplate
			• Logo, Front
			• Spring, Logo
			• Label, Identification

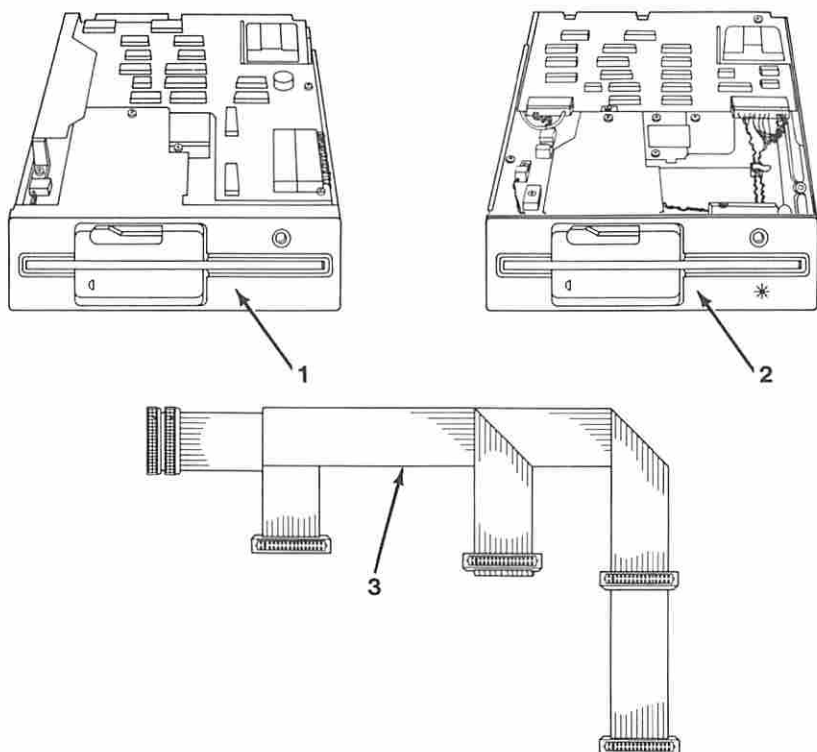
Assembly 2. System Unit - Interior (5170)



System Unit (5170)

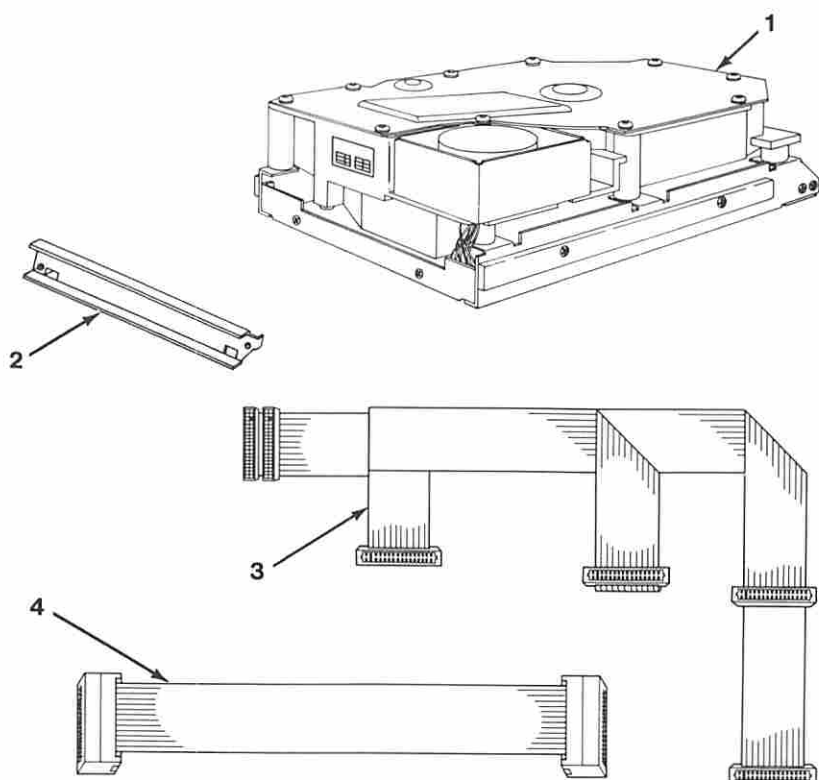
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
2 - 1	6480170	1	System Board, Type 1, 256KB-512KB (Populated to 256K)
- 2	8286139	AR	• 128KB RAM Module (Qty 1)
- 1	6480072	1	System Board, Type 2, 512KB
- 2	6480008	18	• 256KB RAM Module (Qty 1)
- 1	6489922	1	System Board, Type 3, 512KB (Identified by FRU number on board)
- 2	6480008	18	• 256KB RAM Module (Qty 1)
- 3	8286121	1	Battery
- 4	8286122	1	Power Supply
- 5	8286118	1	Cable, Control Panel
- 6	8529143	1	Speaker Assembly
- 7	6480007	R	Base Frame Assembly
- 8	8286123	AR	Load Resistor, Power Supply
- NS	8286132	AR	Miscellaneous Metal Parts Kit • Plate, Access Hole • Bracket, Blank • Keeper, Bracket • Straps, Drive Ground • Clip, Retainer • Clamps, Full Frontal • Clip
- NS	8286135	AR	Plastic Parts Kit • Keeper, Bezel • Bracket, Adapter Support • Spring, Keyboard Foot • Supports, System Board (Qty 5) • Foot Pad, System Unit • Foot Pad, Keyboard • Lens Insert, Keyboard (US UK Spain) • Contact Strip
- NS	8286136	AR	Screw Hardware Kit • Screw, Self-Tap • Screw, System Unit • Star Washer, Lock Washer, Screw 2-56 • Screw, Panel • Screw, Cover • Screw, Hex • Hex Nut, 2-56 • Screw, 6-32 • Nut, 4-40 • Screw, 4-40 • Screw, Head Bind

Assembly 3. Diskette Drives (5-1/4 Inch)



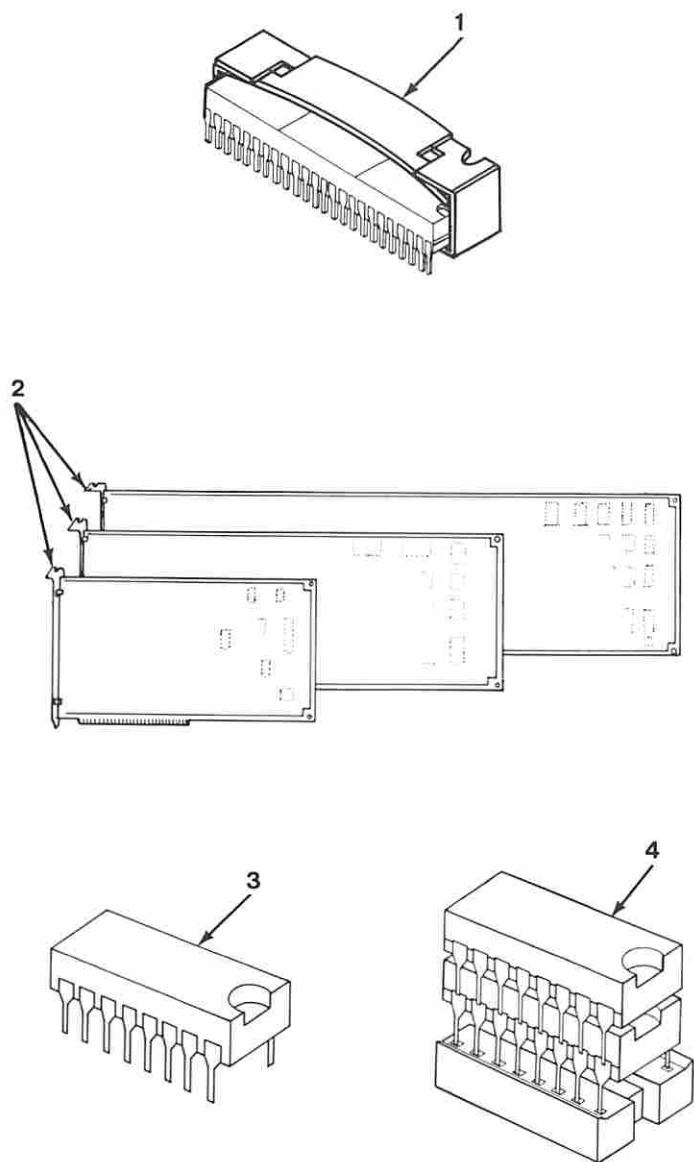
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
3 - 1	8286130	AR	Diskette Drive, High Capacity
- 2	8286131	AR	Diskette Drive, Double Sided
- 3	8286124	1	Signal Cable, Fixed Disk and Diskette Drive

Assembly 4. Fixed Disk Drives



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
4 - 1	6278099	AR	Fixed Disk Drive, 20MB
- 1	8286216	AR	Fixed Disk Drive, 30MB
- 2	6489949	AR	Keeper Bar, Fixed Disk
- 3	8286124	1	Signal Cable, Fixed Disk and Diskette Drive
- 4	8286129	AR	Data Cable, Fixed Disk Drive
Note: All AT fixed disk drives manufactured after October 1, 1985 (except 20MB) will have an identifying label attached.			

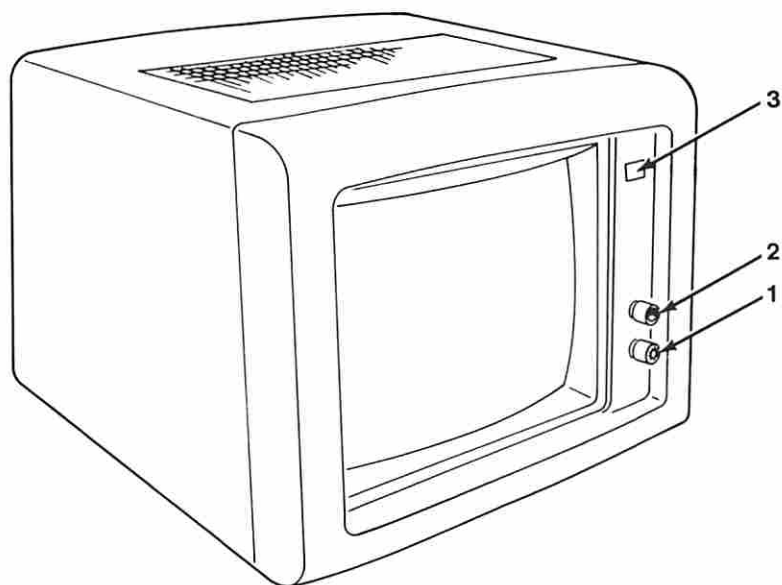
Assembly 5. Internal Options and Adapters



Internal Options and Adapters

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
5 - 1	8286127	AR	80287 Math Coprocessor
- 2	8286116	AR	128KB Memory Expansion Adapter
- 3	59X7317	18	• 64KB Memory Module (Qty 1)
- 2	6279116	AR	128KB/640KB Memory Expansion Adapter
- 3	59X7317	18	• 64KB Memory Module (Qty 1)
- 3	6480008	AR	• 256KB RAM Module (Qty 1)
- 2	8286115	AR	512KB Memory Expansion Adapter
- 4	8286139	36	• 128KB RAM Module (Qty 1)
- 2	59X7294	AR	512KB/2MB Memory Expansion Adapter
- 3	6480008	AR	• 256KB RAM Module (Qty 1)
- 3	62X0641	AR	• 256KB RAM Module Kit (Qty 18)
- 2	8286098	AR	Binary Synchronous Communications (BSC) Adapter
- 2	6323472	AR	Cluster Adapter
- NS	6323575	AR	Cluster Cable Kit
- 2	8529146	AR	Color/Graphics Monitor Adapter
- 2	6181768	AR	Data Acquisition Adapter
- 2	8654215	AR	Enhanced Graphics Adapter (w/o Memory Expansion Card)
- NS	6323468	AR	• Graphics Memory Expansion Card (w/o memory modules)
- NS	8654219	24	• Graphics Memory Module (Qty 1)
- 2	8286125	1	Fixed Disk and Diskette Drive Adapter
2	8529151	AR	Game Control Adapter
2	6181770	AR	GPIO Adapter
- 2	8529148	AR	Monochrome Display and Printer Adapter
- 2	8286171	AR	PC Network Adapter
- NS	8286172	AR	PC Network Adapter Cable
2	62X0912	AR	Professional Graphics Controller
- NS	62X0913	R	• Controller Processor Card
- NS	6133790	R	• 8088 Processor
- NS	6133791	R	• 32KB ROM
- NS	6133792	R	• 32KB ROM
- NS	6323410	R	• Digital-Analog Converter
- NS	6133788	R	• Controller Emulator Card
- NS	6133789	R	• Controller Memory Card
- NS	6181772	40	• Professional Graphics Memory Module (Qty 1)
- NS	6323412	R	• Miscellaneous Hardware Kit
- 2	8286138	AR	Prototype Adapter
- 2	8286147	AR	Serial/Parallel Adapter
- NS	8286170	AR	Serial Adapter Cable
- NS	8286194	AR	Serial Adapter Connector
- 2	8286099	AR	Synchronous Data Link Control (SDLC) Communications Adapter
- 2	2684438	AR	Voice Communications Adapter (VCA)
- NS	2684462	AR	Notched Black Telephone Cable, for VCA
- NS	2684487	AR	Notched White Telephone Cable, for VCA
- NS	2684509	AR	Tabbed Black Telephone Cable, for VCA
- NS	2684514	AR	Tabbed White Telephone Cable, for VCA

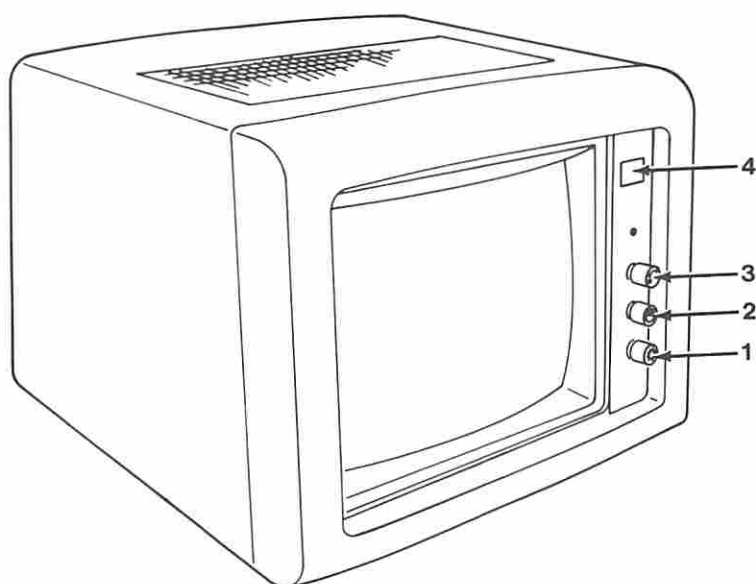
Assembly 6. Monochrome Display (5151)



Monochrome Display (5151)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
6 -	8529171		Display Assembly, 120 Volt
-	8529209		Display Assembly, 220/240 Volt
- 1	8529177	1	• Knob, Brightness
- 2	8529178	1	• Knob, Contrast
- 3	8529179	R	• Logo/Label Kit, 120 Volt
- 3	8654205	R	• Logo/Label Kit, 220/240 Volt
			• Name Plate, Front
			• Label, Caution
			• Name Plate, Rear
			• Label, FCC
- NS	8529229	R	• Panel, Front
- NS	8529230	R	• Cover, Back
- NS	8529231	R	• Plug, Upper Cover
- NS	8529232	R	• Foot
- NS	8529176	R	• Holder, Power Cord
- NS	8529173	R	• Signal Cable
- NS	8529235	R	• Transformer, 120 Volt
- NS	8654206	R	• Transformer, 220/240 Volt
- NS	8529237	R	• Support, Control
- NS	8529236	R	• Support, Transformer
- NS	8529175	R	• Fuse, 0.75 Amp, 120 Volt
- NS	8654204	R	• Fuse, 0.5 Amp, 220/240 Volt
- NS	8529233	R	• Analog Card
- NS	8529234	R	• PC Card
- NS	8529174	R	• Power Cord, 120 Volt
- NS	8654203	R	• Power Cord, 220/240 Volt
- NS	8529180	R	• Display Miscellaneous Hardware Kit
			• Screw, CRT Mounting
			• Screw, Transformer
			• Support, CRT Mounting
			• Bracket, CRT to Front Panel
			• Transformer Support, Front Panel
			• Screw, Rubber Bushing, Display
			• Nut, Rubber Bushing, Display
			• Screw, Cable Restraint, Display
			• Star Washer, Display
- NS	6937013	AR	Shipping Carton
- NS	6448524	AR	Shipping Cushion, Left
- NS	6448525	AR	Shipping Cushion, Right
- NS	6937056	AR	Shipping Bag

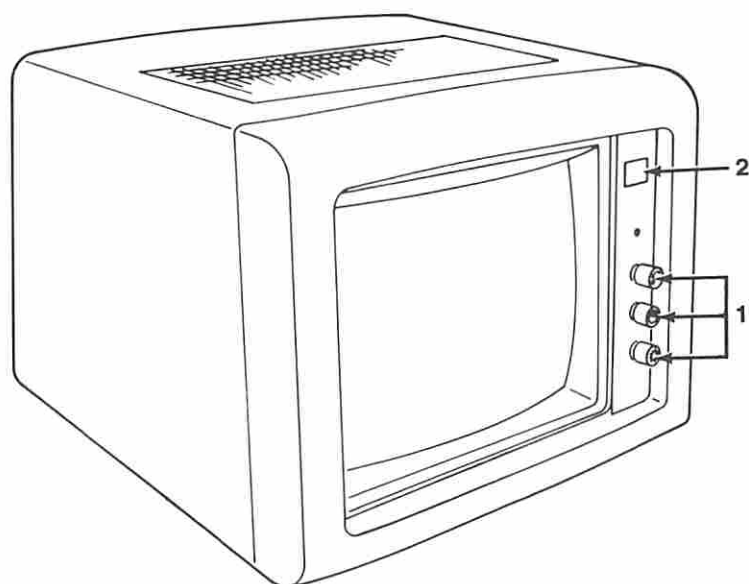
Assembly 7. Color Display (5153)



Color Display (5153)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
7 -	8529227		Display Assembly
-	8654214		Display Assembly (Model-002)
- 1	8529287	1	• Knob, Brightness
- 2	8529288	1	• Knob, Contrast
- 3	8529289	1	• Knob, Power On/Off
- 4	8529339	1	• Logo/Label Kit
- NS	8529285	R	• Cover, Front, Includes Top, Bottom, and Power Supply Brackets
- NS	8529286	R	• Cover, Rear
- NS	8529323	R	• P.C. Board
			• Flyback Transformer
			• Focus Pack
			• Horizontal Drive Transistor
			• Chassis
- NS	8654222	R	• P.C. Board/Flyback Transformer Control Assembly (Model-002)
- NS	6135903	R	• Degaussing Coil
- NS	8529338	R	• Control Assembly
- NS	8654224	R	• Control Assembly (Model-002)
- NS	8654276	R	• Indicator, Power-On
- NS	8529291	R	• Power Supply Assembly
- NS	8654221	R	• Power Supply Assembly (Model-002)
- NS	8529290	R	• CRT and Yoke
- NS	8529324	R	• CRT Board and Shield Cable
- NS	8529334	R	• Cable, Signal
- NS	8529336	R	• Power Receptacle/Line Filter Assembly
- NS	8654223	R	• Power Receptacle/Line Filter Assembly (Model-002)
- NS	8529335	R	• Vertical Size Pot Shaft Extension
- NS	8529337	R	• Vertical Hold Pot Shaft Extension
- NS	8529327	R	• Miscellaneous Hardware Kit
			• Shield, Driver Board
			• Retainers, Driver Board Shield
			• Strain Relief, Signal Cord
			• Screws, Power Supply
			• Screws, CRT Mounting
			• Screws, Control Assembly
			• Screws, P.C. Board Chassis Mounting
			• Screws and Washers, Rear Cover
			• Plugs, Cover Screw
			• Wire Ties, Degaussing Coil
- NS	6937192	R	Packing Material Kit
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS		1	Power Cord (See Power Cord Parts List)

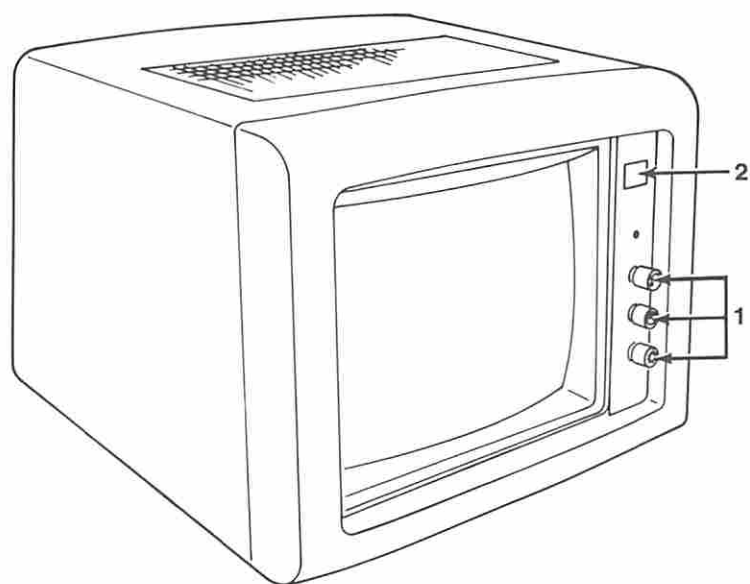
Assembly 8. Enhanced Color Display (5154)



Enhanced Color Display (5154)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
8 -	6321035		Display Assembly, Model 001
	6321049		Display Assembly, Model 002
	6321036		Display Assembly, Model 003
- 1	6321056	1	• Knob and Cover Cap Kit • Knob, On/Off (Qty 1) • Knob, Contrast (Qty 1) • Knob, Brightness (Qty 1) • Cap, Cover (Qty 2) • Knob, Rear (Qty 2)
- 2	6321061	R	• Logo and Label Kit • Logo, Back • Labels, Bottom Cover Warning (Five Languages)
- NS	6323319	1	• Rubber Foot Kit • Rubber Feet (Qty 4) • Washers (Qty 4) • Screws (Qty 4)
- NS	6321050	R	• Cover, Front
- NS	6321051	R	• Cover, Rear
- NS	6321052	R	• Main P.C. Board Assembly/Chassis/ CRT Drive Card
- NS	6321053	R	• Power Supply with Cover
- NS	6321054	R	• Video Amp. Assembly/RGB Cable and Connector
- NS	6321055	R	• Control Assembly, Front
- NS	6321057	R	• Indicator, Power-On
- NS	6321058	R	• Rear Control Panel Assembly/ Strain Relief
- NS	6321059	R	• Signal Cable
- NS	6135903	R	• Degaussing Coil
- NS	6321064	R	• Miscellaneous Hardware Kit • Washers, CRT Rubber Mounting (Qty 4) • Shield, Plastic Drive Board (Qty 1) • Retainers, Plastic Shield (Qty 2)
- NS	6321060	R	• Model 001/Model 002 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6321063	R	• Model 003 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS		1	Power Cord (See Power Cord Parts List)

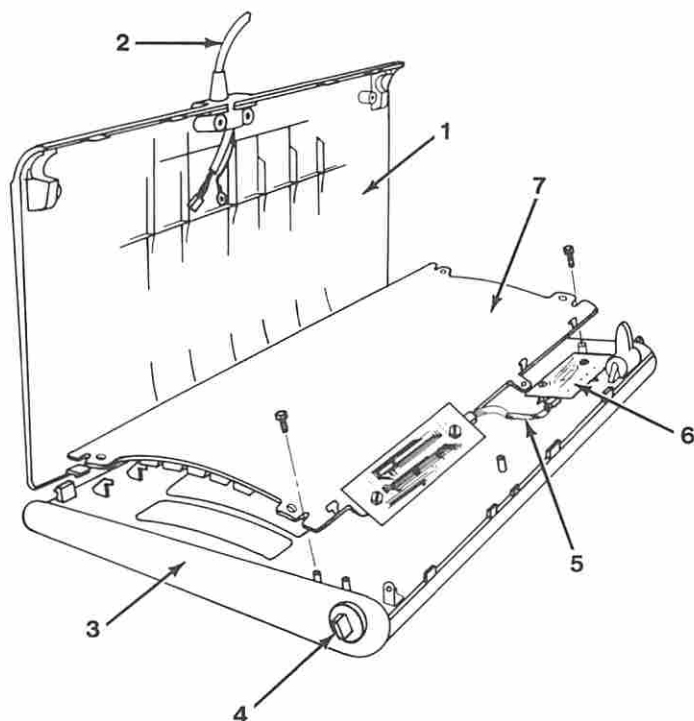
Assembly 9. Professional Graphics Display (5175)



Professional Graphics Display (5175)

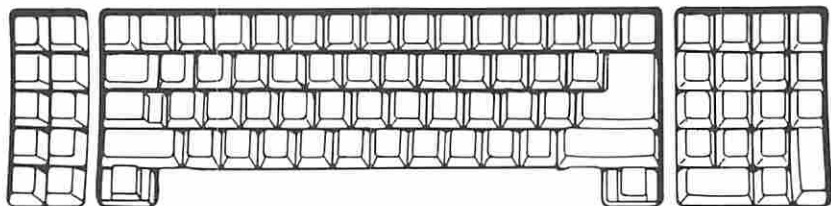
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
9 -	6181764		Display Assembly, Domestic US
-	6181766	R	Display Assembly, Northern Hemisphere
-	6181767	R	Display Assembly, Southern Hemisphere
- 1	6133993	1	• Knob and Cover Cap Kit • Cover Caps (Qty 2) • Knob Set, Front (Qty 3)
- 2	6133997	R	• Logo & Label Kit • Name Plate, Front, IBM • Name Plate, Back, IBM • Labels, Warning Bottom Cover
- NS	6321050	R	• Cover, Front
- NS	6321051	R	• Cover, Rear
- NS	6133989	R	• Main PCB Assembly/Chassis/ CRT Drive Card
- NS	6133990	R	• Power Supply with Cover
- NS	6133991	R	• Video AMP Assembly/RGB Cable and Connector
- NS	6133992	R	• Control Assembly, Front
- NS	6321057	R	• Indicator, Power-On
- NS	6133994	R	• Signal Cable
- NS	6133995	R	• CRT & Deflection Yoke Assembly with Wires/Tubes, Warning Labels (GND Band) (Northern Hemisphere)
- NS	6133996	R	• CRT & Deflection Yoke Assembly with Wires/Tubes, Warning Labels (GND Band) (Southern Hemisphere)
- NS	6323319	1	• Rubber Feet Kit
- NS	6321064	R	• Miscellaneous Hardware Kit • Washers, CRT Mounting Rubber • Shield, Plastic Board • Shield Retainers, Plastic Type
- NS	6133998	R	• Rating Label, Model 002
- NS	6133999	R	• Rating Label, Model 003
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS		1	Power Cord (See Power Cord Parts List)

Assembly 10. Keyboard (84-Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
10 -	8286165		Keyboard Assembly, US
- 1	8286142	1	• Cover, Top
- 2	8286146	1	• Cable, External
- 3	8286143	1	• Base
- 4	8286141	1	• Foot, Adjustable (The Adjustable Foot Spring is included in the Miscellaneous Parts Kit for the System Unit)
- 5	8286145	1	• Cable, Internal
- 6	8286144	1	• LED Card
- 7	8286140	1	• Keypad Assembly, US
- 7	8286160	R	Keypad Assembly, France
- 7	8286162	R	Keypad Assembly, Germany
- 7	8286161	R	Keypad Assembly, Italy
- 7	8286163	R	Keypad Assembly, Spain
- 7	8286164	R	Keypad Assembly, UK

Assembly 11. Keybutton Kits (84-Key)

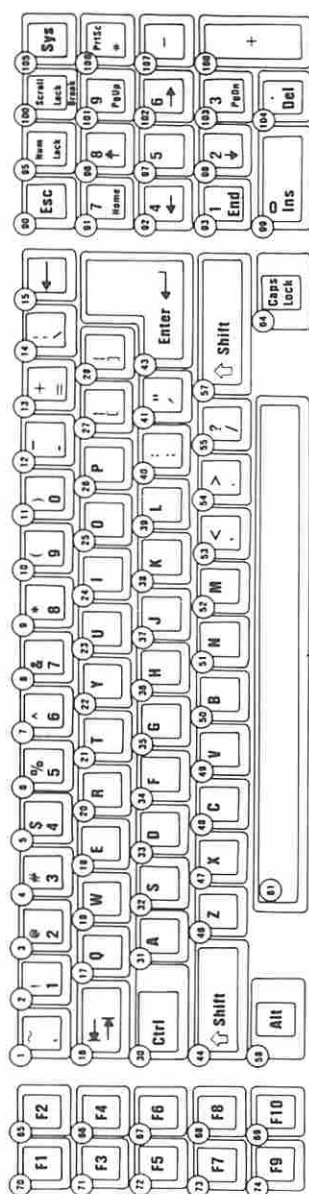


ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
11 - 1	8286153		Keybutton Kit, US
- 1	8286154		Keybutton Kit, France
- 1	8286156		Keybutton Kit, Germany
- 1	8286155		Keybutton Kit, Italy
- 1	8286157		Keybutton Kit, Spain
- 1	8286158		Keybutton Kit, UK

Note:

Keybutton kits contain a complete set of keybuttons (spacebar not included).

Assembly 12. Keybuttons (84 Key)

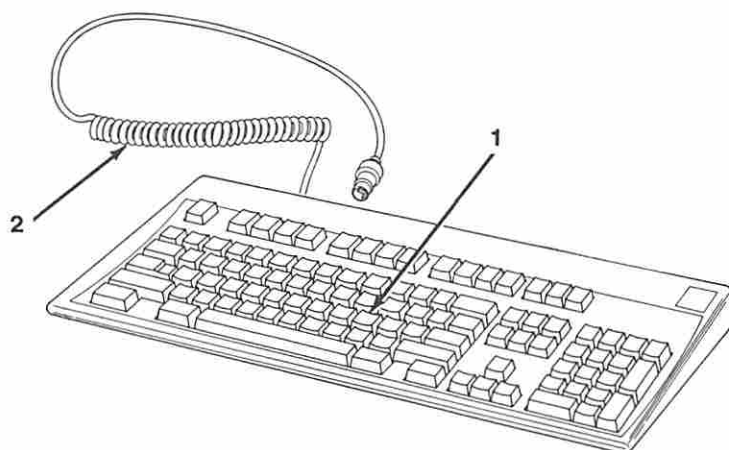


Keybuttons (84 Key)

Key Location	Part Number	Description	Key Location	Part Number	Description
1	1642306	~/'	46	2658860	Z
2	1761460	!/1	47	2658861	X
3	1642308	@/2	48	2658862	C
4	1642309	#/3	49	2658863	V
5	1642342	\$/4	50	2658864	B
6	1642343	%/5	51	2658865	N
7	4496183	^/6	52	2658866	M
8	2658824	&/7	53	1864026	</,
9	2658825	*/8	54	1864027	>/.
10	2658826	(/9	55	2658869	?/ /
11	2658827	)0	57	6111189	⬆
12	1761515	/-	58	1762744	Alt
13	2658829	+/=	61	N/A	Spacebar
14	5997221	|/\	64	8310423	Caps Lock
15	5997176	←	65	4584721	F2
16	8310421	|←/→|	66	4584723	F4
17	2658832	Q	67	4584725	F6
18	2658833	W	68	4584727	F8
19	2658834	E	69	4584729	F10
20	2658835	R	70	4584720	F1
21	2658836	T	71	4584722	F3
22	2658837	Y	72	4584724	F5
23	2658838	U	73	4584726	F7
24	2658839	I	74	4584728	F9
25	2658840	O	90	4584714	Esc
26	2658841	P	91	4584732	7/Home
27	4585286	{/[	92	6111212	4/←
28	8310418	}[/	93	4584737	1/End
30	8310420	Ctrl	95	8310426	Num Lock
31	2658846	A	96	6111213	8/↑
32	2658847	S	97	2658892	5
33	2658848	D	98	6111215	2/↑
34	2658849	F	99	8310424	0/Ins
35	2658850	G	100	8310427	Scr1 Lock
36	2658851	H	101	4584734	9/PgUp
37	2658852	J	102	6111214	6/→
38	2658853	K	103	4584739	3/PgDn
39	2658854	L	104	8310425	Del
40	2658855	:/;	105	8543584	Sys
41	4584779	"/	106	4584718	PrtSc
43	1435031	↩	107	8310448	-
44	6111188	⬆	108	8310429	+

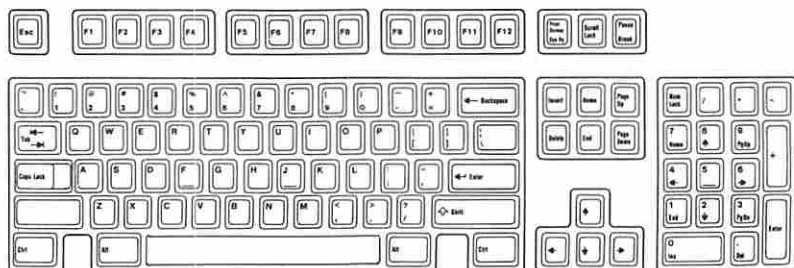
Part numbers for complete keybutton sets are on page 23.

Assembly 13. Keyboard (101/102 Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
13 -	6447033		Keyboard Assembly, US
-	6447035		Keyboard Assembly, France
-	6447036		Keyboard Assembly, Germany
-	6447037		Keyboard Assembly, Italy
-	6447038		Keyboard Assembly, Spain
-	6447034		Keyboard Assembly, UK
- 1	6447039	1	• Keypad Assembly, US
- 1	6447041	R	• Keypad Assembly, France
- 1	6447042	R	• Keypad Assembly, Germany
- 1	6447043	R	• Keypad Assembly, Italy
- 1	6447044	R	• Keypad Assembly, Spain
- 1	6447040	R	• Keypad Assembly, U.K.
- NS	6447052	R	• Circuit Board Assembly
- NS	6448803	R	• Cable, Internal
- NS	6447053	R	• LED Assembly
- NS	6447055	R	• Cover Assembly
- NS	6447054	R	• Foot, Adjustable (Qty 2)
- NS	6447056	AR	• Miscellaneous Parts Kit
			• Screws (Qty 5)
			• Nut
			• Lock Washer
- 2	6447051	1	• Cable Assembly
- NS	6110464		Tool, key cap removal

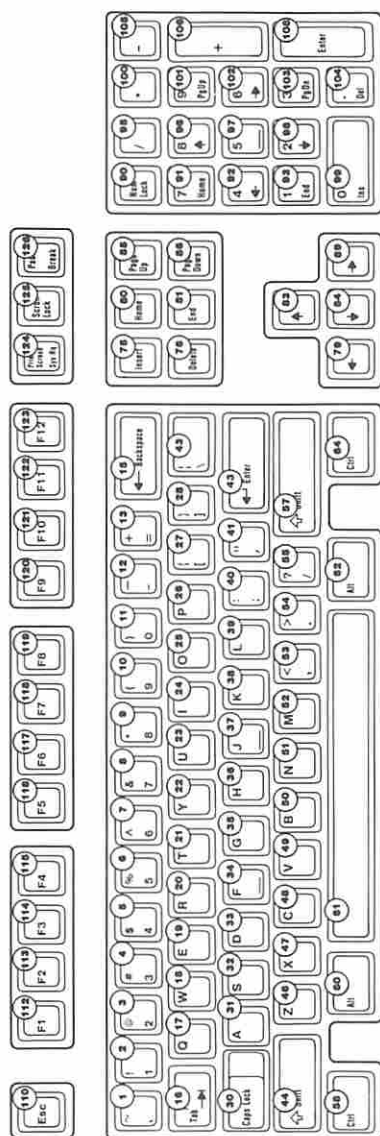
Assembly 14. Keybutton Kits (101/102 Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
14 - 1	6447045	1	Keybutton Kit, US
- 1	6447046	1	Keybutton Kit, U.K.
- 1	6447047	1	Keybutton Kit, France
- 1	6447048	1	Keybutton Kit, Germany
- 1	6447049	1	Keybutton Kit, Italy
- 1	6447050	1	Keybutton Kit, Spain

Note: Keybutton Kit contains a complete set of keybuttons (spacebar is included).

Assembly 15. Keybuttons (101/102-Key Keyboard)

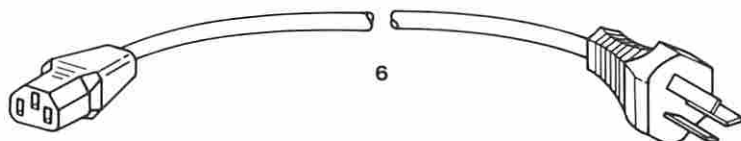
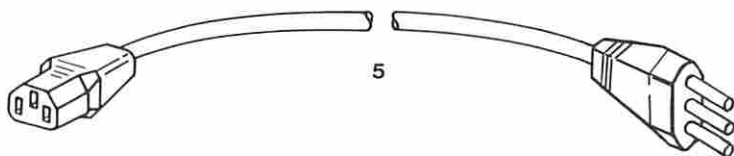
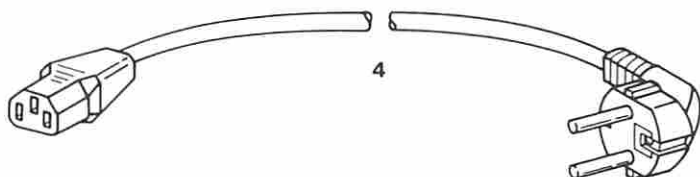
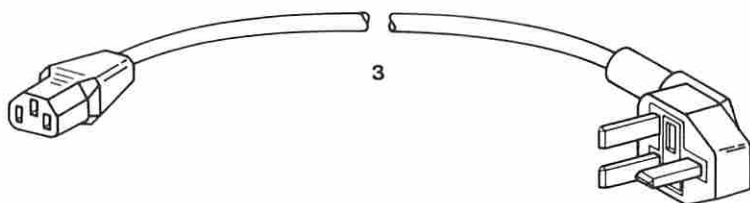
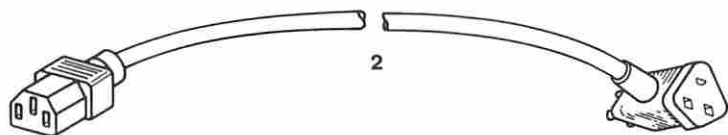
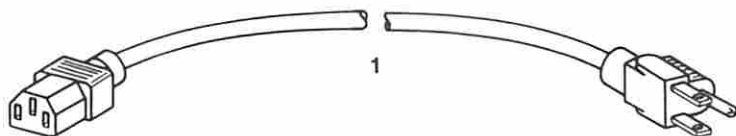


101/102-Key Keybutton Part Numbers

Key Location	Part Number	Description	Key Location	Part Number	Description
1	8502190	~/'	55	1387688	?//
2	1387262	!/1	57	1386320	☆
3	1386780	@/2	58	1385413	Ctrl
4	1387281	#/3	60	1385539	Alt
5	1387282	\$/4	61	N/A	Spacebar
6	1387283	%/5	62	1385539	Alt
7	1387261	^/6	64	1385413	Ctrl
8	1386785	&/7	75	1386653	Insert
9	1386786	* /8	76	1386654	Delete
10	1386787	(/9	79	8502367	←
11	1386788	)/0	80	1386655	Home
12	8502201	/-	81	1386656	End
13	8502202	+/=	83	8502380	↑
15	1385816	←	84	8502381	↓
16	1385797	|←/→|	85	1386657	Page Up
17	8502203	Q	86	1386658	Page Down
18	8502204	W	89	8502371	→
19	8502205	E	90	1386659	Num Lock
20	8502206	R	91	1386660	7/Home
21	8502207	T	92	1386661	4/←
22	8502208	Y	93	1386662	1/End
23	8502209	U	95	1386663	/
24	8502210	I	96	1386664	8/↑
25	8502211	O	97	1386699	5
26	8502212	P	98	1386665	2/↑
27	1385707	{/[	99	1386695	0/Ins
28	1385708	}/]	100	1386666	*
29	1386611	|/\ Caps Lock	101	1386667	9/PgUp
30	1385798		102	1386668	6/→
31	8502215	A	103	1386669	3/pgdn
32	8502216	S	104	1386670	./Del
33	8502217	D	105	1386671	- (minus)
34	8502218	F	106	1386321	+ (plus)
35	8502219	G	108	1386322	Enter
36	8502220	H	110	1386672	Esc
37	8502221	J	112	1386673	F1
38	8502222	K	113	1386674	F2
39	8502223	L	114	1386675	F3
40	8502224	;/: ↑	115	1386676	F4
41	8502225	↑	116	1445836	F5
43	1386612	←	117	1445837	F6
44	1386694	☆	118	1445838	F7
46	8502228	Z	119	1445839	F8
47	8502229	X	120	1386677	F9
48	8502230	C	121	1386678	F10
49	8502231	V	122	1386679	F11
50	8502232	B	123	1386680	F11
51	8502233	N	124	1386681	PrtSc
52	8502234	M	125	1386682	Scroll Lock
53	6111301	</,	126	1386683	Pause
54	6111302	>/.			

Part numbers for complete keybutton sets are on page 27.

Assembly 16. Power Cords



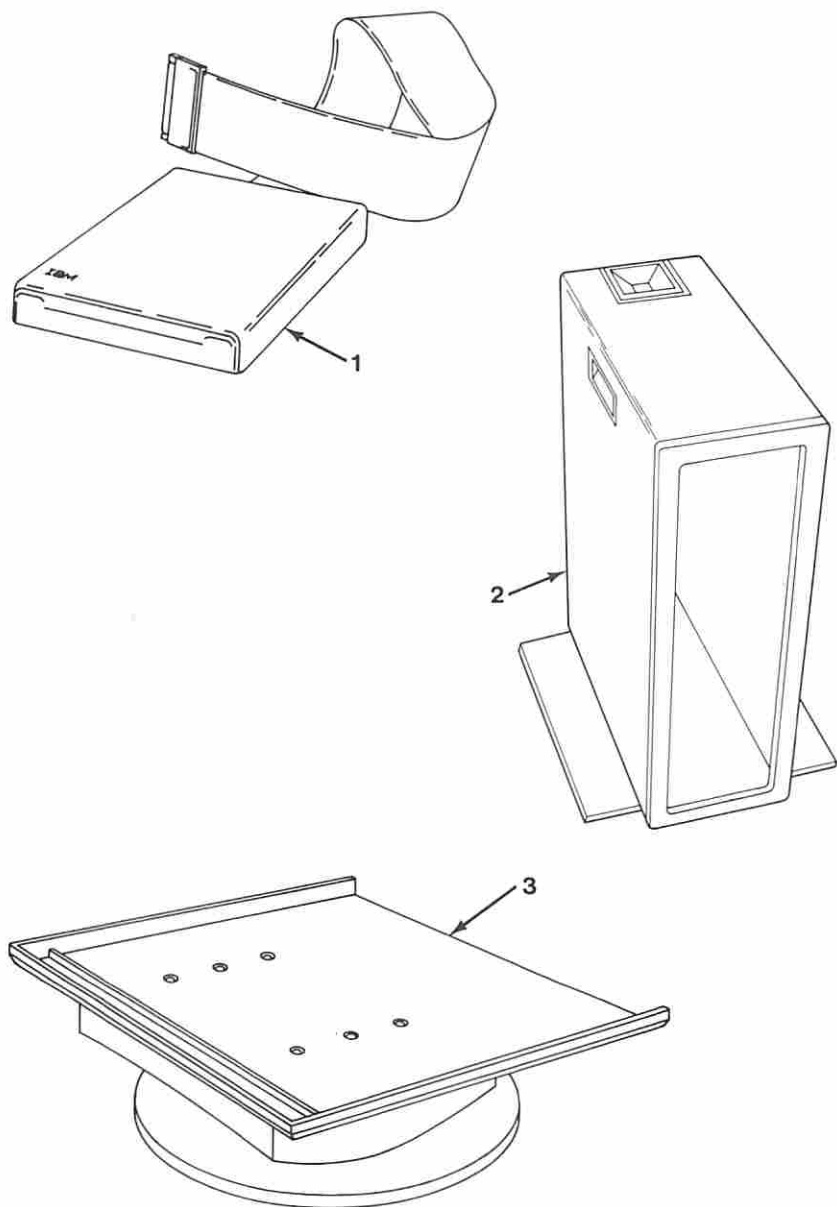
Power Cords

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
16 - 1	8529158	1	Power Cord, Options, US
- 2	8286120	1	Power Cord, System Unit, US Power Cord, Venezuela Power Cord, Colombia
- 3	8529341	1	Power Cord, UK Power Cord, Hong Kong Power Cord, Singapore
- 4	8529281	1	Power Cord, Germany Power Cord, France Power Cord, Spain
- 5	8529282	1	Power Cord, Italy
- 6	8529284	1	Power Cord, Australia Power Cord, New Zealand

Warning:

Use only the proper Power Cord certified for your country.

Assembly 17. Miscellaneous



Miscellaneous

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
17 - 1	6181769	AR	Data Acquisition Distribution Panel
- 2	8286195	AR	Floor Stand
	8286196	R	• Trim, Front Bezel
	8286197	R	• Back Panel
	8286198	R	• Rails
- 3	8286199	AR	Display Stand
	8286200	R	• Platter, Bottom
	8286201	R	• Platter, Top
	8286202	R	• Skirt, Back
- NS	8529228	AR	Parallel Port Wrap Plug
- NS	8529280	AR	Communications Cable Wrap Plug
- NS	8286126	AR	Serial Port Wrap Plug
- NS	6323481	AR	Cluster Terminating Plug
- NS	6323712	AR	Data Acquisition Wrap Plug
- NS	6138013	AR	Plastic Envelope, Wrap Plug

Notes:

Parts Supplements

File any parts supplements behind this page. Enter the name of the supplement and the date it was filed.

NAME

DATE

3.5" Diskette Drive

'August 5, 1986'

NAME

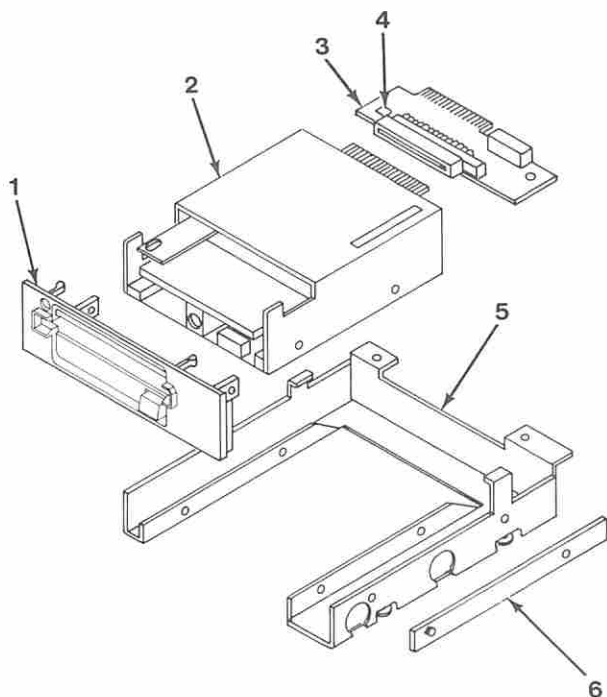
DATE

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3.5 Inch Diskette Drive

Parts Supplement for AT

3.5 Inch Diskette Drive



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1	6279107	1	Bezel Assembly
2	6820821	1	3.5 Inch Diskette Drive (also order index number 3, Cable Adapter Card)
3	6489919	1	Cable Adapter Card
4	6489918	1	• Terminating Resistor
5	6489911	1	Tray
6	6279169	2	Rails, Right or Left (Qty 1)

MAP 0000: Start (XT Type 5162)

This is the entry point for all IBM PERSONAL COMPUTER XT Type 5162 MAPs. The MAPs will help you determine the failing field replaceable unit (FRU).

The Advanced Diagnostics program is intended to test *only* IBM products. Non-IBM products, prototype cards, or modified options may give false errors and invalid system responses.

All voltages in the MAPs are positive unless otherwise shown.

Note: When measuring voltages, always use frame ground unless otherwise specified.

Before you begin:

1. Power off the system.
2. Ensure all connectors are installed correctly.
3. Ensure any jumpers or switches are set correctly.
4. Verify the options are correctly set by running the Setup program. After running the Setup program (or if you cannot run the Setup program) continue with Step 001.

001

- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

IS THE POWER SUPPLY FAN RUNNING?

Yes	No
-----	----

--	--

002

Go to Step 058 in this MAP.

003

- Listen carefully for any audio responses during the power-on self test (POST).

DID YOU HEAR ONE SHORT BEEP AT THE END OF THE POST?

Yes	No
-----	----

--	--

(Step 004 continues)

004

Go to Step 006 in this MAP.

005

Go to Step 034 in this MAP.

006

(From Step 004 in this MAP)

DID YOU RECEIVE A 16X ERROR?

Yes No

007

Go to Step 011 in this MAP.

008

DID YOU RECEIVE A 161 ERROR?

Yes No

009

Go to Step 016 in this MAP.

010

Go to "MAP 0100: System Board Start."

011

(From Step 007 in this MAP)

DID THE MESSAGE (RESUME = "F1" KEY) APPEAR ON THE SCREEN?

Yes No

012

Go to Step 073 in this MAP.

013

- Make a note of any error messages on the screen.
- Press the F1 key to continue.

DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY WHEN THE F1 KEY WAS PRESSED?

Yes No

(Step 014 continues)

014

Go to "MAP 0300: Keyboard Start."

015

Go to Step 034 in this MAP.

016

(From Step 009 in this MAP)

- Make a note of any error messages on the screen.
- Press the F1 key.

**DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY
WHEN THE F1 KEY WAS PRESSED?**

Yes No

017

Go to "MAP 0300: Keyboard Start."

018

Note: If you receive the message (SYSTEM OPTIONS
NOT SET), press Enter.

DID THE COMPLETE DIAGNOSTICS MENU APPEAR?

Yes No

019

Go to "MAP 0600: Diskette Drive Start."

020

- Press 4 (SETUP).
- Follow the instructions on the screen to run the Setup program.

**DID YOU RECEIVE A 16X ERROR AFTER RUNNING THE
SETUP PROGRAM?**

Yes No

021

Go to Step 034 in this MAP.

(Step 022 continues)

022

DID YOU RECEIVE ANY ERRORS IN ADDITION TO THE 16X ERROR?

Yes	No
	023
	Go to Step 025 in this MAP.

024

- Diagnose any errors other than a 16X first.

Go to the MAP (or Start MAP, if any) indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

025

(From Step 023 in this MAP)

- Press **F1**. When the Advanced Diagnostics menu appears, select **0 (SYSTEM CHECKOUT)**.
- Follow the instructions on the screen and run all diagnostic tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

Note: If you are unable to follow the instructions on the screen due to incorrect keyboard response, go to "MAP 0300: Keyboard Start".

DID YOU RECEIVE AN ERROR?

Yes	No
	026
	Go to Step 028 in this MAP.

027

Go to the MAP (or Start MAP, if any) indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

028

(From Step 026 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

|
029

Go to "MAP 0020: Power Start."

030

DID YOU NOTICE ANY FAILURE SYMPTOMS?

Yes No

|
031

Go to Step 033 in this MAP.

032

Go to Step 074 in this MAP.

033

(From Step 031 in this MAP)

The Advanced Diagnostic tests have finished without detecting a failure.

- If you have not resolved the problem:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.
 - Run the Advanced Diagnostic tests on all devices. Use the **(RUN TESTS ONE TIME)** option. If you receive an error, or if you notice any failure symptom, go to the MAP indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."
 - If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.
-

034

(From Steps 005, 015, and 021 in this MAP)

Note: If a message on the screen instructs you to "Press ENTER to continue", press the ENTER key.

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes	No
|	035
|	Go to Step 074 in this MAP.

036

- Select **0 (SYSTEM CHECKOUT)**.

Note: Depending upon the options installed in the system, questions about attached devices may appear on the screen. Press Y or N as required, then **Enter**.

DID THE INSTALLED DEVICES MENU APPEAR?

Yes No

037

Go to Step 065 in this MAP.

038

- Compare the list to the options installed *inside* the system.

Note: The Installed Devices list displays only those devices supported by this manual. If a device is missing from the list and is not supported by this manual, press **Y (IS THE INSTALLED DEVICES LIST CORRECT?)** then **Enter** to continue the diagnostic tests. Go to Step 049 in this MAP.

DOES THE INSTALLED DEVICES LIST CORRECTLY IDENTIFY THE DEVICES INSTALLED INSIDE THE SYSTEM?

Yes No

039

Go to Step 041 in this MAP.

040

- press **Y (IS THE INSTALLED DEVICES LIST CORRECT?)** then **Enter**
Go to Step 049 in this MAP.

Note: If you are unable to follow the instructions on the screen due to incorrect keyboard response, go to "MAP 0300: Keyboard Start".

041

(From Step 039 in this MAP)

Follow the instructions on the screen and attempt to correct the Installed Devices list.

Note: A 199 error indicates you answered "No" to the question about the Installed Devices list. Disregard the error.

COULD YOU CORRECT THE INSTALLED DEVICES LIST?

Yes No

042

Go to Step 044 in this MAP.

043

Go to Step 049 in this MAP.

044

(From Step 042 in this MAP)

IS THE OPTION MISSING FROM THE INSTALLED DEVICES LIST?

Yes No

045

Press Y (**IS THE INSTALLED DEVICES LIST CORRECT?**) then **Enter** to continue the diagnostic tests.
Go to Step 049 in this MAP.

046

- Make sure all switches and jumpers are correctly set for the missing option. Be sure to check the system board video switch as well as the option switches and jumper positions.

ARE THE SWITCHES AND JUMPERS SET CORRECTLY?

Yes No

047

Reset any incorrect jumper or switch settings. Go to Step 001 in this MAP to verify system operation.

048

Go to the appropriate MAP for the missing device.

049

(From Steps 038, 040, 043, and 045 in this MAP)

- Follow the instructions on the screen to run the tests one time. Select the options you want to test, or press **Enter** to run all tests.

Note: If you received a 199 error or you have an undetermined problem, run all tests.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

050

Go to Step 052 in this MAP.

051

Go to the MAP (or Start MAP, if any) indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

052

(From Step 050 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

053

Go to "MAP 0020: Power Start."

054

DID YOU NOTICE ANY FAILURE SYMPTOMS?

Yes No

055

Go to Step 057 in this MAP.

056

Go to Step 074 in this MAP.

057

(From Step 055 in this MAP)

The Advanced Diagnostic tests have finished without detecting a failure.

- If you are still experiencing a failure:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.
 - If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.
-

058

(From Step 002 in this MAP)

IS THE POWER CORD PLUGGED INTO A FUNCTIONING, PROPERLY GROUNDED ELECTRICAL OUTLET?

Yes No

059

- Attach the system to a functioning, properly grounded electrical outlet. Return to Step 001 in this MAP to verify system operation.

060

- Power off the system.
- Disconnect the power cord from the electrical outlet, then from the system unit.
- Check the system unit power cord for continuity.

DOES THE POWER CORD HAVE CONTINUITY?

Yes No

061

(Step 061 continues)

061 (continued)

Replace the power cord.

062

- Reconnect the power cord.
- Power on the system.
- Check for a voltage of 2.4 to 5.5 Vdc between pins 1 and 5 (ground) at power supply connector P8.

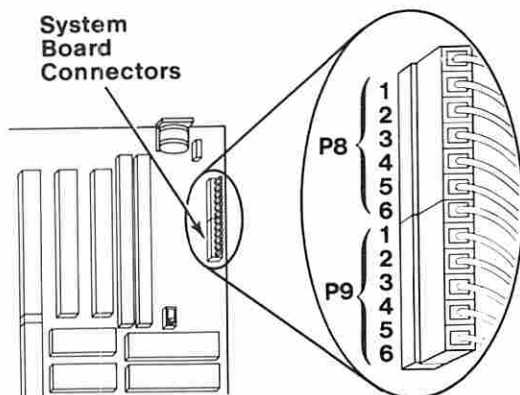


Figure 1. System Board Power Connector

IS THE VOLTAGE 2.4 TO 5.5 VDC?

Yes No

063

Go to "MAP 0020: Power Start."

064

Replace the power supply.

065

(From Step 037 in this MAP)

DID YOU RECEIVE AN ERROR MESSAGE INDICATING A DISKETTE DRIVE READ ERROR?

Yes No

066

Go to Step 068 in this MAP.

(Step 067 continues)

067

Go to "MAP 0600: Diskette Drive Start."

068

(From Step 066 in this MAP)

IS A MATH COPROCESSOR INSTALLED IN THE SYSTEM?

Yes No

|

069

Go to "MAP 0300: Keyboard Start."

070

- Power off the system and remove the math coprocessor.
- Power on the system.
- Select **0 (SYSTEM CHECKOUT)**.

Note: Depending upon the options installed in the system, questions about attached devices may appear on the screen. Press **Y** or **N** as required, then **Enter**.

DID THE INSTALLED DEVICES MENU APPEAR?

Yes No

|

071

Reinstall the math coprocessor and go to "MAP 0300: Keyboard Start."

072

- Replace the math coprocessor. If that does not correct the problem replace the system board.
-

073

(From Step 012 in this MAP)

Find your error in the following figure and take the action indicated.

Note: If an error message and incorrect audio response occur, take the action indicated for the error message.

POST Error:	Action:
No Beep and:	
Blank Display	MAP 0020: Power Start
Unreadable Display	MAP 0020: Power Start
Blinking Cursor	MAP 0020: Power Start
Machine Functioning Properly	MAP 0020: Power Start
1XX Error	MAP 0100: System Board Start
1 Long and 1 Short Beep	Replace System Board
1 Long and 2 Short Beeps	Go to Step 075 in this MAP
1 Long and 3 Short Beeps	Go to Step 075 in this MAP
2 Short Beeps and:	
Blank or Unreadable Display	Go to Step 075 in this MAP
Distorted Display Image	Go to Step 075 in this MAP
1XX Error	MAP 0100: System Board Start
XXXXXXXX XXXX 201 Error	MAP 0200: Memory Start
30X Error	MAP 0300: Keyboard Start
XX30X Error	MAP 0300: Keyboard Start
601 Error	MAP 0600: Diskette Drive Start
17XX Error	MAP 1700: Fixed Disk Drive Start
30XX Error	MAP 3000: PC Network
31XX Error	MAP 3100: Alt PC Network
C8000 ROM Error	Replace Fixed Disk Drive Adapter
IO ROM CC0000	MAP 3000: PC Network
ROM ERROR	Replace System Board
IO ROM XXXXXX (IO Adapter Failure)	MAP 0020: Power Start
Continous Beep	MAP 0020: Power Start
Repeating Short Beeps	MAP 0020: Power Start
Any Errors Not Shown Above	Go to Step 083 in this MAP

Figure 2. POST Errors

(From Steps 032, 035, and 056 in this MAP)

Find your error in the following figure and take the action indicated.

Symptom:	Action:
Incorrect Memory Size Displayed During the POST	MAP 0200: Memory Start
Display Problems:	
Incorrect Colors	Go to Step 075 in this MAP
No High Intensity	Go to Step 075 in this MAP
Missing, Broken, or Incorrect Characters.....	Go to Step 075 in this MAP
Blank Display (Dark)	Go to Step 075 in this MAP
Blank Display (Bright)	Go to Step 075 in this MAP
Distorted Image.....	Go to Step 075 in this MAP
Unreadable Display	Go to Step 075 in this MAP
Other Display Problems.....	Go to Step 075 in this MAP
Flashing Cursor Only	Go to Step 078 in this MAP
BASIC Screen Appears	MAP 0600: Diskette Drive Start
Loads Program from Fixed Disk	MAP 0600: Diskette Drive Start
Loads Program from Remote Station	MAP 0600: Diskette Drive Start
Disk Boot Failure	MAP 0600: Diskette Drive Start
PARITY CHECK	MAP 0200: Memory Start
Keyboard Problem	MAP 0300: Keyboard Start
Cannot Finish Diagnostic Tests	MAP 0020: Power Start
Incomplete Advanced Diagnostic Menu appears	MAP 0020: Power Start
Printer Problems	Refer to the Service Manual for the Printer.
Network Problems.....	Refer to the Service Manual for the Network.

Figure 3. Failure Symptoms

075

(From Steps 073 and 074 in this MAP)

IS AN ENHANCED GRAPHICS ADAPTER INSTALLED?

Yes	No
	076
	Refer to the MAP for the failing display adapter.

077

Go to "MAP 2400: Enhanced Graphics Adapter."

078

(From Step 074 in this MAP)

IS A MATH COPROCESSOR INSTALLED?

Yes	No
	079
	Go to "MAP 0600: Diskette Drive Start."

080

- Power off the system.
- Remove the math coprocessor from the system board.
- Power on the system.

DID THE FAILING SYMPTOM REMAIN?

Yes	No
	081
	Replace the math coprocessor.

082

Reinstall the math coprocessor, then go to "MAP 0600: Diskette Drive Start."

083

(From Step 073 in this MAP)

Go to the MAP (or Start MAP, if any) indicated by the error code. For example, if you receive the error code 7XX, go to "MAP 0700: Math Coprocessor."

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

JUMPERS AND SWITCH SETTINGS

System Setup	3
Option Compatibility	5
BIOS ROM Identification	5
Terminating Resistors and Switches	6
Diskette Drive	6
Fixed Disk Drive	7
Using the Switch Charts	8
System-Board Display Switch	9
Memory Expansion Options	10
Base Memory	10
Expansion Memory	10
Enhanced Graphics Adapter (EGA)	11
PC Network Adapter	13
Serial/Parallel Adapter	14
Binary Synchronous Communications (BSC) Adapter ...	15
Data Acquisition and Control (DAC) Adapter	16
Analog Output Range	16
Analog Input Range	17
Adapter Number	17
Interrupt Request (IRQ) Level	18
General Purpose Interface Bus (GPIB) Adapter	19
Adapter Number	19
Interrupt Request (IRQ) Level	20
Interrupt Acknowledge (INT ACK) Level	21
Direct-Memory Access (DMA) Channel	21
Voice Communications Adapter	22

Notes:

System Setup

The Setup program is on the Advanced Diagnostics diskette. You need to know what options are installed in the system unit to run the Setup program.

1. Make a list of the option adapters installed in the system.
2. Determine the type of drives installed.
 - Fixed Disk Drive: An identification label is on the drive.
 - Half-High Diskette Drives:
 - 5-1/4 Inch 1.2MB: The bezel of a high capacity (1.2 MB) drive is not marked.
 - 5-1/4 Inch 360KB: The bezel of a double-sided (360KB) diskette drive has an asterisk.
 - 3-1/2 Inch 720KB
3. Ensure that all jumpers and switches are set correctly.
4. Ensure that the battery is properly installed.

Note: If you receive an error code, troubleshoot any error indications other than 16X first. If the only error code you receive is 16X, and you cannot correct the Setup error using the instructions on the following page, go to "MAP 0000: Start (XT Type 5162)."

System Setup

1. Insert the Advanced Diagnostics diskette into diskette drive A.
2. Power on the system.
3. When the Advanced Diagnostics menu appears, select option **4 (SETUP)** and verify that the options are correctly set.

The Setup program will prompt you for the following information:

Time	Set or change the time.
Date	Set or change the date.
Diskette Drives	Select the number and type installed.
Fixed Disk Drives	Select the type of drive installed.
Memory	Select the amount of base and expansion memory installed.
Display	Set the primary display if two display adapters are installed. Select the mode (40 or 80 column) if a color display is installed.

Option Compatibility

Certain option adapters conflict with each other when used in the same system.

The following adapters should not be installed together in the system unit:

- Synchronous Data Link Control (SDLC) Adapter.
- Alternate Binary Synchronous Communications (Alt BSC) Adapter.

BIOS ROM Identification

To determine the date of the BIOS ROM module, run the following BASIC program. Type the program exactly as shown.

```
10 DEF SEG=&HF000
20 FOR X=&HFFF5 TO &HFFFF
30 PRINT CHR$(PEEK(X));
40 NEXT
RUN
```

The date that is displayed is the date of your BIOS ROM module.

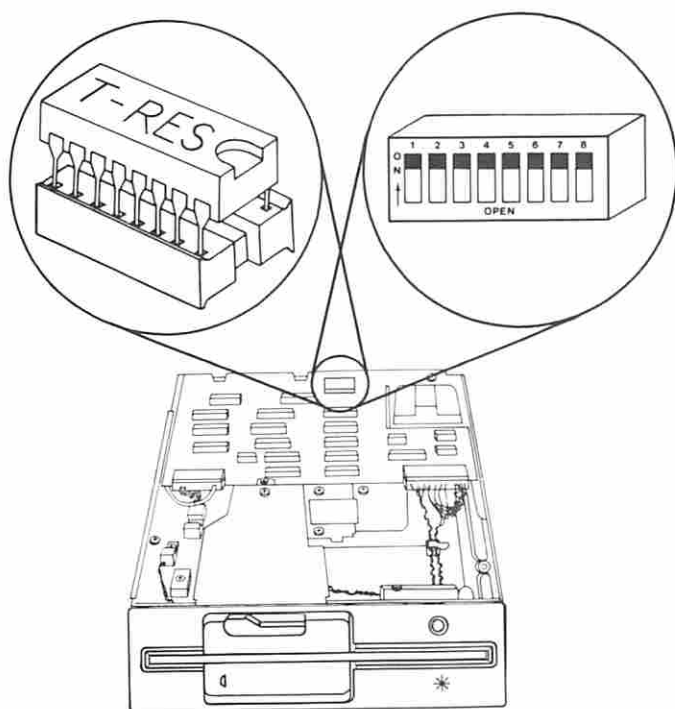
Terminating Resistors and Switches

Diskette Drive

A diskette drive may have a terminating resistor or terminating switch.

- **Terminating Resistor** - A terminating resistor **must** be installed in diskette drive A. Diskette drive B should not have a terminating resistor installed.
- **Terminating Switch** - If a diskette drive is equipped with a terminating switch instead of the terminating resistor, set all switches on diskette drive A to the On position. Set all switches on diskette drive B to the Off position.

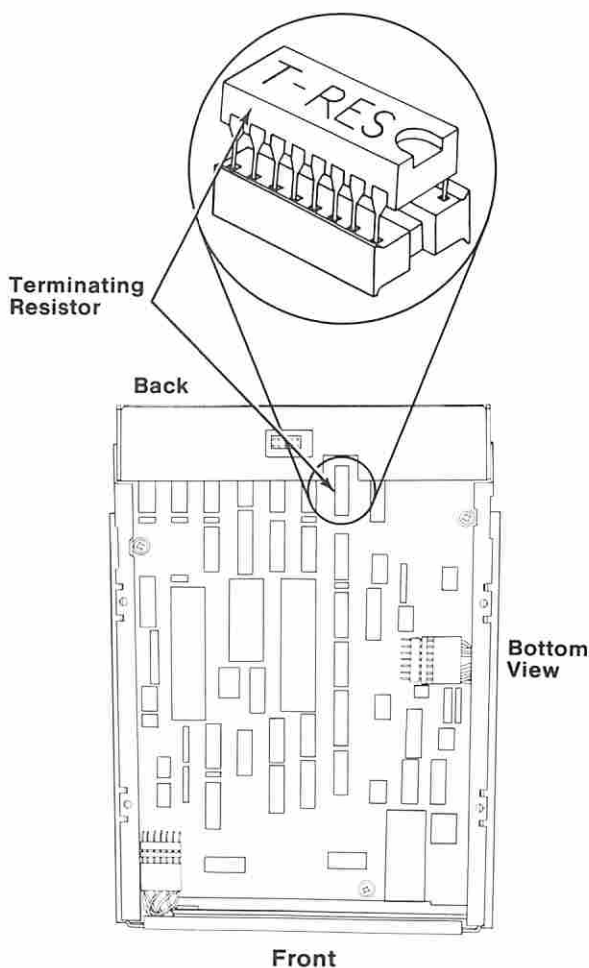
Note: The terminating resistor may appear in a different location on the drive. If so, an identifying label will be attached to the terminating resistor.



Fixed Disk Drive

The terminating resistor must be installed on fixed disk drive C.

Note: The terminating resistor may appear in a different location on the drive. If so, an identifying label will be attached to the terminating resistor.



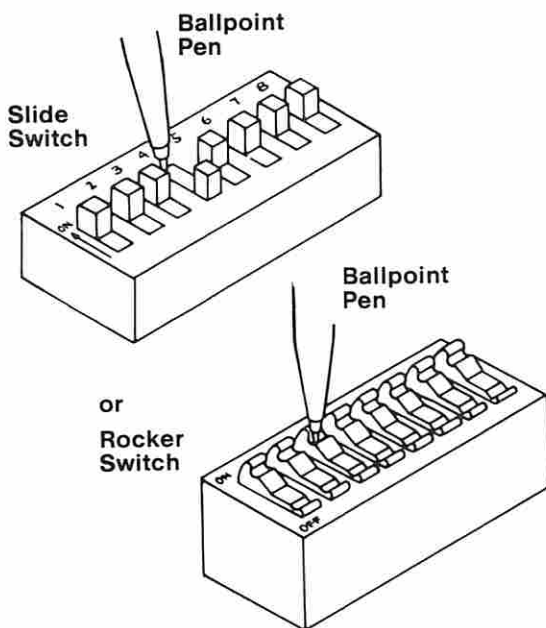
Using the Switch Charts

The following legend applies to the charts in this section.

Symbol	Meaning
*	Not Used by this Application
↑	On/Closed Position Of A Switch
↓	Off/Open Position Of A Switch
N/A	Not Allowed Or Not Applicable

Note: For some options, the customer must supply information for correct setting of jumpers or switches.

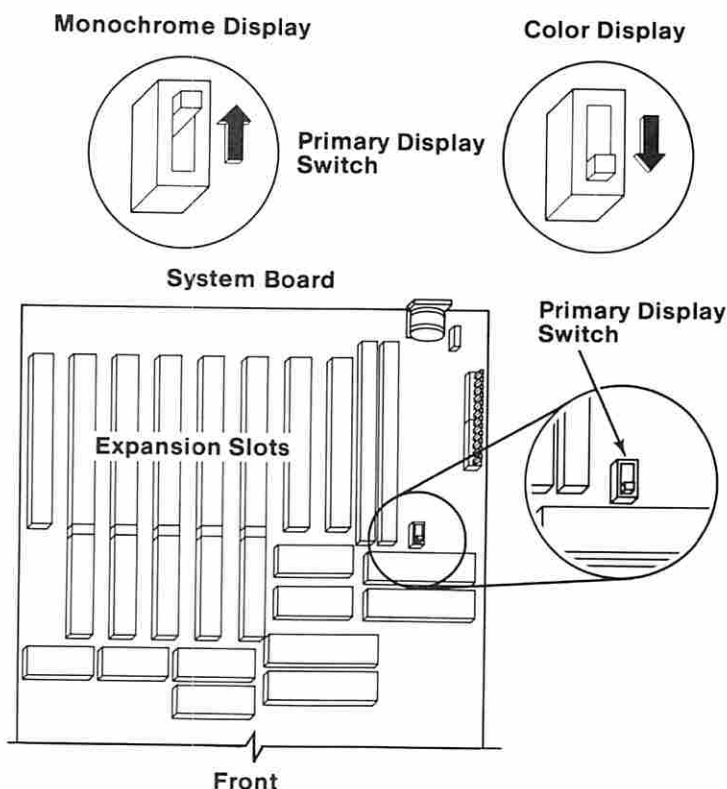
To set a rocker switch, press the rocker down to the desired position; to set a slide switch, slide the lug of the switch to the desired position.



System-Board Display Switch

If your primary display adapter is a:

- Monochrome Display and Printer Adapter - Set the display switch to the rear of the system.
- Color Display Adapter - Set the display switch to the front of the system.
- Enhanced Graphics Display - Set the display switch to either position.



Memory Expansion Options

Base Memory

Base memory is 640K on the system board. There are no memory switches on the system board.

Expansion Memory

Switch settings for the expansion memory options are shown below.

Note: Each memory expansion option must be fully populated before the next memory expansion option is added.

**Expansion Memory
Option 1**

512KB/2MB
12345678 ↑↑↑↓↑↑↑↑

**Expansion Memory
Option 2**

512KB/2MB
12345678 ↑↑↓↑↑↑↑↑

**Expansion Memory
Option 3**

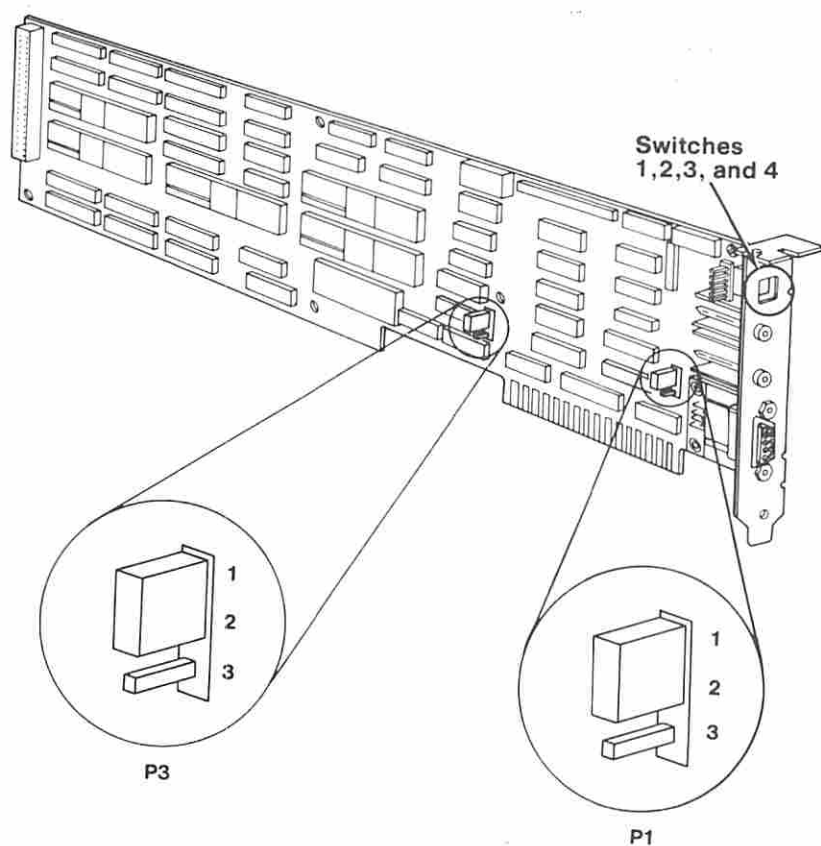
512KB/2MB
12345678 ↑↓↑↓↑↑↑↑

**Expansion Memory
Option 4**

512KB/2MB
12345678 ↑↓↑↑↑↑↑↑

Enhanced Graphics Adapter (EGA)

Warning: Damage to the graphics adapter, the display, or both may result if these jumpers are not in the correct position.



Display	P1	P3
IBM Color Display or IBM Monochrome Display	2 & 3	1 & 2
IBM Enhanced Color Display	1 & 2	1 & 2

If an EGA is the only display adapter installed, or an EGA is installed with a Monochrome Display and Printer Adapter, refer to Figure 1 to set the EGA switches.

If an EGA is installed with a Color/Graphics Monitor Adapter, refer to Figure 2 to set the EGA Switches.

Type of Display Attached to the Enhanced Graphics Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
No Display	N/A	↓↑↑↑
Monochrome Display	↓↑↑↓	N/A
Color Display (40 X 25 Mode)	↑↓↑↑	↑↑↑↑
Color Display (80 X 25 Mode)	↓↑↑↑	↓↑↑↑
Enhanced Color Display (Normal Color Mode)	↑↑↑↓	↑↑↑↑
Enhanced Color Display (Enhanced Color Mode)	↓↑↑↓	↓↑↑↑

Figure 1

Type of Display Attached to the Color/Graphics Monitor Adapter	EGA as Primary	EGA as Secondary
	Switch 1234	Switch 1234
Color Display (40 X 25 Mode)	↑↑↓↓	↑↑↑↑
Color Display (80 X 25 Mode)	↓↑↑↓	↓↑↑↑
No Display	↓↑↑↓	N/A

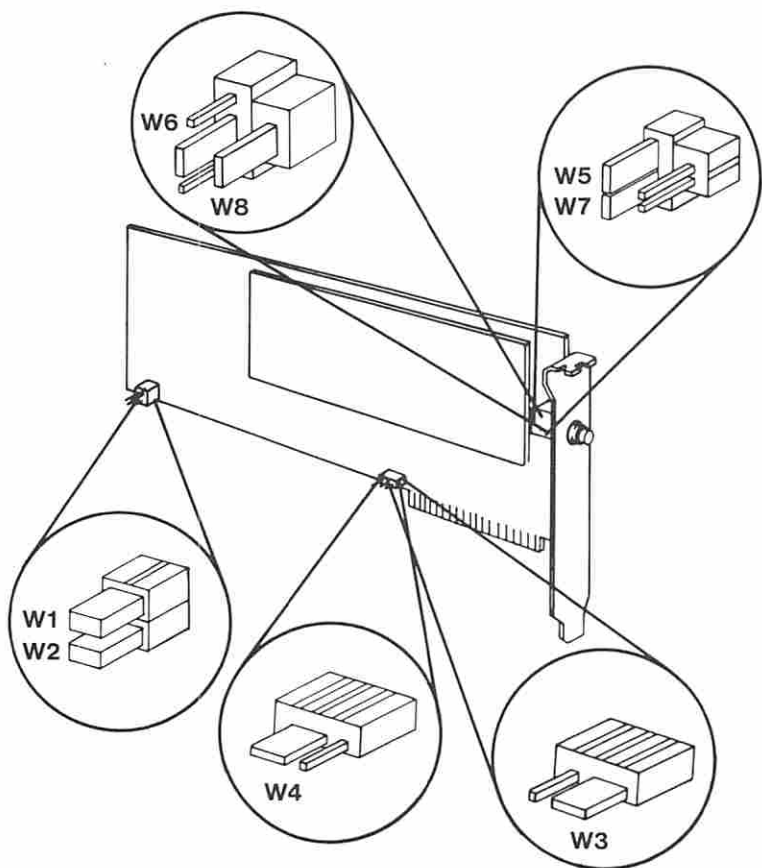
Figure 2

Notes:

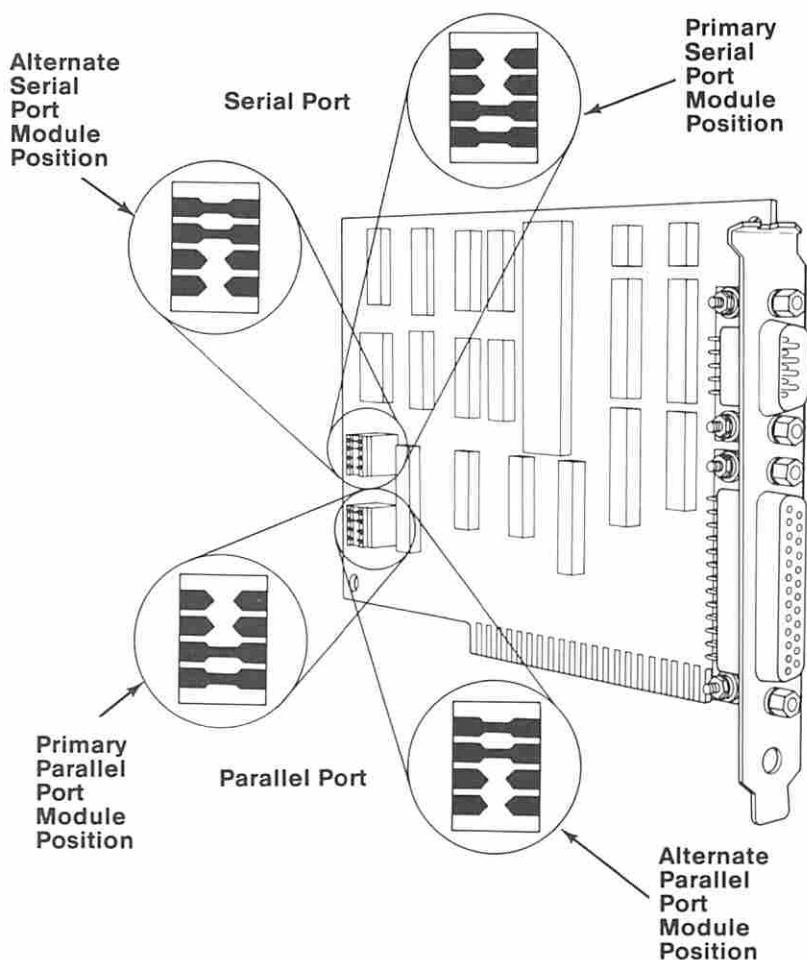
1. Mode selection can be changed by programming.
2. A maximum of two displays can be attached to the system, one color display and one monochrome display.

PC Network Adapter

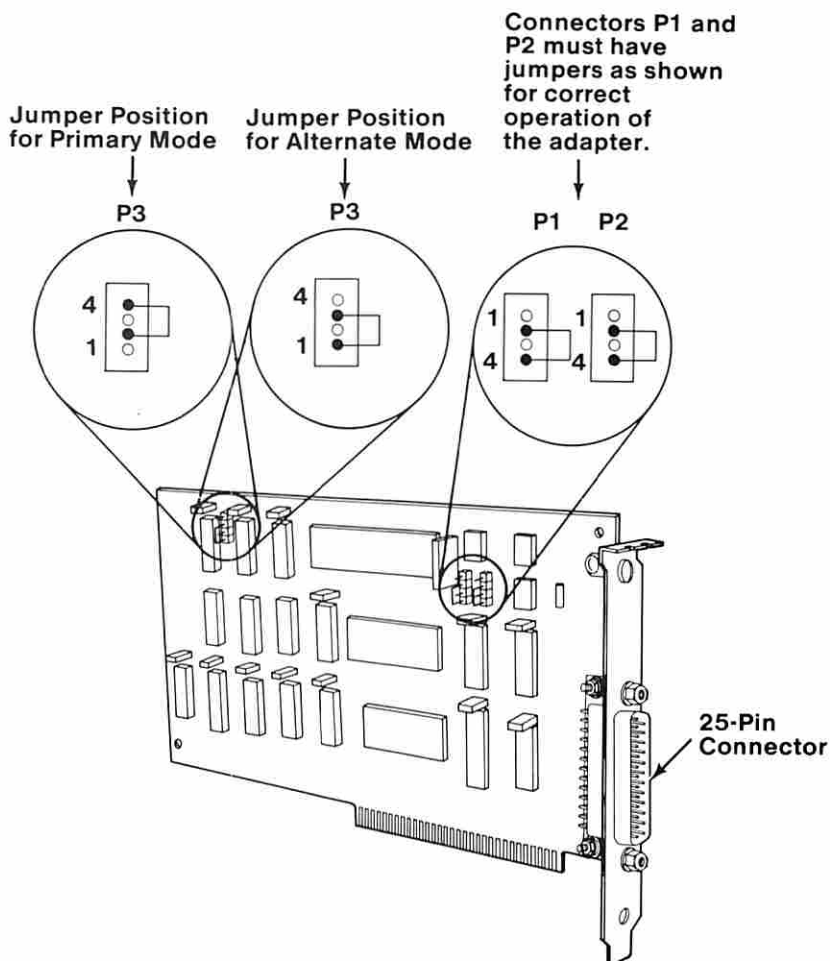
Jumper Position (See figure)	Function
W1	Automatic Remote Program Load (RPL)
W2	Not Used
W3	Sets the adapter to use Interrupt Level 2
W4	Sets the adapter to use Interrupt Level 3
W5 & W7	Sets the adapter as alternate adapter
W6	Sets the adapter as primary adapter
W8	Enables ROM on the adapter (See Note)
Note: Do not enable the ROM on more than one adapter.	



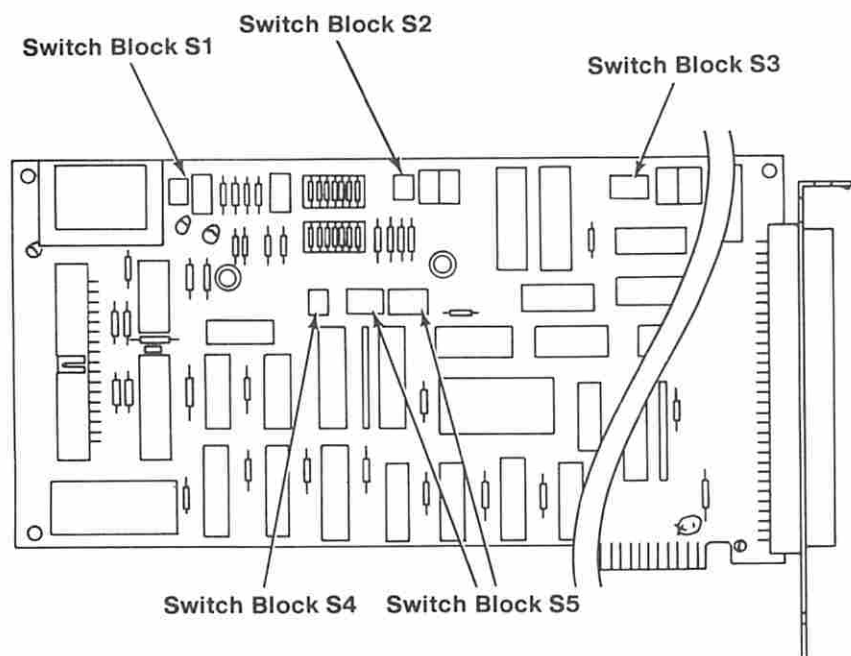
Serial/Parallel Adapter



Binary Synchronous Communications (BSC) Adapter



Data Acquisition and Control (DAC) Adapter



Analog Output Range

Analog Output Range (D/A) Channel 0	Switch Block S1	Analog Output Range (D/A) Channel 1	Switch Block S2
	1 2		1 2
-5 to +5 Volts	↑ ↑	-5 to +5 Volts	↑ ↑
-10 to +10 Volts	↓ ↑	-10 to +10 Volts	↓ ↑
0 to +10 Volts	↑ ↓	0 to +10 Volts	↑ ↓

Note: Only the switch settings shown may be used.

Analog Input Range

Analog Input Range (A/D)	Switch Block S3			
	1	2	3	4
-5 to +5 Volts	↓	↓	↑	↑
-10 to +10 Volts	↓	↑	↓	↑
0 to +10 Volts	↓	↓	↑	↓

Note: Only the switch settings shown may be used.

Adapter Number

Adapter Number	Switch Block S4	
	1	2
0	↓	↓
1	↑	↓
2	↓	↑
3	↑	↑
Note: Each DAC adapter installed in a system must have its own adapter number.		

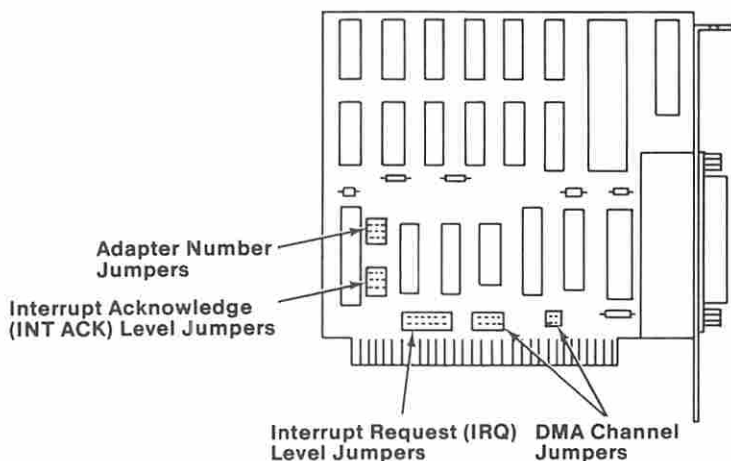
Note: Only the switch settings shown may be used.

Interrupt Request (IRQ) Level

IRQ Level	Switch Block S5									
	1	2	3	4	5	1	2	3	4	5
7	↓	↓	↓	↓	↓	↓	↓	↓	↑	↑
6	↓	↓	↓	↓	↓	↓	↑	↑	↓	↓
5	↓	↓	↓	↓	↑	↑	↓	↓	↓	↓
4	↓	↓	↑	↑	↓	↓	↓	↓	↓	↓
3	↑	↑	↓	↓	↓	↓	↓	↓	↓	↓
Note: The DAC adapter can share its IRQ level with other adapters that can use shared interrupts.										

Note: Only the switch settings shown may be used.

General Purpose Interface Bus (GPIB) Adapter









Adapter Number

Each GPIB adapter installed in a system must have its own adapter number.

Adapter number	Jumper positions
0	
1	
2	
3	
4	
5	
6	
7	







Interrupt Request (IRQ) Level

The GPIB adapter can share its IRQ level with other adapters that use shared interrupts.







Interrupt Request Level	Jumper Positions
7	
6	
5	
4	
3	
2	

Interrupt Acknowledge (INT ACK) Level

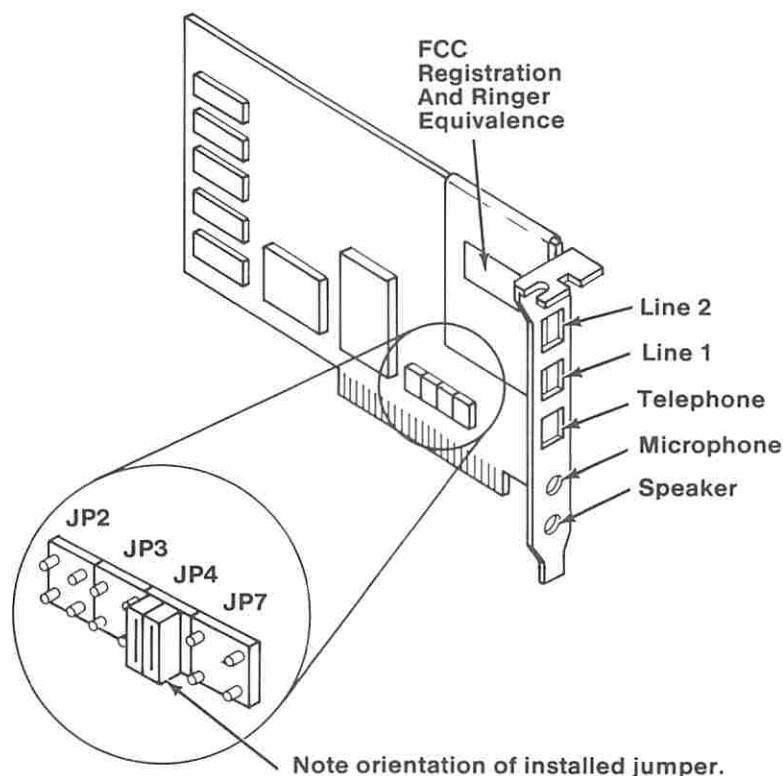
The interrupt acknowledge (INT ACK) and interrupt request (IRQ) levels must be the same.

INT ACK Level	Jumper Positions
7	
6	
5	
4	
3	
2	

Direct-Memory Access (DMA) Channel

DMA Channel	Jumper Positions
1	 
2	 
3	 

Voice Communications Adapter



Note: The jumper block is usually set to position JP4. It must be installed at an interrupt level that does not conflict with other options.

IRQ Level	Jumper Position
2	JP2
3	JP3
4	JP4
7	JP7

PARTS CATALOG

Limited Warranty - IBM Service Parts	2
How To Use This Parts Catalog	3
How to Use the Visual Index	4
Visual Index	5
Assembly 1. System Unit - Exterior (XT Type 5162)	7
Assembly 2. System Unit - Interior (XT Type 5162)	8
Assembly 3. Half-High Diskette Drives (5-1/4 Inch)	9
Assembly 4. 3.5 Inch Diskette Drives	10
Assembly 5. 3.5 Inch External Diskette Drives	11
Assembly 6. Fixed Disk Drives	13
Assembly 7. Internal Options and Adapters	14
Assembly 8. Monochrome Display (5151)	16
Assembly 9. Color Display (5153)	18
Assembly 10. Enhanced Color Display (5154)	20
Assembly 11. Keyboard (101/102-Key)	22
Assembly 12. Keybutton Kits (101/102-Key)	23
Assembly 13. Keybuttons (101/102-Key)	24
Assembly 14. Power Cords	26
Assembly 15. Miscellaneous	28

The warranty terms and conditions applicable in the country of purchase in respect of an IBM Personal Computer product are available from the supplier. Please retain them with your proof of purchase.

No statements contained in this documentation shall affect the statutory rights of consumers.

How To Use This Parts Catalog

1. **Similar Parts** - If two parts are similar, they may be listed in the same list. Similar parts are referred to by one index number but are distinguished by the part number and description.
2. **NS** - When this indication appears in the ASM - INDEX column, it denotes a part not shown in the figure. This designation is generally used for miscellaneous parts packets.
3. **R** - This entry in the Units column indicates the part has a restricted availability.
4. **AR** - in the Units column denotes that the units per assembly may vary based upon system configuration.
5. **Indenture** - The indenture is marked by a series of dots located before the part description. The indenture indicates the relationships of a part to the next higher assembly.

Example of a Parts List

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 -	1234567		Main Assembly
- 1	1234568	1	• Subassembly
- 2	1234569	1	• Subassembly, US
- 2	1234566	1	• Subassembly, Non-US
- 3	1234565	R	•• Detailed Part Restricted
- 4	1234564	1	• Subassembly
			•• Detailed Part
			•• Detailed Part
			•• Detailed Part
- NS	1234563	1	• Subassembly Not Shown
			•• Detailed Part
			•• Detailed Part
- 5	1234562	AR	• Subassembly - Use as Required

How to Use the Visual Index

Visual Index



System Unit (5162)
Assembly 1
Page 7



Diskette Drives 5-1/4" and 3.5"
Assembly 3 and 4
Pages 9 and 10



3.5 inch External Diskette Drive
Assembly 5
Page 11



Fixed Disk Drives
Assembly 6
Page 13



Internal Options and Adapters
Assembly 7
Page 14



Displays
Assembly 8, 9 and 10
Pages 16, 18 and 20



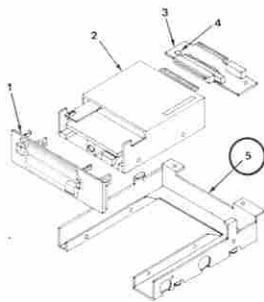
Keyboard (101/102-Key)
Assembly 11
Page 22



Power Cords
Assembly 14
Page 26

1. Turn to the visual index and locate, by illustration, the assembly containing the part.

Assembly 4. 3.5 Inch Diskette Drives



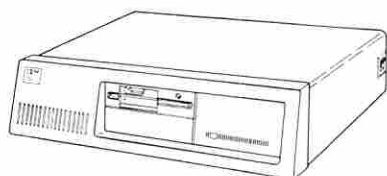
2. Turn to the page for that assembly and locate the part visually.

ASH INDEX	PART NUMBER	UNITS	DESCRIPTION
- 1	6480081	1	Seal Assembly
- 2	6480082	1	3.5 inch Diskette Drive, 720KB
- 3	6489910	1	Cable Adapter Card
- 4	6489918	1	Terminating Resistor
- 5	6489911	1	Tray

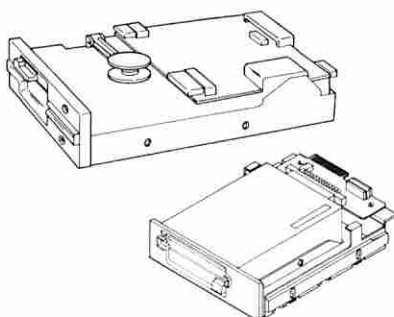
Note: See Half-High Diskette Drives for mounting hardware and cables.

3. Using the index number shown with the part, refer to the accompanying listing to obtain the part number.

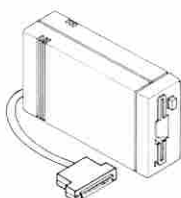
Visual Index



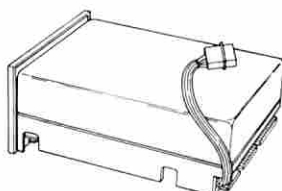
**System Unit (5162)
Assembly 1
Page 7**



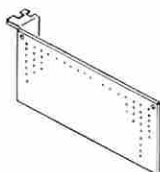
**Diskette Drives 5-1/4" and 3.5"
Assembly 3 and 4
Pages 9 and 10**



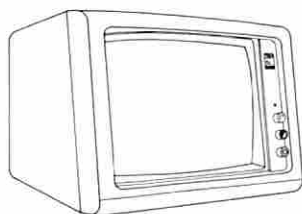
**3.5 Inch External Diskette Drive
Assembly 5
Page 11**



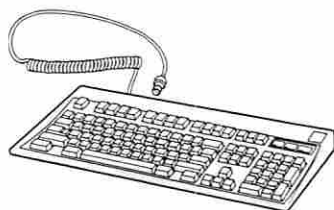
**Fixed Disk Drives
Assembly 6
Page 13**



**Internal Options and Adapters
Assembly 7
Page 14**



**Displays
Assembly 8, 9 and 10
Pages 16, 18 and 20**



**Keyboard (101/102-Key)
Assembly 11
Page 22**

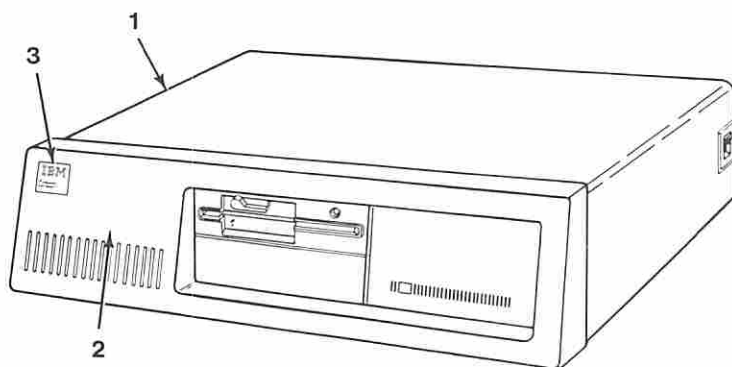


**Power Cords
Assembly 14
Page 26**

Note: Miscellaneous Hardware and Wrap Plugs are listed on page 28.

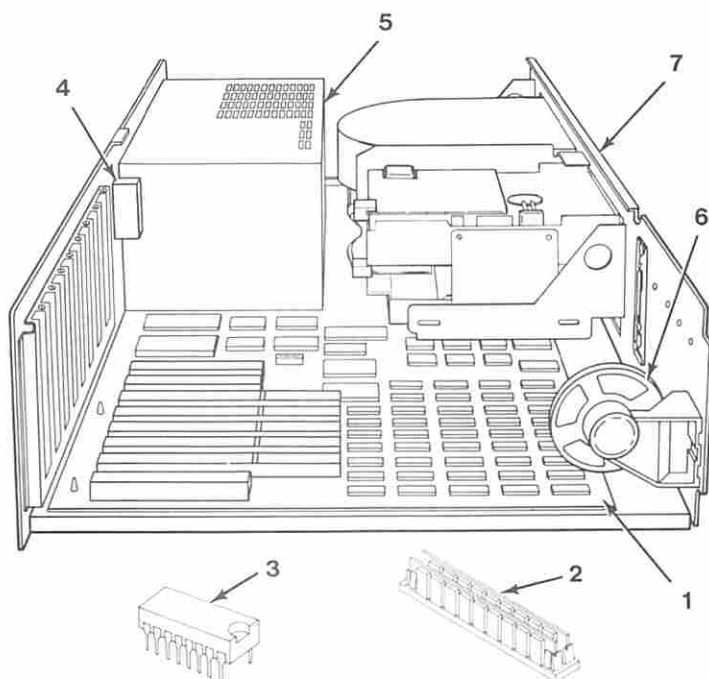
Notes:

Assembly 1. System Unit - Exterior (XT Type 5162)



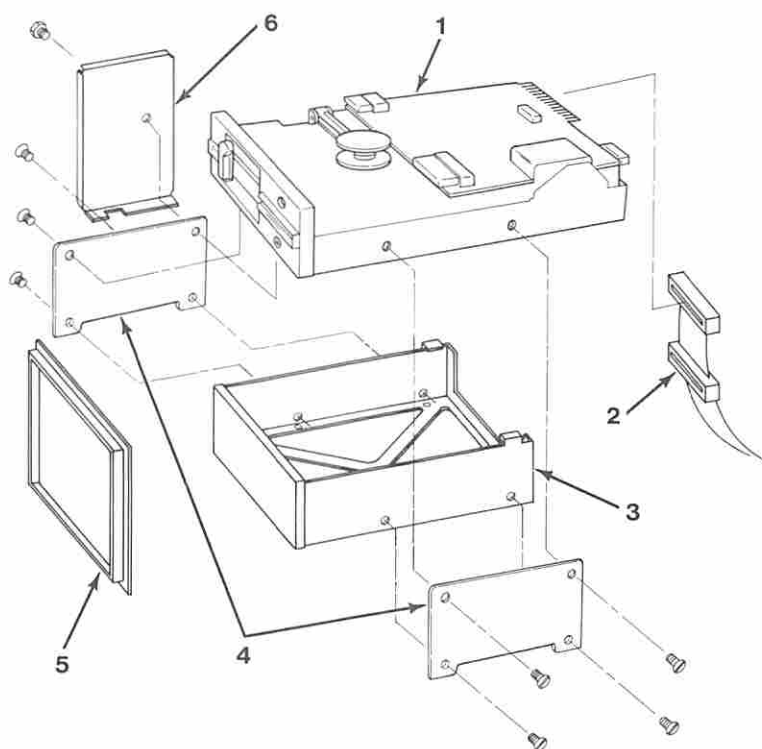
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
1 -	8285980	1	Top Cover Assembly
1 - 1	8529162	1	• Top Cover (No Bezel)
- 2	8285981	1	• Bezel Assembly
- 3	62X1124	1	• Logo/Label Kit (US Only)
			• • Front Name Plate
			• • Rear Name Plate
			• • FCC Label

Assembly 2. System Unit - Interior (XT Type 5162)



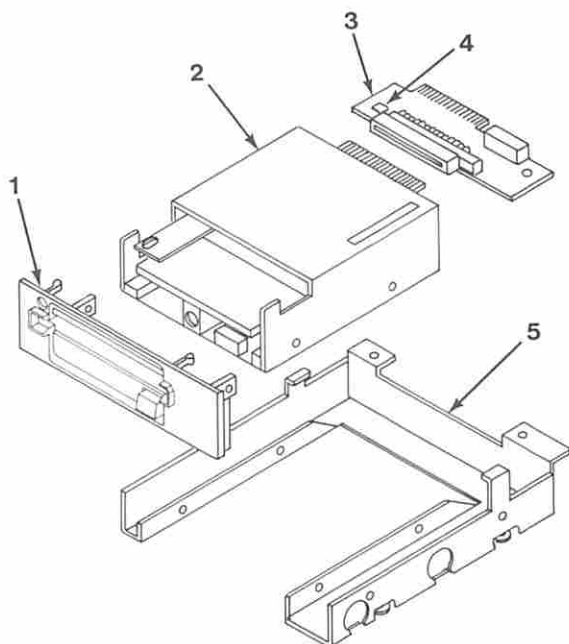
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
2 - 1	62X1025	1	System Board
- 2	62X1035	1	256KB Memory Module Package
- 3	62X1026	1	64KB x 4 Memory Module
- NS	6480008	1	• Parity Module, System Board
- 4	62X1030	1	Battery Holder
- 5	62X1034	1	Power Supply
- 6	8529143	1	Speaker Assembly
- 7	62X1123	R	Base Frame Assembly
- NS	62X1128	AR	Plastic Parts Kit <ul style="list-style-type: none"> • Card Support Bracket (6) • Planar Board Support (5) • Screw, Shield Drives • Foot Pad, CPU (4) • Tape, Air Dam
- NS	62X1129	AR	Miscellaneous Screw Kit <ul style="list-style-type: none"> • Screw, Flat Head, 100 degree (7) • Screw, Hex Head 3mm x .5 inch (5) • Screw, Hex Head 8/32 x .5 inch (5) • Screw, 4mm x 6mm (4) • Bolt Flange (15)
- NS	62X1130	AR	Miscellaneous Metal Parts Kit <ul style="list-style-type: none"> • Bracket, Blank • Mounting Bracket, Diskette Drive

Assembly 3. Half-High Diskette Drives (5-1/4 Inch)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
3 - 1	62X1028	1	Diskette Drive, Half-High 1.2MB
- NS	8285972	AR	• Terminating Resistor
- 1	62X1036	1	Diskette Drive, Half-High 360KB
- 2	62X1033	1	Signal Cable, Fixed Disk and Diskette Drive
- NS	8285972	AR	• Terminating Resistor
- 3	6489901	AR	Blank Bezel Assembly
- 4	6489904	AR	Mounting Plate, Left or Right
- 5	6489912	AR	Molding, Bezel
- 6	6489905	AR	Mounting Bracket
- NS	62X1129	AR	Miscellaneous Screw Kit
			• • Hex Head Screw 3mm x 6mm (Qty 5)
			• • Flat Head Screw 3mm x 6mm (Qty 7)

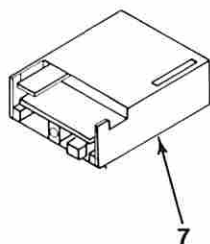
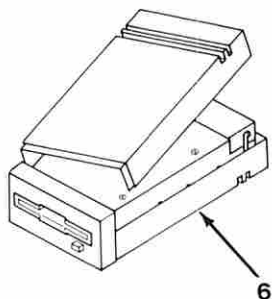
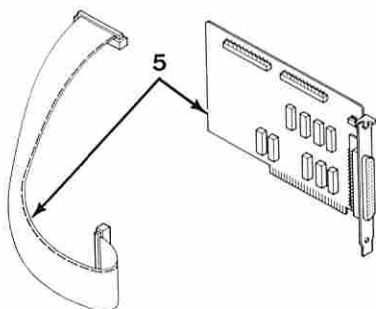
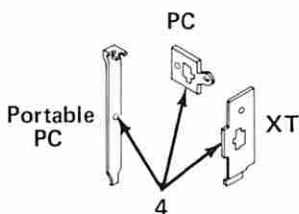
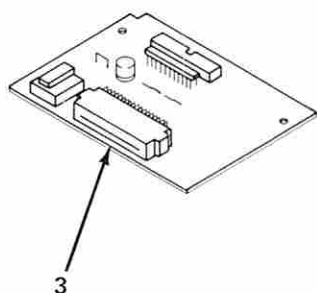
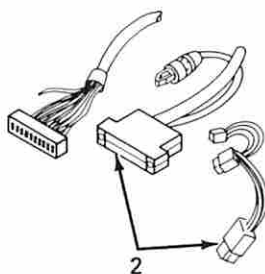
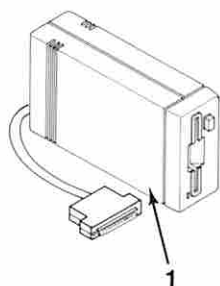
Assembly 4. 3.5 Inch Diskette Drives



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
4 - 1	6480081	1	Bezel Assembly
- 2	6820821	AR	3.5 Inch Diskette Drive, 720KB
- 3	6489919	1	• Cable Adapter Card
- 4	6489918	1	• Terminating Resistor
- 5	6489911	1	• Tray

Note: See Half-High Diskette Drives for mounting hardware and cables.

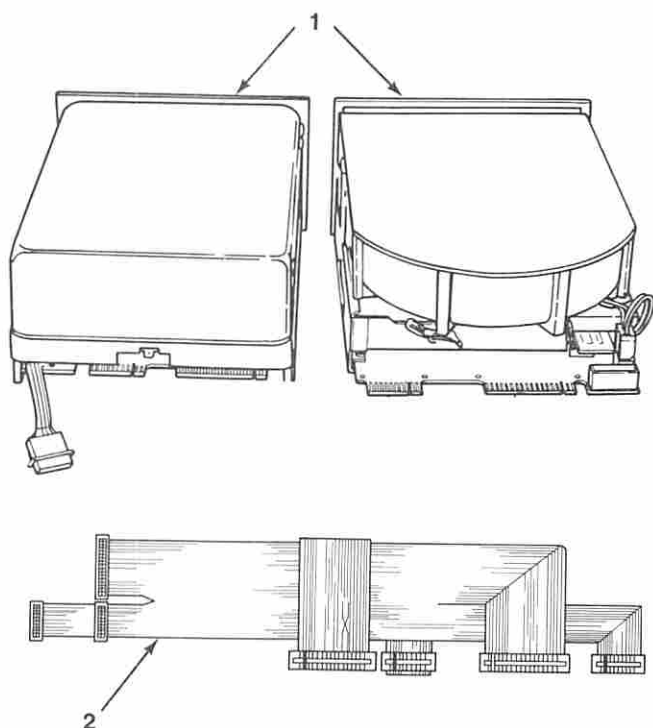
Assembly 5. 3.5 Inch External Diskette Drives



3.5 Inch External Diskette Drives

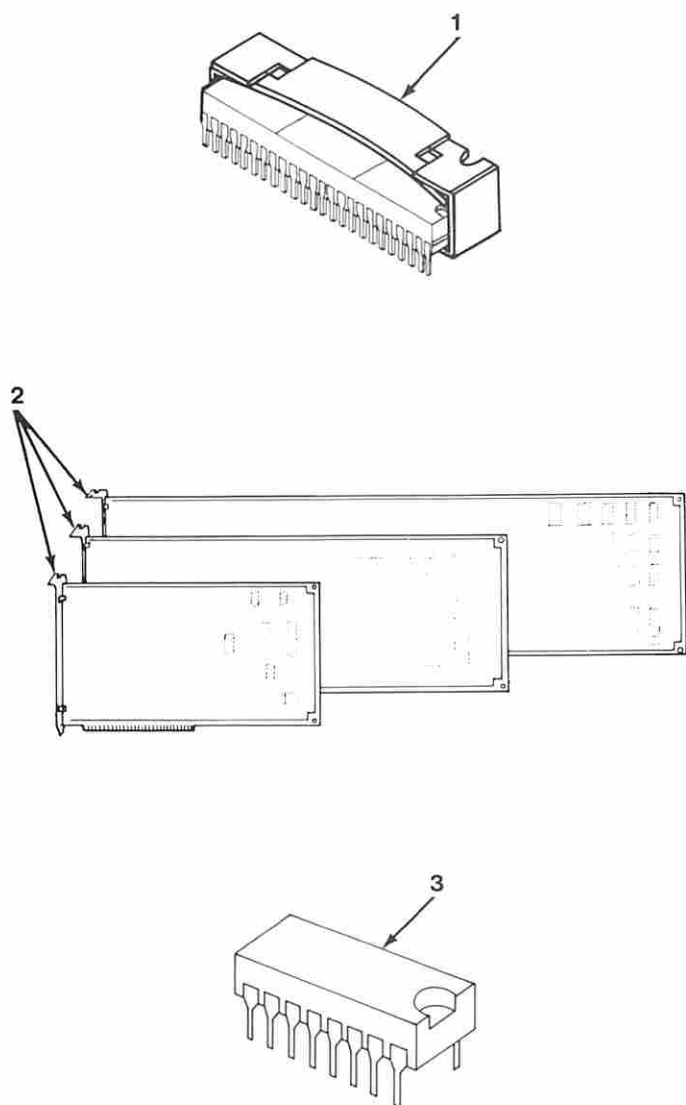
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
5 - 1	2683200	AR	Element Exchange • Diskette Drive • Signal/Power Cable • Converter Card • Cover Group
- 2	2683197	1	Cable Group - AT • Signal/Power Cable • Power-Split Cable
- 3	2683195	1	Converter Card - CMOS/TTL
- 4	2683194	1	Hardware Group • Plate - PC • Plate - XT • Plate - Portable PC • Screw - PC Plate • Screw - Bottom Shield • Screw - Card and Top Shield • Screw - Drive • Lockwasher
- 5	2683198	1	Adapter Group • External Diskette Drive Adapter • Internal Flat Cable
- 6	2683192	1	Cover Group • Top Cover • Bezel/Bottom Cover • Top Shield/Foil • Bottom Shield • Lens • Logo
7	6820821	AR	3.5 Inch Diskette Drive

Assembly 6. Fixed Disk Drives



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
6 - 1	62X1031	AR	Fixed Disk Drive, 20MB
- 2	62X1033	1	Signal Cable, Fixed Disk and Diskette Drive

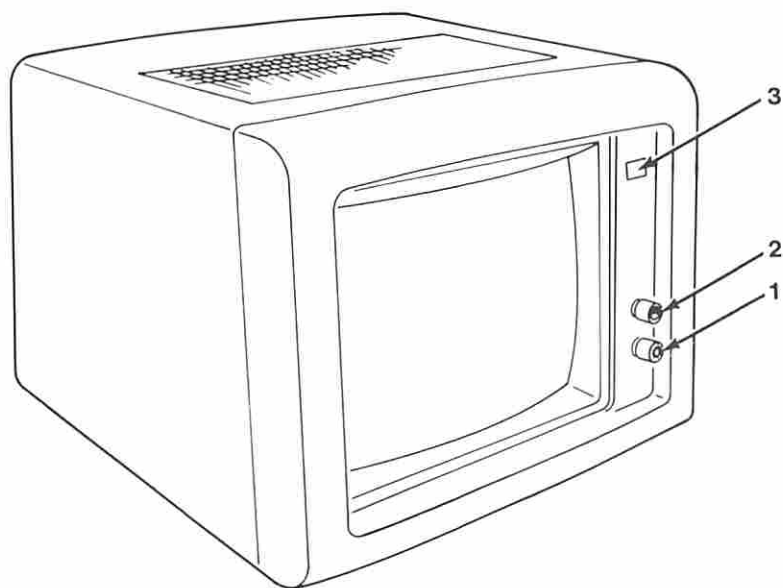
Assembly 7. Internal Options and Adapters



Internal Options and Adapters

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
7 - 1	8286127	AR	80287 Math Coprocessor
- 2	59X7294	AR	512KB/2MB Memory Expansion Adapter
- 3	6480008	1	• 256KB RAM Module (Qty 1)
- 3	62X0641	1	• 256KB RAM Module Kit (Qty 18)
- 2	8286098	AR	Binary Synchronous Communications (BSC) Adapter
- 2	8529146	AR	Color/Graphics Monitor Adapter
2	6181768	AR	Data Acquisition Adapter
- 2	8654215	AR	Enhanced Graphics Adapter (w/o Memory Expansion Card)
- NS	6323468	AR	• Graphics Memory Expansion Card (w/o memory modules)
- NS	8654219	24	•• Graphics Memory Module (Qty 1)
- 2	62X1032	1	Fixed Disk and Diskette Drive Adapter
2	6181770	AR	GPIO Adapter
- 2	8529148	AR	Monochrome Display and Printer Adapter
- 2	8286171	AR	PC Network Adapter
- NS	8286172	AR	PC Network Adapter Cable
- 2	8286147	AR	Serial/Parallel Adapter
- NS	8286170	AR	Serial Adapter Cable
- NS	8286194	AR	Serial Adapter Connector
- 2	8286099	AR	Synchronous Data Link Control (SDLC) Communications Adapter
- 2	2684438	AR	Voice Communications Adapter (VCA)
- NS	2684462	AR	Notched Black Telephone Cable, for VCA
- NS	2684487	AR	Notched White Telephone Cable, for VCA
- NS	2684509	AR	Tabbed Black Telephone Cable, for VCA
- NS	2684514	AR	Tabbed White Telephone Cable, for VCA

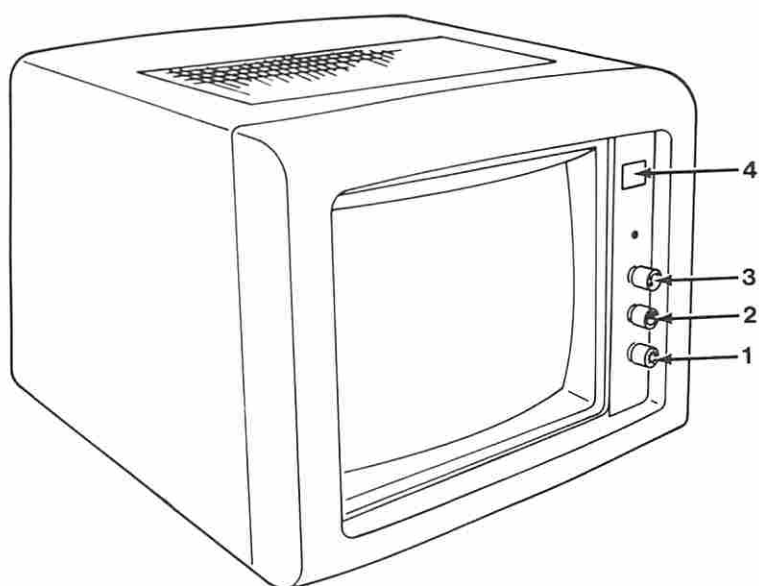
Assembly 8. Monochrome Display (5151)



Monochrome Display (5151)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
8 -	8529171		Display Assembly, 120 Volt
-	8529209		Display Assembly, 220/240 Volt
- 1	8529177	1	• Knob, Brightness
- 2	8529178	1	• Knob, Contrast
- 3	8529179	R	• Logo/Label Kit, 120 Volt
- 3	8654205	R	• Logo/Label Kit, 220/240 Volt
			.. Name Plate, Front
			.. Label, Caution
			.. Name Plate, Rear
			.. Label, FCC
- NS	8529229	R	• Panel, Front
- NS	8529230	R	• Cover, Back
- NS	8529231	R	• Plug, Upper Cover
- NS	8529232	R	• Foot
- NS	8529176	R	• Holder, Power Cord
- NS	8529173	R	• Signal Cable
- NS	8529235	R	• Transformer, 120 Volt
- NS	8654206	R	• Transformer, 220/240 Volt
- NS	8529237	R	• Support, Control
- NS	8529236	R	• Support, Transformer
- NS	8529175	R	• Fuse, 0.75 Amp, 120 Volt
- NS	8654204	R	• Fuse, 0.5 Amp, 220/240 Volt
- NS	8529233	R	• Analog Card
- NS	8529234	R	• PC Card
- NS	8529174	R	• Power Cord, 120 Volt
- NS	8654203	R	• Power Cord, 220/240 Volt
- NS	8529180	R	• Display Miscellaneous Hardware Kit
			.. Screw, CRT Mounting
			.. Screw, Transformer
			.. Support, CRT Mounting
			.. Bracket, CRT to Front Panel
			.. Transformer Support, Front Panel
			.. Screw, Rubber Bushing, Display
			.. Nut, Rubber Bushing, Display
			.. Screw, Cable Restraint, Display
			.. Star Washer, Display
- NS	6937013	AR	Shipping Carton
- NS	6448524	AR	Shipping Cushion, Left
- NS	6448525	AR	Shipping Cushion, Right
- NS	6937056	AR	Shipping Bag

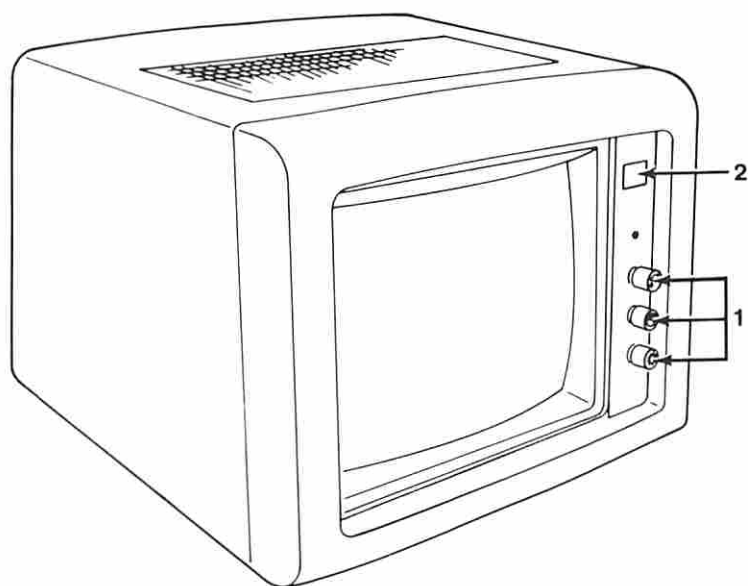
Assembly 9. Color Display (5153)



Color Display (5153)

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
9 -	8529227		Display Assembly
-	8654214		Display Assembly (Model-002)
- 1	8529287	1	• Knob, Brightness
- 2	8529288	1	• Knob, Contrast
- 3	8529289	1	• Knob, Power On/Off
- 4	8529339	R	• Logo/Label Kit
- NS	8529285	R	• Cover, Front, Includes Top, Bottom, and Power Supply Brackets
- NS	8529286	R	• Cover, Rear
- NS	8529323	R	• P.C. Board
			• Flyback Transformer
			• Focus Pack
			• Horizontal Drive Transistor
			• Chassis
- NS	8654222	R	• P.C. Board/Flyback Transformer Control Assembly (Model-002)
- NS	8654275	R	• Degaussing Coil
- NS	8529338	R	• Control Assembly
- NS	8654224	R	• Control Assembly (Model-002)
- NS	8654276	R	• Indicator, Power-On
- NS	8529291	R	• Power Supply Assembly
- NS	8654221	R	• Power Supply Assembly (Model-002)
- NS	8529290	R	• CRT and Yoke
- NS	8529324	R	• CRT Board and Shield Cable
- NS	8529334	R	• Signal Cable
- NS	8529336	R	• Power Receptacle/Line Filter Assembly
- NS	8654223	R	• Power Receptacle/Line Filter Assembly (Model-002)
- NS	8529335	R	• Vertical Size Pot Shaft Extension
- NS	8529337	R	• Vertical Hold Pot Shaft Extension
- NS	8529327	R	• Miscellaneous Hardware Kit
			• Shield, Driver Board
			• Retainers, Driver Board Shield
			• Strain Relief, Signal Cord
			• Screws, Power Supply
			• Screws, CRT Mounting
			• Screws, Control Assembly
			• Screws, P.C. Board Chassis Mounting
			• Screws and Washers, Rear Cover
			• Plugs, Cover Screw
			• Wire Ties, Degaussing Coil
- NS	6937192	R	Packing Material Kit
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS			Power Cord (See Power Cord Parts List)

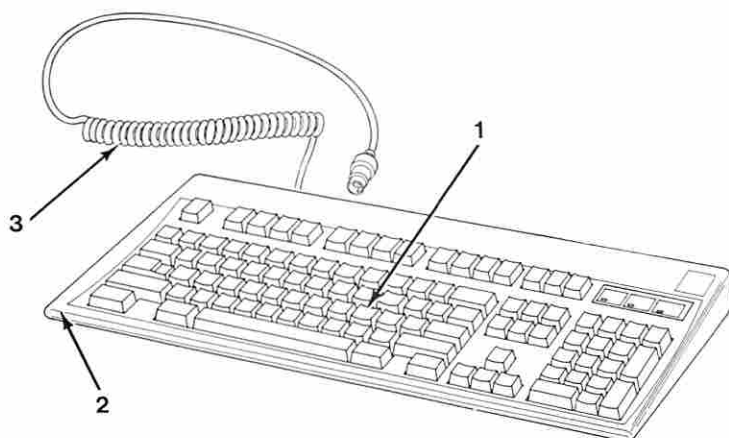
Assembly 10. Enhanced Color Display (5154)



Enhanced Color Display (5154)

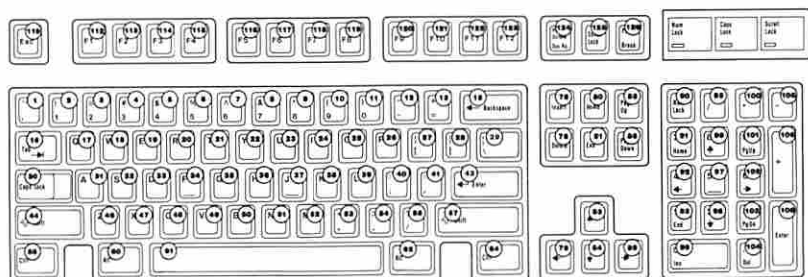
ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
10 -	6321035		Display Assembly, Model 001
	6321049		Display Assembly, Model 002
	6321036		Display Assembly, Model 003
- 1	6321056	1	• Knob and Cover Cap Kit .. Knob, On/Off (Qty 1) .. Knob, Contrast (Qty 1) .. Knob, Brightness (Qty 1) .. Cap, Cover (Qty 2) .. Knob, Rear (Qty 2)
- 2	6321061	R	• Logo and Label Kit .. Logo, Back .. Labels, Bottom Cover Warning (Five Languages)
- NS	6323319	1	• Rubber Feet Kit .. Rubber Feet (Qty 4) .. Washers (Qty 4) .. Screws (Qty 4)
- NS	6321050	R	• Cover, Front
- NS	6321051	R	• Cover, Rear
- NS	6321052	R	• Main P.C. Board Assembly/Chassis/CRT Drive Card
- NS	6321053	R	• Power Supply with Cover
- NS	8529158	R	• Power Cord
- NS	6321054	R	• Video Amp. Assembly/RGB Cable and Connector
- NS	6321055	R	• Control Assembly, Front
- NS	6321057	R	• Indicator, Power-On
- NS	6321058	R	• Rear Control Panel Assembly/Strain Relief
- NS	6321059	R	• Signal Cable
- NS	6135903	R	• Degaussing Coil
- NS	6321064	R	• Miscellaneous Hardware Kit .. Washers, CRT Rubber Mounting (Qty 4) .. Shield, Plastic Drive Board (Qty 1) .. Retainers, Plastic Shield (Qty 2)
- NS	6321060	R	• Model 001/Model 002 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6321063	R	• Model 003 CRT and Deflection Yoke Assembly, includes Wires, Ground Band, and CRT Warning Label
- NS	6182313	AR	Shipping Carton
- NS	6182056	AR	Shipping Cushion, Front
- NS	6182057	AR	Shipping Cushion, Back
- NS	6182319	AR	Shipping Bag
- NS			Power Cord (See Power Cord Parts List)

Assembly 11. Keyboard (101/102-Key)



ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
11 -	6447033		Keyboard (w/o cable), US
-	6447035		Keyboard (w/o cable), France
-	6447036		Keyboard (w/o cable), Germany
-	6447037		Keyboard (w/o cable), Italy
-	6447038		Keyboard (w/o cable), Spain
-	6447034		Keyboard (w/o cable), UK
- 1	6447039	R	• Keypad Assembly, US
- 1	6447041	R	• Keypad Assembly, France
- 1	6447042	R	• Keypad Assembly, Germany
- 1	6447043	R	• Keypad Assembly, Italy
- 1	6447044	R	• Keypad Assembly, Spain
- 1	6447040	R	• Keypad Assembly, UK
- NS	6447052	R	• Circuit Board Assembly
- NS	6447053	R	• LED Assembly
- 2	6447055	R	• Cover Assembly
- NS	6447054	2	• Foot, Adjustable (Qty 2)
- NS	6447056	AR	• Miscellaneous Parts Kit
			• Screws (Qty 5)
			• Nut
			• Lock Washer
- 3	6447051		Cable Assembly, External
- NS	6110464		Tool (key cap removal)

Assembly 12. Keybutton Kits (101/102-Key)

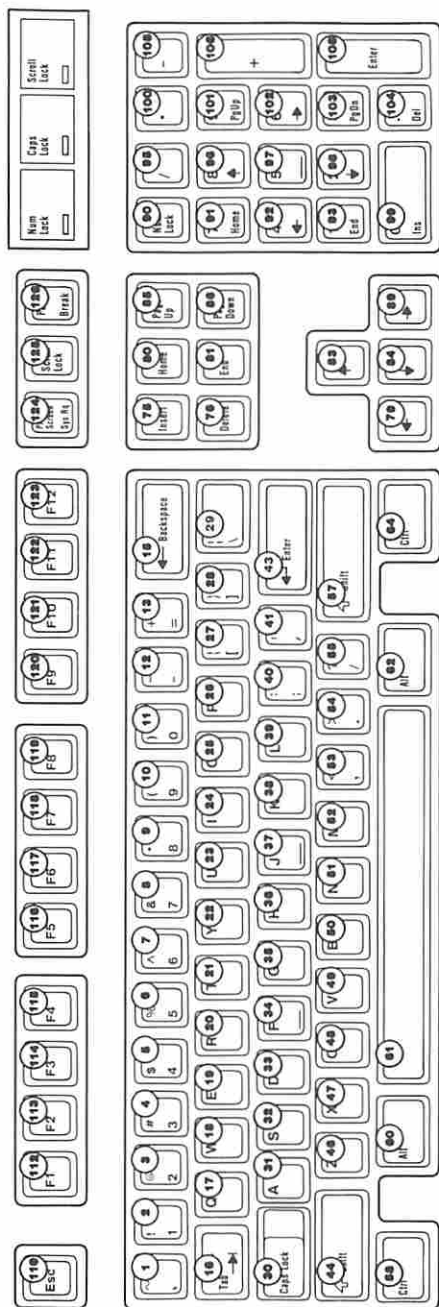


ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
12 -	6447045	1	Keybutton Kit, US *
-	6447047	R	Keybutton Kit, France **
-	6447048	R	Keybutton Kit, Germany **
-	6447049	R	Keybutton Kit, Italy **
-	6447050	R	Keybutton Kit, Spain **
-	6447046	R	Keybutton Kit, UK **

* Complete set of keybuttons with spacebar as listed on page 25.

** Complete set of keybuttons for the specified country.

Assembly 13. Keybuttons (101/102-Key)

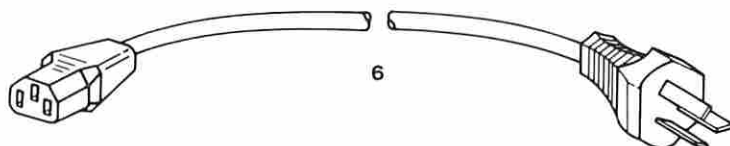
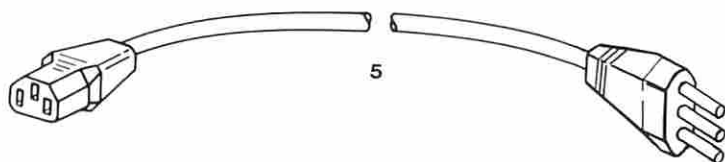
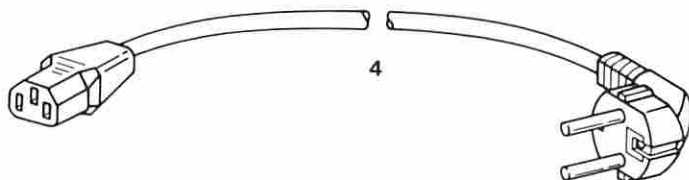
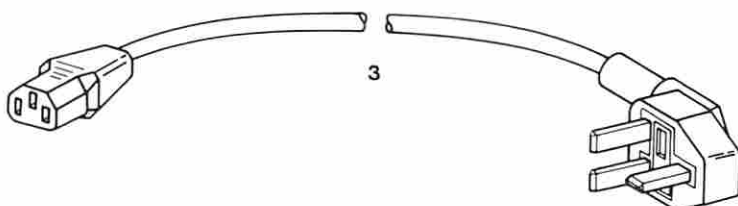
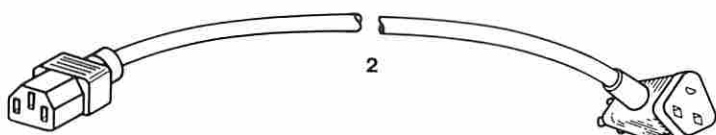
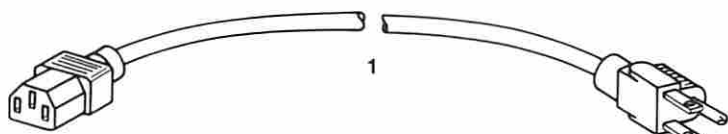


101/102-Key Keyboard Part Numbers

KEY LOCATION	PART NUMBER	DESCRIPTION	KEY LOCATION	PART NUMBER	DESCRIPTION
1	8502190	~/'	55	1387688	?//
2	1387262	!/1	57	1386320	☆
3	1386780	@/2	58	1385413	Ctrl
4	1387281	#/3	60	1385539	Alt
5	1387282	\$/4	61	N/A	Space Bar
6	1387283	%/5	62	1385539	Alt
7	1387261	^/6	64	1385413	Ctrl
8	1386785	ε/7	75	1386653	Insert
9	1386786	* /8	76	1386654	Delete
10	1386787	(/9	79	8502367	←
11	1386788	) /0	80	1386655	Home
12	8502201	_ /-	81	1386656	End
13	8502202	+ /=	83	8502380	↑
15	1385816	←	84	8502381	↓
16	1385797	| ← / → |	85	1386657	Page Up
17	8502203	Q	86	1386658	Page Down
18	8502204	W	89	8502371	→
19	8502205	E	90	1386659	Num Lock
20	8502206	R	91	1386660	7/Home
21	8502207	T	92	1386661	4/←
22	8502208	Y	93	1386662	1/End
23	8502209	U	95	1386663	/
24	8502210	I	96	1386664	8/↑
25	8502211	O	97	1386699	5
26	8502212	P	98	1386665	2/↓
27	1385707	{/[	99	1386695	0/Ins
28	1385708	} /]	100	1386666	*
29	1386611	| / \	101	1386667	9/PgUp
30	1385798	Caps Lock	102	1386668	6/→
31	8502215	A	103	1386669	3/PgDn
32	8502216	S	104	1386670	./Del
33	8502217	D	105	1386671	- (minus)
34	8502218	F	106	1386321	+ (plus)
35	8502219	G	108	1386322	Enter
36	8502220	H	110	1386672	Esc
37	8502221	J	112	1386673	F1
38	8502222	K	113	1386674	F2
39	8502223	L	114	1386675	F3
40	8502224	:/; :	115	1386676	F4
41	8502225	ii / i	116	1445836	F5
43	1386612	←	117	1445837	F6
44	1386694	☆	118	1445838	F7
46	8502228	Z	119	1445839	F8
47	8502229	X	120	1386677	F9
48	8502230	C	121	1386678	F10
49	8502231	V	122	1386679	F11
50	8502232	B	123	1386680	F11
51	8502233	N	124	1386681	PrtSc
52	8502234	M	125	1386682	Scroll Lock
53	6111301	< / ,	126	1386683	Pause
54	6111302	> / .			

Part numbers for complete keyboard sets are on page 23.

Assembly 14. Power Cords



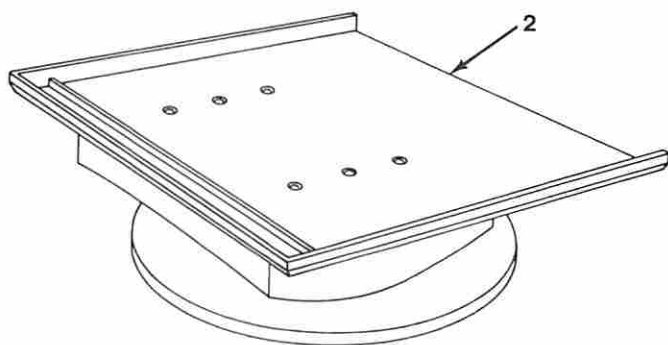
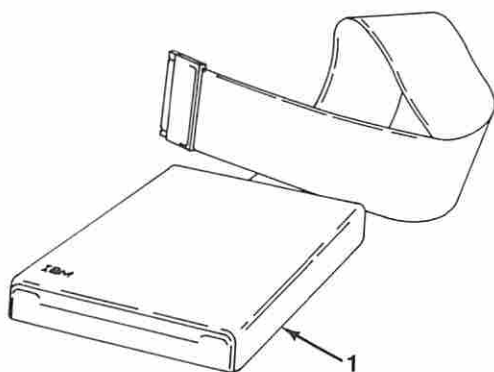
Power Cords

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
14 - 1	8529158	1	Power Cord, Options, US
2	62X1045	1	Power Cord, System Unit, US Power Cord, Venezuela Power Cord, Colombia
- 3	8529341	1	Power Cord, UK Power Cord, Hong Kong Power Cord, Singapore
- 4	8529281	1	Power Cord, Germany Power Cord, France Power Cord, Spain
- 5	8529282	1	Power Cord, Italy
- 6	8529284	1	Power Cord, Australia Power Cord, New Zealand

Warning:

Use only the proper Power Cord certified for your country.

Assembly 15. Miscellaneous



Miscellaneous

ASM - INDEX	PART NUMBER	UNITS	DESCRIPTION
15 - 1	6181769	1	Data Acquisition Distribution Panel
- 2	8286199	1	Display Stand
	8286200	R	• Platter, Bottom
	8286201	R	• Platter, Top
	8286202	R	• Skirt, Back
- NS	8529228	AR	Parallel Adapter Wrap Plug
- NS	62X1083	AR	Communications Wrap Plug, 25-pin
- NS	62X1084	AR	Communications Wrap Plug, 9-pin
- NS	6323712	AR	Data Acquisition Wrap Plug
- NS	6138013	AR	Plastic Envelope, Wrap Plug

Notes:

DIAGNOSTIC MAPs

MAP 0020: Power Start	0020-1
MAP 0020: Power (PC)	0020-1
MAP 0020: Power (AT)	0020-1
MAP 0100: System Board Start	0100-1
MAP 0100: System Board (PC)	0100-1
MAP 0100: System Board (AT)	0100-1
MAP 0200: Memory Start	0200-1
MAP 0200: Memory (PC)	0200-1
MAP 0200: Memory (XT)	0200-1
MAP 0200: PC Family Expansion Memory	0200-1
MAP 0200: Memory (AT)	0200-1
MAP 0300: Keyboard Start	0300-1
MAP 0300: Keyboard (PC)	0300-1
MAP 0300: Keyboard (AT)	0300-1
MAP 0400: Monochrome Display and Printer Adapter	0400-1
MAP 0500: Color/Graphics Monitor Adapter ..	0500-1
MAP 0600: Diskette Drive Start	0600-1
MAP 0600: Full-High Diskette Drive	0600-1
MAP 0600: Diskette Drive (Portable PC)	0600-1
MAP 0600: Diskette Drive (AT)	0600-1
MAP 0700: Math Coprocessor	0700-1
MAP 0900: Parallel Port Start	0900-1
MAP 0900: Printer Adapter	0900-1
MAP 0900: Serial/Parallel Adapter - Parallel Port	0900-1
MAP 1000: Alternate Serial/Parallel Adapter - Parallel Port	1000-1
MAP 1100: Serial Port Start	1100-1
MAP 1100: Asynchronous Communications Adapter	1100-1
MAP 1100: Serial/Parallel Adapter - Serial Port	1100-1
MAP 1200: Alternate Serial Port Start	1200-1
MAP 1200: Alternate Asynchronous Communications Adapter	1200-1
MAP 1200: Alternate Serial/Parallel Adapter - Serial Port	1200-1
MAP 1300: Game Control Adapter	1300-1

MAP 1400: Graphics Printer	1400-1
MAP 1500: Synchronous Data Link Control (SDLC) Communications Adapter	1500-1
MAP 1700: Fixed Disk Drive Start	1700-1
MAP 1700: Fixed Disk Drive (PC)	1700-1
MAP 1700: Fixed Disk Drive (AT)	1700-1
MAP 1800: Expansion Unit	1800-1
MAP 2000: Binary Synchronous Communications (BSC) Adapter	2000-1
MAP 2100: Alternate Binary Synchronous Communications (Alt BSC) Adapter	2100-1
MAP 2200: Cluster Adapter	2200-1
MAP 2400: Enhanced Graphics Adapter	2400-1
MAP 2900: Color Printer	2900-1
MAP 3000: PC Network Adapter	3000-1
MAP 3100: Alternate PC Network Adapter ...	3100-1
MAP 3300: Compact Printer	3300-1
MAP 3600: IBM General Purpose Interface Bus (GPIB) Adapter	3600-1
MAP 3800: IBM Data Acquisition and Control Adapter	3800-1
MAP 3900: IBM Professional Graphics Controller	3900-1
MAP 7100: Voice Communications Adapter ...	7100-1
Supplemental MAPs:	

MAP 0600 : Half-High Diskette Drive
 MAP 0200 : Memory (XT Type 5162)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, you have been directed here from another MAP, or you suspect a power problem.	<ul style="list-style-type: none"> • The power supply is failing. • A diskette drive is failing. • A fixed disk drive is failing. • An option adapter is failing. • The system board is failing. • The math coprocessor is failing. • The speaker is failing.

001

Find your system type in the following figure and go to the MAP indicated.

System Type	MAP
Personal Computer	MAP 0020: Power (PC)
Personal Computer XT	MAP 0020: Power (PC)
Personal Computer XT (5162)	MAP 0020: Power (AT)
Portable PC	MAP 0020: Power (PC)
Personal Computer AT	MAP 0020: Power (AT)

Figure 1. System Identification

Notes:

MAP 0020: Power (PC)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, you have been directed here from another MAP, or you suspect a power problem.	<ul style="list-style-type: none"> • The power supply is failing. • A diskette drive is failing. • A fixed disk drive is failing. • An option adapter is failing. • The system board is failing. • The math coprocessor is failing. • The speaker is failing.

001

- Power off the system.
- Unplug the power cord of the system unit (and expansion unit, if attached) from the electrical outlet.
- Disconnect the keyboard and any external devices, except the primary display (and expansion unit if attached) from the system unit.
- Plug the power cord of the system unit (and expansion unit, if attached) into the electrical outlet.
- Power on the system.

Note: A 301 error may occur if you disconnected the keyboard. Disregard this error.

DID THE SYMPTOM REMAIN?

Yes No

002

CAUTION

Power off the system before connecting any device.

- Connect the external devices to the system unit, one at a time.
- (Step 002 continues)

002 (continued)

- Power on the system after connecting each device. Repair or replace the device that causes the failure to return.

003

- Power off the system.
- Connect the keyboard to the system unit.
- Disconnect the expansion unit cable (if attached) from the system unit.
- Power on the system unit; do not power on the expansion unit.

Note: An 1801 error code may appear if you disconnected an expansion unit. Disregard the error and continue with the POST.

DID THE SYMPTOM REMAIN?

Yes

No

004

Go to Step 048 in this MAP.

005

- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at the system board power connector (Figure 1 on page 0020-3).

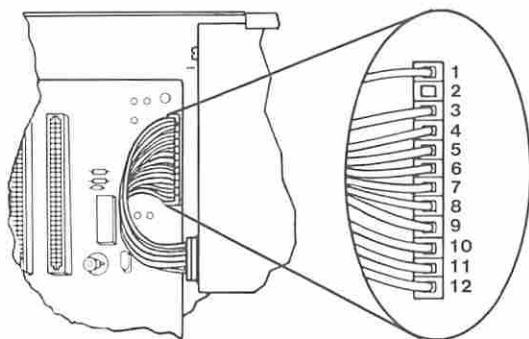


Figure 1. System Board Power Connector

DO YOU HAVE 2.4 TO 5.2 VDC BETWEEN PINS 1 AND 5?

Yes No

006

Go to Step 012 in this MAP.

007

- Check the system board connectors for the correct voltages (Figure 2).

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	5	10
+ 4.5	+ 5.4	9	6
+11.5	+12.6	7	3
+10.8	+12.9	4	8

Figure 2. System Board Voltages

- Check the diskette drive and fixed disk drive power connectors for the correct voltages (Figure 3 on page 0020-4).

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

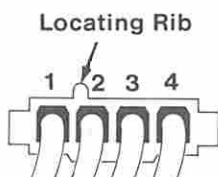


Figure 3. Diskette and Fixed Disk Drive Power Connectors

ARE ALL VOLTAGES CORRECT?

Yes No

008

Replace the power supply.

009

- Power off the system.
- Disconnect the speaker cable from the system board.
- Check the continuity of the speaker.

DOES THE SPEAKER HAVE CONTINUITY?

Yes No

010

Replace the speaker.

011

Reconnect the speaker then go to Step 025 in this MAP.

012

(From Step 006 in this MAP)

IS THE SYSTEM A PERSONAL COMPUTER XT WITH HALF-HIGH DISKETTE DRIVES?

Yes No

013

(Step 013 continues)

013 (continued)

Go to Step 021 in this MAP.

014

- Power off the system.
- Disconnect the power supply connector from the diskette drive power supply extension cable.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes No

015

Go to Step 057 in this MAP.

016

- Power off the system.
- Reconnect the power supply connector to the diskette drive power supply extension cable.

IS A FIXED DISK DRIVE INSTALLED?

Yes No

017

Go to Step 025 in this MAP.

018

- Disconnect the power supply connector from the fixed disk drive.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes No

019

Replace the fixed disk drive.

020

Go to Step 025 in this MAP.

021

(From Step 013 in this MAP)

You may have a failing diskette or fixed disk drive. Perform the following procedure.

- Power off the system.
- Remove the power supply connector from one of the drives.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes No

|

022

Replace the failing drive.

023

- Repeat this procedure for any remaining drives.

DID THE SYMPTOM REMAIN?

Yes No

|

024

Replace the failing drive.

025

(From Steps 011, 017, and 020 in this MAP)

IS A MATH COPROCESSOR INSTALLED IN THE SYSTEM UNIT?

Yes No

|

026

Go to Step 030 in this MAP.

027

- Power off the system.
- Remove the math coprocessor from the system board.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes No

|

028

(Step 028 continues)

028 (continued)

Replace the math coprocessor and the 8088 processor.

029

Reinstall the math coprocessor then continue with Step 030 in this MAP.

030

(From Steps 026 and 029 in this MAP)

An adapter may be failing. Perform the following procedure.

- Power off the system.
- Remove one option adapter from the system board. Do not remove the diskette drive adapter or the primary display adapter.
- Power on the system.
- Repeat the above procedure until you find the failing adapter, or all option adapters, except the diskette drive and the primary display adapter, have been removed.

Note: As adapters are removed, switches may need to be reset to match the system configuration.

DID THE SYMPTOM REMAIN?

Yes No

031

Replace the last adapter removed.

032

- Power off the system.
- Remove the diskette drive adapter from the system board.
- Power on the system.

Note: Removal of the diskette drive adapter may result in a 601 error code. Disregard the error and continue with the POST.

DID THE SYMPTOM REMAIN?

Yes No

033

(Step 033 continues)

033 (continued)

Replace the diskette drive adapter.

034

IS THE PRIMARY DISPLAY ADAPTER AN ENHANCED GRAPHICS ADAPTER?

Yes No

035

Go to Step 039 in this MAP.

036

- Power off the system.
- Remove the Enhanced Graphics Adapter from the system board.
- Set switches 5 and 6 of Switch Block 1 on the system board for color display operation. Set switch 5 to the Off position and 6 to the On position.
- Power on the system.

DID YOU RECEIVE ONE LONG AND TWO SHORT BEEPS?

Yes No

037

Go to Step 042 in this MAP.

038

Replace the Enhanced Graphics Adapter. Set the system board switches back to their original settings.

039

(From Step 035 in this MAP)

- Power off the system.
- Remove the primary display adapter from the system board.
- Power on the system.

DID YOU RECEIVE ONE LONG AND TWO SHORT BEEPS?

Yes No

040

(Step 040 continues)

040 (continued)

Go to Step 042 in this MAP.

041

Replace the primary display adapter.

042

(From Steps 037 and 040 in this MAP)

- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at the system board power connector (Figure 4).

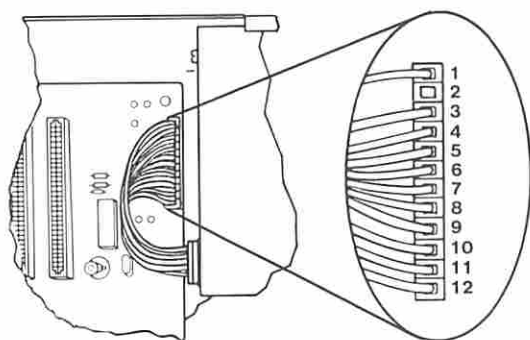


Figure 4. System Board Power Connectors

DO YOU HAVE 2.4 TO 5.2 VDC BETWEEN PINS 1 AND 5?

Yes No

043

Go to Step 045 in this MAP.

044

Replace the system board.

045

(From Step 043 in this MAP)

- Power off the system.
- (Step 045 continues)

045 (continued)

- Disconnect the power supply connectors from the system board.
- Ensure all option adapters have been removed from the system board.
- Check for resistance as shown in Figure 5.

Pins		Minimum Resistance
-Lead	+Lead	
5	3	17 Ohms
6	4	17 Ohms
7	9	17 Ohms
8	10	0.8 Ohms
8	11	0.8 Ohms
8	12	0.8 Ohms

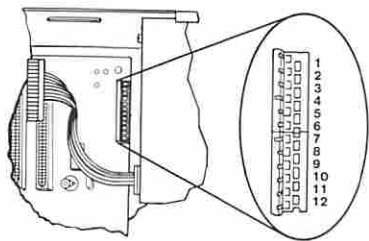


Figure 5. System Board Resistance

ARE ANY RESISTANCE VALUES BELOW THE MINIMUM INDICATED?

Yes No

046

Replace the power supply.

047

Replace the system board.

048

(From Step 004 in this MAP)

- Power off the system.
- Connect the expansion unit cable.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

Note: An 1801 error may occur. Disregard the error and continue with the POST.

DID THE ADVANCED DIAGNOSTIC MENU APPEAR?

Yes	No
-----	----

049

Go to Step 052 in this MAP.

050

- Run the Expansion Option tests. Use the (RUN TESTS ONE TIME) option.

DID YOU RECEIVE AN 1820 ERROR CODE?

Yes	No
-----	----

051

Replace the extender card.

052

(From Step 049 in this MAP)

An adapter may be failing. Perform the the following:

- Power off the system.
- Remove one option adapter (except the receiver card) from the expansion board.
- Power on the system.
- Repeat the above steps until you find the failing adapter, or all option adapters have been removed.

DID THE SYMPTOM REMAIN?

Yes	No
-----	----

053

Replace the last adapter removed.

(Step 054 continues)

054

- Power off the system.
- Replace the receiver card.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes	No
055	
You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.	

056

Replace the expansion card.

057

(From Step 015 in this MAP)

- Remove the Half-High Diskette Drive assembly.
- Connect the diskette drive power supply extension cable to the power supply connector.
- Remove the power supply connectors from both drives.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes	No
058	
- Power off the system.	
- Install the power supply connectors back on the drives one at a time.	
- Power on the system after each connector is installed.	
Replace the diskette drive that causes the symptom to return.	

059

Replace the diskette drive power supply extension cable.

MAP 0020: Power (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, you have been directed here from another MAP, or you suspect a power problem.	<ul style="list-style-type: none"> • The power supply is failing. • The diskette drive is failing. • The fixed disk drive is failing. • An option adapter is failing. • The system board is failing. • The math coprocessor is failing. • The speaker is failing.

001

ARE YOU IN THIS MAP FOR A 101 OR 107 POST ERROR MESSAGE?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 017 in this MAP.

004

(From Step 002 in this MAP)

- Power off the system.
- Unplug the system unit power cord from the electrical outlet.
- If your system unit has a 115/230 Vac selector switch, verify that the selector switch is set for the correct voltage.
- Disconnect all cables and external devices, except the display, from the system unit.
- Plug the system unit power cord into the electrical outlet.
- Power on the system.

(Step 004 continues)

004 (continued)

DID THE SYMPTOM REMAIN?

Yes No

005

CAUTION

Power off the system before connecting any device.

- Connect the external devices to the system unit, one at a time, until the symptom returns.

Repair or replace the device causing the failure.

006

- Power off the system.
- Remove the system unit cover.
- Reseat the power connectors.
- Power on the system.
- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at power supply connector P8.

**System Board
Connectors
(XT Type 5162)**

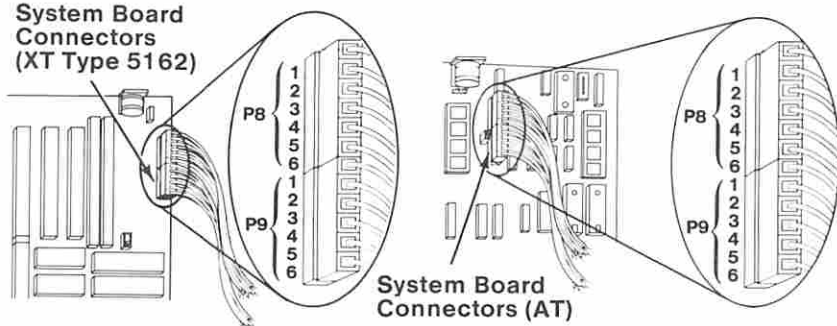


Figure 1. System Board Power Supply Connector

DO YOU HAVE 2.4 TO 5.2 VDC BETWEEN PINS 1 AND 5?

Yes No

(Step 007 continues)

007

Go to Step 013 in this MAP.

008

- Check the system board power connectors for the correct voltages (see Figure 2).
- Check the diskette drive and fixed disk drive power connectors for the correct voltages (see Figure 3).

Note: If no fixed disk drives are installed in your system, a power supply load resistor is required for normal operation of the power supply. The load resistor may be attached to either connector P10 or P11.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	P8-5	P9-4
+ 4.5	+ 5.4	P9-3	P8-6
+11.5	+12.6	P9-1	P8-3
+10.8	+12.9	P8-4	P9-2

Figure 2. System Board Voltages

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

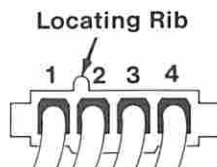


Figure 3. Diskette Drive and Fixed Disk Drive Voltages

ARE ALL VOLTAGES CORRECT?

Yes No

009

Replace the power supply.

(Step 010 continues)

010

- Power off the system.
- Set the meter to the Ohms x 1 scale.
- Disconnect the speaker cable from the system board.
- Check the continuity of the speaker.

DOES THE SPEAKER HAVE CONTINUITY?

Yes	No
	011
	Replace the speaker.

012

- Reconnect the speaker.
- Go to Step 013 in this MAP.
-

013

(From Steps 007, 012, and 015 in this MAP)

You may have a failing diskette drive or fixed disk drive. Perform the following:

- Power off the system.
- Remove the power connector from one of the drives.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes	No
	014
	Replace the failing drive.

015

- Reinstall the connector you removed in Step 013 in this MAP.
- Perform the same procedure for any remaining drives.

DID THE SYMPTOM REMAIN?

Yes	No
	016
	Replace the failing drive.

(Step 017 continues)

017

(From Step 003 in this MAP)

You may have a failing adapter. Perform the following:

- Power off the system.
- Remove one option adapter from the system board. Do not remove the Fixed Disk and Diskette Drive Adapter or the primary display adapter.
- Power on the system.
- Repeat this procedure until you find the failing adapter or all option adapters (except the Fixed Disk and Diskette Drive Adapter and primary display adapter) have been removed.

DID THE SYMPTOM REMAIN?

Yes	No
------------	-----------

	018
--	------------

	Replace the last adapter removed.
--	-----------------------------------

019

You may have a failing math coprocessor.

IS A MATH COPROCESSOR INSTALLED IN THE SYSTEM?

Yes	No
------------	-----------

	020
--	------------

	Go to Step 023 in this MAP.
--	-----------------------------

021

- Power off the system.
- Remove the math coprocessor from the system board.
- Power on the system.

DID THE SYMPTOM REMAIN?

Yes	No
------------	-----------

	022
--	------------

	Replace the math coprocessor. If this does not correct the problem, replace the system board.
--	---

023

(From Step 020 in this MAP)

(Step 023 continues)

023 (continued)

- Power off the system.
- Remove the Fixed Disk and Diskette Drive Adapter from the system board.
- Power on the system.

Removal of the Fixed Disk and Diskette Drive Adapter results in a 601 error code, disregard this error.

DID THE SYMPTOM REMAIN?

Yes	No
-----	----

	024
--	------------

	Replace the Fixed Disk and Diskette Drive Adapter. If that does not correct the problem, replace the system board.
--	--

025

- Power off the system.
- Remove the primary display adapter from the system board.
- Power on the system.

Removal of the primary display adapter results in one long and two short beeps during the POST.

DID YOU RECEIVE ONE LONG AND TWO SHORT BEEPS?

Yes	No
-----	----

	026
--	------------

	Go to Step 028 in this MAP.
--	-----------------------------

027

Replace the primary display adapter. If that does not correct the problem replace the system board.

028

(From Step 026 in this MAP)

- Power off the system.
- Wait 10 seconds.
- Power on the system.
- Check for a voltage of 2.4 to 5.2 Vdc between pins 1 and 5 (ground) at power supply connector P8.

**System Board
Connectors
(XT Type 5162)**

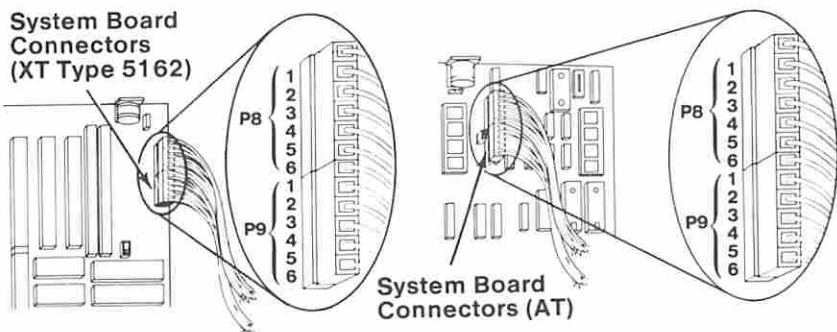


Figure 4. System Board Power Supply Connector

DO YOU HAVE 2.4 TO 5.2 VDC BETWEEN PINS 1 AND 5?

Yes No

029

Replace the power supply. If that does not correct the problem, replace the system board.

030

IS YOUR SYSTEM AN XT Type 5162?

Yes No

031

Replace the system board. If that does not correct the problem replace the power supply.

032

Swap Memory Module Package 1 and Memory Module Package 2.

DID THE SYMPTOM CHANGE?

Yes No

033

(Step 033 continues)

033 (continued)

Replace the system board. If that does not correct the problem replace the power supply.

034

Replace Memory Module Package 1. If this does not correct the problem, replace Memory Module Package 2.

DID THE SYMPTOM REMAIN?

Yes No

035

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

036

Replace the system board. If that does not correct the problem replace the power supply.

MAP 0100: System Board Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, or you received a 1XX error message.	<ul style="list-style-type: none">The system board is failing.

001

Find your system type in the following figure and go to the MAP indicated.

System Type	MAP
Personal Computer	MAP 0100: System Board (PC)
Personal Computer XT	MAP 0100: System Board (PC)
Personal Computer XT (5162)	MAP 0100: System Board (AT)
Portable PC	MAP 0100: System Board (PC)
Personal Computer AT	MAP 0100: System Board (AT)

Figure 1. System Identification

Notes:

MAP 0100: System Board (PC)

0100

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, or you received a 1XX error message.	<ul style="list-style-type: none">The system board is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

DID THE POST FINISH WITHOUT A 1XX ERROR MESSAGE?

Yes No

002

Replace the system board.

003

- Select **0 (SYSTEM CHECKOUT)**.
- Run the System Board tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE A 1XX ERROR MESSAGE?

Yes No

004

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

(Step 005 continues)

005

DID YOU RECEIVE A 199 ERROR MESSAGE?

Yes No

006

Replace the system board.

007

- Refer to "MAP 0000: Start (PC)," and verify the installed devices.

Note: The 199 error message indicates you answered "No" to the question about the installed devices list.

MAP 0100: System Board (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, or you received a 1XX error message.	<ul style="list-style-type: none">• The system board is failing.• The battery is failing.• The keyboard cable is failing.• The keyboard is failing.

0100

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Wait at least 10 seconds.
- Power on the system.

DID YOU RECEIVE A 1XX ERROR MESSAGE DURING THE POST?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 009 in this MAP.

004

(From Step 002 in this MAP)

DID THE ADVANCED DIAGNOSTICS MENU APPEAR ON THE SCREEN?

Yes No

005

Go to "MAP 0000: Start (AT)."

006

(Step 006 continues)

006 (continued)

- Press **0 (SYSTEM CHECKOUT)**.
- Run the System Board tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE A 1XX ERROR?

Yes No

007

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

008

Replace the system board.

009

(From Step 003 in this MAP)

Find your error code in the following figure and take the action indicated.

Error Code	Action
105	Go to Step 018 in this MAP.
162, 163, 164	Go to MAP 0000: Start (AT).
101, 107	Go to MAP 0020: Power Start.
151, 161	Go to Step 010 in this MAP.
102, 103, 104, 106, 108, 109, 121, 152	Replace the System Board.

Figure 1. POST Errors

010

(From Step 009 in this MAP)

This error message indicates a new or a defective battery is in the system.

IS A NEW BATTERY INSTALLED IN THE SYSTEM?

Yes	No
	011
	Go to Step 015 in this MAP.

012

- Run the Setup program and correct any errors.

Note: A 161 Battery Defective or New Battery Installed message appears during the POST after battery installation or replacement.

DID RUNNING THE SETUP PROGRAM CORRECT THE PROBLEM?

Yes	No
	013
	Go to Step 015 in this MAP.

014

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

015

(From Steps 011 and 013 in this MAP)

- Disconnect the battery from the system board and check the voltage between pins 1 and 4 on the battery cable connector.

WAS THE VOLTAGE AT LEAST 6.0 VDC?

Yes No

|

016

Replace the battery.

CAUTION

Fire, explosion, and severe burn hazard can be caused by the battery. **DO NOT** recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose battery cell contents to water.

017

- Replace the system board.
-

018

(From Step 009 in this MAP)

- Power off the system.
- Disconnect the keyboard cable from the system unit.
- Power on the system.

DID YOU RECEIVE A 105 ERROR MESSAGE?

Yes No

|

019

Go to Step 021 in this MAP.

020

Replace the system board.

021

(From Step 019 in this MAP)

- Power off the system.
- Disconnect the keyboard cable from the keyboard.

(Step 021 continues)

021 (continued)

- Refer to Figure 2, and check the keyboard cable for continuity.

Note: Check the continuity of wires 1, 2, 4, and 5 (wire 3 is not used).

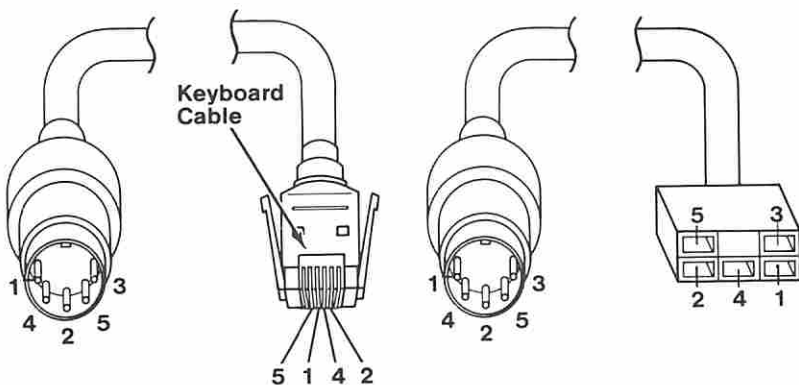


Figure 2. Continuity Check

DOES THE KEYBOARD CABLE HAVE CONTINUITY?

Yes No

022

Replace the keyboard cable.

023

Replace the keyboard assembly.

Notes:

MAP 0200: Memory Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, the memory size displayed was incorrect, there was a memory parity check, you received an error message indicating a memory failure, or you have been directed here from another MAP.	<ul style="list-style-type: none">• A memory module is failing.• A memory expansion adapter is failing.• The system board is failing.• The Setup program options are not correctly set.

001

Find your system and system board type in the following figure and go to the MAP indicated.

System Type	System Board	MAP
Personal Computer	16/64KB	MAP 0200: Memory PC
Personal Computer	64/256KB	MAP 0200: Memory PC
Portable PC	64/256KB	MAP 0200: Memory XT
Personal Computer XT	64/256KB	MAP 0200: Memory XT
Personal Computer XT	256/640KB	MAP 0200: Memory XT
Personal Computer XT (5162)	All	MAP 0200: Memory XT (5162)
Personal Computer AT	All	MAP 0200: Memory AT
Note: 16/64KB, 64/256KB and 256/640KB system boards are marked along the left edge of the system board.		

Figure 1. System Identification

Notes:

MAP 0200: Memory (PC)

001

When a memory failure is detected during the POST, a 201 error message preceded by a four-character error code (XXXX 201) may be displayed. This error message lasts about 1 second before being replaced by a Parity Check message.

Watch the display carefully and make a note of the four-character error code.

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

DID A 201 ERROR OCCUR DURING THE POST?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 011 in this MAP.

004

(From Step 002 in this MAP)

IS THE ADVANCED DIAGNOSTICS MENU DISPLAYED?

Yes No

005

Go to "MAP 0020: Power Start."

006

- Select 0 (SYSTEM CHECKOUT).

DOES THE AMOUNT OF MEMORY DISPLAYED ON THE INSTALLED DEVICES MENU MATCH THE AMOUNT OF INSTALLED MEMORY?

Yes No

007

(Step 007 continues)

007 (continued)

Go to Step 018 in this MAP.

008

(From Step 020 in this MAP)

- Press **Y (IS THE LIST CORRECT)**.
- Press **0 (RUN TESTS ONE TIME)**.
- Press **2 (XXX KB MEMORY)**.

DID YOU RECEIVE AN ERROR MESSAGE DURING DIAGNOSTIC TESTS?

Yes No

009

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

010

- Note the four-character error code as shown in Figure 1. You will need it for later steps.

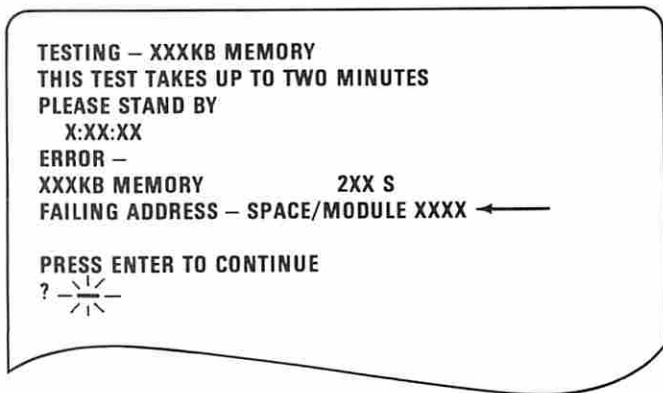


Figure 1. Advanced Diagnostics Error Message

Continue with Step 011 in this MAP.

011

(From Steps 003 and 010 in this MAP)

IS A 16/64KB SYSTEM BOARD INSTALLED?

Yes No

012

Go to Step 021 in this MAP.

013

IS THE FIRST CHARACTER OF THE ERROR CODE 0?

Yes No

014

Go to "MAP 0200: PC Family Expansion Memory."

015

- Find the failing bank and module in Figure 2.

Notes:

1. The failing bank is identified by the first two characters of the error code.
2. The failing module is identified by the last two characters of the error code.

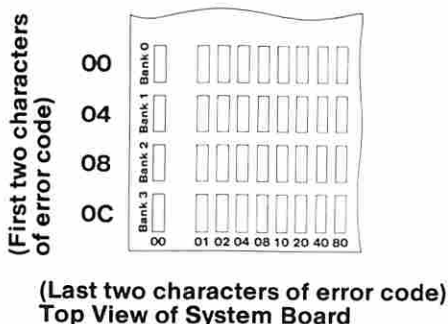


Figure 2. System Board

(Step 015 continues)

015 (continued)

DID YOU FIND THE FAILING MODULE?

Yes No

016

Replace the nine modules in the failing bank. If this does not correct the problem, replace the system board.

017

Replace the failing module, then go to Step 001 to verify system operation.

018

(From Step 007 in this MAP)

- Check the memory switches on the system board and any installed memory expansion options.

ARE THE SWITCH SETTINGS CORRECT?

Yes No

019

Correct the switch settings, then go to Step 001 to verify system operation.

020

- Press **N** then **Enter**.
 - Follow the instructions on the screen to correct the memory size, then go to Step 008 in this MAP to verify system operation.
-

021

(From Step 012 in this MAP)

IS THE FIRST CHARACTER OF THE ERROR CODE 0, 1, 2, OR 3?

Yes No

022

Go to "MAP 0200: PC Family Expansion Memory."

023

(Step 023 continues)

023 (continued)

- Find the failing bank and module in Figure 3.

Notes:

1. The failing bank is identified by the first character of the error code.
2. The failing module is identified by the last two characters of the error code.

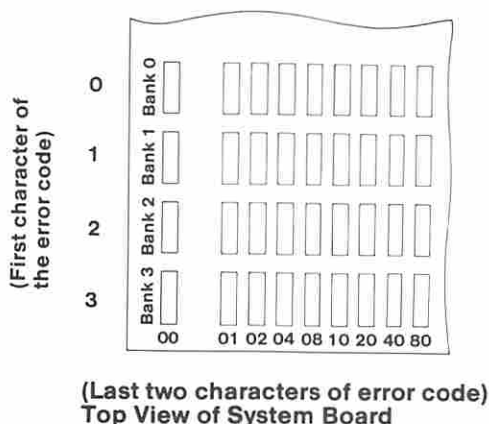


Figure 3. System Board

DID YOU FIND THE FAILING MODULE?

Yes No

024

Replace the nine modules in the failing bank. If this does not correct the problem, replace the system board.

025

Replace the failing module, then go to Step 001 to verify system operation.

Notes:

MAP 0200: Memory XT

001

IS A 64/256KB SYSTEM BOARD INSTALLED?

Yes No

002

Go to Step 034 in this MAP.

003

(From Step 025 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostic diskette into drive A.
- Power on the system.

DID A 201 ERROR OCCUR DURING THE POST?

Yes No

004

Go to Step 006 in this MAP.

005

Go to Step 019 in this MAP.

006

(From Step 004 in this MAP)

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

007

Go to Step 027 in this MAP.

008

- Select 0 (SYSTEM CHECKOUT).

DOES THE AMOUNT OF MEMORY DISPLAYED ON THE
INSTALLED DEVICES LIST MATCH THE AMOUNT OF
MEMORY INSTALLED?

Yes No

(Step 009 continues)

009

Go to Step 024 in this MAP.

010

(From Step 026 in this MAP)

IS THE INSTALLED DEVICES LIST CORRECT?

Yes No

|

011

Press **N** and follow the instructions on the screen, then go to Step 012 in this MAP.

012

(From Step 011 in this MAP)

- Press **Y** (**IS THE LIST CORRECT**).
- Press **0** (**RUN TESTS ONE TIME**).
- Press **2** (**XXX KB MEMORY**).

**DID YOU RECEIVE AN ERROR MESSAGE DURING
DIAGNOSTIC TESTS?**

Yes No

|

013

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

014

**DOES THE ERROR MESSAGE HAVE A 201 ERROR CODE
DISPLAYED?**

Yes No

|

015

Go to Step 027 in this MAP.

016

- Note the seven-character error code (**XXXXXX XX**) as shown in Figure 1 on page 0200-3.

TESTING - XXXKB MEMORY
 THIS TEST TAKES UP TO TWO MINUTES
 PLEASE STAND BY
 X:XX:XX
 ERROR - XXXKB MEMORY 201 S
 FAILING ADDRESS - SPACE/MODULE XXXXX XX


 PRESS ENTER TO CONTINUE
 ? 

Figure 1. Advanced Diagnostic Error Message

IS THE FIRST CHARACTER OF THE SEVEN-CHARACTER ERROR CODE 0, 1, 2, OR 3?

Yes No

017

Go to "MAP 0200: PC Family Expansion Memory."

018

Go to Step 021 in this MAP.

019

(From Step 005 in this MAP)

201 is preceded by a seven-character error code (XXXXXX XX 201).

IS THE FIRST CHARACTER OF THE SEVEN-CHARACTER ERROR CODE 0, 1, 2, OR 3?

Yes No

020

Go to "MAP 0200: PC Family Expansion Memory."

021

(From Step 018 in this MAP)

- Find the failing bank and module in Figure 2 on page 0200-4.

Notes:

1. The failing bank is identified by the first character of the error code.
2. The failing module is identified by the last two characters of the error code.

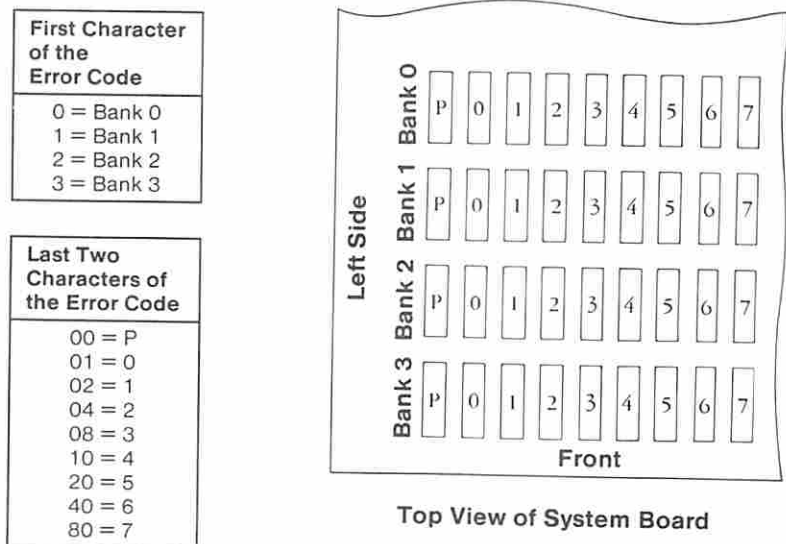


Figure 2. System Board

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

022

Replace the nine modules in the failing bank. If this does not correct the problem, replace the system board.

023

Replace the failing module, then go to Step 001 in this MAP to verify system operation.

024

(From Step 009 in this MAP)

- Check the memory switch settings on the system board and any installed memory expansion options.

ARE THE SWITCH SETTINGS CORRECT?

Yes No

025

Correct the switch settings, then go to Step 003 in this MAP to verify system operation.

026

- Press **N** then **Enter**.
 - Follow the instructions on the screen to correct the memory size, then go to Step 010 in this MAP.
-

027

(From Steps 007 and 015 in this MAP)

IS A PARITY CHECK MESSAGE DISPLAYED?

Yes No

028

Go to "MAP 0020: Power Start."

029

IS A FIVE-CHARACTER ERROR CODE DISPLAYED UNDER THE PARITY CHECK MESSAGE?

Yes No

030

Go to "MAP 0020: Power Start."

031

IS THE FIRST CHARACTER OF THE ERROR CODE 0, 1, 2, OR 3.

Yes No

032

Go to "MAP 0200: PC Family Expansion Memory."

(Step 033 continues)

033

- Find the failing bank in the following figure.

Note: The failing bank is identified by the first character of the error code.

- Replace the nine memory modules in the failing bank, then go to Step 001 in this MAP to verify system operation.

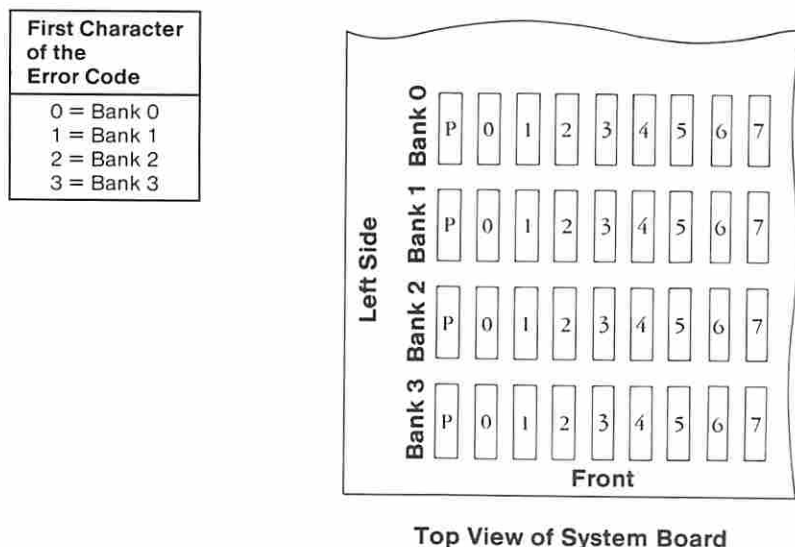


Figure 3. System Board

034

(From Steps 002 and 050 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

(Step 034 continues)

034 (continued)

DID A 201 ERROR OCCUR DURING THE POST?

Yes No

035

Go to Step 037 in this MAP.

036

201 is preceded by a seven-character error code (XXXXXX XX 201). Note the seven-character error code then go to Step 046 in this MAP.

037

(From Step 035 in this MAP)

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

038

Go to Step 052 in this MAP.

039

- Select 0 (SYSTEM CHECKOUT).

DOES THE AMOUNT OF MEMORY DISPLAYED ON THE INSTALLED DEVICES LIST MATCH THE AMOUNT OF MEMORY INSTALLED?

Yes No

040

Go to Step 049 in this MAP.

041

(From Step 051 in this MAP)

- Press Y (IS THE LIST CORRECT).
- Press 0 (RUN TESTS ONE TIME).
- Press 2 (XXX KB MEMORY).

(Step 041 continues)

DID YOU RECEIVE AN ERROR MESSAGE DURING DIAGNOSTIC TESTS?

Yes No

042

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

043

DID THE ERROR MESSAGE HAVE A 201 ERROR CODE DISPLAYED?

Yes No

044

Go to Step 052 in this MAP.

045

- Note the seven-character error code (XXXXXX XX) as shown in Figure 4.

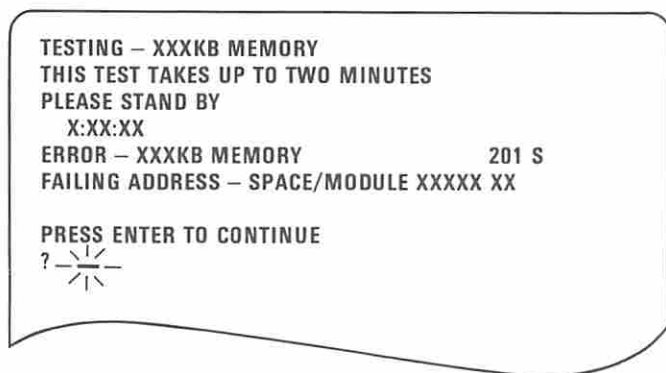


Figure 4. Advanced Diagnostic Error Message

- Continue with Step 046 in this MAP.

046

(From Steps 036 and 045 in this MAP)

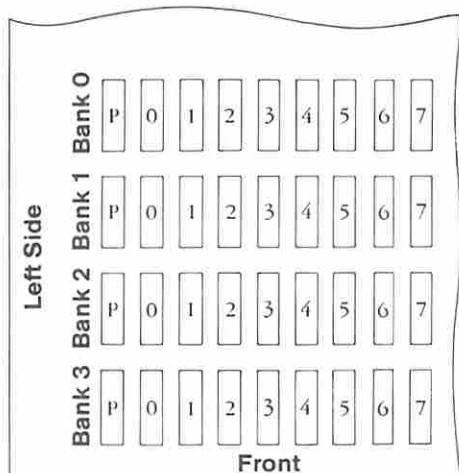
- Refer to Figure 5 on page 0200-9 and find the failing bank and module.

Notes:

1. The failing bank is identified by the first character of the error code.
2. The failing module is identified by the last two characters of the error code.

First Character of the Error Code
0,1,2, or 3 = Bank 0
4,5,6, or 7 = Bank 1
8 = Bank 2
9 = Bank 3

Last Two Characters of the Error Code
00 = P
01 = 0
02 = 1
04 = 2
08 = 3
10 = 4
20 = 5
40 = 6
80 = 7



Top View of System Board

Figure 5. System Board

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

047

Replace the nine modules in the failing bank. If this does not correct the problem, replace the system board.

048

Replace the failing module, then go to Step 001 in this MAP to verify system operation.

Note: Banks 0 and 1 use 256K memory modules. Banks 2 and 3 use 64K memory modules.

049

(From Step 040 in this MAP)

- Check the memory switches on the system board and any installed memory expansion options.

ARE THE SWITCH SETTINGS CORRECT?

Yes	No

050

Correct the switch settings, then go to Step 034 in this MAP to verify system operation.

051

- Press **N** then **Enter**.
 - Follow the instructions on the screen, then go to Step 041 in this MAP.
-

052

(From Steps 038 and 044 in this MAP)

DO YOU HAVE A PARITY CHECK MESSAGE DISPLAYED?

Yes	No

053

Go to "MAP 0020: Power Start."

054

IS A FIVE-CHARACTER ERROR CODE DISPLAYED UNDER THE PARITY CHECK MESSAGE?

Yes	No

055

Go to "MAP 0020: Power Start."

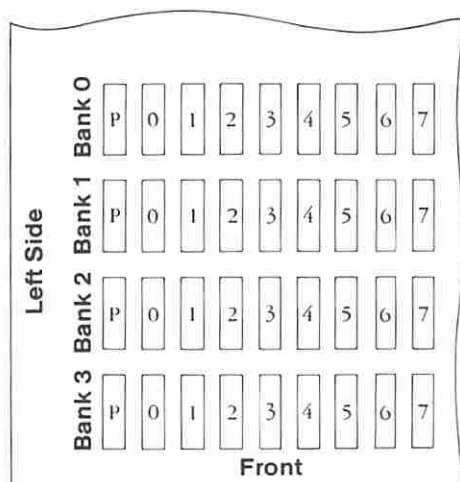
056

- Find the failing bank in Figure 6 on page 0200-11.

Note: The failing bank is identified by the first character of the error code.

**First Character of
the Error Code**

0,1,2, or 3 = Bank 0
4,5,6, or 7 = Bank 1
8 = Bank 2
9 = Bank 3



Top View of System Board

Figure 6. System Board

- Replace the nine memory modules in the failing bank, then go to Step 001 in this MAP to verify system operation.

Note: Banks 0 and 1 use 256K memory modules.
Banks 2 and 3 use 64K memory modules.

Notes:



MAP 0200: PC Family Expansion Memory

Symptom Explanation	Conditions That Could Cause This Symptom
<p>You have entered this MAP from another memory MAP because you have one of the following error messages:</p> <p>XXXXXX XX 20X</p> <p>XXXX 20X</p> <p>PARITY CHECK X XXXXX</p>	<ul style="list-style-type: none">• The memory expansion option is failing.• A memory module is failing.• The system board is failing.

0200

001

DID YOU RECEIVE AN XXXXX XX OR XXXX ERROR MESSAGE?

Yes No

002

Go to Step 049 in this MAP.

003

ARE ANY 32KB MEMORY EXPANSION OPTIONS INSTALLED?

Yes No

004

Go to Step 008 in this MAP.

005

- Refer to Figure 1 on page 0200-2 and find the first two characters of the error code and the corresponding 32KB Memory Expansion Option switch setting.
(Step 005 continues)

005 (continued)

- Compare the switch setting identified in Figure 1 to the switch setting on each 32KB Memory Expansion Option in the system.

32KB Memory Expansion Option		32KB Memory Expansion Option	
First Two Characters of Error Code	Switch Settings 12345678	First Two Characters of Error Code	Switch Settings 12345678
10 or 14	↑↑↑↓↑***	58 or 5C	↑↓↑↓↑***
18 or 1C	↑↑↑↓↑***	60 or 64	↑↓↑↑↑***
20 or 24	↑↑↓↑↑***	68 or 6C	↑↓↑↓↑***
28 or 2C	↑↑↓↑↓***	70 or 74	↑↓↑↑↑***
30 or 34	↑↑↓↑↑***	78 or 7C	↑↓↑↓↑***
38 or 3C	↑↑↓↑↓***	80 or 84	↓↑↑↑↑***
40 or 44	↑↓↑↑↑***	88 or 8C	↓↑↑↑↓***
48 or 4C	↑↓↑↑↓***	90 or 94	↓↑↑↑↑***
50 or 54	↑↓↑↑↑***	98 or 9C	↓↑↑↓↑***

Figure 1. 32KB Memory Expansion Option

IS A 32KB MEMORY EXPANSION OPTION INSTALLED WITH SWITCH SETTINGS THAT MATCH THE ONE IDENTIFIED (Figure 1)?

Yes No

|

006

Go to Step 008 in this MAP.

007

(Step 007 continues)

007 (continued)

Replace the 32KB Memory Expansion Option. Refer to "MAP 0200: Memory Start" to verify system operation.

008

(From Steps 004 and 006 in this MAP)

**ARE ANY 64KB MEMORY EXPANSION OPTIONS
INSTALLED?**

Yes No

009

Go to Step 013 in this MAP.

010

- Refer to Figure 2 on page 0200-4 and find the first character of the error code and the corresponding 64KB Memory Expansion Option switch setting.
- Compare the switch setting identified in Figure 2 on page 0200-4 to the switch setting on each 64KB Memory Expansion Option in the system.

64KB Memory Expansion Option	
First Characters of Error Code	Switch Settings 12345678
1	↑↑↑↓****
2	↑↑↓↑****
3	↑↑↓↓****
4	↑↓↑↑****
5	↑↓↓↓****
6	↑↓↓↑****
7	↑↓↓↓****
8	↓↑↑↑****
9	↓↑↑↓****

Figure 2. 64KB Memory Expansion Option

**IS A 64KB MEMORY EXPANSION OPTION INSTALLED
WITH SWITCH SETTINGS THAT MATCH THE ONE
IDENTIFIED (Figure 2)?**

Yes No

|

011

Go to Step 013 in this MAP.

012

Replace the 64KB Memory Expansion Option. Refer to "MAP
0200: Memory Start" to verify system operation.

013

(From Steps 009 and 011 in this MAP)

ARE ANY 64/256KB MEMORY EXPANSION OPTIONS INSTALLED?

Yes	No

014

Go to Step 034 in this MAP.

015

- Refer to Figure 3 on page 0200-6 and find the first character of the error code and the corresponding 64/256KB Memory Expansion Option switch setting.
- Compare the switch setting identified in Figure 3 on page 0200-6 to the switch setting on each 64/256KB Memory Expansion Option in the system.

64/256KB Memory Expansion Option		
First Character of Error Code	Switch Settings	
	16/64KB CPU 12345678	64/256KB CPU 12345678
1	↑↑↑↓****	N/A
2	↑↑↑↓****	N/A
3	↑↑↑↓****	N/A
4	↑↑↑↓****	↑↓↑↑*****
5	↑↓↑↓****	↑↓↑↑*****
6	↑↓↑↓****	↑↓↑↑*****
7	↑↓↑↓****	↑↓↑↑*****
8	↑↓↑↓****	↓↑↑↑*****
9	↓↑↑↓****	↓↑↑↑*****

Figure 3. 64/256KB Memory Expansion Option

**IS A 64/256KB MEMORY EXPANSION OPTION
INSTALLED WITH SWITCH SETTINGS THAT MATCH THE
ONE IDENTIFIED (Figure 3)?**

Yes No

016

Go to Step 034 in this MAP.

017

**ARE THE LAST TWO CHARACTERS OF THE ERROR CODE
00, 01, 02, 04, 08, 20, 40, OR 80?**

Yes No

(Step 018 continues)

018

Replace the 64/256KB Memory Expansion Option. Remove the memory modules from the old option, and install them on the new option. Refer to "MAP 0200: Memory Start" to verify system operation.

019

- Find the failing bank and module in Figure 4.

Note: The failing bank is identified by the first character of the error code; the failing module is identified by the last two characters of the error code.

First Character of Error Code	Type of System Board		Last Two Characters of the Error Code
	16KB/64KB	64KB/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

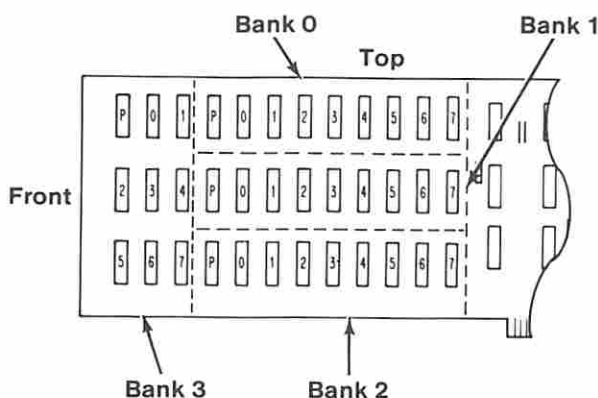


Figure 4. 64/256KB Memory Expansion Option

- Power off the system.
 - Replace the failing module.
- (Step 019 continues)

019 (continued)

- Power on the system.
- Run the Memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE A MEMORY ERROR?

Yes No

020

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

021

- Compare the error code to the error code received earlier.

IS THE FIRST CHARACTER OF EACH ERROR CODE THE SAME?

Yes No

022

You have another problem with memory. Go to "MAP 0200: Memory Start."

023

ARE THE LAST TWO CHARACTERS OF EACH ERROR CODE THE SAME?

Yes No

024

You have another problem with memory. Go to "MAP 200: Memory Start."

025

(From Step 032 in this MAP)

The same 64/256KB Memory Expansion Option is failing. The first character of the error code has incorrectly identified the failing bank.

- Power off the system.
- Refer to Figure 5.
- Replace the module in one of the banks that has not had the module replaced.

Note: The module is identified by the last two characters of the error code.

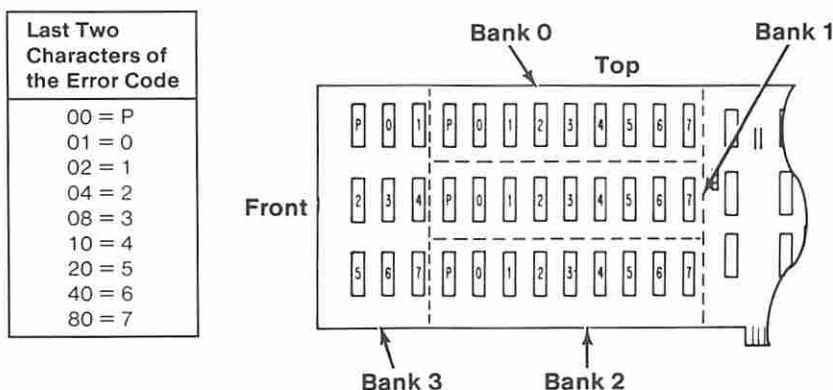


Figure 5. 64/256KB Memory Expansion Option

- Power on the system.
- Run the Memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE A MEMORY ERROR?

Yes No

026

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

027

- Compare the error code to the one you previously received.

DOES THE FIRST CHARACTER OF THE NEW ERROR CODE MATCH THE FIRST CHARACTER OF THE PREVIOUS ERROR CODE?

Yes No

(Step 028 continues)

028

You have another problem with memory. Go to "MAP 0200: Memory Start" and start again.

029

DO THE LAST TWO CHARACTERS OF THE NEW ERROR CODE MATCH THE LAST TWO CHARACTERS OF THE PREVIOUS ERROR CODE?

Yes No

030

You have another problem with memory. Go to "MAP 0200: Memory Start."

031

The same 64/256KB Memory Option is still failing.

HAVE YOU REPLACED THE MODULE (IDENTIFIED BY THE LAST TWO CHARACTERS OF THE ERROR CODE) IN ALL FOUR BANKS?

Yes No

032

Go to Step 025 in this MAP.

033

Replace the 64/256KB Memory Expansion Option. Remove the modules from the old option and install them on the new option. Refer to "MAP 0200: Memory Start" to verify system operation.

034

(From Steps 014 and 016 in this MAP)

DO YOU HAVE A 256KB MEMORY EXPANSION OPTION INSTALLED?

Yes No

035

Check all memory switch settings. Make the necessary corrections, then go to "MAP 0200: Memory Start."

(Step 036 continues)

- Refer to Figure 6 and find the first character of the error code and the corresponding 256KB Memory Expansion Option switch setting.
- Compare the switch setting identified in Figure 6 to the switch setting on each 256KB Memory Expansion Option in the system.

256KB Memory Expansion Option		
First Character of Error Code	Switch Settings	
	16/64KB CPU 12345678	64/256KB CPU 12345678
1	↑↑↑↓****	N/A
2	↑↑↑↓****	N/A
3	↑↑↑↓****	N/A
4	↑↑↑↓****	↑↓↑↑****
5	↑↓↑↓****	↑↓↑↑****
6	↑↓↑↓****	↑↓↑↑****
7	↑↓↑↓****	↑↓↑↑****
8	↑↓↑↓****	↓↑↑↑****
9	↓↑↑↓****	↓↑↑↑****

Figure 6. 256KB Memory Expansion Option

DO YOU HAVE A 256KB MEMORY EXPANSION OPTION WITH SWITCH SETTINGS THAT MATCH THE ONE IDENTIFIED (Figure 6)?

Yes No

|

(Step 037 continues)

037

Check all memory switch settings. Make the necessary corrections, then go to "MAP 0200: Memory Start."

038

- Refer to Figure 7 and find the failing module (identified by the first character of the error code).

First Character of Error Code	Type of System Board	
	16KB/64KB	64KB/256KB
1	Module 0	N/A
2	Module 1	N/A
3	Module 2	N/A
4	Module 3	Module 0
5	Module 0	Module 1
6	Module 1	Module 2
7	Module 2	Module 3
8	Module 3	Module 0
9	Module 0	Module 1

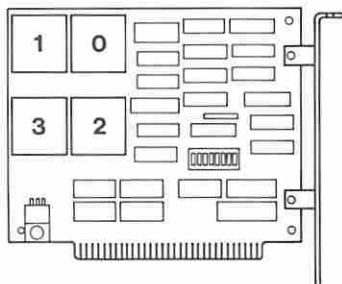


Figure 7. 256KB Memory Expansion Option

- Power off the system.
- Replace the failing module.
- Power on the system.
- Run the memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE AN ERROR?

Yes No

039

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

040

- Compare the error code to the error code received earlier.

(Step 040 continues)

040 (continued)

DOES THE FIRST CHARACTER OF THE NEW ERROR CODE MATCH THE FIRST CHARACTER OF THE PREVIOUS ERROR CODE?

Yes No

041

You have another problem with memory. Go to "MAP 0200: Memory Start."

042

(From Step 047 in this MAP)

The same 256KB Memory Expansion Option is failing. The Advanced Diagnostic tests have incorrectly identified the failing module.

- Power off the system.
- Replace one of the modules that has not been replaced.
- Power on the system.
- Run the Memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE AN ERROR?

Yes No

043

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

044

- Compare the error code to the error code you received earlier.

DOES THE FIRST CHARACTER OF THE NEW ERROR CODE MATCH THE FIRST CHARACTER OF THE PREVIOUS ERROR CODE?

Yes No

045

Go to "MAP 0200: Memory Start."

(Step 046 continues)

046

The same 256KB Memory Expansion Option is still failing.

HAVE ALL FOUR MODULES BEEN REPLACED?

Yes No

|
|
047

Go to Step 042 in this MAP.

048

Replace the 256KB Memory Expansion Option. Refer to "MAP 0200: Memory Start" to verify system operation.

049

(From Step 002 in this MAP)

You are here because you have received a Parity Check error message.

**ARE ANY 32KB MEMORY EXPANSION OPTIONS
INSTALLED?**

Yes No

|
|
050

Go to Step 054 in this MAP.

051

- Refer to Figure 8 on page 0200-15 and find the first two characters of the error code and the corresponding 32KB Memory Expansion Option switch settings.
- Compare the switch setting identified in Figure 8 on page 0200-15 to the switch settings on each 32KB Memory Expansion Option in the system.

32KB Memory Expansion Option	
First Two Characters of Error Code	Switch Settings 12345678
40 or 44	↑↓↑↑↑***
48 or 4C	↑↓↑↑↓***
50 or 54	↑↓↑↓↑***
58 or 5C	↑↓↑↓↓***
60 or 64	↑↓↑↑↑***
68 or 6C	↑↓↑↓↓***
70 or 74	↑↓↑↓↑***
78 or 7C	↑↓↑↓↓***
80 or 84	↓↑↑↑↑***
88 or 8C	↓↑↑↑↓***
90 or 94	↓↑↑↑↑***
98 or 9C	↓↑↑↓↓***

Figure 8. 32KB Memory Expansion Option

IS A 32KB MEMORY EXPANSION OPTION INSTALLED WITH SWITCH SETTINGS THAT MATCH THE ONE IDENTIFIED (Figure 8)?

Yes No

052

Go to Step 054 in this MAP.

(Step 053 continues)

053

Replace the 32KB Memory Expansion Option. Refer to "MAP 0200: Memory Start" to verify system operation.

054

(From Steps 050 and 052 in this MAP)

**ARE ANY 64KB MEMORY EXPANSION OPTIONS
INSTALLED?**

Yes No

055

Go to Step 059 in this MAP.

056

- Refer to Figure 9 and find the first character of the error code and the corresponding switch settings.
- Compare the switch setting identified in Figure 9 to the switch settings on each 64KB Memory Expansion Option in the system.

64KB Memory Expansion Option	
First Character of Error Code	Switch Settings 12345678
4	↑↓↑↑****
5	↑↓↑↓****
6	↑↓↑↑****
7	↑↓↑↓****
8	↓↑↑↑****
9	↓↑↑↓****

Figure 9. 64KB Memory Expansion Option

(Step 056 continues)

056 (continued)

IS A 64KB MEMORY EXPANSION OPTION INSTALLED WITH SWITCH SETTINGS THAT MATCH THE ONE IDENTIFIED (Figure 9 on page 0200-16)?

Yes No

057

Go to Step 059 in this MAP.

058

Replace the 64KB Memory Expansion Option. Refer to "MAP 0200: Memory Start" to verify system operation.

059

(From Steps 055 and 057 in this MAP)

ARE ANY 64/256KB MEMORY EXPANSION OPTIONS INSTALLED?

Yes No

060

Go to Step 064 in this MAP.

061

- Refer to Figure 10 and find the first character of the error code and the corresponding 64/256KB Memory Expansion Option switch setting.
- Compare the switch setting identified in Figure 10 to the switch settings on each 64/256KB Memory Expansion Option in the system.

64/256KB Memory Expansion Option	
First Character of Error Code	Switch Settings 12345678
4, 5, 6, or 7	↑↓↑↑****
8 or 9	↓↑↑↑****

Figure 10. 64/256KB Memory Expansion Option

061 (continued)

IS A 64/256KB MEMORY EXPANSION OPTION
INSTALLED WITH SWITCH SETTINGS THAT MATCH THE
ONE IDENTIFIED (Figure 10 on page 0200-17)?

Yes No

062

Go to Step 064 in this MAP.

063

- Refer to Figure 11 and find the failing bank identified by the first character of the error code.

First Character of Error Code
4 = Bank 0
5 = Bank 1
6 = Bank 2
7 = Bank 3
8 = Bank 0
9 = Bank 1

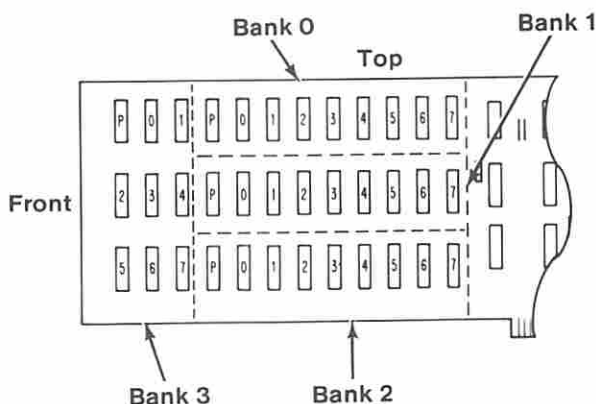


Figure 11. 64/256KB Memory Expansion Option

- Replace the nine modules in the failing bank. Refer to "MAP 0200: Memory Start" to verify system operation.

064

(From Steps 060 and 062 in this MAP)

ARE ANY 256KB MEMORY EXPANSION OPTIONS
INSTALLED?

Yes No

065

Check all memory switch settings. Make any necessary corrections, then go to "MAP 0200: Memory Start."

(Step 066 continues)

066

- Compare the switch setting identified in Figure 12 to the 256KB Memory Expansion Option in the system.

256KB Memory Expansion Option	
First Character of Error Code	Switch Settings 12345678
4, 5, 6, or 7	↑↓↑↑****

Figure 12. 256KB Memory Expansion Option

IS A 256KB MEMORY EXPANSION OPTION INSTALLED WITH SWITCH SETTINGS THAT MATCH THE ONE IDENTIFIED (Figure 12)?

Yes No

067

Check all memory switch settings. Make any necessary corrections, then go to "MAP 0200: Memory Start."

068

- Refer to Figure 13 and find the failing module identified by the first character of the error code.

First Character of Error Code
4 = Module 0
5 = Module 1
6 = Module 2
7 = Module 3
8 = Module 0
9 = Module 1

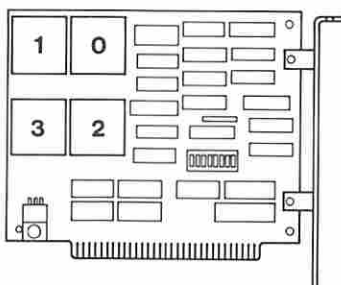


Figure 13. 256KB Memory Expansion Option

(Step 068 continues)

068 (continued)

- Replace the failing module. Refer to "MAP 0200: Memory Start" to verify system operation.
-

MAP 0200: Memory (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, the memory size displayed was incorrect, there was a memory parity check, or you have an error message indicating a memory failure.	<ul style="list-style-type: none">• A memory module is failing• A memory expansion option is failing• The system board is failing• The Setup program options are not correctly set.

0200

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

DID YOU RECEIVE A 10-CHARACTER ERROR CODE?

Note: If you also received a 164-Memory Size Error, run the Setup program and verify the memory size. If you receive a 164-Memory Size Error after attempting to correct the Setup program disregard the error and continue with this MAP.

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 019 in this MAP.

004

(From Step 002 in this MAP)

DID YOU RECEIVE A PARITY-CHECK MESSAGE?

Yes No

005

Go to Step 007 in this MAP.

006

Go to Step 129 in this MAP.

007

(From Step 005 in this MAP)

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

008

Go to "MAP 0020: Power Start."

009

- Select 0 (SYSTEM CHECKOUT).

**DOES THE AMOUNT OF MEMORY SHOWN IN THE
INSTALLED DEVICES LIST MATCH THE AMOUNT
INSTALLED IN THE SYSTEM?**

Yes No

010

Go to Step 012 in this MAP.

011

Go to Step 015 in this MAP.

012

(From Step 010 in this MAP)

- Check the switch settings on all installed memory expansion options.

(Step 012 continues)

012 (continued)

ARE THE SWITCH SETTINGS CORRECT?

Yes No

013

- Correct the switch settings and run the Setup program to verify the memory size.
Go to Step 001 in this MAP to verify system operation.

014

- Press "N" then **Enter**.
- Follow the instructions on the screen to correct the Installed Devices list.

Go to Step 017 in this MAP.

015

(From Step 011 in this MAP)

IS THE INSTALLED DEVICES LIST CORRECT?

Yes No

016

- Follow the instructions on the screen to correct the Installed Devices list then go to Step 017 in this MAP.

017

(From Steps 014 and 016 in this MAP)

- Run the Memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE A 10-CHARACTER ERROR CODE FOLLOWED BY 20X (XXXXXX XXXX 20X)?

Yes No

018

- Go to Step 127 in this MAP.

019

(From Steps 003 and 142 in this MAP)

- Refer to Figure 1 on page 0200-4 and find the first two characters of the error code and go to the step indicated.

First Two Digits of Error Code	Step
00 01 02 03 04 05 06 07	Step 020 in this MAP.
08 09	Step 032 in this MAP.
10 11 12 13 14 15 16 17	Step 046 in this MAP.
18 19 1A 1B 1C 1D 1E 1F	Step 049 in this MAP.
20 21 22 23 24 25 26 27	Step 052 in this MAP.
28 29 2A 2B 2C 2D 2E 2F	Step 055 in this MAP.
30 31 32 33 34 35 36 37	Step 058 in this MAP.
38 39 3A 3B 3C 3D 3E 3F	Step 061 in this MAP.
40 41 42 43 44 45 46 47	Step 064 in this MAP.
48 49 4A 4B 4C 4D 4E 4F	Step 067 in this MAP.
50 51 52 53 54 55 56 57	Step 070 in this MAP.
58 59 5A 5B 5C 5D 5E 5F	Step 073 in this MAP.
60 61 62 63 64 65 66 67	Step 076 in this MAP.
68 69 6A 6B 6C 6D 6E 6F	Step 079 in this MAP.
70 71 72 73 74 75 76 77	Step 082 in this MAP.
78 79 7A 7B 7C 7D 7E 7F	Step 085 in this MAP.
80 81 82 83 84 85 86 87	Step 088 in this MAP.
88 89 8A 8B 8C 8D 8E 8F	Step 091 in this MAP.
90 91 92 93 94 95 96 97	Step 094 in this MAP.
98 99 9A 9B 9C 9D 9E 9F	Step 097 in this MAP.
A0 A1 A2 A3 A4 A5 A6 A7	Step 100 in this MAP.
A8 A9 AA AB AC AD AE AF	Step 103 in this MAP.

Figure 1. Error Codes

020

(From Step 019 in this MAP)

- Refer to Figure 2 and determine the type of system board installed.

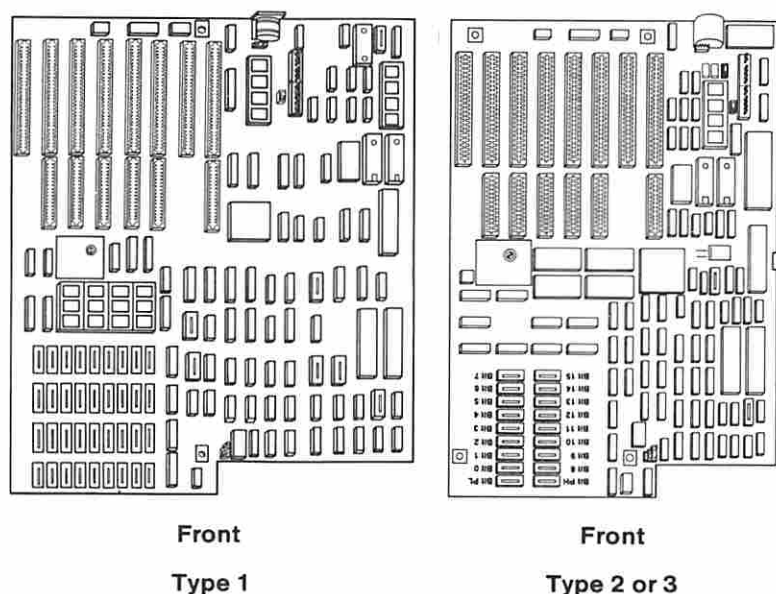


Figure 2. System Board Type

IS A TYPE 1 SYSTEM BOARD INSTALLED?

Yes No

021

Go to Step 027 in this MAP.

022

The first two characters of the error code (XXXXXX XXXX) indicate the bank with the failing memory module. The last four characters of the error code (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 3 on page 0200-6 and find the failing memory module identified by the error code.

Last Four Characters of Error Code
0000 = P
0001 = 0
0002 = 1
0004 = 2
0008 = 3
0010 = 4
0020 = 5
0040 = 6
0080 = 7
0100 = 8
0200 = 9
0400 = 10
0800 = 11
1000 = 12
2000 = 13
4000 = 14
8000 = 15

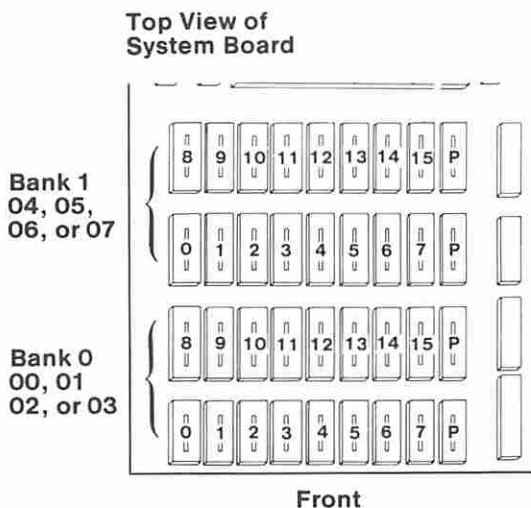


Figure 3. Type 1 System Board Memory

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

023

Replace the system board.

024

- Replace the failing memory module on the system board.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules in the failing bank.

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

025

Replace the system board.

(Step 026 continues)

026

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

027

(From Step 021 in this MAP)

The last four characters of the error code (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 4 and find the failing memory module identified by the error code.

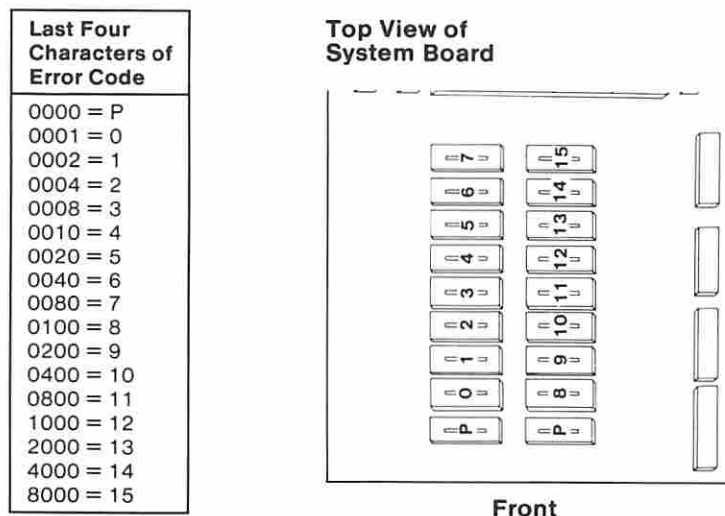


Figure 4. Type 2 and 3 System Board Memory

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

028

Replace the system board.

029

- Replace the failing memory module on the system board.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules.

029 (continued)

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

030

Replace the system board.

031

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

032

(From Step 019 in this MAP)

IS A 128KB MEMORY EXPANSION OPTION INSTALLED?

Yes No

033

Go to Step 039 in this MAP.

034

A 10-character error code that begins with 08 or 09 indicates a failure in bank 1 of the 128KB Memory Expansion Option. The last four characters of the error code (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 5 on page 0200-9 and find the failing memory module identified by the error code.

Last Four Characters of Error Code
0000 = P
0001 = 0
0002 = 1
0004 = 2
0008 = 3
0010 = 4
0020 = 5
0040 = 6
0080 = 7
0100 = 8
0200 = 9
0400 = 10
0800 = 11
1000 = 12
2000 = 13
4000 = 14
8000 = 15

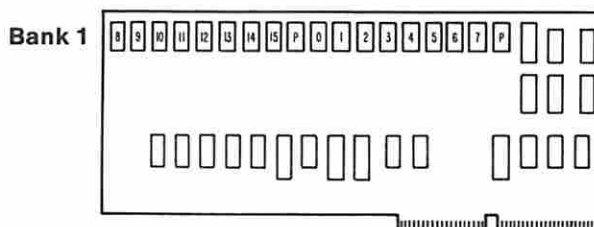


Figure 5. 128KB Memory Expansion Option

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

035

Replace the 128KB Memory Expansion Option.

036

Replace the failing memory module on the 128KB Memory Expansion Option.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules.

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

037

Replace the 128KB Memory Expansion Option.

(Step 038 continues)

038

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

039

(From Step 033 in this MAP)

IS A 128KB/640KB MEMORY EXPANSION OPTION INSTALLED?

Yes No

040

Go to Step 140 in this MAP.

041

A 10-character error code that begins with 08 or 09 indicates a failure in bank 1 of the 128/640KB Memory Expansion Option. The last four characters of your error code (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 6 and find the failing memory module for the error code.

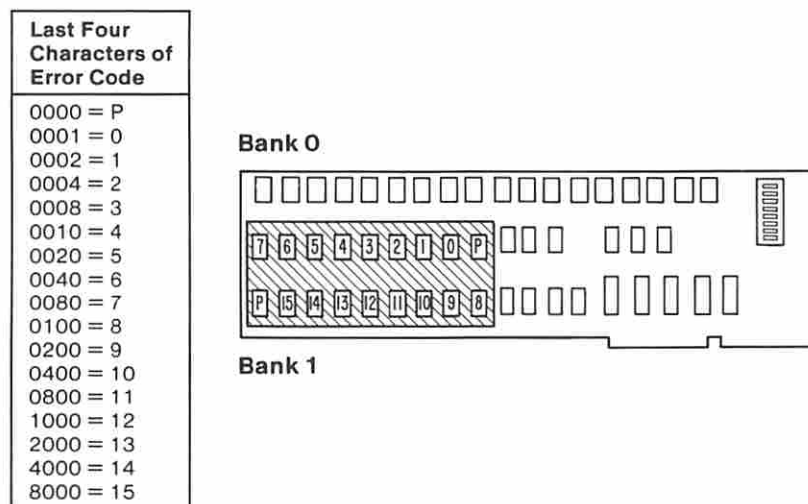


Figure 6. 128/640KB Memory Expansion Option

041 (continued)

DID YOU FIND THE FAILING MEMORY MODULE?

Yes	No
-----	----

042

Replace the 128KB/640KB Memory Expansion Option.

043

- Replace the failing memory module on the 128/640KB Memory Expansion Option.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules.

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes	No
-----	----

044

Replace the 128KB/640KB Memory Expansion Option.

045

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

046

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 7 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↑↓↑↑↑↑		512KB	10 11 12 13
1		↑↑↑↓↑↓↑↓	512KB	14 15 16 17
0	↑↑↑↓↑↑↑↓		128/640KB	10 11 12 13 14 15 16 17
0	↑↑↑↓↑↑↑↑		512KB/2MB	10 11 12 13 14 15 16 17

Figure 7.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

047

Go to Step 140 in this MAP.

048

Go to Step 106 in this MAP.

0200

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 8 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↑↓↑↑↑↑		512KB	18 19 1A 1B
1		↑↑↑↓↑↓↑↓	512KB	1C 1D 1E 1F
0	↑↑↑↓↑↑↑↓		128/640KB	18 19 1A 1B 1C 1D 1E 1F
0	↑↑↑↓↑↑↑↑		512KB/2MB	18 19 1A 1B 1C 1D 1E 1F
1	↑↑↑↓↑↑↑↑		512KB/2MB	18 19 1A 1B 1C 1D 1E 1F

Figure 8.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

050

Go to Step 140 in this MAP.

051

Go to Step 106 in this MAP.

052

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 9 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↓↑↑↑↑↑		512KB	20 21 22 23
1		↑↑↓↑↑↓↑↓	512KB	24 25 26 27
0	↑↑↓↑↑↑↑↓		128/640KB	20 21 22 23 24 25 26 27
0	↑↑↓↑↑↑↑↑		512KB/2MB	20 21 22 23 24 25 26 27
1	↑↑↑↓↑↑↑↑		512KB/2MB	20 21 22 23 24 25 26 27
2	↑↑↑↓↑↑↑↑		512KB/2MB	20 21 22 23 24 25 26 27

Figure 9.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

053

Go to Step 140 in this MAP.

054

Go to Step 106 in this MAP.

055

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 10 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↓↑↓↑↑↑		512KB	28 29 2A 2B
1		↑↑↑↓↑↓↑↓	512KB	2C 2D 2E 2F
0	↑↑↓↑↓↑↑↓		128/640KB	28 29 2A 2B 2C 2D 2E 2F
0	↑↑↓↑↓↑↑↑		512KB/2MB	28 29 2A 2B 2C 2D 2E 2F
1	↑↑↑↑↑↑↑↑		512KB/2MB	28 29 2A 2B 2C 2D 2E 2F
2	↑↑↑↓↑↑↑↑		512KB/2MB	28 29 2A 2B 2C 2D 2E 2F
3	↑↑↑↑↑↑↑↑		512KB/2MB	28 29 2A 2B 2C 2D 2E 2F

Figure 10.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

| |

056

Go to Step 140 in this MAP.

057

Go to Step 106 in this MAP.

058

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 11 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↓↑↑↑↑↑		512KB	30 31 32 33
1		↑↑↓↑↑↓↑↓	512KB	34 35 36 37
0	↑↑↓↑↑↑↑↓		128/640KB	30 31 32 33 34 35 36 37
0	↑↑↓↑↑↑↑↑		512KB/2MB	30 31 32 33 34 35 36 37
1	↑↑↓↑↑↑↑↑		512KB/2MB	30 31 32 33 34 35 36 37
2	↑↑↓↑↑↑↑↑		512KB/2MB	30 31 32 33 34 35 36 37
3	↑↑↑↓↑↑↑↑		512KB/2MB	30 31 32 33 34 35 36 37

Figure 11.

**DID YOU FIND THE FAILING MEMORY EXPANSION
OPTION AND BANK?**

Yes No

059

Go to Step 140 in this MAP.

060

Go to Step 106 in this MAP.

061

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 12 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↓↑↑↑↑↑		512KB	38 39 3A 3B
1		↑↑↓↑↑↑↑↓	512KB	3C 3D 3E 3F
0	↑↑↓↑↑↑↑↓		128/640KB	38 39 3A 3B 3C 3D 3E 3F
0	↑↑↓↑↑↑↑↑		512KB/2MB	38 39 3A 3B 3C 3D 3E 3F
1	↑↑↓↑↑↑↑↑		512KB/2MB	38 39 3A 3B 3C 3D 3E 3F
2	↑↑↓↑↑↑↑↑		512KB/2MB	38 39 3A 3B 3C 3D 3E 3F
3	↑↑↓↑↑↑↑↑		512KB/2MB	38 39 3A 3B 3C 3D 3E 3F

Figure 12.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

062

Go to Step 140 in this MAP.

063

Go to Step 106 in this MAP.

0200

064

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 13 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↑↑↑↑↑		512KB	40 41 42 43
1		↑↓↑↑↑↓↑↓	512KB	44 45 46 47
0	↑↓↑↑↑↑↑↓		128/640KB	40 41 42 43 44 45 46 47
0	↑↓↑↑↑↑↑↑		512KB/2MB	40 41 42 43 44 45 46 47
1	↑↑↓↓↑↑↑↑		512KB/2MB	40 41 42 43 44 45 46 47
2	↑↑↓↓↑↑↑↑		512KB/2MB	40 41 42 43 44 45 46 47
3	↑↑↓↓↑↑↑↑		512KB/2MB	40 41 42 43 44 45 46 47

Figure 13.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

065

Go to Step 140 in this MAP.

066

Go to Step 106 in this MAP.

067

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 14 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↑↑↑↑↑↑↑		512KB	48 49 4A 4B
1		↑↑↑↑↓↑↓	512KB	4C 4D 4E 4F
0	↑↑↑↑↓↑↓		128/640KB	48 49 4A 4B 4C 4D 4E 4F
0	↑↑↑↑↑↑↑↑		512KB/2MB	48 49 4A 4B 4C 4D 4E 4F
1	↑↑↑↑↑↑↑↑		512KB/2MB	48 49 4A 4B 4C 4D 4E 4F
2	↑↑↓↑↑↑↑↑		512KB/2MB	48 49 4A 4B 4C 4D 4E 4F
3	↑↑↓↑↑↑↑↑		512KB/2MB	48 49 4A 4B 4C 4D 4E 4F

Figure 14.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

068

Go to Step 140 in this MAP.

069

Go to Step 106 in this MAP.

070

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 15 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↓↑↑↑↑		512KB	50 51 52 53
1		↑↓↑↓↑↓↑↓	512KB	54 55 56 57
0	↑↓↑↓↑↑↑↓		128/640KB	50 51 52 53 54 55 56 57
0	↑↓↑↓↑↑↑↑		512KB/2MB	50 51 52 53 54 55 56 57
1	↑↓↑↓↑↑↑↑		512KB/2MB	50 51 52 53 54 55 56 57
2	↑↓↑↑↑↑↑↑		512KB/2MB	50 51 52 53 54 55 56 57
3	↑↑↓↓↑↑↑↑		512KB/2MB	50 51 52 53 54 55 56 57

Figure 15.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

071

Go to Step 140 in this MAP.

072

Go to Step 106 in this MAP.

073

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 16 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↓↑↓↑↑		512KB	58 59 5A 5B
1		↑↑↑↓↑↓↑↓	512KB	5C 5D 5E 5F
0	↑↑↑↓↑↓↑↓		128/640KB	58 59 5A 5B 5C 5D 5E 5F
0	↑↑↑↓↑↓↑↑		512KB/2MB	58 59 5A 5B 5C 5D 5E 5F
1	↑↑↑↓↑↓↑↑		512KB/2MB	58 59 5A 5B 5C 5D 5E 5F
2	↑↑↑↓↑↓↑↑		512KB/2MB	58 59 5A 5B 5C 5D 5E 5F
3	↑↑↑↑↑↑↑↑		512KB/2MB	58 59 5A 5B 5C 5D 5E 5F

Figure 16.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

|

074

Go to Step 140 in this MAP.

075

Go to Step 106 in this MAP.

076

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 17 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↑↑↑↑↑		512KB	60 61 62 63
1		↑↓↑↑↑↓↑↓	512KB	64 65 66 67
0	↑↓↑↑↑↑↑↓		128/640KB	60 61 62 63 64 65 66 67
0	↑↓↑↑↑↑↑↑		512KB/2MB	60 61 62 63 64 65 66 67
1	↑↑↑↓↑↑↑↑		512KB/2MB	60 61 62 63 64 65 66 67
2	↑↑↑↓↑↑↑↑		512KB/2MB	60 61 62 63 64 65 66 67
3	↑↑↑↑↓↑↑↑		512KB/2MB	60 61 62 63 64 65 66 67

Figure 17.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

077

Go to Step 140 in this MAP.

078

Go to Step 106 in this MAP.

079

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 18 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↓↑↓↑↑		512KB	68 69 6A 6B
1		↑↓↑↓↑↓↑↓	512KB	6C 6D 6E 6F
0	↑↓↑↓↑↓↑↓		128/640KB	68 69 6A 6B 6C 6D 6E 6F
0	↑↓↑↓↑↓↑↑		512KB/2MB	68 69 6A 6B 6C 6D 6E 6F
1	↑↓↑↑↑↑↑↑		512KB/2MB	68 69 6A 6B 6C 6D 6E 6F
2	↑↓↑↓↑↓↑↑		512KB/2MB	68 69 6A 6B 6C 6D 6E 6F
3	↑↓↑↓↑↑↑↑		512KB/2MB	68 69 6A 6B 6C 6D 6E 6F

Figure 18.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

080

Go to Step 140 in this MAP.

081

Go to Step 106 in this MAP.

0200

082

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 19 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↓↑↑↑↑		512KB	70 71 72 73
1		↑↓↑↓↑↓↑↓	512KB	74 75 76 77
0	↑↓↑↓↑↑↑↓		128/640KB	70 71 72 73 74 75 76 77
0	↑↓↑↓↑↑↑↑		512KB/2MB	70 71 72 73 74 75 76 77
1	↑↓↑↓↑↑↑↑		512KB/2MB	70 71 72 73 74 75 76 77
2	↑↓↑↑↑↑↑↑		512KB/2MB	70 71 72 73 74 75 76 77
3	↑↓↑↓↑↑↑↑		512KB/2MB	70 71 72 73 74 75 76 77

Figure 19.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

083

Go to Step 140 in this MAP.

084

Go to Step 106 in this MAP.

085

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 20 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↑↓↑↓↑↑↑↑		512KB	78 79 7A 7B
1		↑↓↑↓↑↓↑↓	512KB	7C 7D 7E 7F
0	↑↓↑↓↑↑↑↓		128/640KB	78 79 7A 7B 7C 7D 7E 7F
0	↑↓↑↓↑↑↑↑		512KB/2MB	78 79 7A 7B 7C 7D 7E 7F
1	↑↓↑↑↑↑↑↑		512KB/2MB	78 79 7A 7B 7C 7D 7E 7F
2	↑↓↑↑↑↑↑↑		512KB/2MB	78 79 7A 7B 7C 7D 7E 7F
3	↑↓↑↑↑↑↑↑		512KB/2MB	78 79 7A 7B 7C 7D 7E 7F

Figure 20.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

|

|

086

Go to Step 140 in this MAP.

087

Go to Step 106 in this MAP.

088

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 21 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↑↑↑↑↑↑		512KB	80 81 82 83
1		↓↑↑↑↑↓↑↓	512KB	84 85 86 87
0	↓↑↑↑↑↑↑↓		128/640KB	80 81 82 83 84 85 86 87
0	↓↑↑↑↑↑↑↑		512KB/2MB	80 81 82 83 84 85 86 87
1	↑↓↑↓↑↑↑↑		512KB/2MB	80 81 82 83 84 85 86 87
2	↑↓↑↓↑↑↑↑		512KB/2MB	80 81 82 83 84 85 86 87
3	↑↓↑↓↑↑↑↑		512KB/2MB	80 81 82 83 84 85 86 87

Figure 21.

**DID YOU FIND THE FAILING MEMORY EXPANSION
OPTION AND BANK?**

Yes No

089

Go to Step 140 in this MAP.

090

Go to Step 106 in this MAP.

091

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 22 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↑↑↓↑↑↑		512KB	88 89 8A 8B
1		↓↑↑↑↓↑↑↓	512KB	8C 8D 8E 8F
0	↓↑↑↑↓↑↑↓		128/640KB	88 89 8A 8B 8C 8D 8E 8F
0	↓↑↑↑↓↑↑↑		512KB/2MB	88 89 8A 8B 8C 8D 8E 8F
1	↓↑↑↑↑↑↑↑		512KB/2MB	88 89 8A 8B 8C 8D 8E 8F
2	↑↓↑↓↑↑↑↑		512KB/2MB	88 89 8A 8B 8C 8D 8E 8F
3	↑↓↑↓↑↑↑↑		512KB/2MB	88 89 8A 8B 8C 8D 8E 8F

Figure 22.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

092

Go to Step 140 in this MAP.

093

Go to Step 106 in this MAP.

094

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 23 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↑↓↑↑↑↑		512KB	90 91 92 93
1		↓↑↑↓↑↑↓	512KB	94 95 96 97
0	↓↑↑↓↑↑↓		128/640KB	90 91 92 93 94 95 96 97
0	↓↑↑↓↑↑↑↑		512KB/2MB	90 91 92 93 94 95 96 97
1	↓↑↑↓↑↑↑↑		512KB/2MB	90 91 92 93 94 95 96 97
2	↓↑↑↑↑↑↑↑		512KB/2MB	90 91 92 93 94 95 96 97
3	↑↓↓↓↑↑↑↑		512KB/2MB	90 91 92 93 94 95 96 97

Figure 23.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

095

Go to Step 140 in this MAP.

096

Go to Step 106 in this MAP.

097

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 24 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↑↓↑↑↑↑		512KB	98 99 9A 9B
1		↓↑↑↓↑↑↓↑	512KB	9C 9D 9E 9F
0	↓↑↑↓↑↑↑↓		128/640KB	98 99 9A 9B 9C 9D 9E 9F
0	↓↑↑↓↑↑↑↑		512KB/2MB	98 99 9A 9B 9C 9D 9E 9F
1	↓↑↑↑↑↑↑↑		512KB/2MB	98 99 9A 9B 9C 9D 9E 9F
2	↓↑↑↑↑↑↑↑		512KB/2MB	98 99 9A 9B 9C 9D 9E 9F
3	↓↑↑↑↑↑↑↑		512KB/2MB	98 99 9A 9B 9C 9D 9E 9F

Figure 24.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

098

Go to Step 140 in this MAP.

099

Go to Step 106 in this MAP.

0200

100

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 25 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↓↑↑↑↑↑		512KB	A0 A1 A2 A3
1		↓↑↓↑↑↓↑↓	512KB	A4 A5 A6 A7
0	↓↑↓↑↑↑↑↓		128/640KB	A0 A1 A2 A3 A4 A5 A6 A7
0	↓↑↓↑↑↑↑↑		512KB/2MB	A0 A1 A2 A3 A4 A5 A6 A7
1	↓↑↑↓↑↑↑↑		512KB/2MB	A0 A1 A2 A3 A4 A5 A6 A7
2	↓↑↑↓↑↑↑↑		512KB/2MB	A0 A1 A2 A3 A4 A5 A6 A7
3	↓↑↑↑↓↑↑↑		512KB/2MB	A0 A1 A2 A3 A4 A5 A6 A7

Figure 25.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

101

Go to Step 140 in this MAP.

102

Go to Step 106 in this MAP.

103

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 26 with the memory options installed.

Failing Bank	Switch Setting		Memory Expansion Option	1st Two Digits of Error Code
	Bank 0 12345678	Bank 1 12345678		
0	↓↑↓↑↓↑↑↑		512KB	A8 A9 AA AB
1		↓↑↓↑↓↑↓↑	512KB	AC AD AE AF
0	↓↑↓↑↓↑↓↑		128/640KB	A8 A9 AA AB AC AD AE AF
0	↓↑↓↑↓↑↑↑		512KB/2MB	A8 A9 AA AB AC AD AE AF
1	↓↑↑↑↑↑↑↑		512KB/2MB	A8 A9 AA AB AC AD AE AF
2	↓↑↑↓↑↑↑↑		512KB/2MB	A8 A9 AA AB AC AD AE AF
3	↓↑↑↓↑↑↑↑		512KB/2MB	A8 A9 AA AB AC AD AE AF

Figure 26.

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

104

Go to Step 140 in this MAP.

105

Go to Step 106 in this MAP.

106

(From Steps 048, 051, 054, 057, 060, 063, 066, 069, 072, 075, 078, 081, 084, 087, 090, 093, 096, 099, 102, and 105 in this MAP)

106 (continued)

IS THE FAILING OPTION A 128/640KB MEMORY EXPANSION OPTION?

Yes No

107

Go to Step 113 in this MAP.

108

The first two characters of your error code (XXXXXX XXXX) indicate the failing memory module is located in bank 0. The last four characters (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 27 and find the failing memory module identified by the error code.

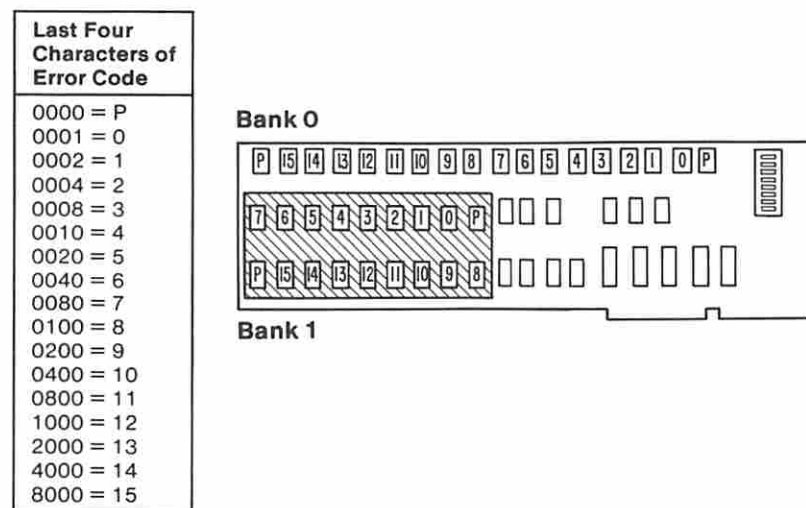


Figure 27. 128/640 Memory Expansion Option

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

109

Replace the 128KB/640KB memory expansion option and memory modules.

(Step 110 continues)

110

- Replace the failing 256KB memory module.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules in the failing bank.

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes	No
|	111
|	Replace the 128KB/640KB memory expansion option and memory modules.

112

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

113

(From Step 107 in this MAP)

IS THE FAILING OPTION A 512KB MEMORY EXPANSION OPTION?

Yes	No
|	114
|	Go to Step 120 in this MAP.

115

The first two characters of your error code (XXXXXX XXXX) indicate the bank with the failing memory module. The last four characters (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 28 on page 0200-34 and find the failing memory module identified by the error code.

Last Four Characters of Error Code
0000 = P
0001 = 0
0002 = 1
0004 = 2
0008 = 3
0010 = 4
0020 = 5
0040 = 6
0080 = 7
0100 = 8
0200 = 9
0400 = 10
0800 = 11
1000 = 12
2000 = 13
4000 = 14
8000 = 15

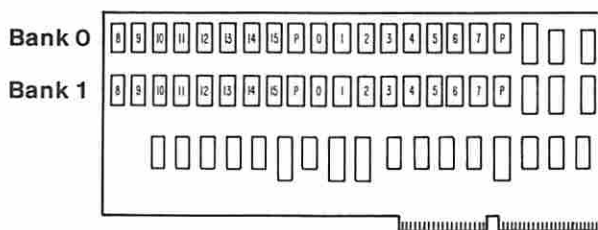


Figure 28. 512KB Memory Expansion Option

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

116

Replace the 512KB Memory Expansion Option.

117

- Replace the failing 128KB memory module.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules.

- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

118

Replace the 512KB Memory Expansion Option.

119

(Step 119 continues)

119 (continued)

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

120

(From Step 114 in this MAP)

IS A 512KB/2MB MEMORY EXPANSION OPTION INSTALLED?

Yes No

121

Go to Step 140 in this MAP.

122

The first two characters of the error code (XXXXXX XXXX) indicate the bank with the failing memory module. The last four characters (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 29 and find the failing memory module identified by the error code.

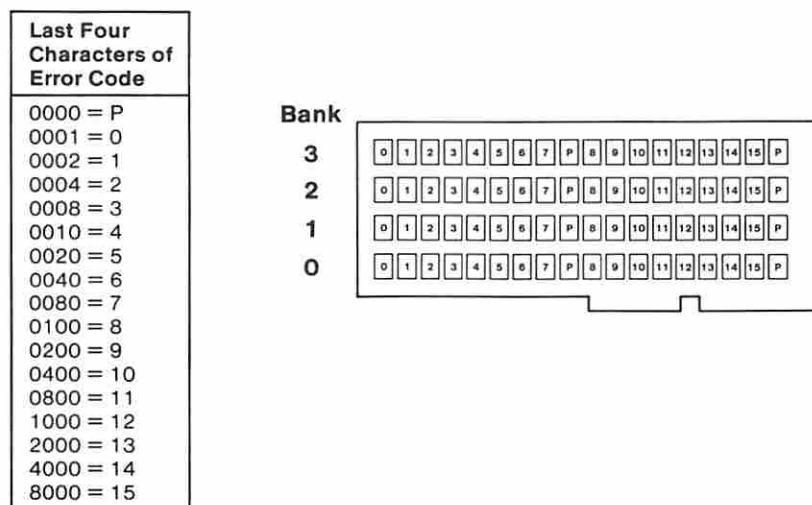


Figure 29. 512/2M Memory Expansion Option

(Step 122 continues)

122 (continued)

DID YOU FIND THE FAILING MEMORY MODULE?

Yes	No
123	
Replace the 512KB/2MB memory expansion option and memory modules.	
124	
- Replace the failing memory module on the Memory Expansion Option.	
Note: If the last four characters of your error code are 0000, replace both Parity (P) modules.	
- Repeat the Memory tests.	
DID THE TESTS RUN WITHOUT AN ERROR?	
Yes	No
125	
Replace the 512KB/2MB memory expansion option and memory modules.	
126	
Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.	
127	
(From Step 018 in this MAP)	
DO YOU HAVE A PARITY-CHECK ERROR MESSAGE?	
Yes	No
128	
Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.	
(Step 129 continues)	

129

(From Step 006 in this MAP)

IS A FIVE-CHARACTER ERROR CODE DISPLAYED UNDER THE PARITY CHECK MESSAGE?

Yes No

130

Go to Step 134 in this MAP.

131

IS THE FIRST CHARACTER OF THE ERROR CODE 0, 1, 2, 3, 4, 5, 6, OR 7?

Yes No

132

Go to Step 134 in this MAP.

133

- Find the first character of the error code (XXXXX) in Figure 30 on page 0200-38 and replace the memory modules indicated.

Repeat the Memory tests. If the same parity check error code occurs, replace the system board.

0200

First Character of Parity Error	Type 1 System Board	Type 2 or 3 System Board
0, 1, 2, 3	18 Memory Modules in System Board Bank 0	All 18 System Board Memory Modules
4, 5, 6, or 7	18 Memory Modules in System Board Bank 1	All 18 System Board Memory Modules

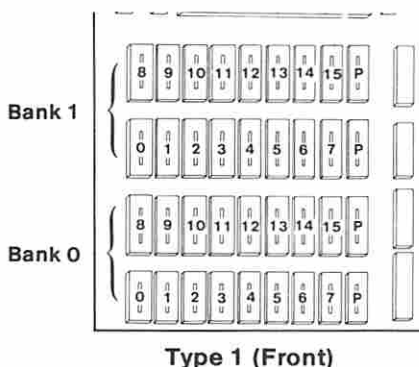


Figure 30. Parity-Check Error

134

(From Steps 130 and 132 in this MAP)

Parity Checks

Parity Check 1 indicates a system board parity error. Parity Check 2 indicates a memory expansion option parity error. To isolate a parity failure:

- Power off the system.
- Remove all installed memory expansion options.
- Power on the system.
- You may receive a 16X or 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

(Step 134 continues)

134 (continued)

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

135

Go to Step 137 in this MAP.

136

Replace all memory modules on the system board and repeat the Memory tests. If the same parity check error code occurs, replace the system board.

137

(From Steps 135 and 138 in this MAP) .

- Power off the system.
- Install one Memory Expansion Option. Ensure any switches are set correctly.

Note: If any memory expansion option is not fully populated, install it last.

- Power on the system.
- You may receive a 16X or 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

138

Repeat the procedure in Step 137 in this MAP for each Memory Expansion Option. When all memory expansion options have been installed go to Step 146 in this MAP.

139

Replace all memory modules on the last option installed. If the same parity check error code occurs, replace the Memory Expansion Option.

140

(From Steps 040, 047, 050, 053, 056, 059, 062, 065, 068, 071, 074, 077, 080, 083, 086, 089, 092, 095, 098, 101, 104, and 121 in this MAP)

Memory Errors

- Power off the system.
- Remove all installed Memory Expansion Option.
- Power on the system.
- You may receive a 16X and a 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

DID YOU RECEIVE A MEMORY ERROR MESSAGE?

Yes	No
	141
	Go to Step 143 in this MAP.

142

Go to Step 019 in this MAP and continue. If you cannot find a failing memory module, replace the system board.

143

(From Steps 141 and 144 in this MAP)

- Power off the system.
- Install one Memory Expansion Option. Ensure any switches are set correctly.

Note: If any memory expansion option is not fully populated, install it last.

- Power on the system.
- You may receive a 16X and a 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

(Step 143 continues)

143 (continued)

DID YOU RECEIVE A MEMORY ERROR MESSAGE?

Yes No

144

Repeat the procedure in Step 143 in this MAP for each Memory Expansion Option. When all memory expansion options have been installed go to Step 146 in this MAP.

145

Replace all memory modules on the last memory expansion option installed. If the same error code occurs, replace the Memory Expansion Option.

146

(From Steps 138 and 144 in this MAP)

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

0200

Notes:

MAP 0200: Memory (XT Type 5162)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, the memory size displayed was incorrect, there was a memory parity check, or you have an error message indicating a memory failure.	<ul style="list-style-type: none">• A memory module is failing• A memory expansion option is failing• The system board is failing• The Setup program options are not correctly set.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

DID YOU RECEIVE A 10-CHARACTER ERROR CODE?

Note: If you also received a 164-Memory Size Error, run the Setup program and verify the memory size. If you receive a 164-Memory Size Error after attempting to correct the Setup program disregard the error and continue with this MAP.

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 019 in this MAP.

004

(From Step 002 in this MAP)

DID YOU RECEIVE A PARITY-CHECK MESSAGE?

Yes No

005

Go to Step 007 in this MAP.

006

Go to Step 055 in this MAP.

007

(From Step 005 in this MAP)

- If any message appears, Press Enter, or F1 as required to continue.

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

008

Go to "MAP 0020: Power Start."

009

- Select 0 (SYSTEM CHECKOUT).

**DOES THE AMOUNT OF MEMORY SHOWN IN THE
INSTALLED DEVICES LIST MATCH THE AMOUNT
INSTALLED IN THE SYSTEM?**

Yes No

010

Go to Step 014 in this MAP.

011

IS THE INSTALLED DEVICES LIST CORRECT?

Yes No

012

- Follow the instructions on the screen to correct the Installed Devices list. When the correct amount of memory is displayed in the Installed Devices List, press Y then Enter.

012 (continued)
Go to Step 017 in this MAP.

013

- Press Y, then Enter.
Go to Step 017 in this MAP.
-

014

(From Step 010 in this MAP)

- Check the switch settings on all installed memory expansion options.

ARE THE SWITCH SETTINGS CORRECT?

Yes No

|

015

- Correct the switch settings and run the Setup program to verify the memory size.
Go to Step 001 in this MAP to verify system operation.

016

- Press N then Enter. Follow the instructions on the screen to correct the Installed Devices list. When the correct amount of memory is displayed in the Installed Devices List, press Y then Enter.

Go to Step 017 in this MAP.

017

(From Steps 012, 013, and 016 in this MAP)

- Run the Memory tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE A 10-CHARACTER ERROR CODE (XXXXXX XXXX), FOLLOWED BY XXXXKB Memory 20X?

Yes No

|

018

Go to Step 053 in this MAP.

019

(Step 019 continues)

019 (continued)

(From Steps 003 and 086 in this MAP)

- Refer to Figure 1, find the first two characters of the error code and go to the step indicated.

First two digits of error code	
00 01 02 03 04 05 06 07	Step 020 in this MAP.
08 09	Step 035 in this MAP.
10 11 12 13 14 15 16 17	Step 043 in this MAP.
18 19 1A 1B 1C 1D 1E 1F	
20 21 22 23 24 25 26 27	
28 29 2A 2B 2C 2D 2E 2F	
30 31 32 33 34 35 36 37	
38 39 3A 3B 3C 3D 3E 3F	
40 41 42 43 44 45 46 47	
48 49 4A 4B 4C 4D 4E 4F	
50 51 52 53 54 55 56 57	
58 59 5A 5B 5C 5D 5E 5F	
60 61 62 63 64 65 66 67	
68 69 6A 6B 6C 6D 6E 6F	
70 71 72 73 74 75 76 77	
78 79 7A 7B 7C 7D 7E 7F	
80 81 82 83 84 85 86 87	
88 89 8A 8B 8C 8D 8E 8F	

Figure 1. Error Codes

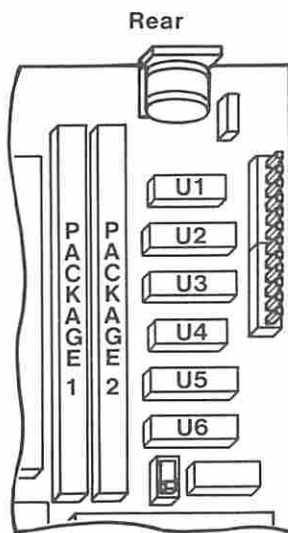
020

(From Step 019 in this MAP)

The last four characters of the error code (XXXXXX XXXX) indicate the failing Memory Module Package.

- Refer to Figure 2 and find the failing Memory Module Package identified by the error code.

Last Four Characters of Error Code	Replace Memory Module Package
0000	1 & 2
XXXX	1 & 2
00XX	1
XX00	2



Note: XX = any combination other than 00.

Figure 2. System Board Memory Module Package

- Replace the failing Memory Module Package.
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

021

Go to Step 023 in this MAP.

022

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

023

(From Step 021 in this MAP)

HAVE BOTH MEMORY MODULE PACKAGES BEEN REPLACED?

Yes No

024

Go to Step 026 in this MAP.

025

Go to Step 029 in this MAP.

026

(From Step 024 in this MAP)

- Replace the Memory Module Package that has not yet been replaced. (See Figure 2 on page 0200-5).
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

027

Go to Step 029 in this MAP.

028

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

029

(From Steps 025 and 027 in this MAP)

- Replace both 128KB parity modules (U1 and U4) on the system board (See Figure 2 on page 0200-5).
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

030

Go to Step 032 in this MAP.

(Step 031 continues)

031

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

032

(From Step 030 in this MAP)

- Replace all four 128KB memory modules (U2, U3, U5, and U6) on the system board (See Figure 2 on page 0200-5).
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes	No
	033
	- Replace the system board.

033

- Replace the system board.

034

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

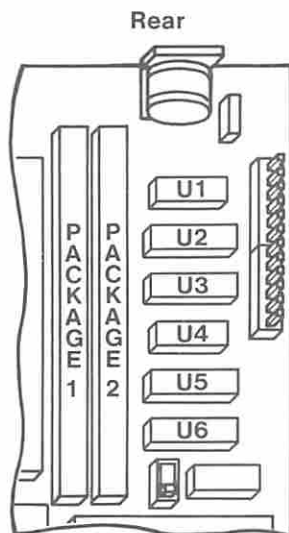
035

(From Step 019 in this MAP)

A 10-character error code beginning with 08 or 09 indicates a failure in the 128KB memory bank on the system board. The last four characters of the error code (XXXXXX XXXX) indicate the failing memory module.

- Refer to Figure 3 on page 0200-8, and find the failing memory module identified by the error code.

Last Four Characters of Error Code	Replace
0000 =	Module U1 & U4
000X =	Module U6
00X0 =	Module U5
0X00 =	Module U3
X000 =	Module U2



Note: X = any character other than 0.

Figure 3. 128KB System Board Memory

DID YOU FIND THE FAILING MEMORY MODULE ?

Yes No

036

Go to Step 040 in this MAP.

037

- Replace the failing memory module.
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

038

Go to Step 040 in this MAP.

039

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

040

(From Steps 036 and 038 in this MAP)

- Replace all six 128KB system board memory modules. (See Figure 3 on page 0200-8).
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

041

Replace the system board.

042

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

043

(From Step 019 in this MAP)

- Locate the failing memory expansion option and bank by comparing the switch settings in Figure 4 on page 0200-10 with the memory options installed.

1st Two Digits of Error Code	Failing Bank	Switch Setting of Failing 512KB/2MB Option
10 11 12 13 14 15 16 17	0	12345678 ↑↑↑↓↑↑↑↑
18 19 1A 1B 1C 1D 1E 1F	1	
20 21 22 23 24 25 26 27	2	
28 29 2A 2B 2C 2D 2E 2F	3	
30 31 32 33 34 35 36 37	0	12345678 ↑↑↓↑↑↑↑↑
38 39 3A 3B 3C 3D 3E 3F	1	
40 41 42 43 44 45 46 47	2	
48 49 4A 4B 4C 4D 4E 4F	3	
50 51 52 53 54 55 56 57	0	12345678 ↑↑↓↑↑↑↑↑
58 59 5A 5B 5C 5D 5E 5F	1	
60 61 62 63 64 65 66 67	2	
68 69 6A 6B 6C 6D 6E 6F	3	
70 71 72 73 74 75 76 77	0	12345678 ↑↑↓↑↑↑↑↑
78 79 7A 7B 7C 7D 7E 7F	1	
80 81 82 83 84 85 86 87	2	
88 89 8A 8B 8C 8D 8E 8F	3	

Figure 4. 512/2MB Memory Option

DID YOU FIND THE FAILING MEMORY EXPANSION OPTION AND BANK?

Yes No

044

Go to Step 084 in this MAP.

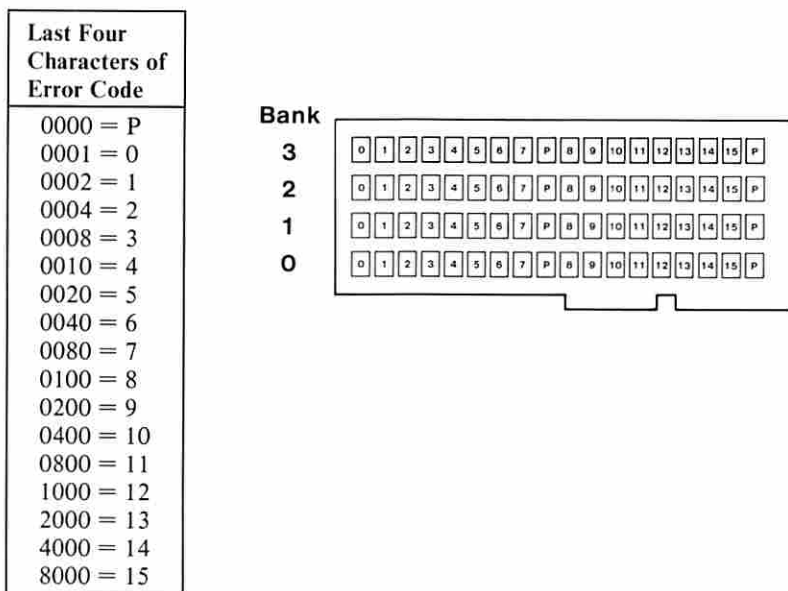
045

The first two characters of the error code (XXXXXX XXXX) indicate the bank with the failing memory module. The last four characters (XXXXXX XXXX) indicate the failing memory module.

(Step 045 continues)

045 (continued)

- Refer to Figure 5 and find the failing memory module identified by the error code.



0200

Figure 5. 512/2M Memory Expansion Option

DID YOU FIND THE FAILING MEMORY MODULE?

Yes No

046

Go to Step 050 in this MAP.

047

- Replace the failing memory module on the Memory Expansion Option.

Note: If the last four characters of your error code are 0000, replace both Parity (P) modules in the failing bank.

- Repeat the Memory tests.

(Step 047 continues)

047 (continued)

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

048

Replace the failing 512KB/2MB memory expansion option and memory modules.

049

The system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

050

(From Step 046 in this MAP)

- Refer to Figure 5 on page 0200-11, and replace the failing bank of memory modules.
- Repeat the Memory tests.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

051

Replace the failing 512KB/2MB memory expansion option and memory modules.

052

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

053

(From Step 018 in this MAP)

DO YOU HAVE A PARITY-CHECK ERROR MESSAGE?

Yes No

054

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

(Step 055 continues)

055

(From Step 006 in this MAP)

IS A FIVE-CHARACTER ERROR CODE DISPLAYED UNDER THE PARITY CHECK MESSAGE?

Yes No

056

Go to Step 069 in this MAP.

057

IS THE FIRST CHARACTER OF THE ERROR CODE 0, 1, 2, 3, 4, 5, 6, OR 7?

Yes No

058

Go to Step 064 in this MAP.

059

- Refer to the following figure, and replace Memory Module Package 1 on the system board.

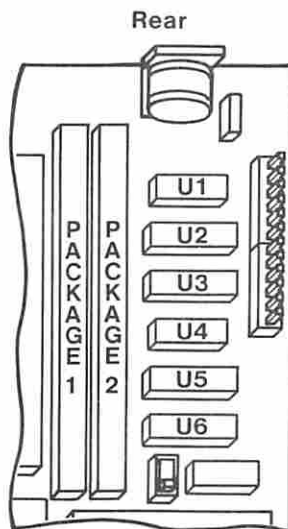


Figure 6. Memory Module Packages

- Repeat the memory tests.

(Step 059 continues)

059 (continued)

DID YOU RECEIVE THE SAME PARITY CHECK ERROR MESSAGE?

Yes No

060

Go to Step 001 in this MAP to verify system operation.

061

- Replace Memory Module Package 2 (See Figure 6 on page 0200-13).

DID YOU RECEIVE THE SAME PARITY CHECK ERROR MESSAGE?

Yes No

062

Go to Step 001 in this MAP to verify system operation.

063

- Replace the system board.
-

064

(From Step 058 in this MAP)

IS THE FIRST CHARACTER OF THE ERROR CODE 8 OR 9?

Yes No

065

Go to Step 069 in this MAP.

066

- Refer to the following figure, and replace both 128KB parity modules (U1 and U4) on the system board.

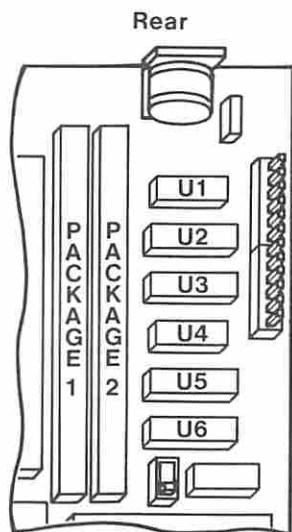


Figure 7. 128KB Memory Modules

- Repeat the memory tests.

DID YOU RECEIVE THE SAME PARITY CHECK ERROR MESSAGE?

Yes No

067

Go to Step 001 in this MAP to verify system operation.

068

- Replace the four 128KB memory modules (U2, U3, U5, and U6) (See Figure 7).
- Repeat the memory tests. If the same parity error occurs, replace the system board.

069

(From Steps 056 and 065 in this MAP)

Parity Checks

Parity Check 1 indicates a system board parity error. Parity Check 2 indicates a memory expansion option parity error. To isolate a parity failure:

- Power off the system.
(Step 069 continues)

069 (continued)

- Remove all installed memory expansion options.
- Power on the system.

Note: If you receive a 16X or 20X error message, press the F1 key to finish POST.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

070

Go to Step 072 in this MAP.

071

Replace the system board.

072

(From Step 070 in this MAP)

- Run the Setup program to ensure the memory size is correct.
- Repeat the Memory tests.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

073

Go to Step 075 in this MAP.

074

Replace the system board.

075

(From Steps 073 and 082 in this MAP)

- Power off the system.
- Install one Memory Expansion Option. Ensure the switches on the option are set correctly.

Note: If any memory expansion option is not fully populated, install it last.

- Power on the system.

Note: If you receive a 16X or 20X error message, press the F1 key to finish POST.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

076

Go to Step 078 in this MAP.

077

Replace all memory modules on the last option installed. If the same parity check error code occurs, replace the Memory Expansion Option.

078

(From Step 076 in this MAP)

- Run the Setup program to ensure the memory size is correct.
- Repeat the Memory tests.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes No

079

Go to Step 081 in this MAP.

080

Replace all memory modules on the last option installed. If the same parity check error code occurs, replace the Memory Expansion Option.

081

(From Step 079 in this MAP)

HAVE ALL MEMORY EXPANSION OPTIONS BEEN INSTALLED?

Yes No

082

Go to Step 075 in this MAP.

083

Go to Step 090 in this MAP.

084

(From Step 044 in this MAP)

Memory Errors

- Power off the system.
- Remove all installed Memory Expansion Options.
- Power on the system.
- You may receive a 16X and a 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

DID YOU RECEIVE A MEMORY ERROR MESSAGE?

Yes	No
	085
	Go to Step 087 in this MAP.

086

Go to Step 019 in this MAP and continue. If you cannot find a failing memory module, replace the system board.

087

(From Steps 085 and 088 in this MAP)

- Power off the system.
- Install one Memory Expansion Option. Ensure all switches are set correctly.

Note: If any memory expansion option is not fully populated, install it last.

- Power on the system.
- You may receive a 16X and a 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests.

DID YOU RECEIVE A MEMORY ERROR MESSAGE?

Yes	No
	088
	(Step 088 continues)

088 (continued)

Repeat the procedure in Step 087 in this MAP for each Memory Expansion Option. When all memory expansion options have been installed go to Step 090 in this MAP.

089

Replace all memory modules on the last memory expansion option installed. If the same error code occurs, replace the Memory Expansion Option.

090

(From Steps 083 and 088 in this MAP)

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

Notes:

MAP 0300: Keyboard Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 3XX error code, you have been directed here from another MAP, or you suspect a keyboard problem.	<ul style="list-style-type: none">• The keyboard is failing.• The keyboard cable is failing.• The system board is failing.

001

Find your system type in the following figure and go to the MAP indicated.

System Type	MAP
Personal Computer.....	MAP 0300: Keyboard (PC)
Personal Computer XT	MAP 0300: Keyboard (PC)
Personal Computer XT (5162).....	MAP 0300: Keyboard (AT)
Portable PC.....	MAP 0300: Keyboard (PC)
Personal Computer AT	MAP 0300: Keyboard (AT)

Figure 1. System Identification

Notes:

MAP 0300: Keyboard (PC)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 3XX error code, you have been directed here by another MAP, or you suspect a keyboard problem.	<ul style="list-style-type: none">• The keyboard is failing.• The keyboard cable is failing.• The system board is failing.

001

DO YOU HAVE A TOTALLY NON-FUNCTIONAL KEYBOARD?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 009 in this MAP.

004

(From Step 002 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system and observe the POST.

DID YOU RECEIVE A 3XX ERROR?

Yes No

005

Go to Step 007 in this MAP.

(Step 006 continues)

006

Go to Step 009 in this MAP.

007

(From Step 005 in this MAP)

- Run the Keyboard tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE A 3XX ERROR?

Yes No

008

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

009

(From Steps 003 and 006 in this MAP)

IS THE SYSTEM AN IBM PORTABLE PERSONAL COMPUTER?

Yes No

010

Go to Step 019 in this MAP.

011

- Power off the system.
- Disconnect the keyboard cable from the system unit.
- Power on the system.
- Check the keyboard connector at the front of the system for the correct voltages as shown in Figure 1.

Pin	Voltage (Vdc)
1	Ground
2	+4.8 to +5.25
3	Ground
4	+2.0 to +5.25
5	+2.0 to +5.25
6	Not Used

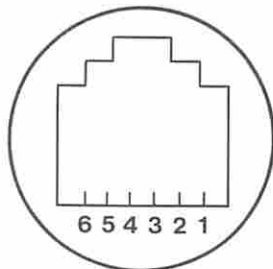


Figure 1. Voltage Check - Portable Personal Computer

011 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

012

Go to Step 016 in this MAP.

013

DOES THE KEYBOARD CABLE HAVE ANY VISIBLE DEFECTS?

Yes No

014

Replace the keyboard and cable.

015

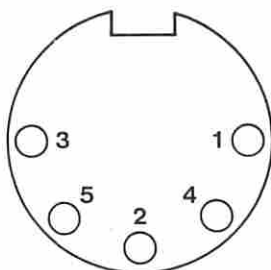
Replace the keyboard cable.

016

(From Step 012 in this MAP)

- Power off the system.
- Disconnect the internal keyboard cable from the system board.
- Power on the system.
- Check the voltage at the system board keyboard connector as shown in Figure 2.

Pin	Voltage (Vdc)
1	+2.0 to +5.5
2	+4.8 to +5.5
3	+2.0 to +5.5
4	Ground
5	+2.0 to +5.5



0300

Figure 2. Voltage Check - System Board Keyboard Connector

(Step 016 continues)

016 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

017

Replace the system board.

018

Replace the internal keyboard cable.

019

(From Step 010 in this MAP)

- Power off the system.
- Disconnect the keyboard cable from the system unit.
- Power on the system.
- Check the voltage on the system board keyboard connector as shown in Figure 3.

Pin	Voltage (Vdc)
1	+2.0 to +5.5
2	+4.8 to +5.5
3	+2.0 to +5.5
4	Ground
5	+2.0 to +5.5

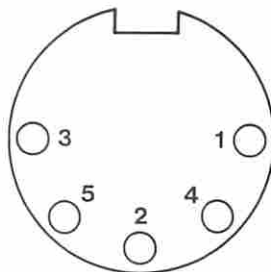


Figure 3. Voltage Check - System Board Keyboard Connector

ARE THE VOLTAGES CORRECT?

Yes No

020

Replace the system board.

021

DOES THE SYSTEM HAVE A 101/102-KEY KEYBOARD?

Yes No

(Step 022 continues)

022

Go to Step 026 in this MAP.

023

- Check the keyboard cable for continuity as shown in Figure 4.

Note: Wire 3 is not used.

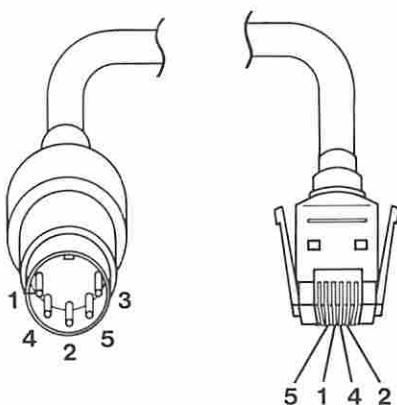


Figure 4. Continuity Check

DO YOU HAVE CONTINUITY ON ALL THE WIRES?

Yes No

024

Replace the keyboard cable.

025

Replace the keyboard.

026

(From Step 022 in this MAP)

DOES THE KEYBOARD CABLE HAVE ANY VISIBLE DEFECTS?

Yes No

027

(Step 027 continues)

027 (continued)

Replace the keyboard and cable.

028

Replace the keyboard cable.

MAP 0300: Keyboard (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 3XX error code, you have been directed here by another MAP, or you suspect a keyboard problem.	<ul style="list-style-type: none">• The keyboard is failing.• The keyboard LED card is failing.• The keyboard internal cable is failing.• The keyboard cable is failing.• The control panel is failing.• The system board is failing.

001

ARE YOU SERVICING AN 84-KEY KEYBOARD?

Yes No

002

Go to Step 038 in this MAP.

003

(From Step 032 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

004

Go to Step 014 in this MAP.

005

- Run the Keyboard tests. Use the **(RUN TESTS ONE TIME)** option.

(Step 005 continues)

005 (continued)

CAN THE TEST BE STARTED?

Yes No

006

Replace the keyboard assembly.

007

- Follow the instructions on the screen.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

008

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

009

DID YOU HAVE AN ERROR BECAUSE THE STATUS LIGHTS DID NOT WORK CORRECTLY?

Yes No

010

Replace the keyboard assembly.

011

- Remove the keyboard internal cable.
- Check the continuity of the cable (Figure 1).

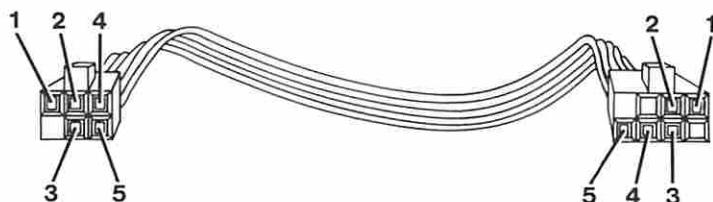


Figure 1. Continuity Check

(Step 011 continues)

011 (continued)

DOES THE KEYBOARD INTERNAL CABLE HAVE CONTINUITY?

Yes No

012

Replace the keyboard internal cable.

013

Replace the LED card.

014

(From Step 004 in this MAP)

DID YOU RECEIVE A 302 ERROR MESSAGE DURING THE POST?

Yes No

015

Go to Step 023 in this MAP.

016

IS THE KEY LOCK LOCKED?

Yes No

017

Go to Step 020 in this MAP.

018

- Unlock the key lock, then press **F1** to continue.

DOES THE 302 ERROR MESSAGE REMAIN?

Yes No

019

Go to Step 023 in this MAP.

020

(From Step 017 in this MAP)

- Disconnect the control panel cable from the system board.
- Check the control panel switch as shown in Figure 2 on page 0300-4.

Notes:

1. With the key lock locked, the continuity should be 0 Ohms.
2. With the key lock unlocked, there should be no continuity (infinity).

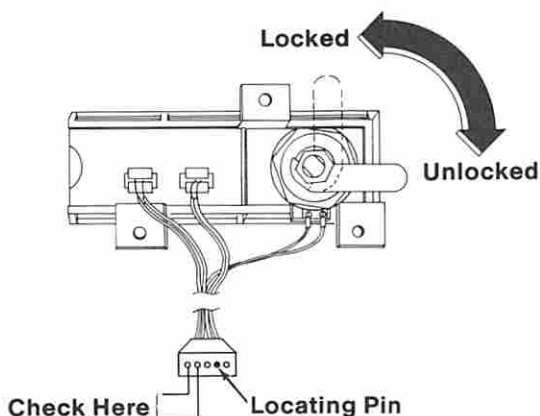


Figure 2. Continuity Check

DOES THE CONTROL PANEL SWITCH HAVE THE PROPER CONTINUITY IN BOTH POSITIONS?

Yes No

021

Replace the control panel.

022

Replace the system board.

023

(From Steps 015 and 019 in this MAP)

DID YOU RECEIVE A 301 ERROR MESSAGE?

Yes No

024

Go to Step 028 in this MAP.

025

(Step 025 continues)

025 (continued)

(From Step 036 in this MAP)

- Disconnect the keyboard cable from the system unit and the keyboard.
- Check continuity of the cable (Figure 3).

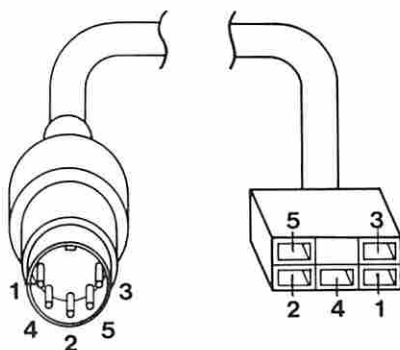


Figure 3. Continuity Check

DOES THE KEYBOARD CABLE HAVE CONTINUITY?

Yes No

026

Replace the keyboard cable.

027

Replace the keyboard assembly.

028

(From Step 024 in this MAP)

DID YOU RECEIVE AN XX301 ERROR MESSAGE?

Yes No

029

Go to Step 033 in this MAP.

030

- This error message indicates a stuck key.
- Press F1 to complete the POST.

(Step 030 continues)

030 (continued)

WERE YOU ABLE TO COMPLETE THE POST?

Yes No

031

Replace the keyboard assembly.

032

Go to Step 003 in this MAP.

033

(From Step 029 in this MAP)

DID YOU RECEIVE A 303 OR A 304 ERROR MESSAGE?

Yes No

034

Go to "MAP 0020: Power Start."

035

- Power off the system.
- Disconnect the keyboard cable from the system unit.
- Power on the system.

DID YOU RECEIVE A 303 OR A 304 ERROR MESSAGE?

Yes No

036

Go to Step 025 in this MAP.

037

Replace the system board.

038

(From Step 002 in this MAP)

- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Observe the POST.

(Step 038 continues)

038 (continued)

DID YOU RECEIVE A 3XX ERROR?

Yes No

039

Go to Step 059 in this MAP.

040

IS THE ERROR MESSAGE A 302?

Yes No

041

Go to Step 052 in this MAP.

042

IS THE KEY LOCK LOCKED?

Yes No

043

Go to Step 046 in this MAP.

044

- Unlock the key lock, then press **F1** to continue.

DOES THE 302 ERROR MESSAGE REMAIN?

Yes No

045

Go to Step 049 in this MAP.

046

(From Steps 043 and 065 in this MAP)

- Disconnect the control panel cable from the system board.
- Check the control panel switch as shown in Figure 4 on page 0300-8.

Notes:

1. With the key lock locked, the continuity should be 0 Ohms.
2. With the key lock unlocked, there should be no continuity (infinity).

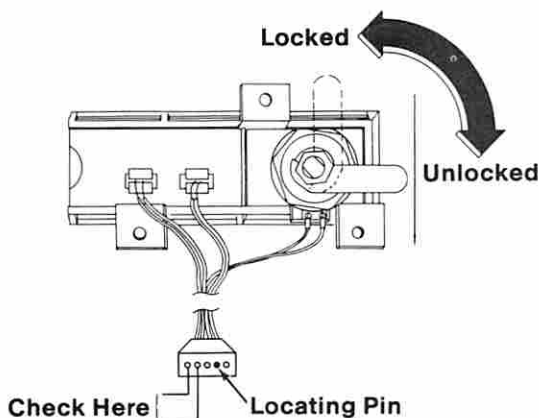


Figure 4. Continuity Check

DOES THE CONTROL PANEL SWITCH HAVE THE PROPER CONTINUITY IN BOTH POSITIONS?

Yes No

047

Replace the control panel.

048

Replace the system board.

049

(From Step 045 in this MAP)

DID YOU RECEIVE A 3XX ERROR MESSAGE?

Yes No

050

Go to Step 059 in this MAP.

051

Go to Step 054 in this MAP.

052

(From Step 041 in this MAP)

DO YOU HAVE A COMPLETELY NONFUNCTIONING KEYBOARD?

Yes No

(Step 053 continues)

053

Press **F1** to complete the POST, then go to Step 059 in this MAP.

054

(From Steps 051 and 062 in this MAP)

- Power off the system.
- Disconnect the keyboard cable from the system unit.
- Power on the system.
- Check the voltage on the system board keyboard connector as shown in Figure 5.

Pin	Voltage (Vdc)
1	+2.0 to +5.5
2	+2.0 to +5.5
3	Not Used
4	Ground
5	+2.0 to +5.5

Rear View of System Unit

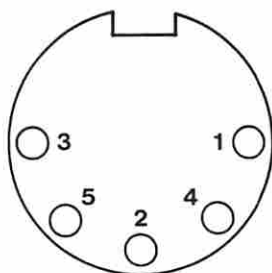


Figure 5. Voltage Check

ARE THE VOLTAGES CORRECT?

Yes No

055

Replace the system board.

056

- Check the keyboard cable for continuity as shown in Figure 6 on page 0300-10.

Note: Wire 3 is not used.

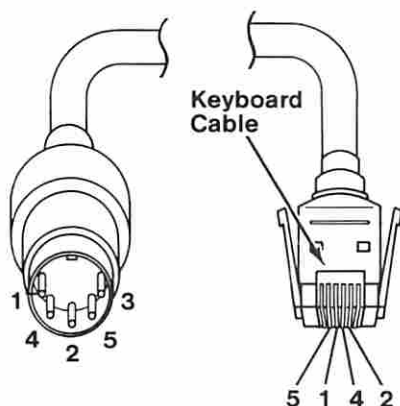


Figure 6. Continuity Check

DO YOU HAVE CONTINUITY ON ALL WIRES?

Yes No

057

Replace the keyboard cable.

058

Replace the keyboard.

059

(From Steps 039, 050, 053, and 064 in this MAP)

- Run the Keyboard tests. Use the **(RUN TESTS ONE TIME OPTION)**.

DID YOU RECEIVE A 3XX ERROR?

Yes No

060

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

061

(Step 061 continues)

061 (continued)

IS THE ERROR MESSAGE A 317?

Yes No

062

Go to Step 054 in this MAP.

063

**IS THE KEY LOCK CABLE PROPERLY CONNECTED TO
THE SYSTEM BOARD?**

Yes No

064

Connect the key lock cable to the system board, then go to
Step 059 in this MAP.

065

Go to Step 046 in this MAP.

Notes:

MAP 0400: Monochrome Display and Printer Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, you suspect a Monochrome Display and Printer Adapter problem, you suspect a monochrome display problem, or you received a 4XX error message.	<ul style="list-style-type: none">• Brightness and contrast adjustments are incorrect• The Monochrome Display and Printer Adapter is failing.• The monochrome display is failing.• The power supply is failing.• The system board is failing

001

- Power off the system.
- Disconnect the monochrome display signal cable from the system unit.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system and listen for the audio response during the POST.

WAS THE AUDIO RESPONSE ONE LONG AND TWO SHORT BEEPS?

Yes No

002

Go to Step 006 in this MAP.

003

Check the switch setting on the system board.

(Step 003 continues)

003 (continued)

IS THE SYSTEM BOARD SWITCH SETTING CORRECT?

Yes No

004

Correct the switch setting. Go to Step 001 in this MAP to verify system operation.

005

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

006

(From Step 002 in this MAP)

- Power off the system.
- Connect the monochrome display signal cable to the system unit.
- Power on the system.
- Set the brightness and contrast controls fully clockwise.

IS THE IMAGE ON THE SCREEN STEADY AND READABLE, AND ARE THE CHARACTERS CORRECT?

Yes No

007

Go to Step 026 in this MAP.

008

The display may function correctly except the cursor may be missing or out of position.

IS THE CURSOR VISIBLE AND IN THE CORRECT POSITION ON THE SCREEN?

Yes No

009

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

(Step 010 continues)

010

The image on the screen may be distorted or the characters may be the wrong size, as in Figure 1.

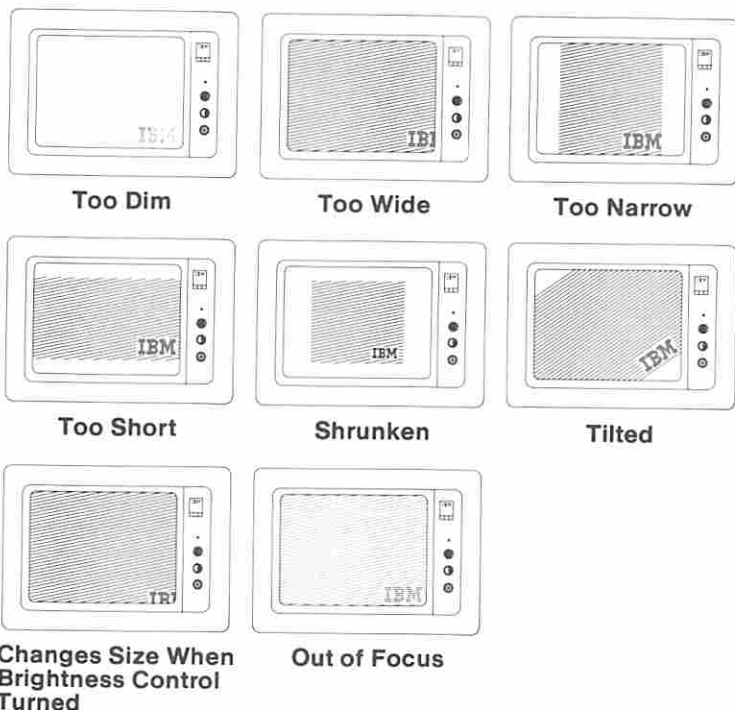


Figure 1. Distorted Images

IS THE IMAGE ON THE SCREEN DISTORTED OR THE WRONG SIZE? (Figure 1)

Yes No

011

Go to Step 013 in this MAP.

012

Replace the monochrome display.

013

(From Step 011 in this MAP)

- Run the Monochrome and Printer Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Select option **10 (RUN ALL ABOVE TESTS)**.

DID THE DISPLAY ATTRIBUTES SCREEN APPEAR WITHOUT A 401 ERROR MESSAGE?

Yes No

014

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

015

- Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.

**WERE YOU ABLE TO ADJUST THE INTENSIFIED LINE
BRIGHTER THAN THE OTHER LINES?**

Yes No

016

Go to Step 026 in this MAP.

017

DO THE LINES ON THE SCREEN MATCH THEIR DESCRIPTIONS?

Yes No

018

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

019

- Press **Y** then **Enter**.
The Character Set screen appears.

(Step 019 continues)

019 (continued)

ARE ALL THE CHARACTERS PRESENT AND CORRECT ON THE DISPLAY (NO EXTRA DOTS IN THE CHARACTER BOXES OR MISSING DOTS)?

Yes No

020

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

021

- Press **Y** then **Enter**.

The 80x25 Display screen appears.

IS THE BORDER BLACK AND ARE THE CHARACTERS PRESENT AND SOLID?

Yes No

022

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

023

- Disconnect the printer cable if it is attached to the IBM Monochrome Display and Printer Adapter.
- Install the printer adapter wrap plug (IBM part 8529228).

Note: Failure to install the wrap plug will result in an invalid error message.

- Press **Y** then **Enter**.
- Press **Enter** to begin the test.

DID YOU RECEIVE A 432 ERROR MESSAGE?

Yes No

024

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

025

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter). If this does not correct the problem, replace the system board.

026

(From Steps 007 and 016 in this MAP)

The following steps help you diagnose a problem in the IBM Monochrome Display through the use of audio responses.

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Follow the steps in Figure 2. Listen for the "beep" each time you press **Enter**.

Note: Use the numbers on the top row of the keyboard; do not use the numeric keypad.

Steps	Test Selected	Audio Response
1. Press Ø	Run Diagnostic Tests	None
2. Press Enter	---	1 Beep
Note: Skip Steps 3 and 4 if you have only one display adapter in your system.		
3. Press Y or N	Is a monitor attached to every display adapter?	None
4. Press Enter	---	1 Beep
5. Press Y	Is the installed-devices list correct?	None
6. Press Enter	---	1 Beep
7. Press Ø	Run tests one time	None
8. Press Enter	---	1 Beep
9. Press 4	Select Monochrome Display and Printer Adapter test	None
10. Press Enter		2 Beeps

Figure 2. Audio Responses

(Step 026 continues)

026 (continued)

DID YOU RECEIVE THE CORRECT AUDIO RESPONSES?

Yes No

027

You may have a power supply or connector problem.
Check the connections; if the connections are good, go to
"MAP 0020: Power Start."

028

**IS THE MONOCHROME DISPLAY AND PRINTER
ADAPTER TEST DISPLAYED ON THE SCREEN, AND ARE
THE CHARACTERS READABLE AND CORRECT?**

Yes No

029

If you have incorrect or incomplete characters displayed,
replace the monochrome display adapter (IBM
Monochrome Display and Printer Adapter).

- or -

If the screen is blank, is in complete reverse video, or is
unreadable, go to Step 030 in this MAP.

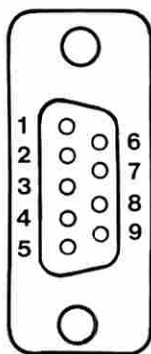
030

(From Step 029 in this MAP)

- Type **11**, then press **Enter**.
- Disconnect the monochrome display signal cable.
- Set the meter to the 12 Vdc scale.

Note: Make all voltage readings on the adapter
connector.

- Measure the voltage between pins 2 (ground) and 7 for 2.4 to 3.8 Vdc (Figure 3 on page 0400-8).
- Measure the voltage between pins 2 (ground) and 6 for 2.4 to 3.8 Vdc (Figure 3 on page 0400-8).



Adapter

Figure 3. Adapter Connector

ARE THE VOLTAGES CORRECT?

Yes No

031

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter).

032

- Press **Enter**.
- Measure the voltage between pins 2 (ground) and 7 for 0.0 to 0.5 Vdc (Figure 3).
- Measure the voltage between pins 2 (ground) and 6 for 0.0 to 0.5 Vdc (Figure 3).

ARE THE VOLTAGES CORRECT?

Yes No

033

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter).

034

- Press **Enter**, and wait for two beeps.
- Measure the voltage between pins 2 (ground) and 8 for 0.4 to 1.1 Vdc (Figure 3).
- Measure the voltage between pins 2 (ground) and 9 for 3.0 to 4.2 Vdc (Figure 3).

034 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

035

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter).

036

- Type **12**, then press **Enter**.
- Measure the voltage between pins 2 (ground) and 8 for 1.5 to 2.5 Vdc (Figure 3 on page 0400-8).
- Measure the voltage between pins 2 (ground) and 9 for 1.8 to 2.6 Vdc (Figure 3 on page 0400-8).

ARE THE VOLTAGES CORRECT?

Yes No

037

Replace the monochrome display adapter (IBM Monochrome Display and Printer Adapter).

038

Replace the monochrome display.

Notes:

MAP 0500: Color/Graphics Monitor Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, you suspect a color/graphics problem, or you received a color/graphics error message.	<ul style="list-style-type: none">• The Color/Graphics Monitor Adapter is failing.• The display is failing.• The power cord is failing.• The power connector is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Turn the brightness and contrast controls fully clockwise.
- Power on the system and note any audio responses during the POST.

WAS THE AUDIO RESPONSE ONE LONG AND TWO SHORT BEEPS?

Yes No

002

Go to Step 008 in this MAP.

003

- Check the switch setting on the system board.

IS THE SYSTEM BOARD SWITCH SETTING CORRECT?

Yes No

004

Correct the switch setting. Go to Step 001 in this MAP to verify system operation.

(Step 005 continues)

005

**DOES THE SYSTEM HAVE TWO DISPLAY ADAPTERS
INSTALLED?**

Yes No

006

Replace the Color/Graphics Monitor Adapter. If this does not correct the problem, replace the system board.

007

Replace the primary display adapter. If this does not correct the problem, replace the system board.

008

(From Step 002 in this MAP)

IS THE SCREEN DARK (NO ILLUMINATION)?

Yes No

009

Go to Step 025 in this MAP.

010

IS THE FAILING DISPLAY AN IBM COLOR DISPLAY?

Yes No

011

Go to Step 020 in this MAP.

012

IS THE POWER-ON INDICATOR GLOWING?

Yes No

013

Go to Step 017 in this MAP.

014

- Power off the system.
- Power off the color display.
- Disconnect the color display signal cable from the Color/Graphics Monitor Adapter.

(Step 014 continues)

014 (continued)

- Power on the color display.

IS THE SCREEN STILL DARK (NO ILLUMINATION)?

Yes No

|

015

Replace the Color/Graphics Monitor Adapter.

016

Replace the color display.

017

(From Step 013 in this MAP)

- Check the display power cord for continuity.

DOES THE POWER CORD HAVE CONTINUITY?

Yes No

|

018

Replace the power cord.

019

Replace the color display.

020

(From Step 011 in this MAP)

IS THE FAILING DISPLAY AN IBM PORTABLE PERSONAL COMPUTER DISPLAY?

Yes No

|

021

Go to Step 075 in this MAP.

022

- Refer to Figure 1 on page 0500-4 and measure the voltage at the display power connector P12. Do not unplug the connector.

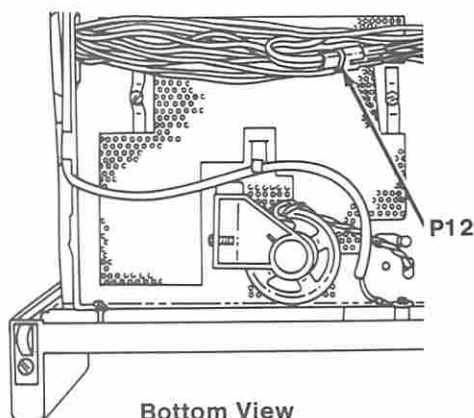


Figure 1. Portable Personal Computer Power Connector

DID THE VOLTAGE AT P12 MEASURE 12 VDC?

Yes	No
	023
	Replace the power supply.

024

Go to Step 075 in this MAP.

025

(From Step 009 in this MAP)

IS THE IMAGE ON THE SCREEN STEADY AND READABLE?

Yes	No
	026
	Go to Step 028 in this MAP.

027

Go to Step 030 in this MAP.

028

(From Step 026 in this MAP)

- Perform the vertical-hold adjustment, if possible.

Note: The IBM Portable Personal Computer display does not have a vertical-hold adjustment; go to Step 075 in this MAP.

DID ADJUSTING THE VERTICAL HOLD SOLVE THE PROBLEM?

Yes No

|
029

Go to Step 075 in this MAP.

030

(From Step 027 in this MAP)

- Run the Color/Graphics Monitor Adapter tests. Use the **(RUN TESTS ONE TIME)** option.

IS THE CURSOR VISIBLE AND IN THE CORRECT POSITION?

Yes No

|
031

Replace the Color/Graphics Monitor Adapter.

032

- The image on the screen may be distorted or the characters may be the wrong size, as shown in Figure 2 on page 0500-6.

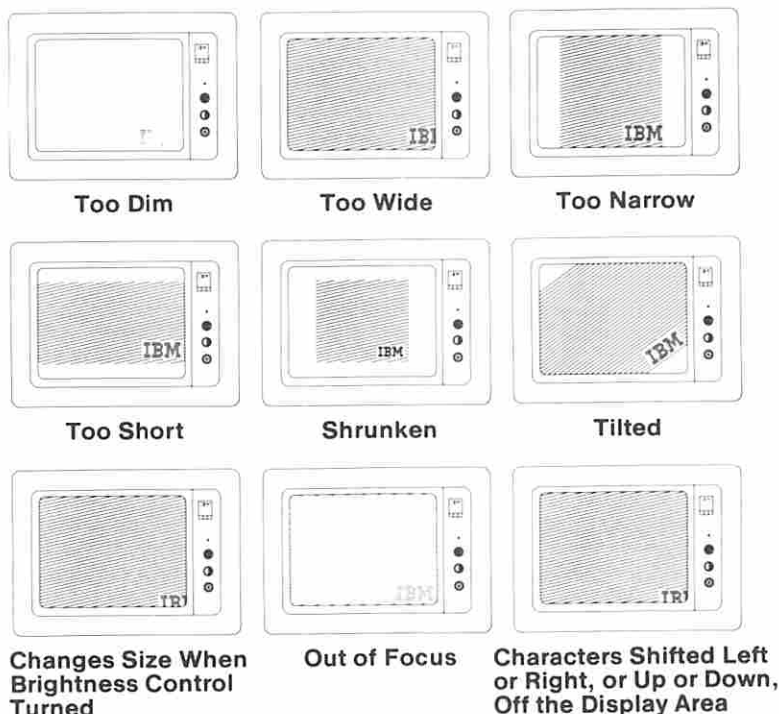


Figure 2. Distorted Images

IS THE IMAGE ON THE SCREEN DISTORTED OR THE WRONG SIZE? (Figure 2)

Yes No

033

Go to Step 038 in this MAP.

034

DOES THE DISPLAY HAVE A VERTICAL-SIZE ADJUSTMENT?

Yes No

035

Replace the display.

036

(Step 036 continues)

036 (continued)

- Perform the vertical-size adjustment.

DID THE VERTICAL-SIZE ADJUSTMENT CORRECT THE PROBLEM?

Yes No

037

Replace the display.

038

(From Step 033 in this MAP)

- Select **10 (RUN ALL ABOVE TESTS)** then press **Enter**.

DID THE DISPLAY ATTRIBUTES SCREEN APPEAR?

Yes No

039

Replace the Color/Graphics Monitor Adapter.

040

DO YOU HAVE AN IBM COLOR DISPLAY, IBM PORTABLE DISPLAY, OR ANOTHER DIRECT-DRIVE DISPLAY?

Yes No

041

Go to Step 047 in this MAP.

042

DO YOU HAVE AN IBM COLOR DISPLAY?

Yes No

043

Go to Step 052 in this MAP.

044

- Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.

(Step 044 continues)

WERE YOU ABLE TO ADJUST FOR AN INTENSIFIED
LINE?

045

046

Go to Step 052 in this MAP.

047

(From Step 041 in this MAP)

A composite color display may be limited to two color shades, with the darker shade on top.

ARE ALL COLORS PRESENT AND THE CORRECT SHADE?

048

Go to Step 050 in this MAP.

049

Go to Step 052 in this MAP.

050

(From Step 048 in this MAP)

- Adjust the variable capacitor on the system board.

DID ADJUSTING THE VARIABLE CAPACITOR CORRECT THE PROBLEM?

051

Go to Step 075 in this MAP.

052

(From Steps 043, 046, and 049 in this MAP)

IBM Color Display - Each line on the screen should match the description stated in the line.

(Step 052 continues)

052 (continued)

IBM Portable Display - shades of amber only.

Direct-drive displays - may not support the intensified line.

DO ALL TEXT LINES MATCH THEIR DESCRIPTIONS?

Yes No

053

Replace the Color/Graphics Monitor Adapter.

054

- Press **Y** then **Enter**. The Character Set screen appears.

ARE ALL CHARACTERS PRESENT AND CORRECT ON THE DISPLAY? (NO EXTRA DOTS IN CHARACTER BOXES OR MISSING DOTS.)

Yes No

055

Replace the Color/Graphics Monitor Adapter.

056

Press **Y** then **Enter**. The 80x25 Display screen appears.

IS THE BORDER BLACK AND ARE THE CHARACTERS PRESENT AND SOLID?

Yes No

057

Replace the Color/Graphics Monitor Adapter.

058

- Press **Y** then **Enter**. The 40X25 Display screen appears.

ARE THE CHARACTERS PRESENT AND COMPLETE?

Yes No

059

Replace the Color/Graphics Monitor Adapter.

060

(Step 060 continues)

060 (continued)

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 0 screen appears. The background should be dark cyan. The boxes, from left to right, should be intensified green, intensified red, and intensified yellow. The characters are displayed in intensified yellow.

Note: IBM Portable Display - The background should be amber. The boxes, from left to right, should be shaded amber, dark shaded amber, and light amber.

IS THE SCREEN CORRECT?

Yes No

061

Replace the Color/Graphics Monitor Adapter.

062

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 1 screen appears. The background should be intensified red. The boxes, from left to right, should be dark cyan, dark magenta, and nonintensified white (light gray). The characters are displayed in dark magenta.

Note: IBM Portable Display - The background should be amber. The boxes, from left to right, should be shaded amber, dark shaded amber, and light amber.

IS THE SCREEN CORRECT?

Yes No

063

Replace the Color/Graphics Monitor Adapter.

064

- Press **Y** then **Enter**.

The 640X200 Graphics screen appears. The background should be black. The boxes, from left to right, should be gray, gray, and white. The characters are displayed in white.

Note: IBM Portable Display - The background should be dark amber. The boxes, from left to right, should be amber, amber, and intensified light amber.

064 (continued)

IS THE SCREEN CORRECT?

Yes No

065

Replace the Color/Graphics Monitor Adapter.

066

DO YOU HAVE A LIGHT PEN ATTACHED?

Yes No

067

Answer the prompt on the screen and skip the Light Pen test. Go to Step 072 in this MAP.

068

DO YOU WANT TO TEST THE LIGHT PEN?

Yes No

069

Answer the prompt on the screen and skip the Light Pen test. Go to Step 072 in this MAP.

070

Note: The light pen test is timed. If you wait longer than 60 seconds to respond, or are not careful where you place the tip of the pen before pushing it, you may receive an error message.

Place the tip of the light pen in the center of the block and press the pen toward the screen. The displayed block will be replaced by an asterisk (*). Repeat this procedure for each new block that appears. When the test is complete, Video Page 0 is displayed.

- Answer the prompt on the screen to start Light Pen test.

**WERE YOU ABLE TO COMPLETE THE LIGHT PEN TEST
(SCREEN DISPLAYS VIDEO PAGE 0)?**

Yes No

(Step 071 continues)

071

Replace the light pen.

072

(From Steps 067 and 069 in this MAP)

- Follow the instructions on the screen to check the internal video addressing function of the Color/Graphics Monitor Adapter. Look for any discrepancy in the sequence of appearance of video pages 0 through 7.

WERE ALL EIGHT PAGES DISPLAYED?

Yes No

073

Replace the Color/Graphics Monitor Adapter.

074

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

075

(From Steps 021, 024, 028, 029, 045, and 051 in this MAP)

The following information helps you diagnose a problem in the color display through the use of audio responses.

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system; listen for the beep at the end of the POST and wait for the LED on drive A to light and then go off.
- Follow the steps in Figure 3 on page 0500-13. Listen for the "beep" each time you press **Enter**.

Note: Use the numbers on the top row of the keyboard; do not use the numeric keypad.

Steps	Test Selected	Audio Response
1. Press Ø	Run Diagnostic Tests	None
2. Press Enter	---	1 Beep
Note: Skip Steps 3 and 4 if you have only one display adapter in your system.		
3. Press Y or N	Is a monitor attached to every display adapter?	None
4. Press Enter	---	1 Beep
5. Press Y	Is the installed-devices list correct?	None
6. Press Enter	---	1 Beep
7. Press Ø	Run tests one time	None
8. Press Enter	---	1 Beep
9. Press 5	Select Color/Graphics Monitor Adapter test	None
10. Press Enter		2 Beeps

Figure 3. Audio Responses

DID YOU RECEIVE THE CORRECT AUDIO RESPONSES?

Yes No

076

Replace the Color/Graphics Monitor Adapter.

077

IS THE COLOR/GRAPHICS MONITOR ADAPTER TEST DISPLAYED ON THE SCREEN AND READABLE?

Yes No

078

Go to Step 080 in this MAP.

079

Go to Step 082 in this MAP.

080

(From Step 078 in this MAP)

IS THE SCREEN BLANK (NO CHARACTERS OR CURSOR DISPLAYED)?

Yes No

081

Replace the Color/Graphics Monitor Adapter.

082

(From Step 079 in this MAP)

- Disconnect the color display signal cable.
- Select **11** then press **Enter**.
- Set the meter to the 12 Vdc scale.
- Measure the voltage on the 9-pin signal connector between pin 2 (ground) and pins 3, 4, 5, and 6 (signal) of the Color/Graphics Monitor Adapter. The voltage should be between 2.4 and 5.5 Vdc.
- Measure the voltage between the outer edge and the center conductor of the phono jack. The voltage should be between 1.0 and 2.4 Vdc.

Note: If you are testing an IBM Portable Personal Computer display, you must also measure the voltage between pins P1-3 (ground) and P1-4 for 1.0 to 1.5 Vdc.

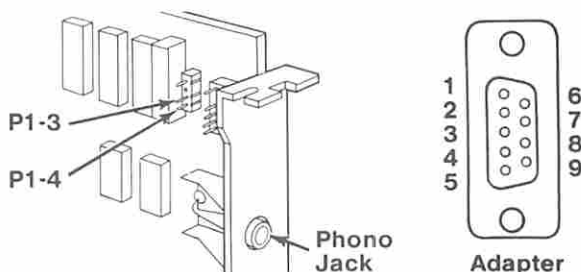


Figure 4. Signal Connectors

ARE THE VOLTAGES CORRECT?

Yes No

083

Replace the Color/Graphics Monitor Adapter.

(Step 084 continues)

084

- Press **Enter** one time.
- Measure the voltage on the 9-pin signal connector between pin 2 (ground) and pins 3, 4, 5, and 6 (signal) of the Color/Graphics Monitor Adapter. The voltage should be between 0.0 and 0.5 Vdc.
- Measure the voltage between the outer edge and the center conductor of the phono jack. The voltage should be between 0.0 and 0.9 Vdc.

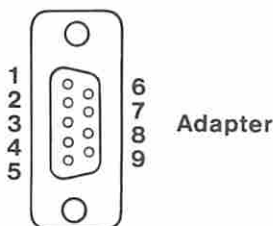


Figure 5. Color/Graphics Monitor Adapter Test

ARE THE VOLTAGES CORRECT?

Yes No

085

Replace the Color/Graphics Monitor Adapter.

086

- Press **9** and listen for two beeps.
- Measure the voltage on the 9-pin signal connector between pins 2 (ground) and 8 of the Color/Graphics Monitor Adapter. The voltage should be between 0.0 and 0.7 Vdc.
- Measure the voltage between pins 2 (ground) and 9. The voltage should be between 0.0 and 0.3 Vdc.
- Measure the voltage between the outer edge and the center conductor of the phono jack. The voltage should be between 0.4 and 1.5 Vdc.

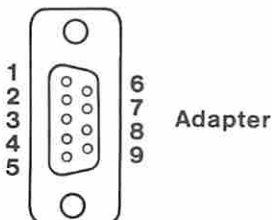


Figure 6. Color/Graphics Monitor Adapter Test

086 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

087

Replace the Color/Graphics Monitor Adapter.

088

- Select **12** then press **Enter**.
- Measure the voltage between pins 2 (ground) and 8 on the 9-pin signal connector of the Color/Graphics Monitor Adapter. The voltage should be between 0.8 and 1.5 Vdc.
- Measure the voltage between pins 2 (ground) and 9. The voltage should be between 0.3 and 1.0 Vdc.
- Measure the voltage between the outer edge and the center conductor of the phono jack. The voltage should be between 0.2 and 0.6 Vdc.

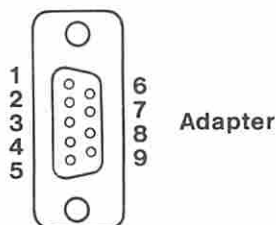


Figure 7. Color/Graphics Monitor Adapter Test

ARE THE VOLTAGES CORRECT?

Yes No

089

Replace the Color/Graphics Monitor Adapter.

090

Replace the display.

MAP 0600: Diskette Drive Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 6XX error code or you have been directed here from another MAP.	<ul style="list-style-type: none"> • A diskette drive is failing. • The signal cable is failing. • The diskette drive adapter is failing. • The power supply is failing.

001

IS A 3.5 INCH EXTERNAL DISKETTE DRIVE ATTACHED?

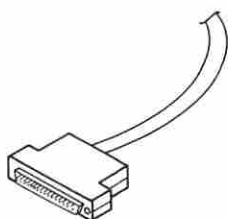
Yes No

002

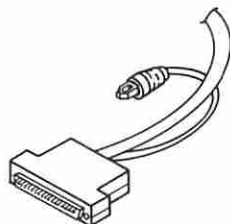
Go to Step 018 in this MAP.

003

- Use the following figure to identify the type of cable that attaches the 3.5" External Diskette Drive to the system.



Type 1



Type 2

Figure 1. 3.5" External Diskette Drive Cables

003 (continued)

IS THE CABLE A TYPE 1?

Yes No

|

004

Go to Step 012 in this MAP.

005

- Power off the system.
- Disconnect the *internal* diskette drive signal cable from the 3.5" External Diskette Drive Adapter.
- Disconnect the 3.5" External Diskette Drive from the system.
- Remove the 3.5" External Diskette Drive Adapter and cable.
- Connect the *internal* diskette drive signal cable to the diskette drive adapter installed in the system.
- Ensure the Advanced Diagnostics diskette is in drive A.
- Power on the system.

DID THE POST FINISH WITHOUT A 6XX ERROR?

Yes No

|

006

Go to Step 018 in this MAP.

007

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

|

008

Go to Step 018 in this MAP.

009

- Select **0 (SYSTEM CHECKOUT)**.
- Run the Diskette Drive and Adapter tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE A 6XX ERROR DURING THE TESTS?

Yes No

|

010

- Power off the system.
(Step 010 continues)

010 (continued)

- Reinstall the 3.5" External Diskette Drive and adapter.
- Go to "MAP 7300: 3.5" External Diskette Drive".

011

Go to Step 018 in this MAP.

012

(From Step 004 in this MAP)

- Power off the system.
- Disconnect the 3.5" External Diskette Drive from the system.
- Ensure the Advanced Diagnostics diskette is in drive A.
- Power on the system.

DID THE POST FINISH WITHOUT A 6XX ERROR?

Yes No

013

Go to Step 018 in this MAP.

014**DID THE ADVANCED DIAGNOSTICS MENU APPEAR?**

Yes No

015

Go to Step 018 in this MAP.

016

- Select 0 (SYSTEM CHECKOUT).
- Run the Diskette Drive and Adapter tests. Use the (RUN TESTS MULTIPLE TIMES) option.

DID YOU RECEIVE A 6XX ERROR DURING THE TESTS?

Yes No

017

- Power off the system.
- Reinstall the 3.5" External Diskette Drive.
- Go to "MAP 7300: 3.5" External Diskette Drive".

(Step 018 continues)

(From Steps 002, 006, 008, 011, 013, and 015 in this MAP)

- Find your system and diskette drive type in the following figure and go to the MAP indicated.

System/Diskette Drive Type	
Personal Computer	MAP 0600: Full-High Diskette Drive
Personal Computer XT	
With Full-High Drives	MAP 0600: Full-High Diskette Drive
With Half-High Drives	MAP 0600: Half-High Diskette Drive
With One Half-High Drive and One 3.5 Inch Internal Drive	MAP 0600: Half-High Diskette Drive
Personal Computer XT (5162) ...	MAP 0600: Diskette Drive (AT)
Portable PC	MAP 0600: Diskette Drive (Portable PC)
Personal Computer AT.....	MAP 0600: Diskette Drive (AT)

Figure 2. Diskette Drive Identification

MAP 0600: Full-High Diskette Drive

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 6XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none"> • The diskette drive is failing. • The diskette drive adapter is failing. • The system board is failing. • The diskette drive signal cable is failing. • The power supply is failing.

Refer to Figure 1 and determine the type of diskette drives installed in the system.

- Type 1 diskette drives have an A, B, or no character before the serial number.
- Type 2 diskette drives have a D before the serial number.
- Type 3 diskette drives have an E before the serial number.

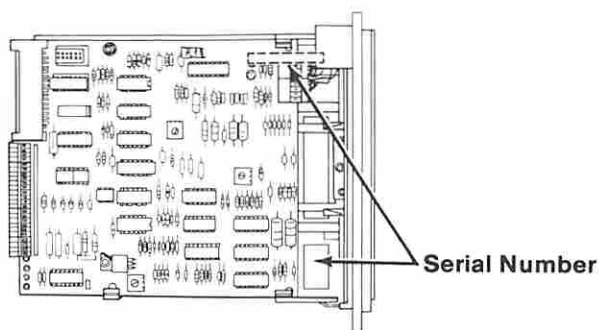


Figure 1. Diskette Drive Type

Test Point Reference pages are at the end of this MAP. These pages identify the test points and pin locations called out in this MAP. Diskette drive-motor speed adjustment procedures are also provided.

(Step 001 continues)

001

- Power off the system.
- Ensure the terminating resistor is installed in drive A and no terminating resistor is installed in drive B.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system and observe the light-emitting diode (LED) on drive A during the POST.

DID THE LED ON DRIVE A COME ON BEFORE THE BEEP AT THE END OF THE POST?

Yes No

002

Go to Step 014 in this MAP.

003

IS THE ADVANCED DIAGNOSTICS MENU DISPLAYED?

Yes No

004

Go to Step 024 in this MAP.

005

- Test the write-protect feature as follows:
 1. Select **1 (FORMAT DISKETTE)**.
 2. Remove the Advanced Diagnostics diskette from drive A.
 3. Insert a formatted write-protected scratch diskette into drive A.
 4. Press **A** then **Enter**.

**FORMAT NOT COMPLETED
WRITE PROTECTED DISKETTE
DRIVE A, TRACK 0, HEAD 0, SECTOR 0**

Figure 2. Write Protect Error

(Step 005 continues)

005 (continued)

DID A WRITE PROTECT ERROR MESSAGE APPEAR ON THE SCREEN? (Figure 2 on page 0600-2)

Yes No

006

Go to Step 084 in this MAP.

007

The write-protect feature is working properly on drive A.

- Remove the scratch diskette from drive A.
- Insert the Advanced Diagnostics diskette into drive A.
- Run the Diskette Drives and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.
- Note any messages that appear on the screen.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

008

Go to Step 074 in this MAP.

009

Refer to Figure 3. The fourth character of the message line indicates which diskette drive is failing. If the character is 0, drive A is failing. If the character is 1, drive B is failing.

Note: If more than one error message appears, refer to line 2 of the first error message.

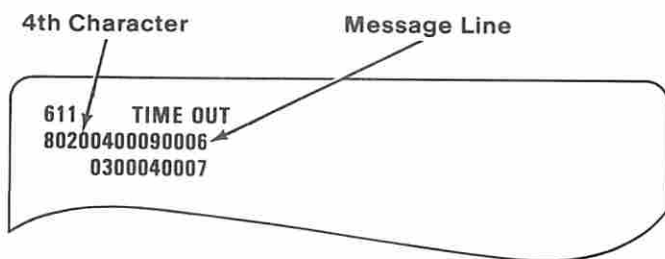


Figure 3. Error Message

009 (continued)

**IS THE FOURTH CHARACTER OF THE MESSAGE LINE
ZERO?**

Yes No

|
010

- Power off the system. Exchange the signal cable connectors between drives A and B. The diskette drive in the drive B slot is now recognized by the system as diskette drive A. Go back to the beginning of this MAP and start again.

If you still have the same failure after exchanging connectors, go to Step 077 in this MAP.

011

- Repeat the Diskette Drives and Adapter tests using another formatted scratch diskette in the failing drive.

DO YOU STILL HAVE AN ERROR MESSAGE?

Yes No

|
012

The diskette you used for the first test is either defective or improperly formatted.

013

- Find the error code in Figure 4 on page 0600-5, and take the action indicated.

Error Code	Probable Cause	Corrective Action
606 621 622 623 625 626	- Signal Cable - Diskette Drive Adapter - Diskette Drive	Go to Step 066 in this MAP
607	Write Protect Error	Go to Step 084 in this MAP
608	There is a problem with your Advanced Diagnostics diskette.	Use your backup copy of the Advanced Diagnostics diskette.
612 613	- Signal Cable - Diskette Drive Adapter	Go to Step 066 in this MAP
611	- Signal Cable - Diskette Drive Adapter - Diskette Drive	Go to Step 091 in this MAP
624	- Signal Cable - Diskette Drive Adapter - Diskette Drive	Go to Step 099 in this MAP

Figure 4. Error Codes

014

(From Step 002 in this MAP)

You may have a bad LED.

- Remove the Advanced Diagnostics diskette.
- Power off the system for about 5 seconds.
- Power on the system.
- Check the voltage between test points C and D while the diskette drive spindle is turning (see the Test Point Reference page).

DID THE VOLTAGE MEASURE CORRECTLY AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

015

Go to Step 017 in this MAP.

(Step 016 continues)

016

Replace the LED assembly.

017

(From Step 015 in this MAP)

- Check the power connector at drive A for the voltages listed in Figure 5.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

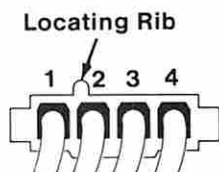


Figure 5. Diskette Drive Power Connector

ARE THE VOLTAGES CORRECT?

Yes No

018

Go to "MAP 0020: Power Start."

019

- Power off the system for about 5 seconds.
- Power on the system.
- Monitor the voltage at pin 12 of the diskette drive logic board from the start of the POST until the end of the POST.

Note: Use the frame as ground.

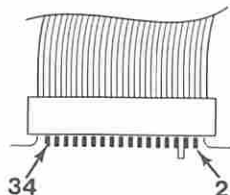


Figure 6. Signal Connector - Pin 12

WAS THE VOLTAGE APPROXIMATELY 5 VDC AT THE START OF THE POST?

Yes No

020

Replace the diskette drive logic board.

021

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

022

Go to Step 077 in this MAP.

023

Replace the diskette drive logic board.

024

(From Step 004 in this MAP)

- Remove the Advanced Diagnostics diskette from the drive.
- Power off the system for about 5 seconds.
- Power on the system and observe the spindle on drive A during the POST.

DID THE SPINDLE BEGIN TO ROTATE BEFORE THE BEEP AT THE END OF THE POST?

Yes No

(Step 025 continues)

025

Go to Step 049 in this MAP.

026

- Perform the preliminary speed check on drive A (see the Test Point Reference page).

Note: Do not adjust the speed until this MAP instructs you to do so.

IS THE SPEED CORRECT?

Yes No

027

Go to Step 029 in this MAP.

028

Go to Step 034 in this MAP.

029

(From Step 027 in this MAP)

ARE YOU CHECKING EITHER A TYPE 1 OR 2 DRIVE?

Yes No

030

Go to Step 059 in this MAP.

031

- Adjust the drive-motor speed (see the Test Point Reference page).

IS THE SPEED NOW CORRECT?

Yes No

032

Go to Step 053 in this MAP.

033

Go to Step 001 in this MAP to verify system operation.

034

(From Step 028 in this MAP)

- Power off the system.
- Remove the diskette drive logic board.
- Move the read/write head assembly to track 0 (rear of the drive).

Note: You should feel some resistance, but the head should not bind.

DID THE HEAD MOVE TO TRACK 0 WITHOUT BINDING?

Yes No

035

Replace the diskette drive.

036

- With the head at track 0, install the diskette drive logic board.
- Power on the system.
- Check the voltage between Test Point E and ground for the conditions described on the Test Point Reference page.

Note: The head may move away from track 0 during this test. The head must be manually moved back to track 0 if you want to check the voltage again.

IS THE VOLTAGE CORRECT?

Yes No

037

Replace the diskette drive.

038

- Power off the system.
- Remove the diskette drive logic board.
- Move the read/write head assembly to track 0 (rear of the drive).
- Install the diskette drive logic board.
- Power on the system.
- Monitor the voltage at pin 26 of the diskette drive logic board from the start of the POST until the end of the POST.

Note: Use the frame as ground.

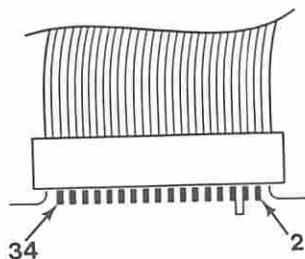


Figure 7. Signal Connector - Pin 26

WAS THE VOLTAGE APPROXIMATELY 5 VDC AT THE START OF THE POST?

Yes No

039

Go to Step 077 in this MAP.

040

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

041

Replace the diskette drive logic board.

042

- Power off the system for about 5 seconds.
- Power on the system.
- Check that the voltage at pin 18 on the diskette drive logic board meets the following conditions:

Note: Use the frame as ground.

- The voltage is approximately 5 Vdc at the start of the POST.
- The voltage decreases to approximately 0 Vdc before the beep at the end of the POST.

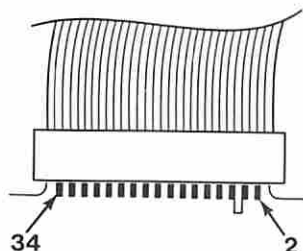


Figure 8. Signal Connector - Pin 18

WERE BOTH CONDITIONS MET?

Yes No

043

Go to Step 077 in this MAP.

044

- Power off the system.
- Remove the mounting screws from the diskette drive logic board.
- Disconnect the read/write head connectors. Leave all other connectors connected.
- Lift the diskette drive logic board enough to see the read/write head assembly.
- Move the read/write head assembly to track 0 (rear of drive).
- Power on the system and observe the motion of the read/write head assembly. It should move from track 0 forward to track 39 and back to track 0.

Note: Type 3 drives perform this exercise twice.

DID THE HEAD ASSEMBLY MOVE FROM TRACK 0 TO TRACK 39 AND BACK TO TRACK 0 (TWICE WITH A TYPE 3 DRIVE)?

Yes No

045

Replace the diskette drive.

046

(Step 046 continues)

046 (continued)

- Power off the system.
- Install the diskette drive logic board.
- Connect the read/write head connectors.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system and check for a change in voltage between Test Point F and ground as described on the Test Point Reference page.

DID THE VOLTAGE CHANGE AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

047

Replace the diskette drive.

048

Go to Step 077 in this MAP.

049

(From Step 025 in this MAP)

- Check the power connector at drive A for the voltages listed in Figure 9.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

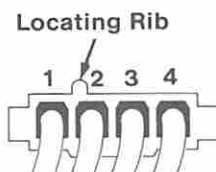


Figure 9. Diskette Drive A Power Connector

ARE THE VOLTAGES CORRECT?

Yes No

050

(Step 050 continues)

050 (continued)

Go to "MAP 0020: Power Start."

051

- Power off the system for about 5 seconds.
- Power on the system and check that the voltage at pin 16 of the diskette drive logic board meets the following conditions:

Note: Use the frame as ground.

- The voltage is approximately 5 Vdc at the start of the POST.
- The voltage decreases to approximately 0 Vdc before the beep at the end of the POST.

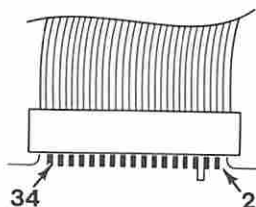


Figure 10. Signal Connector - Pin 16

WERE BOTH CONDITIONS MET?

Yes No

052

Go to Step 077 in this MAP.

053

(From Steps 032, 072, and 111 in this MAP)

IS A SERVO BOARD MOUNTED TO THE BACK OF THE DRIVE?

Yes No

054

(Step 054 continues)

054 (continued)
Go to Step 059 in this MAP.

055

- Check the voltage between P20-1 and P20-2 (ground) on the servo board.

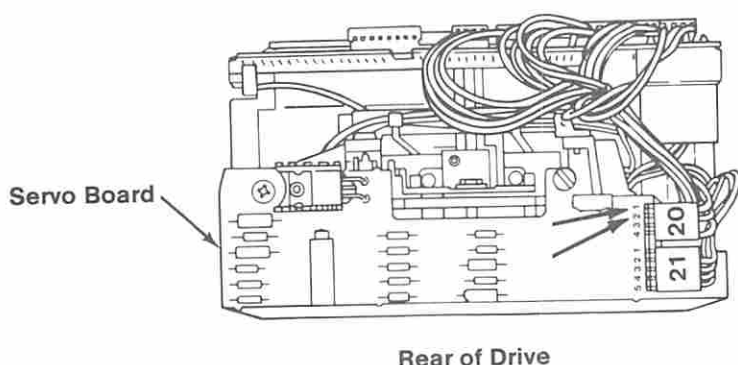


Figure 11. Servo Board - Pin P20-1 and P20-2

IS THE VOLTAGE APPROXIMATELY 12 VDC?

Yes No

056

Replace the diskette drive logic board.

057

- Power off the system for about 5 seconds.
- Power on the system and check that the voltage at pin P20-4 on the servo board meets the following conditions:

Note: Use the frame as ground.

- The voltage is approximately 5 Vdc at the start of the POST.
- The voltage decreases to approximately 0 Vdc when the LED lights.

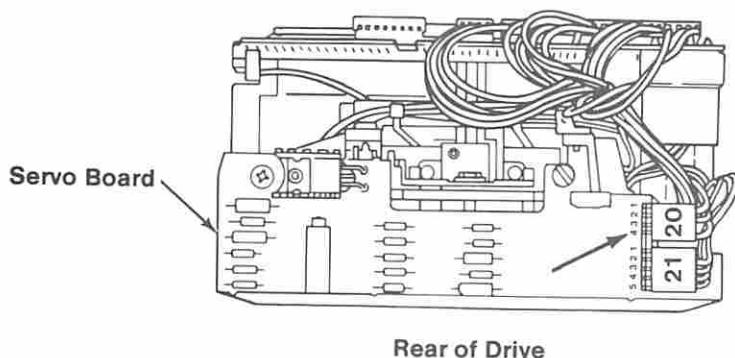


Figure 12. Servo Board - Pin P20-4

WERE BOTH CONDITIONS MET?

Yes No

058

Replace the diskette drive logic board.

059

(From Steps 030, 054, 070, and 109 in this MAP)

IS THE DRIVE BELT CORRECTLY INSTALLED ON THE PULLEYS AND IN GOOD CONDITION?

Yes No

060

Replace the drive belt.

061

- Power off the system.
- Remove the drive belt and turn the spindle drive pulley (large pulley) by hand.

DOES THE SPINDLE DRIVE PULLEY TURN FREELY?

Yes No

062

Replace the spindle assembly.

(Step 063 continues)

063

- Install the drive belt.
- Power on the system and check the voltage between test point G and ground when the LED is lit (see the Test Point Reference page).

IS THE VOLTAGE CORRECT AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

|
064

Replace the servo board. If that does not correct the problem, replace the diskette drive logic board.

065

Replace the diskette drive motor.

066

(From Step 013 in this MAP)

- Perform the preliminary speed check on drive A (see the Test Point Reference page).

Note: Do not adjust the speed until this MAP instructs you to do so.

IS THE SPEED CORRECT?

Yes No

|
067

Go to Step 069 in this MAP.

068

Go to Step 077 in this MAP.

069

(From Step 067 in this MAP)

(Step 069 continues)

069 (continued)

ARE YOU CHECKING EITHER A TYPE 1 OR TYPE 2 DRIVE?

Yes No

070

Go to Step 059 in this MAP.

071

- Adjust the drive-motor speed (see the Test Point Reference page).

IS THE SPEED NOW CORRECT?

Yes No

072

Go to Step 053 in this MAP.

073

Go to Step 096 in this MAP.

074

(From Step 008 in this MAP)

- Type 1 diskette drives without a connector on P5 are single-sided drives.
- All type 2 and type 3 diskette drives are double-sided drives.

DID THE DIAGNOSTICS PROGRAM CORRECTLY IDENTIFY EACH DRIVE AS "SINGLE SIDED" OR "DOUBLE SIDED?"

Yes No

075

Replace the drive that was not correctly identified.

076

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

077

(From Steps 010, 022, 039, 043, 048, 052, 068, 087, 095, 098, and 104 in this MAP)

You may have a bad signal cable.

- Power off the system.
- Disconnect the diskette drive signal cable from the drives and the adapter.
- Carefully inspect the cable and cable connectors for damage.
- Inspect the connectors on the adapter and drives for cracks or corrosion.

ARE THE CABLE AND CONNECTORS DEFECT-FREE?

Yes No

078

Replace or repair the defective part.

079

Use the adapter end of the cable to check for shorts.

- Touch one meter probe to pin 1 and the other meter probe to pin 2. The meter should read infinity.
- Check pin 2 to pin 3, pin 3 to pin 4, and so on until all pins have been checked.

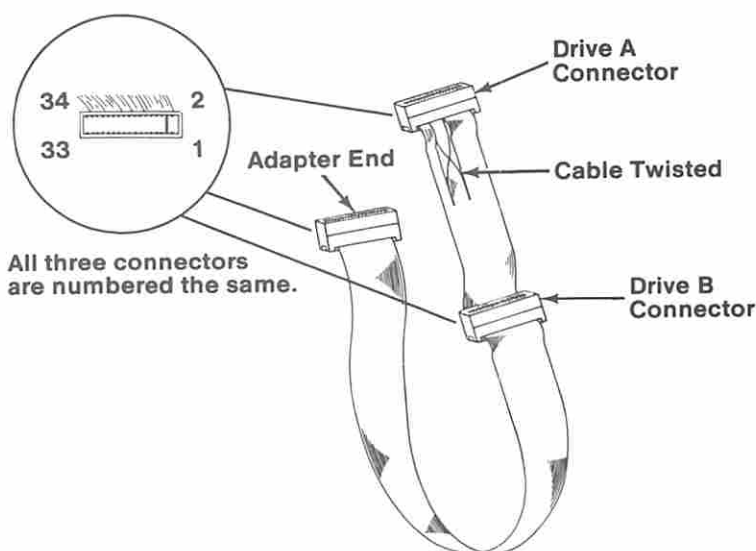


Figure 13. Signal Cable

079 (continued)

IS THE CABLE FREE FROM SHORTS?

Yes No

080

Replace the signal cable.

081

- Refer to Figure 14 and check the signal cable for continuity.

Note: Check the continuity from pin number to pin number except the pins preceded by an asterisk.

Signal Cable Connector							
Even Pins				Odd Pins			
Drive A - Adapter		Drive B - Adapter		Drive A - Adapter		Drive B - Adapter	
2	2	2	2	1	1	1	1
4	4	4	4	3	3	3	3
6	6	6	6	5	5	5	5
8	8	8	8	7	7	7	7
*10	16	10	10	9	9	9	9
*12	14	12	12	*11	15	11	11
*14	12	14	14	13	13	13	13
*16	10	16	16	*15	11	15	15
18	18	18	18	17	17	17	17
20	20	20	20	19	19	19	19
22	22	22	22	21	21	21	21
24	24	24	24	23	23	23	23
26	26	26	26	25	25	25	25
28	28	28	28	27	27	27	27
30	30	30	30	29	29	29	29
32	32	32	32	31	31	31	31
34	34	34	34	33	33	33	33

*Check for continuity between the pins listed.

Figure 14. Continuity Check

DOES THE SIGNAL CABLE HAVE CONTINUITY?

Yes No

082

Replace the signal cable.

083

Replace the diskette drive adapter. If the problem still exists, replace the diskette drive.

084

(From Steps 006 and 013 in this MAP)

- Check for a change in voltage between Test Point H and ground as you slide a diskette in and out of the diskette drive (see the Test Point Reference page).

DID THE VOLTAGE CHANGE AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

085

Replace the write-protect sensor.

086

- Remove the diskette.
- Check the voltage at pin 28 on the diskette drive logic board.

Note: Use the frame as ground.

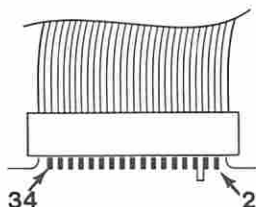


Figure 15. Signal Connector - Pin 28

IS THE VOLTAGE APPROXIMATELY 5 VDC?

Yes No

087

Go to Step 077 in this MAP.

088

- Power off the system for about 5 seconds.
- Power on the system.
- When the LED lights, monitor the voltage at pin 28 of the diskette drive logic board as you slide a diskette in and out of the drive.

Note: To test drive B, exchange the cables and repeat this step.

WHILE THE LED WAS ON, DID THE VOLTAGE CHANGE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC EACH TIME THE WRITE PROTECT SENSOR OPERATED?

Yes No

089

Replace the diskette drive logic board.

090

Replace the diskette drive adapter.

091

(From Step 013 in this MAP)

- Remove the diskette from the drive.
- Check the voltage between Test Point A and ground while inserting a diskette (see the Test Point Reference page).

Warning: Do not short the pins together when taking this voltage reading; damage to the boards may occur.

DID THE VOLTAGE CHANGE AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

092

Replace the diskette drive.

093

- Remove the diskette from the drive.
- Check the voltage between test point B and ground (see the Test Point Reference page).

DID THE VOLTAGE CHANGE AS DESCRIBED ON THE TEST POINT REFERENCE PAGE?

Yes No

(Step 094 continues)

094

Replace the diskette drive logic board.

095

Go to Step 077 in this MAP.

096

(From Step 073 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DO YOU STILL HAVE AN ERROR CODE?

Yes No

097

Run the Advanced Diagnostic tests one more time to verify you have fixed the problem.

098

Go to Step 077 in this MAP.

099

(From Step 013 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED IN THE SYSTEM?

Yes No

100

Go to Step 105 in this MAP.

101

DID MORE THAN ONE DISKETTE DRIVE ERROR MESSAGE APPEAR?

Yes No

102

Go to Step 105 in this MAP.

(Step 103 continues)

103**ARE THE 6XX ERROR CODES DIFFERENT?**

Yes No

104

Go to Step 077 in this MAP.

105

(From Steps 100 and 102 in this MAP)

- Perform the final drive-motor speed check (see the Test Point Reference page).

Note: Do not adjust the speed until this MAP instructs you to do so.

IS THE SPEED WITHIN THE LIMITS DISPLAYED ON THE SCREEN?

Yes No

106

Go to Step 108 in this MAP.

107

Replace the diskette drive logic board.

108

(From Step 106 in this MAP)

ARE YOU TESTING EITHER A TYPE 1 OR TYPE 2 DRIVE?

Yes No

109

Go to Step 059 in this MAP.

110

- Adjust the drive-motor speed (see the Test Point Reference page).

IS THE SPEED NOW CORRECT?

Yes No

(Step 111 continues)

111

Go to Step 053 in this MAP.

112

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DO YOU STILL HAVE A 624 ERROR CODE?

Yes No

113

Run the Advanced Diagnostic tests one more time to verify you have fixed the problem.

114

Replace the diskette drive logic board.

002

Go to Step 093 in this MAP.

003

IS THE LED ON ANY INSTALLED DISKETTE DRIVE LIT CONSTANTLY?

Yes No

004

Go to Step 006 in this MAP.

005

Go to Step 103 in this MAP.

006

(From Step 004 in this MAP)

IS THE ADVANCED DIAGNOSTICS MENU DISPLAYED?

Yes No

007

Try using your backup copy of the Advanced Diagnostics diskette. If you are still unable to load the Advanced Diagnostics program, go to Step 110 in this MAP.

008

- Select 0 (**SYSTEM CHECKOUT**).
- Select the Diskette Drives and Adapter tests. Use the (**RUN TESTS ONE TIME**) option.

Note: Do not run the individual tests until instructed to do so by this MAP.

DID THE DISKETTE DIAGNOSTIC MENU APPEAR WITHOUT AN ERROR?

Yes No

009

Go to Step 046 in this MAP.

010

(Step 010 continues)

010 (continued)

- Run the speed test on each diskette drive.

Note: If the speed does not appear on the display within 30 seconds when attempting to test drive B, go to Step 127 in this MAP.

DID YOU RECEIVE AN ERROR MESSAGE DURING THE SPEED TEST?

Yes No

011

Go to Step 025 in this MAP.

012

WAS THE ERROR MESSAGE A 607?

Yes No

013

Go to Step 015 in this MAP.

014

Go to Step 075 in this MAP.

015

(From Step 013 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

016

Go to Step 022 in this MAP.

017

DID YOU RECEIVE THE ERROR ON BOTH DISKETTE DRIVES?

Yes No

018

Go to Step 085 in this MAP.

(Step 019 continues)

019

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Locate system board switch block 1; set switch 7 On and switch 8 On.
- Power on the system.
- Run the Diskette Drives and Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- When the Diskette Diagnostic menu appears, perform the speed test on diskette drive A.

DID YOU RECEIVE AN ERROR MESSAGE DURING THE SPEED TEST?

Yes	No
-----	----

020	Replace diskette drive B.
------------	---------------------------

Note: Be sure to reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

021

- Power off the system.
- Reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

Go to Step 022 in this MAP.

022

(From Steps 016 and 021 in this MAP)

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and check the voltage at pin 8 of the signal cable (diskette drive end) as shown in Figure 1 on page 0600-5. The voltage should be 2.0 to 5.5 Vdc.

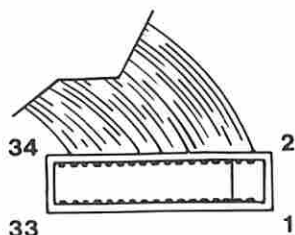


Figure 1. Signal Cable Voltage Check

IS THE VOLTAGE CORRECT?

Yes

No

023

Go to Step 139 in this MAP.

024

Replace diskette drive A.

025

(From Step 011 in this MAP)

IS THE SPEED OF EACH DISKETTE DRIVE CORRECT?

Yes

No

026

Replace the diskette drive with the incorrect speed.

027

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Power on the system.
- Use the Advanced Diagnostics format option and try to format a **write-protected** diskette in each diskette drive.

DID YOU RECEIVE AN ERROR FROM EACH DISKETTE DRIVE INDICATING THE DISKETTE WAS WRITE PROTECTED?

Yes

No

(Step 028 continues)

028

Go to Step 075 in this MAP.

029

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Power on the system.
- Use the Advanced Diagnostics format option again and format a **non write-protected** diskette in diskette drive A.

DID YOU RECEIVE AN ERROR?

Yes No

030

Go to Step 039 in this MAP.

031

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

032

Go to Step 036 in this MAP.

033

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Locate system board switch block 1; set switch 7 On and switch 8 On.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Power on the system.
- Use the Advanced Diagnostics format option again and format a **non write-protected** diskette in diskette drive A.

DID YOU RECEIVE AN ERROR?

Yes No

034

Replace diskette drive B.

Note: Be sure to reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

035

- Power off the system.
- Reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

Go to Step 036 in this MAP.

036

(From Steps 032 and 035 in this MAP)

DOES THE ERROR INDICATE THE DISKETTE IS WRITE PROTECTED?

Yes No

037

Go to Step 066 in this MAP.

038

Go to Step 075 in this MAP.

039

(From Step 030 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

040

Go to Step 066 in this MAP.

041

- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Use the Advanced Diagnostics format option again and format a **non write-protected** diskette in diskette drive B.

DID YOU RECEIVE AN ERROR?

Yes No

042

Go to Step 044 in this MAP.

043

Replace diskette drive B.

044

(From Step 042 in this MAP)

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Ensure all cables and connectors are properly connected.
- Power on the system.
- When the Advanced Diagnostics menu appears, select **0 (SYSTEM CHECKOUT)**.
- Run the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR?

Yes No

045

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem start an error log. If you need instructions, refer to the Reference manual.

046

(From Step 009 in this MAP)

IS THE ERROR CODE 602, 603, 608, or 614?

Yes No

047

Go to Step 049 in this MAP.

048

A **608** or **614** error code indicates that your Advanced Diagnostics diskette may be defective. A **602** or **603** error code indicates that you have a defective diskette or incorrect type of diskette installed in one of the diskette drives. Replace the failing diskette and return to Step 001 in this MAP to verify system operation.

049

(From Step 047 in this MAP)

- Repeat the Advanced Diagnostic tests using another formatted diskette in the failing diskette drive.

(Step 049 continues)

049 (continued)

DID YOU RECEIVE AN ERROR?

Yes No

050

Your first diskette was defective. Return to Step 001 in this MAP to verify system operation.

051

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

052

Go to Step 058 in this MAP.

053

IS DISKETTE DRIVE A FAILING?

Yes No

054

Go to Step 058 in this MAP.

055

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Locate system board switch block 1; set switch 7 On and switch 8 On.
- Power on the system.
- Repeat the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR?

Yes No

056

Replace diskette drive B.

Note: Be sure to reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

(Step 057 continues)

057

- Make a note of the error code.
- Power off the system
- Reconnect the signal cable to diskette drive B.
- Locate system board switch block 1; set switch 7 Off and switch 8 On.

Go to Step 058 in this MAP.

058

(From Steps 052, 054, and 057 in this MAP)

- Find your error code in the following figure and take the action indicated.

Error Code	Action
601 606 612 613 621 622 623 625	Go to Step 139 in this MAP
626	Go to Step 066 in this MAP
624	Go to Step 059 in this MAP

Figure 2. Error Messages

059

(From Step 058 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

060

Replace the diskette drive.

061

DID YOU RECEIVE THE ERROR ON BOTH DISKETTE DRIVES?

Yes No

(Step 062 continues)

062

Replace the failing diskette drive.

063

ARE BOTH ERRORS THE SAME?

Yes No

064

Replace the diskette drive with the 624 error.

065

Go to Step 139 in this MAP.

066

(From Steps 037, 040, and 058 in this MAP)

- Power off the system for approximately 5 seconds.
- Power on the system and check the voltage at pin 30 on the diskette drives' circuit board (Figure 3).

The voltage should be approximately 5 Vdc at the start of the POST and decrease by approximately 0.5 Vdc when the diskette drive LED is on during the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0.5 Vdc" includes a range of 0.3 to 1.0 Vdc.

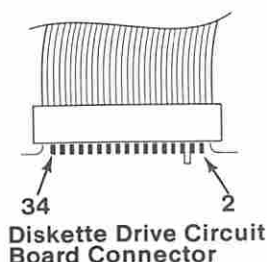


Figure 3. Voltage Check

DID THE VOLTAGE DECREASE BY APPROXIMATELY 0.5 VDC?

Yes No

(Step 067 continues)

067

Replace the failing diskette drive.

Note: You must format the scratch diskette before running the diagnostic procedures again.

068

- Power off the system.
- Disconnect the signal cable from the failing diskette drive.
- Power on the system.
- Check the voltage at pin 24 on the diskette drive circuit board (Figure 4). Use the system unit frame as ground.



Figure 4. Voltage Check

IS THE VOLTAGE 2.0 TO 5.5 VDC?

Yes No

069

Replace the diskette drive.

070

- Power off the system.
- Reconnect the diskette drive signal cable.
- Power on the system and monitor the voltage at pin 24 on the diskette drive circuit board (Figure 5 on page 0600-13).

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc.

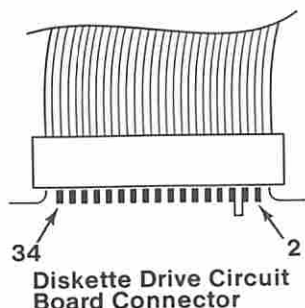


Figure 5. Voltage Check

IS THE VOLTAGE APPROXIMATELY 5.0 VDC AT THE START OF THE POST?

Yes No

071

Go to Step 139 in this MAP.

072

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Power on the system.
- Use the Advanced Diagnostics format option again and format a **non write-protected** diskette in the failing diskette drive.
- Monitor the voltage at pin 24 on the diskette drive circuit board while the diskette is formatting.
- The voltage should decrease to approximately 2.5 Vdc while the diskette is formatting.

Notes:

1. You may notice a fluctuation of the meter reading during this test.
2. "Approximately 2.5" includes a range of 2.0 to 3.0 Vdc.

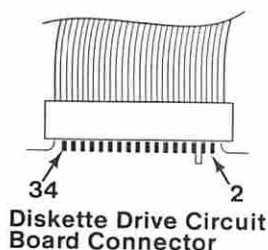


Figure 6. Voltage Check

DID THE VOLTAGE DECREASE TO APPROXIMATELY 2.5 VDC?

Yes No

073

Go to Step 139 in this MAP.

074

Replace the failing diskette drive.

075

(From Steps 014, 028, and 038 in this MAP)

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Check the voltage at pin 28 on the signal cable (Figure 7).

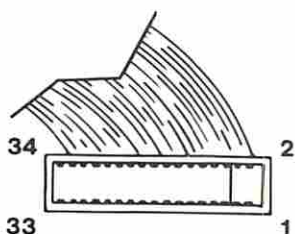


Figure 7. Signal Cable Voltage Check

(Step 075 continues)

075 (continued)

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC?

Yes No

076

Go to Step 139 in this MAP.

077

- Power off the system.
- Reconnect the signal cable to any installed diskette drives.
- Remove any diskettes from the diskette drives.
- Power on the system and monitor the voltage at pin 28 on the failing diskette drive circuit board during the POST (Figure 8).

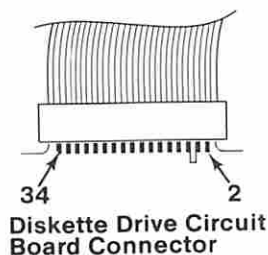


Figure 8. Voltage Check

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC AT THE START OF THE POST?

Yes No

078

Replace the failing diskette drive.

079

Note: "Approximately 0 Vdc" includes a range of 0 Vdc to 0.8 Vdc.

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

(Step 080 continues)

080

Go to Step 082 in this MAP.

081

Replace the failing diskette drive.

082

(From Step 080 in this MAP)

- Power off the system.
- Insert a **write-protected** diskette into the failing drive.
- Power on the system and monitor the voltage at pin 28 on the failing diskette drive circuit board during the POST. The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 Vdc to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 Vdc to 0.8 Vdc.

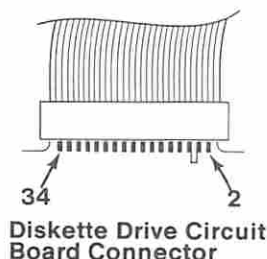


Figure 9. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

083

Replace the failing diskette drive.

084

Go to Step 139 in this MAP.

085

(From Step 018 in this MAP)

IS DISKETTE DRIVE A FAILING?

Yes

No

086

Go to Step 090 in this MAP.

087

- Check the continuity of the signal cable from pin 8 of the diskette drive A end to pin 8 of the adapter end.

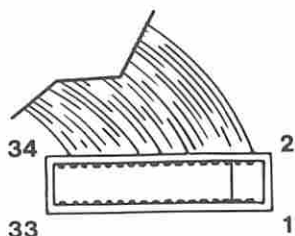


Figure 10. Signal Cable Continuity

DOES THE SIGNAL CABLE HAVE CONTINUITY?

Yes

No

088

Replace the signal cable.

089

Replace the diskette drive.

090

(From Step 086 in this MAP)

- Power off the system.
- Remove diskette drive B from the system.
- Reconnect the signal and power cable connectors to diskette drive B.

(Step 090 continues)

090 (continued)

- Position diskette drive B so you can see the bottom of the drive.
- Power on the system and observe the rotor.

DID THE ROTOR SPIN BEFORE THE BEEP AT THE END OF THE POST?

Yes No

|

|

091

Go to Step 134 in this MAP.

092

Replace diskette drive B.

093

(From Step 002 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

|

|

094

Go to Step 103 in this MAP.

095

DID THE LED ON DISKETTE DRIVE A LIGHT?

Yes No

|

|

096

Go to Step 100 in this MAP.

097

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and observe the LED on diskette drive B.

Note: You may receive an error message during the POST. Disregard the error message.

(Step 097 continues)

097 (continued)

DID THE LED ON DISKETTE DRIVE B LIGHT BEFORE THE BEEP AT THE END OF THE POST?

Yes No

098

Go to Step 103 in this MAP.

099

Replace diskette drive A.

100

(From Step 096 in this MAP)

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Power on the system and observe the LED on diskette drive A.

Note: You may receive an error message during the POST. Disregard the error message.

DID THE LED ON DISKETTE DRIVE A LIGHT BEFORE THE BEEP AT THE END OF THE POST?

Yes No

101

Go to Step 103 in this MAP.

102

Replace diskette drive B.

103

(From Steps 005, 094, 098, and 101 in this MAP)

- Check the power connector at each installed diskette drive for the voltages listed in Figure 11.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

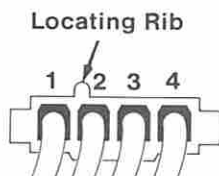


Figure 11. Diskette Drive Power Connectors

ARE THE VOLTAGES CORRECT?

Yes No

104

Go to "MAP 0020: Power Start."

105

- Power off the system.
- Disconnect the signal cable from the diskette drives.
- Power on the system.
- Check the voltage at pin 12 on the circuit board of the failing diskette drive (Figure 12).
- The voltage should be 2.0 to 5.5 Vdc.



Figure 12. Voltage Check

105 (continued)

IS THE VOLTAGE CORRECT?

Yes No

106

Replace the failing diskette drive.

107

- Power off the system.
- Reconnect the signal cable to the failing diskette drive.
- Power on the system and monitor the voltage at pin 12 on the circuit board of the failing diskette drive (Figure 13). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.

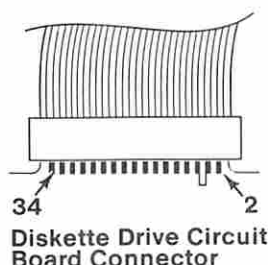


Figure 13. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

108

Go to Step 139 in this MAP.

109

Replace the failing diskette drive.

110

(From Step 007 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

111

Go to Step 115 in this MAP.

112

- Power off the system
- Disconnect the signal cable from diskette drive B.
- Locate system board switch block 1; set switch 7 On and switch 8 On.
- Power on the system.

DOES THE ADVANCED DIAGNOSTICS MENU APPEAR AT THE END OF THE POST?

Yes No

113

- Reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).
- Go to Step 115 in this MAP.

114

Replace diskette drive B.

Note: Be sure to reset the system board switches for two diskette drives (switch 7 Off, switch 8 On).

115

(From Steps 111 and 113 in this MAP)

- Power off the system for about 5 seconds.
- Power on the system and observe the spindle on diskette drive A (Figure 14 on page 0600-23).

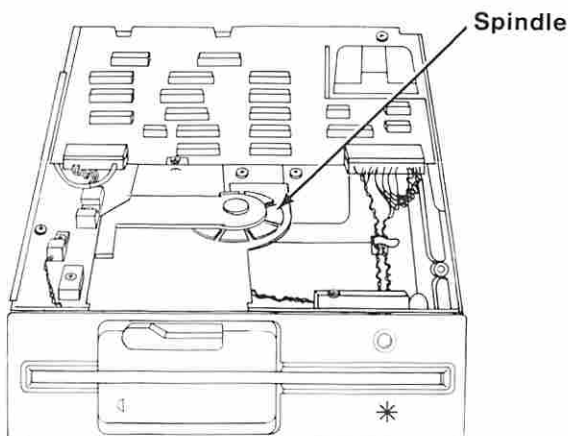


Figure 14. Diskette Drive Spindle

DID THE SPINDLE ROTATE BEFORE THE BEEP AT THE END OF THE POST?

Yes No

116

Go to Step 134 in this MAP.

117

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and check the voltage at pin 18 on the diskette drive A circuit board (Figure 15).



Figure 15. Voltage Check

(Step 117 continues)

117 (continued)

IS THE VOLTAGE APPROXIMATELY 5 VDC?

Yes No

118

Replace diskette drive A.

119

- Power off the system.
- Reconnect the signal cable to diskette drive A.
- Power on the system and monitor the voltage at pin 18 of diskette drive A (Figure 16). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.

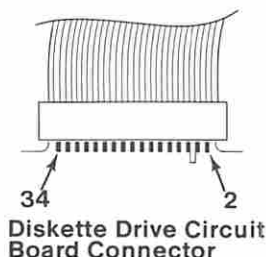


Figure 16. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

120

Go to Step 139 in this MAP.

121

- Power off the system.
 - Remove diskette drive A from the system.
- (Step 121 continues)

121 (continued)

- Reconnect the signal and power cable to diskette drive A.
- Manually slide the read/write head to track 0 (rear of the diskette drive). If you are unable to move the head, replace the diskette drive.
- Position diskette drive A so you can observe the read/write head from the bottom.
- Power on the system and observe the read/write head. The head should move from track 0 forward to track 39 (front of the diskette drive).

Note: Some diskette drives may perform this exercise more than one time.

DID THE HEAD MOVE AS DESCRIBED?

Yes	No
	<p>122</p> <p>Replace diskette drive A.</p>

123

- Power off the system for about 5 seconds.
- Power on the system and monitor the voltage at pin 26 of diskette drive A (Figure 17 on page 0600-26). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Notes:

1. "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.
2. This voltage shifts rapidly and the meter may not appear to drop all the way to 0.0 Vdc.

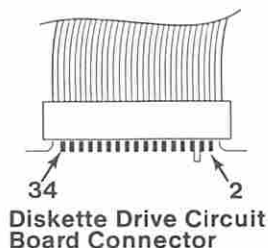


Figure 17. Voltage Check

WAS THE VOLTAGE APPROXIMATELY 5 VDC AT THE START OF THE POST?

Yes No

124

Go to Step 139 in this MAP.

125

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

126

Replace diskette drive A.

127

(From Step 010 in this MAP)

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Refer to Figure 18 on page 0600-27 and check the voltage at pin 30 of the diskette drive A signal cable connector (diskette drive end).

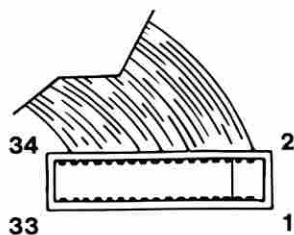


Figure 18. Signal Cable Voltage Check

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC?

Yes No

128

Go to Step 139 in this MAP.

129

- Power off the system.
- Reconnect the signal cable to the diskette drives.
- Power on the system and monitor the voltage at pin 30 on each diskette drive circuit board during the POST (Figure 19).

The voltage should be approximately 5 Vdc at the start of the POST and decrease by approximately 0.5 Vdc when the diskette drive LED is on during the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0.5 Vdc" includes a range of 0.3 to 1.0 Vdc.

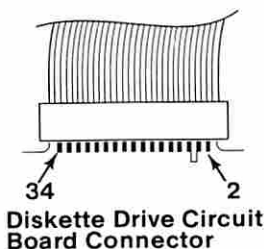


Figure 19. Voltage Check

129 (continued)

**DID THE VOLTAGE DECREASE BY APPROXIMATELY
0.5 VDC?**

Yes	No
130	
Replace the failing diskette drive.	

131

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Check for a voltage of approximately 5 Vdc at pin 32 on the diskette drive A circuit board.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc.

IS THE VOLTAGE APPROXIMATELY 5 VDC?

Yes	No
132	
Replace the failing diskette drive.	

133

Go to Step 139 in this MAP.

134

(From Steps 091 and 116 in this MAP)

- Power off the system.
- Disconnect the signal cable from the diskette drives.
- Power on the system and check the voltage of pin 16 on the circuit board of the failing diskette drive (Figure 20 on page 0600-29). The voltage should be 2.0 to 5.5 Vdc.



Figure 20. Voltage Check

IS THE VOLTAGE CORRECT?

Yes No

135

Replace the failing diskette drive.

136

- Power off the system.
- Reconnect the signal cable to the failing diskette drive.
- Power on the system and check the voltage at pin 16 of the failing diskette drive circuit board (Figure 21).

The voltage should decrease from approximately 5 Vdc to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.

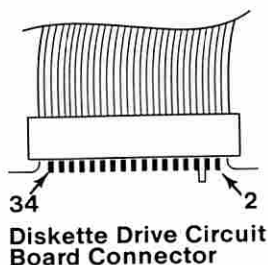


Figure 21. Voltage Check

(Step 136 continues)

136 (continued)

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

137

Go to Step 139 in this MAP.

138

Replace the failing diskette drive.

139

(From Steps 023, 058, 065, 071, 073, 076, 084, 108, 120, 124, 128, 133, and 137 in this MAP)

- Power off the system.
- Check the diskette drive signal cable for continuity. The line numbers at one end of the cable match the line numbers at the other end, except for those listed in Figure 22. Check all lines for continuity.

Diskette Drive A Signal Cable Connector		Diskette Drive B Signal Cable Connector	
Pin Numbering		Pin Numbering	
Drive End	Adapter End	Drive End	Adapter End
10	16	10	10
11	15	11	11
12	14	12	12
14	12	14	14
15	11	15	15
16	10	16	16

Figure 22. Continuity Check

DID ALL LINES HAVE CONTINUITY?

Yes No

140

Replace the diskette drive signal cable.

141

Replace the diskette drive adapter. If this does not correct the problem, replace the system board.

004

Go to Step 011 in this MAP.

005

DOES THE FAILURE OCCUR ON DRIVE A?

Yes No

006

Go to Step 011 in this MAP.

007

- Remove the system unit cover.
- Remove the signal cable from diskette drive B.
- Remove the signal cable from diskette drive A and install it on diskette drive B.
- Power on the system.
- Retry the failing operation on diskette drive B.

DOES THE SAME FAILURE OCCUR ON DISKETTE DRIVE B AS ON DISKETTE DRIVE A?

Yes No

008

Go to Step 010 in this MAP.

009

Go to Step 057 in this MAP.

010

(From Step 008 in this MAP)

- Power off the system.
 - Remove the signal cable from diskette drive B and install it on diskette drive A.
 - Install the diskette drive B signal connector on diskette drive B, then go to Step 011 in this MAP.
-

011

(From Steps 004, 006, 010, and 035 in this MAP)

- Power off the system.
 - Insert your Advanced Diagnostics diskette into drive A.
- (Step 011 continues)

011 (continued)

- Power on the system.
- Observe the light-emitting diode (LED) on drive A.

DID THE LED ON DISKETTE DRIVE A LIGHT JUST BEFORE THE BEEP AT THE END OF POST?

Yes No

012

Go to Step 022 in this MAP.

013

DID THE ADVANCED DIAGNOSTICS MENU APPEAR?

Yes No

014

Go to Step 027 in this MAP.

015

DO YOU HAVE A FORMATTED DISKETTE FOR EACH DRIVE?

Yes No

016

Go to Step 018 in this MAP.

017

Go to Step 019 in this MAP.

018

(From Step 016 in this MAP)

- Press 1 (**FORMAT DISKETTE**), then press Enter.
- Follow the instructions on your screen and format a diskette to be used as a scratch diskette, then go to Step 019 in this MAP.

Note: If two diskette drives are installed in the system unit, format two scratch diskettes.

019

(From Steps 017 and 018 in this MAP)

- Run the Diskette Drive and Adapter tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR CODE ON THE SCREEN?

Yes No

020

Go to Step 036 in this MAP.

021

The fourth character of message line 2, as shown in Figure 1, indicates which diskette drive is failing. If the character is 0, drive A is failing. If the character is 1, drive B is failing.

- Make a note of the error code and the fourth character on your screen.

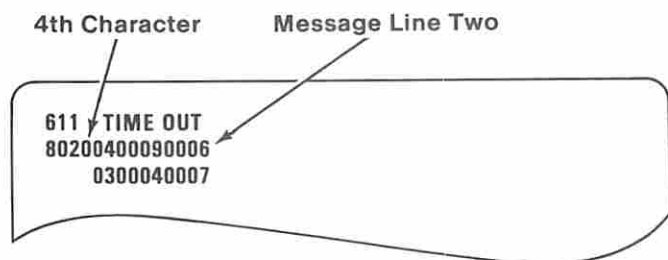


Figure 1. Error Message

- Format another diskette using the failing drive. Make a note of the error code.
- Find your error code in Figure 2 on page 0600-5 and take the action described.

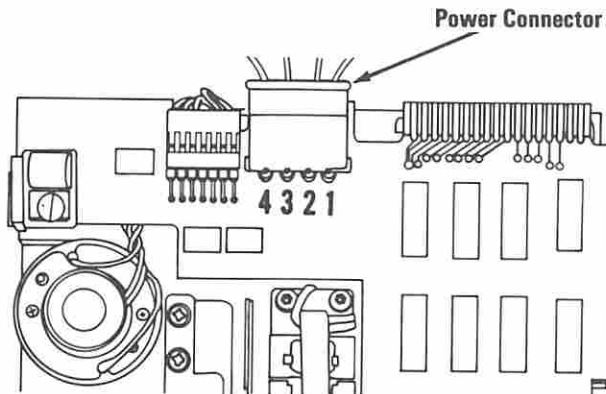
Error Code	Action
606.....	Go to Step 054 in this MAP
607.....	Go to Step 049 in this MAP
608.....	Replace the Diskette Drive
611.....	Go to Step 054 in this MAP
612.....	Go to Step 046 in this MAP
613.....	Go to Step 046 in this MAP
621.....	Go to Step 052 in this MAP
622.....	Go to Step 052 in this MAP
623.....	Go to Step 052 in this MAP
624.....	Go to Step 052 in this MAP
625.....	Go to Step 052 in this MAP
626.....	Go to Step 052 in this MAP

Figure 2. Error Codes

022

(From Step 012 in this MAP)

- Remove the system unit cover.
- Check the power connector on the diskette drive for the voltages listed in Figure 3. If two diskette drives are installed, measure the voltages at both drives.



Diskette Drive Power Connector			
Min Vdc	Max Vdc	-Lead	+Lead
+ 4.8	+ 5.25	3	4
+11.52	+12.6	2	1

Figure 3. Voltage Check

022 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

023

Go to "MAP 0020: Power Start."

024

- Power off the system for at least 5 seconds.
- Power on the system.
- Monitor the voltage between pin 12 of the signal cable connector and ground. The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

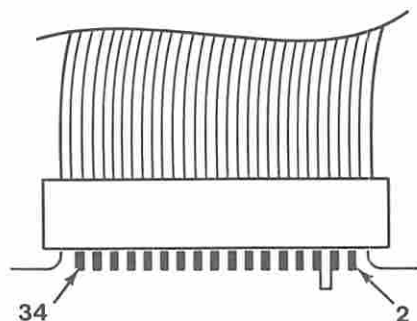


Figure 4. Voltage Check

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF POST?

Yes No

025

Replace the diskette drive adapter.

026

Replace the diskette drive.

027

(From Step 014 in this MAP)

- Remove the Advanced Diagnostics diskette.
- Power off the system.
- Remove the failing diskette drive.
- Install the power and signal connectors on the diskette drive.
- Power on the system.
- Observe the spindle during the POST.

DID THE SPINDLE BEGIN TO ROTATE BEFORE THE BEEP AT THE END OF POST?

Yes	No
-----	----

--	--

|	028 Go to Step 039 in this MAP.
--	------------------------------------

029

- Perform the diskette-drive-motor preliminary speed test.

Note: You need a fluorescent light to see the strobe effect of this test.

IS THE SPEED OF THE DRIVE CORRECT?

Yes	No
-----	----

--	--

|	030 Adjust the variable resistor for the proper speed. If you are unable to adjust the speed satisfactorily, replace the diskette drive.
--	---

031

- Power off the system.
- Measure the voltage between pin 26 of the signal cable connector and ground, as shown in Figure 5 on page 0600-8.
- Power on the system.
- Ensure the voltage is between approximately 2.0 and 5.0 Vdc at the start of the POST.

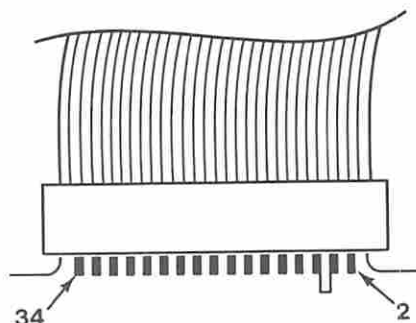


Figure 5. Voltage Check

**WAS THE VOLTAGE BETWEEN PIN 26 AND GROUND
APPROXIMATELY 5 VDC AT THE START OF POST?**

Yes No

032

Go to Step 046 in this MAP.

033

- Power off the system for at least 5 seconds.
- Ensure that a terminating resistor is installed in diskette drive A only.
- Power on the system.
- Monitor the voltage between pin 18 and ground during the POST.

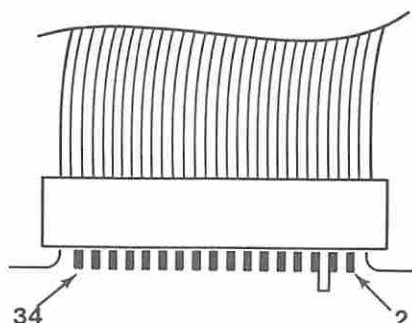


Figure 6. Voltage Check

DID THE VOLTAGE BETWEEN PIN 18 AND GROUND GO FROM 5 VDC TO 0 VDC AND BACK TO 5 VDC BEFORE THE BEEP AT THE END OF POST?

Yes No

034

Go to Step 046 in this MAP.

035

Replace the diskette drive and go to Step 011 in this MAP to verify proper diskette drive operation. If this is your second time at this point and your problem still exists, replace the diskette drive adapter.

036

(From Step 020 in this MAP)

Portable PC diskette drives are double-sided drives.

(Step 036 continues)

036 (continued)

DID THE DIAGNOSTIC TESTS CORRECTLY IDENTIFY THE DRIVES AS "DOUBLE SIDED?"

Yes No

037

Replace the diskette drive that is identified as "single sided" in the message.

038

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

039

(From Steps 028 and 050 in this MAP)

IS THE DISKETTE DRIVE BELT INSTALLED ON THE PULLEYS CORRECTLY AND IN GOOD CONDITION?

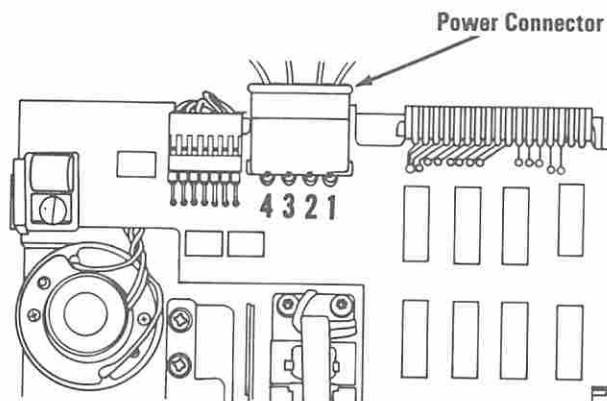
Yes No

040

Replace the drive belt.

041

- Check the power connector on the diskette drive for the voltages listed in Figure 7 on page 0600-11. If two diskette drives are installed, the voltages listed in the figure apply to both.



Diskette Drive Power Connector			
Min Vdc	Max Vdc	-Lead	+Lead
+ 4.8	+ 5.25	3	4
+11.52	+12.6	2	1

Figure 7. Voltage Check

ARE THE VOLTAGES WITHIN THE LIMITS INDICATED (Figure 7)?

Yes No

042

Go to "MAP 0020: Power Start."

043

- Power off the system for at least 5 seconds.
- Power on the system.
- Monitor the voltage between pin 16 of the signal cable connector and ground.
- The voltage should decrease from approximately 5.0 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

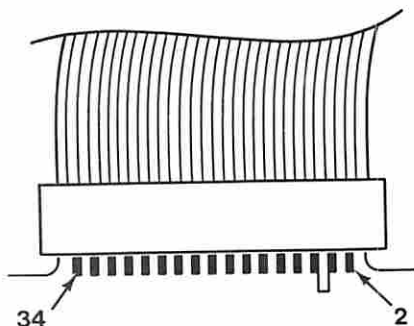


Figure 8. Voltage Check

**DID THE VOLTAGE BETWEEN PIN 16 AND GROUND
DECREASE TO APPROXIMATELY 0 VDC?**

Yes No

044

Go to Step 046 in this MAP.

045

Replace the diskette drive.

046

(From Steps 021, 032, 034, and 044 in this MAP)

Check the continuity of the diskette-drive cable as follows:

- Power off the system.
- Set your meter to the Ohms X 1 scale.
- Refer to Figure 9 on page 0600-13 to locate the test points on the signal cable.

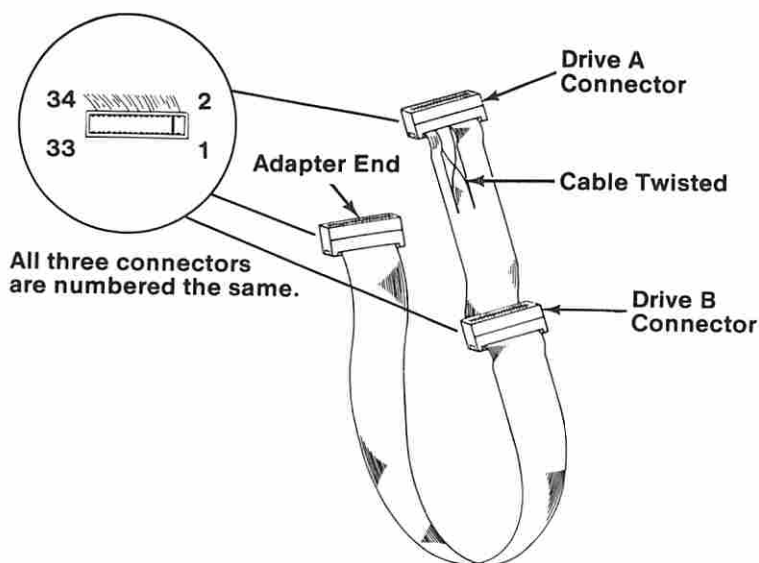


Figure 9. Signal Cable Pin Locations

- Refer to Figure 10 on page 0600-14 and check the continuity of the signal cable.
- Check for continuity from pin number to pin number except for those numbers preceded by an asterisk.

Signal Cable Connector							
Even Pins				Odd Pins			
Drive A - Adapter		Drive B - Adapter		Drive A - Adapter		Drive B - Adapter	
2	2	2	2	1	1	1	1
4	4	4	4	3	3	3	3
6	6	6	6	5	5	5	5
8	8	8	8	7	7	7	7
*10	16	10	10	9	9	9	9
*12	14	12	12	*11	15	11	11
*14	12	14	14	13	13	13	13
*16	10	16	16	*15	11	15	15
18	18	18	18	17	17	17	17
20	20	20	20	19	19	19	19
22	22	22	22	21	21	21	21
24	24	24	24	23	23	23	23
26	26	26	26	25	25	25	25
28	28	28	28	27	27	27	27
30	30	30	30	29	29	29	29
32	32	32	32	31	31	31	31
34	34	34	34	33	33	33	33

*Check for continuity between the pins listed.

Figure 10. Pin Numbers

IS THE CONTINUITY OF THE SIGNAL CABLE CORRECT?

Yes No

047

Replace the signal cable.

048

Replace the diskette drive and go to Step 001 in this MAP. If this is your second time at this point and your problem still exists, replace the diskette drive adapter.

049

(From Step 021 in this MAP)

- Power off the system for at least 5 seconds.
- Power on the system.
- When the LED lights, monitor the voltage between pin 28 of the signal cable connector and ground as you slide a diskette in and out of the drive. The voltage should decrease from approximately 5 Vdc to approximately 0 Vdc each time the write protect switch operates.

Note: If diskette drive B is being tested, exchange the signal cable connectors with diskette drive A.

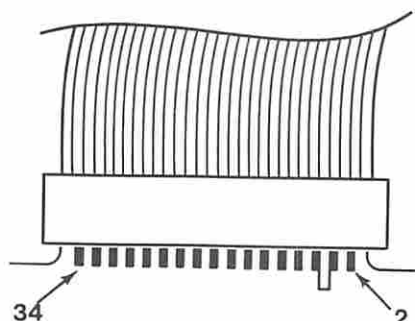


Figure 11. Signal Cable Connector

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5.0 VDC TO 0 VDC EACH TIME THE WRITE-PROTECT SWITCH WAS OPERATED WHILE THE LED WAS ON?

Yes No

050

If approximately 5.0 Vdc was never present, go to Step 039 in this MAP. If the voltage did not decrease from approximately 5.0 Vdc to 0 Vdc, replace the diskette drive.

051

Replace the diskette drive adapter.

052

(From Step 021 in this MAP)

- Perform the diskette-drive-motor preliminary speed test.

Note: You need a fluorescent light to see the strobe effect of this test.

(Step 052 continues)

052 (continued)

IS THE SPEED OF THE DRIVE CORRECT?

Yes No

053

Adjust the speed of the diskette drive. If you are unable to adjust the diskette drive speed satisfactorily, go to Step 054 in this MAP.

054

(From Steps 021 and 053 in this MAP)

Check the continuity of the diskette-drive cable as follows:

- Power off the system.
- Disconnect the diskette drive signal cable from the diskette drive adapter and the diskette drive.
- Set your meter to the Ohms X 1 scale.
- Refer to Figure 12 for the test points on the signal cable.

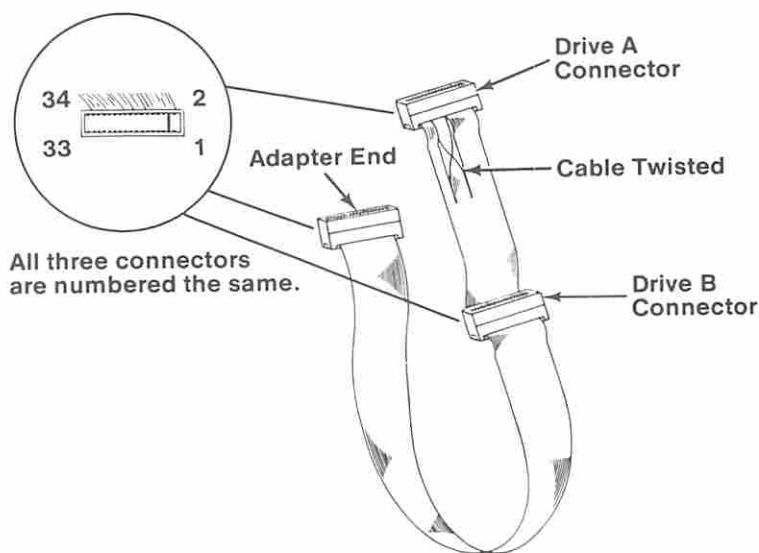


Figure 12. Signal Cable

054 (continued)

- Refer to Figure 13. Check signal cable continuity from pin number to pin number, except for those numbers preceded by an asterisk.

Signal Cable Connector							
Even Pins				Odd Pins			
Drive A – Adapter		Drive B – Adapter		Drive A – Adapter		Drive B – Adapter	
2	2	2	2	1	1	1	1
4	4	4	4	3	3	3	3
6	6	6	6	5	5	5	5
8	8	8	8	7	7	7	7
*10	16	10	10	9	9	9	9
*12	14	12	12	*11	15	11	11
*14	12	14	14	13	13	13	13
*16	10	16	16	*15	11	15	15
18	18	18	18	17	17	17	17
20	20	20	20	19	19	19	19
22	22	22	22	21	21	21	21
24	24	24	24	23	23	23	23
26	26	26	26	25	25	25	25
28	28	28	28	27	27	27	27
30	30	30	30	29	29	29	29
32	32	32	32	31	31	31	31
34	34	34	34	33	33	33	33

*Check for continuity between the pins listed.

Figure 13. Continuity Check

IS THE CONTINUITY OF THE SIGNAL CABLE CORRECT?

Yes No

055

Replace the signal cable.

056

Replace the diskette drive and go to Step 001 in this MAP. If this is your second time at this point and your problem still exists, replace the diskette drive adapter.

057

(From Step 009 in this MAP)

Check the continuity of the diskette-drive cable as follows:

- Power off the system.
- Disconnect the diskette drive signal cable from the diskette drive adapter and the diskette drive.

(Step 057 continues)

057 (continued)

- Set your meter to the Ohms X 1 scale.
- Refer to Figure 14 for the test points on the signal cable.

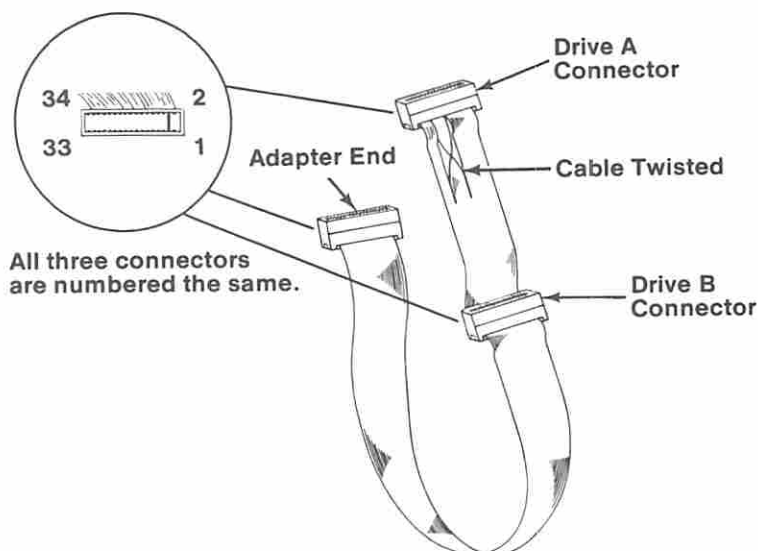


Figure 14. Signal Cable

- Refer to Figure 15 on page 0600-19 and check the continuity of the signal cable.
- Check continuity from pin number to pin number, except for those numbers preceded by an asterisk.

Signal Cable Connector							
Even Pins				Odd Pins			
Drive A - Adapter		Drive B - Adapter		Drive A - Adapter		Drive B - Adapter	
2	2	2	2	1	1	1	1
4	4	4	4	3	3	3	3
6	6	6	6	5	5	5	5
8	8	8	8	7	7	7	7
*10	16	10	10	9	9	9	9
*12	14	12	12	*11	15	11	11
*14	12	14	14	13	13	13	13
*16	10	16	16	*15	11	15	15
18	18	18	18	17	17	17	17
20	20	20	20	19	19	19	19
22	22	22	22	21	21	21	21
24	24	24	24	23	23	23	23
26	26	26	26	25	25	25	25
28	28	28	28	27	27	27	27
30	30	30	30	29	29	29	29
32	32	32	32	31	31	31	31
34	34	34	34	33	33	33	33

*Check for continuity between the pins listed.

Figure 15. System Board Identification

IS THE CONTINUITY OF THE SIGNAL CABLE CORRECT?

Yes No

058

Replace the signal cable.

059

Replace the diskette drive adapter.

Notes:

MAP 0600: Diskette Drive (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 6XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none"> • The diskette drive is failing. • The diskette drive adapter is failing. • The system board is failing. • The diskette drive signal cable is failing. • The power supply is failing.

Notes:

1. Within this MAP, the term "scratch diskette" refers to a blank formatted diskette that is **not write protected**.
2. A double-sided (360K) diskette cannot be formatted in a High-Capacity (1.2M) diskette drive using the Advanced Diagnostics format routine.

001

- Power off the system.
- Ensure the terminating resistor is correctly installed or the terminating switches are correctly set for each installed diskette drive.

Terminating Resistors - A terminating resistor must be installed on diskette drive A. Diskette drive B should not have a terminating resistor installed.

Terminating Switches - Terminating Switches must be set to the On position for diskette drive A and the Off position for diskette drive B.

- Insert the Advanced Diagnostics diskette into diskette drive A.
- Power on the system.
- You may receive an error during the POST. Disregard the error and press **F1** to continue with the POST.

001 (continued)

**DID THE LED ON EACH INSTALLED DISKETTE DRIVE
LIGHT BEFORE THE BEEP AT THE END OF THE POST?**

Yes No

002

Go to Step 078 in this MAP.

003

**IS THE LED ON ANY INSTALLED DISKETTE DRIVE LIT
CONSTANTLY?**

Yes No

004

Go to Step 006 in this MAP.

005

Go to Step 088 in this MAP.

006

(From Step 004 in this MAP)

IS THE ADVANCED DIAGNOSTICS MENU DISPLAYED?

Yes No

007

Try using your backup copy of the Advanced Diagnostics diskette. If you are still unable to load the Advanced Diagnostics program, go to Step 095 in this MAP.

008

- Select 0 (SYSTEM CHECKOUT).
- Select the Diskette Drives and Adapter tests. Use the (RUN TESTS ONE TIME) option.

Note: Do not run the individual tests until instructed to do so by this MAP.

**DID THE DISKETTE DIAGNOSTIC MENU APPEAR
WITHOUT AN ERROR?**

Yes No

(Step 009 continues)

009

Go to Step 033 in this MAP.

010

- Press **5 (DSKT CHANGE TEST)** then press **Enter**.
- Follow the instructions to run the Diskette Change test on each installed High-Capacity (1.2M) Diskette Drive.

DID YOU RECEIVE A MESSAGE INDICATING A DISKETTE CHANGE ERROR?

Yes No

011

Go to Step 013 in this MAP.

012

Go to Step 118 in this MAP.

013

(From Step 011 in this MAP)

- Run the speed test on each diskette drive.

Note: If the speed does not appear on the display within 30 seconds when attempting to test drive B, go to Step 112 in this MAP.

DID YOU RECEIVE AN ERROR MESSAGE DURING THE SPEED TEST?

Yes No

014

Go to Step 027 in this MAP.

015**WAS THE ERROR MESSAGE 607?**

Yes No

016

Go to Step 018 in this MAP.

(Step 017 continues)

Go to Step 060 in this MAP.

(From Step 016 in this MAP)

Yes No

Go to Step 024 in this MAP.

DID YOU RECEIVE THE ERROR ON BOTH DISKETTE DRIVES?

021

Go to Step 070 in this MAP.

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Power on the system.
- Run the Diskette Drives and Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- When the Diskette Diagnostic menu appears, perform the speed test on diskette drive A.

DID YOU RECEIVE AN ERROR MESSAGE DURING THE SPEED TEST?

023

Replace diskette drive B.

(From Step 019 in this MAP)

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and check the voltage at pin 8 of the signal cable (diskette drive end) as shown in Figure 1 on page 0600-5. The voltage should be 2.0 to 5.5 Vdc.

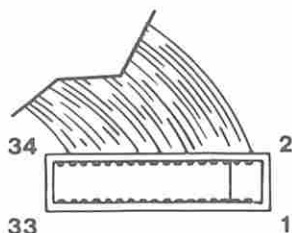


Figure 1. Signal Cable Voltage Check

IS THE VOLTAGE CORRECT?

Yes No

|

|

025

Go to Step 130 in this MAP.

026

Replace diskette drive A.

027

(From Step 014 in this MAP)

IS THE SPEED OF EACH DISKETTE DRIVE CORRECT?

Yes No

|

|

028

Replace the diskette drive with the incorrect speed.

029

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Power on the system.
- Use the Advanced Diagnostics format option and try to format a write-protected diskette in each diskette drive.

DID YOU RECEIVE AN ERROR FROM EACH DISKETTE DRIVE INDICATING THE DISKETTE WAS WRITE PROTECTED?

Yes No

|

|

(Step 030 continues)

030

Go to Step 060 in this MAP.

031

- Power off the system.
- Ensure the Advanced Diagnostics diskette is in diskette drive A.
- Ensure all cables and connectors are properly connected.
- Power on the system.
- When the Advanced Diagnostics menu appears, select **0 (SYSTEM CHECKOUT)**.
- Run the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR?

Yes No

032

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem start an error log. If you need instructions, refer to the Reference manual.

033

(From Step 009 in this MAP)

IS THE ERROR CODE 602, 603, 608, or 614?

Yes No

034

Go to Step 036 in this MAP.

035

A **608** or **614** error code indicates that your Advanced Diagnostics diskette may be defective. A **602** or **603** error code indicates that you have a defective diskette or incorrect type of diskette installed in one of the diskette drives. Replace the failing diskette and return to Step 001 in this MAP.

036

(From Step 034 in this MAP)

- Repeat the Advanced Diagnostic tests using another formatted diskette in the failing diskette drive.

036 (continued)

DID YOU RECEIVE AN ERROR?

Yes No

037

Your first diskette was defective. Return to Step 001 in this MAP to verify system operation.

038

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

039

Go to Step 045 in this MAP.

040

IS DISKETTE DRIVE A FAILING?

Yes No

041

Go to Step 045 in this MAP.

042

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Power on the system.
- When the Advanced Diagnostics menu appears select **4 (RUN SETUP)**. Change the setup options to indicates one diskette drive is installed.
- Repeat the Diskette Drive and Adapter tests one time. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR?

Yes No

043

Replace diskette drive B.

Note: Be sure to run the Setup program. Reset the setup options to indicate two diskette drives are installed.

(Step 044 continues)

044

- Make a note of the error code.
- Power off the system
- Reconnect the signal cable to diskette drive B.
- Power on the system.
- When the Advanced Diagnostics menu appears select **4 (RUN SETUP)**. Change the setup options to indicate that two diskette drives are installed.

Go to Step 045 in this MAP

045

(From Steps 039, 041, and 044 in this MAP)

- Find your error code in the following figure and take the action indicated.

Error Code	Action
601 606	Go to Step 130 in this MAP
607	Go to Step 060 in this MAP
612 613 621 622 623	Go to Step 130 in this MAP
624	Go to Step 046 in this MAP
625	Go to Step 130 in this MAP
626	Go to Step 053 in this MAP

Figure 2. Error Messages

046

(From Step 045 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

047

Replace the diskette drive.

(Step 048 continues)

048

DID YOU RECEIVE THE ERROR ON BOTH DISKETTE DRIVES?

Yes No

049

Replace the failing diskette drive.

050

ARE BOTH ERRORS THE SAME?

Yes No

051

Replace the diskette drive with the **624** error.

052

Go to Step 130 in this MAP.

053

(From Step 045 in this MAP)

- Power off the system for approximately 10 seconds.
- Power on the system and check the voltage at pin 30 on the diskette drive circuit board (Figure 3).

The voltage should be approximately 5 Vdc at the start of the POST and decrease by approximately 0.5 Vdc when the diskette drive LED is on during the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0.5 Vdc" includes a range of 0.3 to 1.0 Vdc.

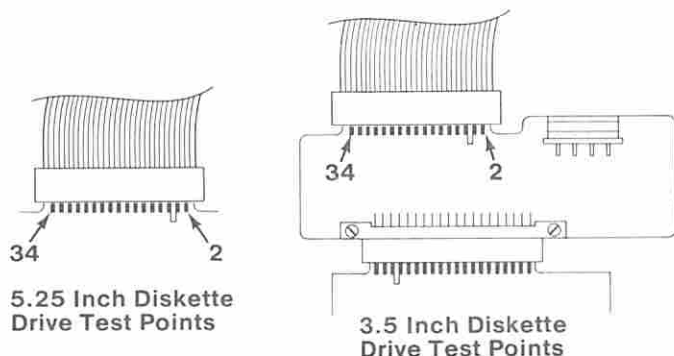


Figure 3. Voltage Check

053 (continued)

DID THE VOLTAGE DECREASE BY APPROXIMATELY 0.5 VDC?

Yes No

054

Replace the failing diskette drive.

Note: You must format the scratch diskette before running the diagnostic procedures again.

055

- Power off the system.
- Disconnect the signal cable from the failing diskette drive.
- Power on the system.
- Check the voltage at pin 24 on the diskette drive circuit board (Figure 4). Use the system unit frame as ground.

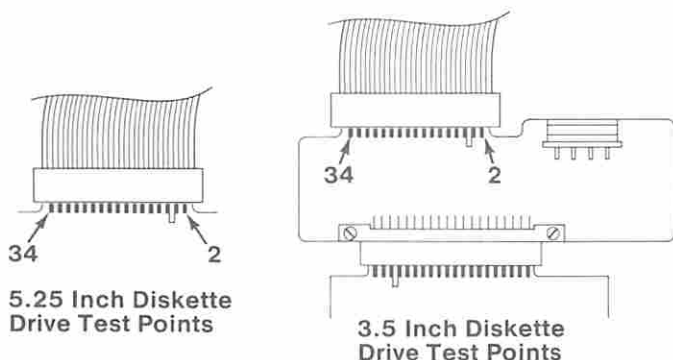


Figure 4. Voltage Check

IS THE VOLTAGE 2.0 TO 5.5 VDC?

Yes No

056

Replace the diskette drive.

057

- Power off the system.
- (Step 057 continues)

057 (continued)

- Reconnect the diskette drive signal cable.
- Power on the system and monitor the voltage at pin 24 on the diskette drive circuit board (Figure 5).

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc.

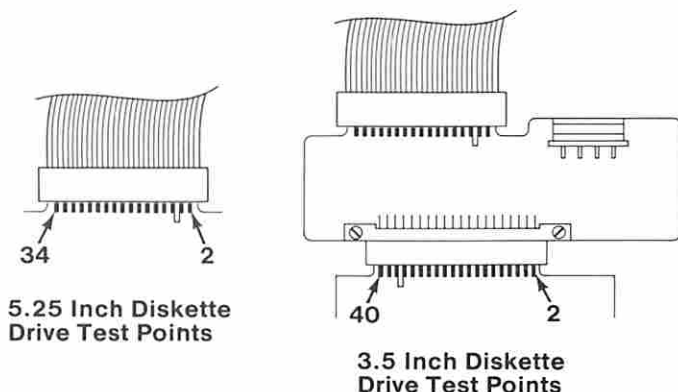


Figure 5. Voltage Check

IS THE VOLTAGE APPROXIMATELY 5.0 VDC AT THE START OF THE POST?

Yes No

058

Go to Step 130 in this MAP.

059

Replace the failing diskette drive.

060

(From Steps 017, 030, and 045 in this MAP)

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Check the voltage at pin 28 on the signal cable (Figure 6 on page 0600-12).

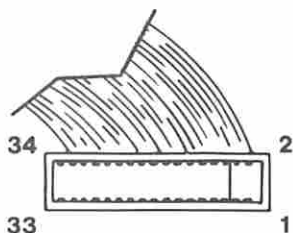


Figure 6. Signal Cable Voltage Check

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC?

Yes No

061

Go to Step 130 in this MAP.

062

- Power off the system.
- Reconnect the signal cable to any installed diskette drives.
- Remove any diskettes from the diskette drives.
- Power on the system and monitor the voltage at pin 28 on the failing diskette drive circuit board during the POST (Figure 7).

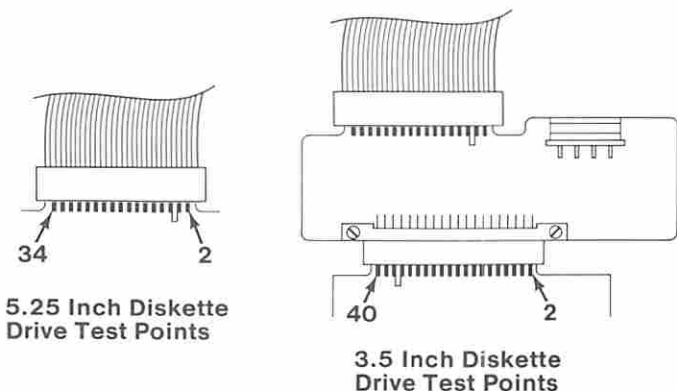


Figure 7. Voltage Check

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC AT THE START OF THE POST?

Yes No

(Step 063 continues)

063

Replace the failing diskette drive.

064

Note: "Approximately 0 Vdc" includes a range of 0 Vdc to 0.8 Vdc.

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

065

Go to Step 067 in this MAP.

066

Replace the failing diskette drive.

067

(From Step 065 in this MAP)

- Power off the system.
- Insert a **write-protected** diskette into the failing drive.
- Power on the system and monitor the voltage at pin 28 on the failing diskette drive circuit board during the POST. The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 Vdc to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 Vdc to 0.8 Vdc.

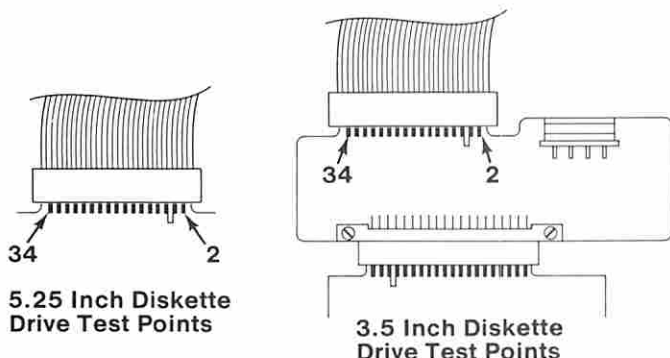


Figure 8. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

068

Replace the failing diskette drive.

069

Go to Step 130 in this MAP.

070

(From Step 021 in this MAP)

IS DISKETTE DRIVE A FAILING?

Yes No

071

Go to Step 075 in this MAP.

072

- Check the continuity of the signal cable from pin 8 of the diskette drive A end to pin 8 of the adapter end.

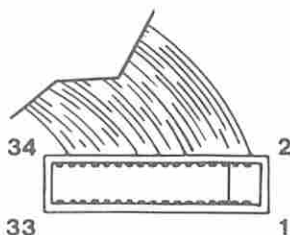


Figure 9. Signal Cable Continuity

DOES THE SIGNAL CABLE HAVE CONTINUITY?

Yes

No

073

Replace the signal cable.

074

Replace the diskette drive.

075

(From Step 071 in this MAP)

- Power off the system.
- Remove diskette drive B from the system.
- Reconnect the signal and power cable connectors to diskette drive B.
- Position diskette drive B so you can see the bottom of the drive.
- Power on the system and observe the rotor.

DID THE ROTOR SPIN BEFORE THE BEEP AT THE END OF THE POST?

Yes

No

076

Go to Step 125 in this MAP.

077

(Step 077 continues)

077 (continued)

Replace diskette drive B.

078

(From Step 002 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes No

079

Go to Step 088 in this MAP.

080

DID THE LED ON DISKETTE DRIVE A LIGHT?

Yes No

081

Go to Step 085 in this MAP.

082

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and observe the LED on diskette drive B.

DID THE LED ON DISKETTE DRIVE B LIGHT BEFORE THE BEEP AT THE END OF THE POST?

Yes No

083

Go to Step 088 in this MAP.

084

Replace diskette drive A.

085

(From Step 081 in this MAP)

- Power off the system.
- Disconnect the signal cable from diskette drive B.
- Power on the system and observe the LED on diskette drive A.

(Step 085 continues)

085 (continued)

DID THE LED ON DISKETTE DRIVE A LIGHT BEFORE THE BEEP AT THE END OF THE POST?

Yes No

086

Go to Step 088 in this MAP.

087

Replace diskette drive B.

088

(From Steps 005, 079, 083, and 086 in this MAP)

- Check the power connector at each installed diskette drive for the voltages listed in Figure 10.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

Locating Rib

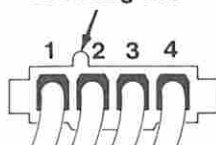


Figure 10. Diskette Drive Power Connectors

ARE THE VOLTAGES CORRECT?

Yes No

089

Go to "MAP 0020: Power Start."

090

- Power off the system.
- Disconnect the signal cable from the diskette drives.
- Power on the system.
- Check the voltage at pin 12 on the circuit board of the failing diskette drive (Figure 11 on page 0600-18).

(Step 090 continues)

090 (continued)

- The voltage should be 2.0 to 5.5 Vdc.

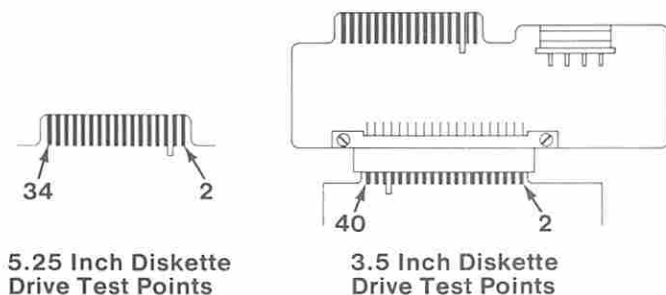


Figure 11. Voltage Check

IS THE VOLTAGE CORRECT?

Yes

No

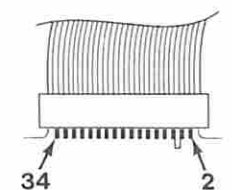
091

Replace the failing diskette drive.

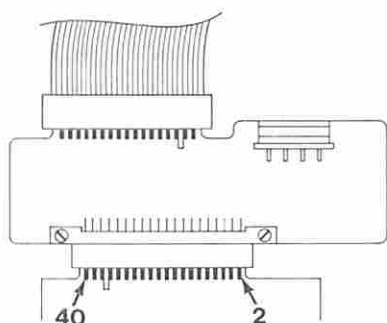
092

- Power off the system.
- Reconnect the signal cable to the failing diskette drive.
- Power on the system and monitor the voltage at pin 12 on the circuit board of the failing diskette drive (Figure 12 on page 0600-19). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.



5.25 Inch Diskette
Drive Test Points



3.5 Inch Diskette
Drive Test Points

Figure 12. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes

No

093

Go to Step 130 in this MAP.

094

Replace the failing diskette drive.

095

(From Step 007 in this MAP)

ARE TWO DISKETTE DRIVES INSTALLED?

Yes

No

096

Go to Step 100 in this MAP.

097

- Power off the system
- Disconnect the signal cable from diskette drive B.
- Power on the system.

Note: If the message (RESUME = "F1" KEY) appears during the POST, press F1 to continue.

(Step 097 continues)

097 (continued)

DOES THE ADVANCED DIAGNOSTICS MENU APPEAR AT THE END OF THE POST?

Yes No

098

Go to Step 100 in this MAP.

099

Replace diskette drive B.

100

(From Steps 096 and 098 in this MAP)

- Power off the system for about 10 seconds.
- Power on the system and observe the spindle on diskette drive A (Figure 13).

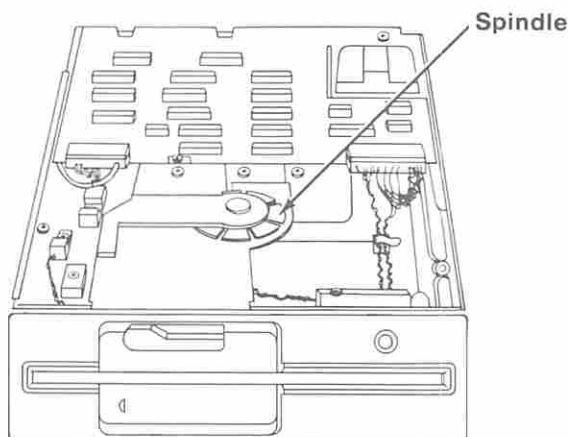


Figure 13. Diskette Drive Spindle

DID THE SPINDLE ROTATE BEFORE THE BEEP AT THE END OF THE POST?

Yes No

101

Go to Step 125 in this MAP.

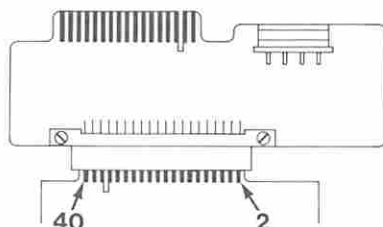
(Step 102 continues)

102

- Power off the system.
- Disconnect the signal cable from diskette drive A.
- Power on the system and check the voltage at pin 18 on the diskette drive A circuit board (Figure 14).



5.25 Inch Diskette
Drive Test Points



3.5 Inch Diskette
Drive Test Points

Figure 14. Voltage Check

IS THE VOLTAGE APPROXIMATELY 5 VDC?

Yes

No

103

Replace diskette drive A.

104

- Power off the system.
- Reconnect the signal cable to diskette drive A.
- Power on the system and monitor the voltage at pin 18 of diskette drive A (Figure 15 on page 0600-22). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.

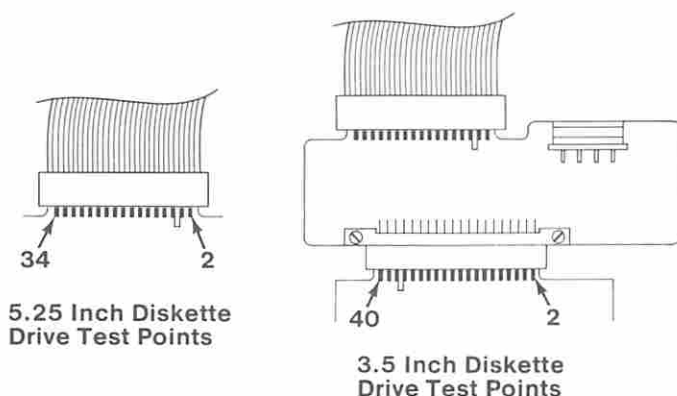


Figure 15. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

105

Go to Step 130 in this MAP.

106

- Power off the system.
- Remove diskette drive A from the system.
- Reconnect the signal and power cable to diskette drive A.
- Manually slide the read/write head to track 0 (rear of the diskette drive). If you are unable to move the head, replace the diskette drive.
- Position diskette drive A so you can observe the read/write head from the bottom.
- Power on the system and observe the read/write head. The head should move from track 0 forward to track 39 (front of the diskette drive).

Note: Some diskette drives may perform this exercise more than one time.

DID THE HEAD MOVE AS DESCRIBED?

Yes No

107

(Step 107 continues)

107 (continued)
Replace diskette drive A.

108

- Power off the system for about 5 seconds.
- Power on the system and monitor the voltage at pin 26 of diskette drive A (Figure 16). The voltage should decrease from approximately 5 Vdc at the start of the POST to approximately 0 Vdc before the beep at the end of the POST.

Notes:

1. "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.
2. This voltage shifts rapidly and the meter may not appear to drop all the way to 0.0 Vdc.

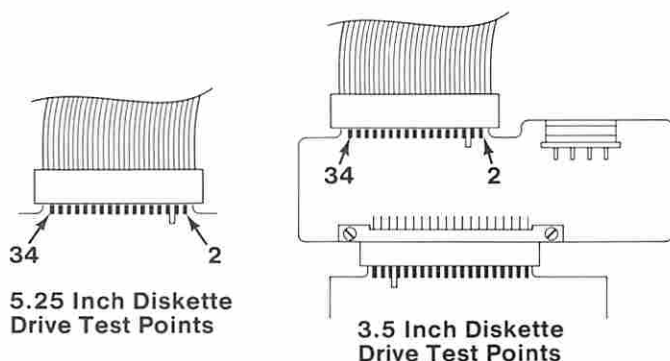


Figure 16. Voltage Check

WAS THE VOLTAGE APPROXIMATELY 5 VDC AT THE START OF THE POST?

Yes No

109

Go to Step 130 in this MAP.

110

(Step 110 continues)

110 (continued)

DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

111

Replace diskette drive A.

112

(From Step 013 in this MAP)

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Refer to Figure 17 and check the voltage at pin 30 of the diskette drive A signal cable connector (diskette drive end).

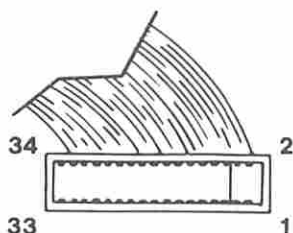


Figure 17. Signal Cable Voltage Check

IS THE VOLTAGE BETWEEN 2.0 AND 5.5 VDC?

Yes No

113

Go to Step 130 in this MAP.

114

- Power off the system.
- Reconnect the signal cable to the diskette drives.
- Power on the system and monitor the voltage at pin 30 on each diskette drive circuit board during the POST (Figure 18 on page 0600-25).

The voltage should be approximately 5 Vdc at the start of the POST and decrease by approximately 0.5 Vdc when the diskette drive LED is on during the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0.5 Vdc" includes a range of 0.3 to 1.0 Vdc.

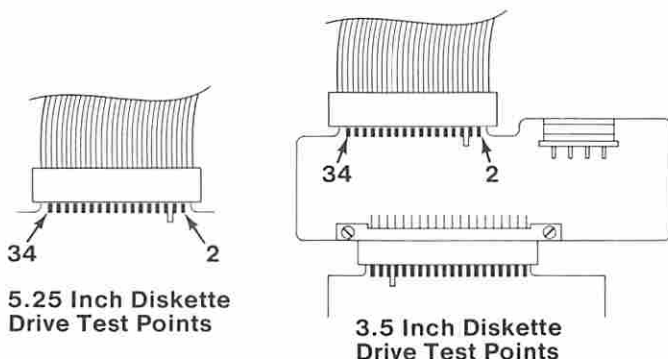


Figure 18. Voltage Check

DID THE VOLTAGE DECREASE BY APPROXIMATELY 0.5 VDC?

Yes No

115

Replace the failing diskette drive.

116

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Check for a voltage of approximately 5 Vdc at pin 32 on the diskette drive A circuit board.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc.

IS THE VOLTAGE APPROXIMATELY 5 VDC?

Yes No

117

Replace diskette drive A.

(Step 118 continues)

118

(From Step 012 in this MAP)

- Power off the system.
- Disconnect the signal cable from any installed diskette drives.
- Power on the system.
- Monitor the voltage at pin 34 (diskette drive A end) of the signal cable (Figure 19).

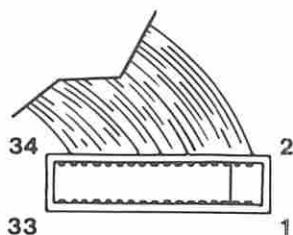


Figure 19. Signal Cable Voltage Check

IS THE VOLTAGE 5.0 VDC?

Yes No

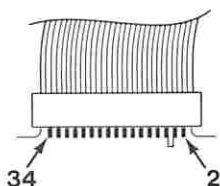
119

Go to Step 130 in this MAP.

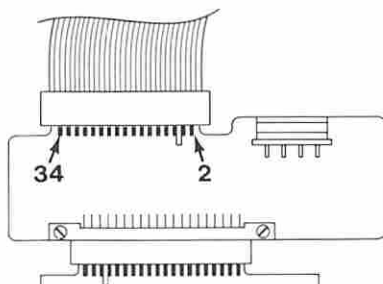
120

- Power off the system.
- Reconnect the signal cable to the diskette drives.
- Power on the system and monitor the voltage of pin 34 on diskette drive A during the POST (Figure 20 on page 0600-27). The voltage should be approximately 5 Vdc at the start of the POST and drop to 0 Vdc the **first time** the LED of diskette drive A lights during the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.



5.25 Inch Diskette
Drive Test Points



3.5 Inch Diskette
Drive Test Points

Figure 20. Voltage Check

IS THE VOLTAGE APPROXIMATELY 5 VDC AT THE START OF THE POST?

Yes No

121

Replace the failing diskette drive.

122

DID THE VOLTAGE DROP TO APPROXIMATELY 0 VDC WHILE THE LED WAS LIT?

Yes No

123

Replace the failing diskette drive.

124

Go to Step 130 in this MAP.

125

(From Steps 076 and 101 in this MAP)

- Power off the system.
- Disconnect the signal cable from the diskette drives.
- Power on the system and check the voltage of pin 16 on the circuit board of the failing diskette drive (Figure 21 on page 0600-28). The voltage should be 2.0 to 5.5 Vdc.

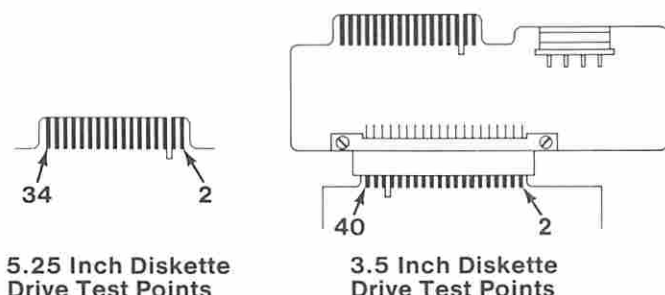


Figure 21. Voltage Check

IS THE VOLTAGE CORRECT?

Yes No

126

Replace the failing diskette drive.

127

- Power off the system.
- Reconnect the signal cable to the failing diskette drive.
- Power on the system and check the voltage at pin 16 of the failing diskette drive circuit board (Figure 22 on page 0600-29).

The voltage should decrease from approximately 5 Vdc to approximately 0 Vdc before the beep at the end of the POST.

Note: "Approximately 5 Vdc" includes a range of 2.0 to 5.5 Vdc; "approximately 0 Vdc" includes a range of 0.0 to 0.8 Vdc.

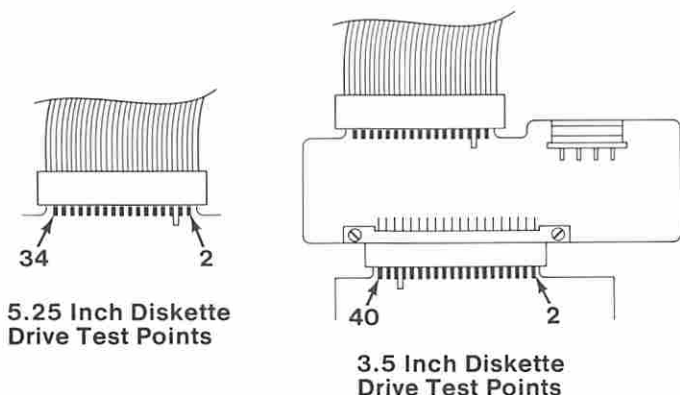


Figure 22. Voltage Check

DID THE VOLTAGE DECREASE FROM APPROXIMATELY 5 VDC TO APPROXIMATELY 0 VDC BEFORE THE BEEP AT THE END OF THE POST?

Yes No

128

Go to Step 130 in this MAP.

129

Replace the failing diskette drive.

130

(From Steps 025, 045, 052, 058, 061, 069, 093, 105, 109, 113, 119, 124, and 128 in this MAP)

- Power off the system.
- Check the diskette drive signal cable for continuity. The line numbers at one end of the cable match the line numbers at the other end, except for those listed in Figure 23 on page 0600-30. Check all lines for continuity.

Diskette Drive A Signal Cable Connector		Diskette Drive B Signal Cable Connector	
Pin Numbering		Pin Numbering	
Drive End	Adapter End	Drive End	Adapter End
10	16	10	10
11	15	11	11
12	14	12	12
14	12	14	14
15	11	15	15
16	10	16	16

Figure 23. Continuity Check

DID ALL LINES HAVE CONTINUITY?

Yes **No**

|

|

131

Replace the diskette drive signal cable.

132

Replace the diskette drive adapter. If this does not correct the problem, replace the system board.

TEST POINT REFERENCE PAGE

for

TYPE 1 DISKETTE DRIVES

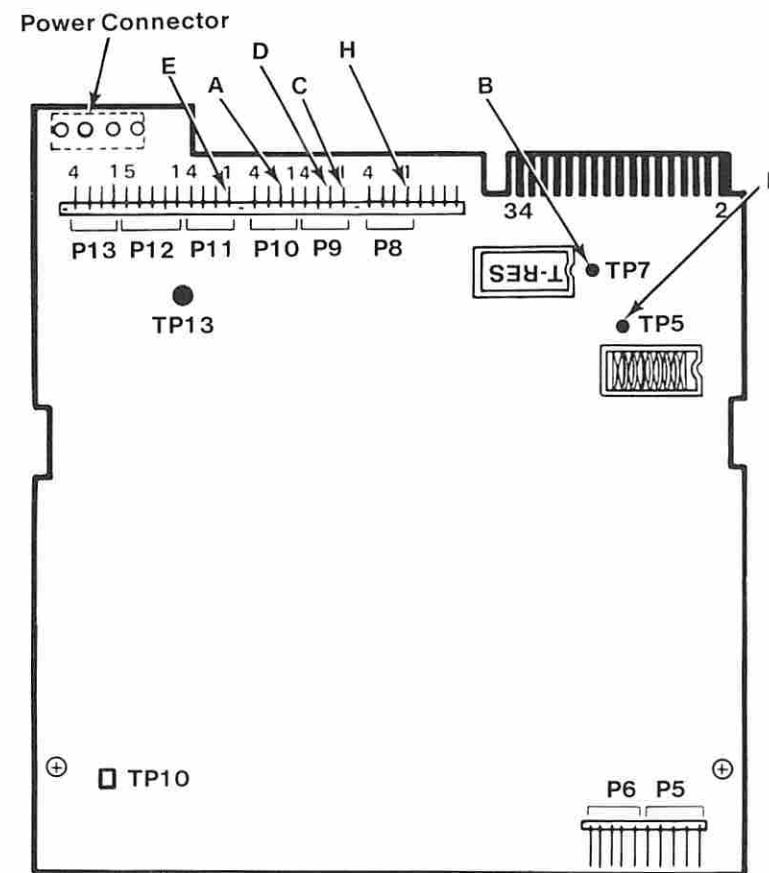
(Drives with a serial number prefix A, B, or no prefix)

Test Point Reference Chart

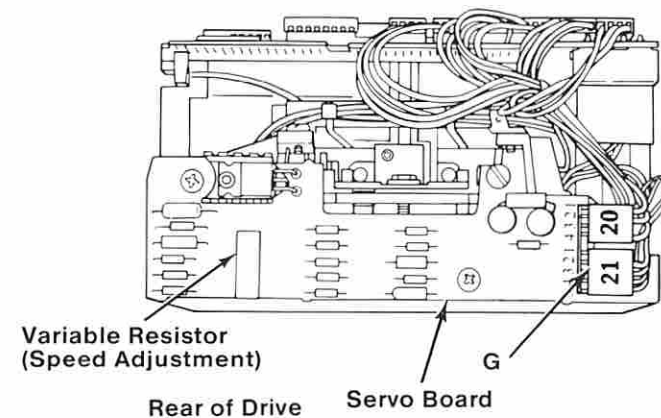
Test Point	Location	Specifications
A	P10-2	Decreases from 0.5 Vdc to 0 Vdc while inserting a diskette in the drive.
B	TP-7	Decreases from 5.0 Vdc to 0 Vdc while inserting a diskette in the drive.
C	P9-1 (+)	1.5 Vdc minimum across these two test points.
D	P9-2 (-)	
E	P11-1	0 Vdc before the LED lights.
F	TP-5	As the LED initially lights, the voltage increases by 0.2 Vdc.
G	P21-3	3 Vdc to 12 Vdc with the LED on.
H	P8-1	Increases from 0 Vdc to 5.0 Vdc while inserting a diskette into the drive.

Requested Voltage Reading	Minimum	Maximum
Approximately 0 Vdc	0.0 Vdc	0.8 Vdc
Approximately 0.2 Vdc	0.15 Vdc	0.25 Vdc
Approximately 0.5 Vdc	0.5 Vdc	1.0 Vdc
Approximately 5.0 Vdc	2.0 Vdc	5.5 Vdc
Approximately 12 Vdc	11.2 Vdc	12.6 Vdc

Test Point Locations



Logic Board



Preliminary Speed Check

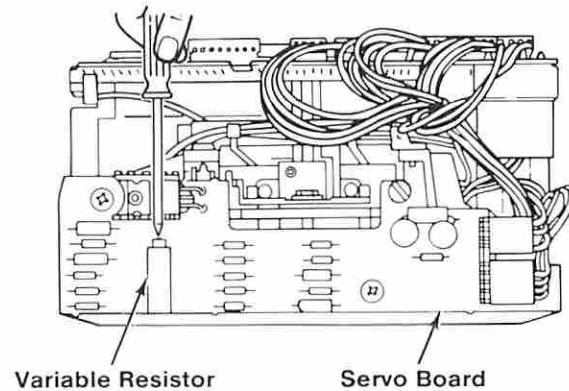
1. Remove the diskette drive.
2. Plug the power connector into the diskette drive logic board. Leave the signal cable disconnected.
3. Insert a scratch diskette into the diskette drive.
4. Connect a jumper between TP-10 and TP-13 of the diskette drive logic board.
5. Power on the system.
6. Observe the strobe marks on the drive pulley under fluorescent lighting.

Note: The outer ring is for 60 hertz and the inner ring is for 50 hertz.

If the speed is correct, the appropriate ring of strobe marks will appear to stand still.

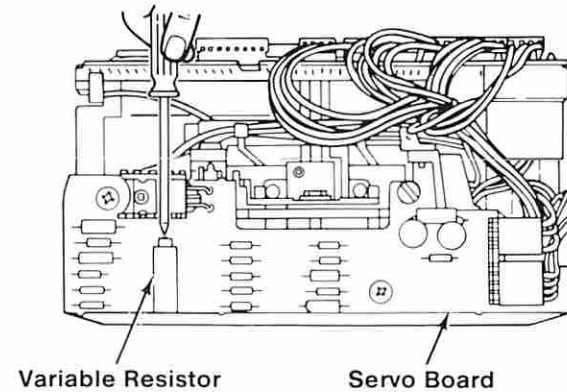
Preliminary Speed Adjustment

Adjust the variable resistor on the servo board until the appropriate ring of strobe marks appears to stand still.



Final Speed Adjustment

1. Power off the system.
2. Insert the Advanced Diagnostic into the diskette drive.
3. Power on the system.
4. Run the Diskette Drive and Adapter tests. Use the (RUN TESTS MULTIPLE TIMES) option.
5. When the Diskette Diagnostic menu appears, select option 4, (SPEED TEST).
6. Adjust the variable resistor on the servo board until the speed falls within the range displayed.



TEST POINT REFERENCE PAGE

for

TYPE 2 DISKETTE DRIVES

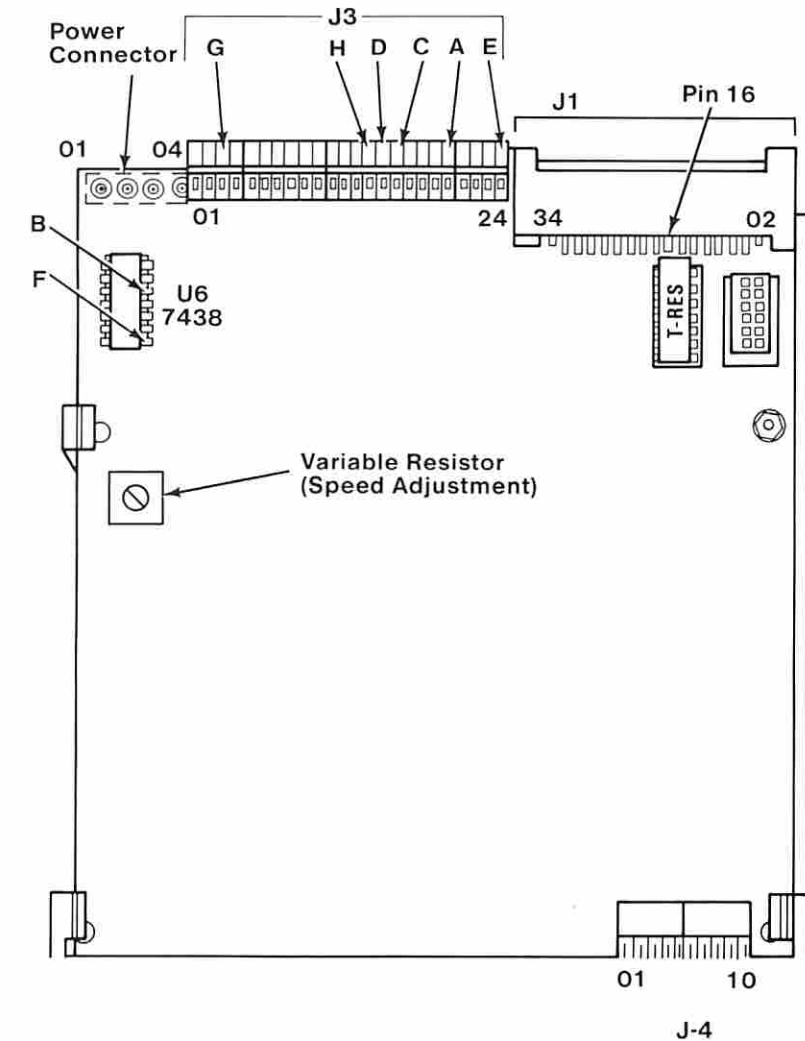
(Drives with a serial number prefix D)

Test Point Reference Chart

Test Point	Location	Specifications
A	J2-20	Increases from 0 Vdc to 5.0 Vdc while inserting a diskette in the drive.
B	U6 Pin 5	Decreases from 5.0 Vdc to 0 Vdc while inserting a diskette in the drive.
C	J3-16 (+)	1.5 Vdc minimum across these two test points.
D	J3-15 (-)	
E	J3-24	0 Vdc before the LED lights.
F	U6 Pin 1	As the LED initially lights, the voltage increases by 0.2 Vdc.
G	J3-3	3 Vdc to 12 Vdc with the LED on.
H	J3-14	Decreases from 5.0 Vdc to 0 Vdc while inserting a diskette into the drive.

Requested Voltage Reading	Minimum	Maximum
Approximately 0 Vdc	0.0 Vdc	0.8 Vdc
Approximately 0.2 Vdc	0.15 Vdc	0.25 Vdc
Approximately 0.5 Vdc	0.5 Vdc	1.0 Vdc
Approximately 5.0 Vdc	2.0 Vdc	5.5 Vdc
Approximately 12 Vdc	11.2 Vdc	12.6 Vdc

Test Point Locations



Preliminary Speed Check

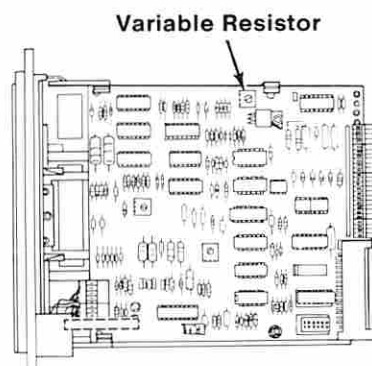
1. Remove the diskette drive.
2. Plug the power connector into the diskette drive logic board. Leave the signal cable disconnected.
3. Insert a scratch diskette into the diskette drive.
4. Connect a jumper between pin 16 of the diskette drive signal connector and ground (use the frame as ground).
5. Power on the system.
6. Observe the strobe marks on the drive pulley under fluorescent lighting.

Note: The outer ring is for 60 hertz and the inner ring is for 50 hertz.

If the speed is correct, the appropriate ring of strobe marks will appear to stand still.

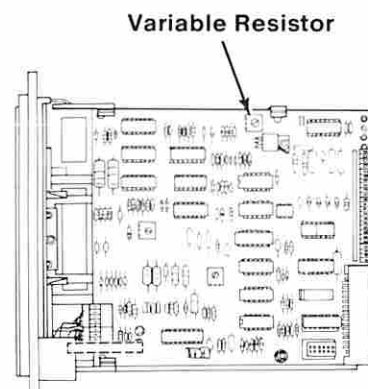
Preliminary Speed Adjustment

Adjust the variable resistor on the diskette drive logic board until the appropriate ring of strobe marks appears to stand still.



Final Speed Adjustment

1. Power off the system.
2. Insert the Advanced Diagnostic diskette into drive A.
3. Power on the system.
4. Run the Diskette Drive and Adapter test using the **(RUN TESTS MULTIPLE TIMES)** option.
5. When the Diskette Diagnostic menu appears, select option 4, **(SPEED TEST)**.
6. Adjust the variable resistor on the diskette drive logic board until the speed falls within the range displayed.



TEST POINT REFERENCE PAGE

for

TYPE 3 DISKETTE DRIVES

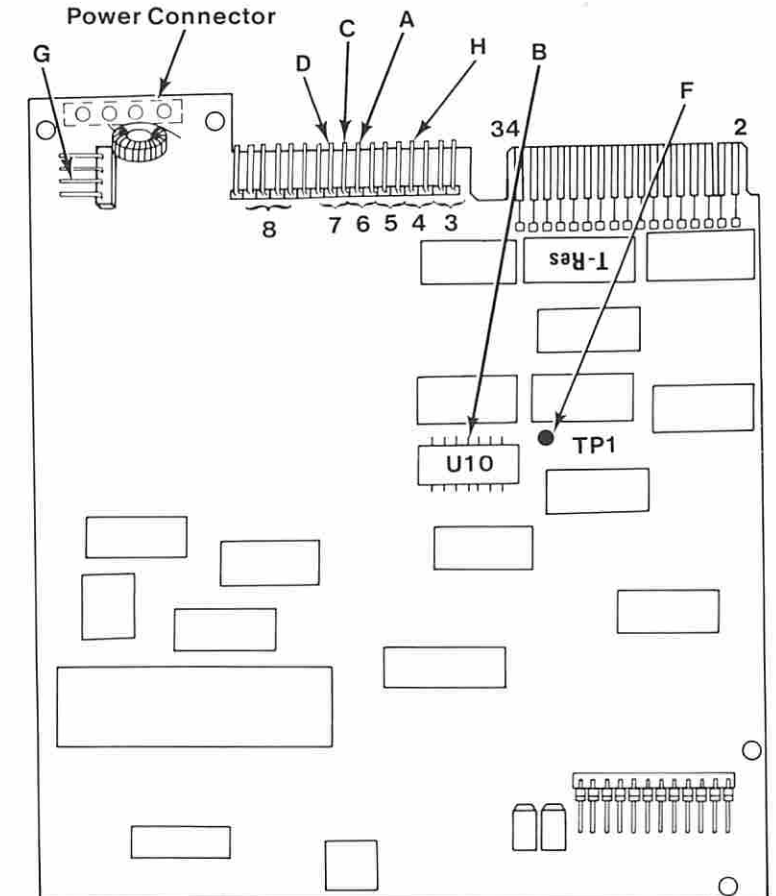
(Drives with a serial number prefix E)

Test Point Reference Chart

Test Point	Location	Specifications
A	J6-2	5.0 Vdc with the diskette removed and the latch closed.
B	U10-4	Do the following: <ol style="list-style-type: none"> 1. Insert a diskette into drive A. 2. Power off the system for 5 seconds. 3. Power on the system. 4. With the diskette inserted and the latch closed, a fluctuation of approximately 0.1 Vdc will occur after the beep at the end of the POST and will continue for as long as the spindle rotates.
C	P7-1 (+)	1.5 Vdc minimum across these two test points.
D	P7-2 (-)	
E	N/A	Go to Step 038.
F	TP-1	As the LED initially lights, the voltage decreases by 0.2 Vdc.
G	P9-3	3 Vdc to 12 Vdc with the LED on.
H	P4-2	Decreases from 5.0 Vdc to 0 Vdc while inserting a diskette into the drive.

Requested Voltage Reading	Minimum	Maximum
Approximately 0 Vdc	0.0 Vdc	0.8 Vdc
Approximately 0.2 Vdc	0.15 Vdc	0.25 Vdc
Approximately 0.5 Vdc	0.5 Vdc	1.0 Vdc
Approximately 5.0 Vdc	2.0 Vdc	5.5 Vdc
Approximately 12 Vdc	11.2 Vdc	12.6 Vdc

Test Point Locations



Preliminary Speed Check

1. Remove the diskette drive.
2. Plug the power connector into the diskette drive logic board. Leave the signal cable disconnected.
3. Insert a scratch diskette into the diskette drive.
4. Connect a jumper between pin 16 of the diskette drive signal connector and ground (use the frame as ground).
5. Power on the system.
6. Observe the strobe marks on the drive pulley under fluorescent lighting.

Note: The outer ring is for 60 hertz and the inner ring is for 50 hertz.

7. If the speed is correct, the appropriate ring of strobe marks will appear to stand still.

The Type 3 diskette drive monitors its own speed and compensates accordingly. There are no speed adjustments on the drive. If the speed is not correct, an electrical or mechanical problem exists. Return to the MAP to isolate the failure.

Final Speed Check

1. Power off the system.
2. Insert the Advanced Diagnostic diskette into drive A.
3. Power on the system.
4. Run the Diskette Drive and Adapter test using the **(RUN TESTS MULTIPLE TIMES)** option.
5. When the Diskette Diagnostic menu appears, select option 4, **(SPEED TEST)**.
6. The speed should fall within the range displayed.

The Type 3 diskette drive monitors its own speed and compensates accordingly. There are no speed adjustments on the drive. If the speed is not correct, an electrical or mechanical problem exists. Return to the MAP to isolate the failure.

MAP 0700: Math Coprocessor

0700

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 7XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The math coprocessor is failing.• The system board is failing.• The switch settings are incorrect.

001

(From Step 008 in this MAP)

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Math Coprocessor tests. Use the (RUN TESTS ONE TIME) option.

WAS THE MESSAGE "TESTING MATH COPROCESSOR" DISPLAYED FOR 10 SECONDS OR LESS?

Yes No

002

Replace the math coprocessor. If this does not correct the problem, replace the system board. Use the original math coprocessor in the new system board.

003

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

004

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

(Step 005 continues)

005

DID YOU RECEIVE THE ERROR MESSAGE "SWITCH 1-2 INCORRECT"?

Yes No

006

Replace the math coprocessor. If this does not correct the problem, replace the system board. Use the original math coprocessor in the new system board.

007

IS SWITCH 2 OF SWITCH BLOCK 1 ON THE SYSTEM BOARD SET TO THE OFF POSITION.

Yes No

008

Set the switch to the Off position and return to Step 001 in this MAP to verify proper operation.

009

Replace the system board.

MAP 0900: Parallel Port Start

0060

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 9XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The Printer Adapter is failing.• The Serial/Parallel Adapter is failing.• The printer cable is failing.

001

Find your system type in the following figure and refer to the MAP indicated.

System Type	MAP
Personal Computer.....	MAP 0900: Printer Adapter
Personal Computer XT.....	MAP 0900: Printer Adapter
Personal Computer XT (5162)	MAP 0900: Serial/Parallel Adapter - Parallel Port
Portable PC.....	MAP 0900: Printer Adapter
Personal Computer AT.....	MAP 0900: Serial/Parallel Adapter - Parallel Port

Figure 1. System Identification

Notes:

MAP 0900: Printer Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 9XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The printer adapter is failing.

001

- Power off the system.
- Disconnect the printer cable from the adapter.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Printer Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 8529228) when instructed to install the wrap plug.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the printer adapter.

Notes:

MAP 0900: Serial/Parallel Adapter - Parallel Port

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 9XX error code, you suspect a Serial/Parallel Adapter - Parallel Port problem, or you have been directed here from another MAP.	<ul style="list-style-type: none">The adapter assigned as the "Primary Parallel Port" is failing.

Ensure the following conditions exist:

1. An adapter is set for "Primary Parallel Port" operation.
2. If a second adapter with a parallel port is installed, it is set for "Alternate Parallel Port" operation.

001

- Power off the system.
- Disconnect the printer cable if it is attached to the parallel port set for primary operation.
- Insert the Advanced Diagnostics diskette into drive A.
- Run the Serial/Parallel - Parallel Port tests. Use the (**RUN TESTS ONE TIME**) option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 8529228) when instructed to install the wrap plug.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes **No**

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the Primary Serial/Parallel Adapter.

MAP 1000: Alternate Serial/Parallel Adapter - Parallel Port

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 10XX error code, you suspect an Alternate Serial/Parallel Adapter - Parallel Port problem, or you have been directed here from another MAP.	<ul style="list-style-type: none">The adapter assigned as the "Alternate Parallel Port" is failing.

Ensure the following conditions exist:

1. An adapter is set for "Primary Parallel Port" operation.
2. A second adapter with a parallel port is installed and is set for "Alternate Parallel Port" operation.

001

- Power off the system.
- Disconnect the printer cable if it is attached to the parallel port set for alternate operation.
- Insert the Advanced Diagnostics diskette into drive A.
- Run the Alternate Serial/Parallel - Parallel Port tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 8529228) when instructed to install the wrap plug.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes **No**

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the Alternate Serial/Parallel Adapter.

MAP 1100: Serial Port Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 11XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The Asynchronous Communications Adapter is failing.• The primary serial port of a Serial/Parallel Adapter is failing.• The communications cable is failing.• The power supply is failing.

001

Find your system type in the following figure and refer to the MAP indicated.

System Type	MAP
Personal Computer.....	MAP 1100: Asynchronous Communications Adapter
Personal Computer XT.....	MAP 1100: Asynchronous Communications Adapter
Personal Computer XT (5162)	MAP 1100: Serial/Parallel Adapter - Serial Port
Portable PC.....	MAP 1100: Asynchronous Communications Adapter
Personal Computer AT	MAP 1100: Serial/Parallel Adapter - Serial Port

Figure 1. System Identification

Notes:

MAP 1100: Asynchronous Communications Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 11XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The adapter is failing.• The adapter cable is failing.• Jumpers are set incorrectly.• The power supply is failing.

Ensure the following conditions exist:

1. An adapter is set for primary asynchronous communications adapter operation.

Note: The J13 jumper must be installed if the adapter is in slot 8 of an IBM Personal Computer XT.

2. If a second asynchronous communications adapter is installed, it is set for alternate asynchronous communications adapter operation.
3. All asynchronous communications adapters must be set for RS232-C operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Asynchronous Communications Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug.

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

WERE YOU INSTRUCTED TO REPLACE THE ADAPTER?

Yes No

004

Replace the adapter cable.

005

- Check for a voltage of -10.8 to -12.9 Vdc between pins 4 and 8 (ground) at the system board power connector, Figure 1.

DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4 AND 8?

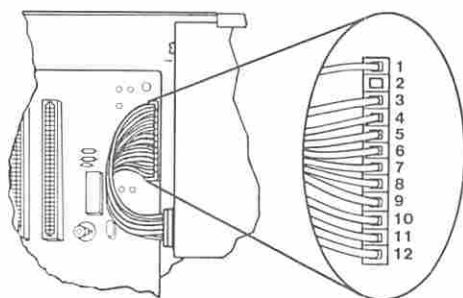


Figure 1. System Board Power Connectors

Yes No

006

Replace the power supply.

007

(Step 007 continues)

007 (continued)
Replace the adapter.

Notes:

MAP 1100: Serial/Parallel Adapter - Serial Port

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 11XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The primary Serial/Parallel Adapter is failing.• The adapter cable is failing.• The power supply is failing.

Ensure the following conditions exist:

1. A Serial/Parallel Adapter is set for "Primary Serial Port" operation.
2. If a second serial port is installed, it is set for "Alternate Serial Port" operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Run the Serial/Parallel Adapter - Serial Port tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Notes:

1. Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug on the cable.
2. Use wrap plug (IBM Part 62X1084) when instructed to install the wrap plug on the adapter.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

DID THE ERROR MESSAGE INSTRUCT YOU TO REPLACE THE CABLE?

Yes No

004

Go to Step 006 in this MAP.

005

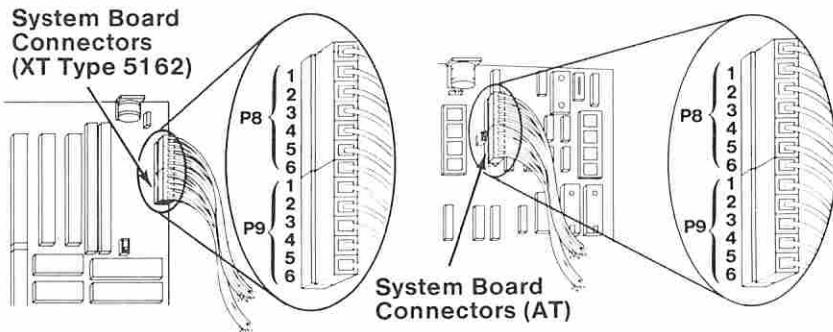
Replace the adapter cable.

006

(From Step 004 in this MAP)

- Check for a voltage of -10.8 to -12.9 Vdc between pins 4 and 5 (ground) of system board power connector P8, Figure 1 on page 1100-3.

System Board
Connectors
(XT Type 5162)



System Board
Connectors (AT)

Figure 1. System Board Power Connectors

**DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4
AND 5?**

Yes No

007

Replace the power supply.

008

Replace the adapter.

Notes:

MAP 1200: Alternate Serial Port Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 12XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The alternate Asynchronous Communications Adapter is failing.• The alternate serial port of a Serial/Parallel Adapter is failing.• The communications cable is failing.• The power supply is failing.

001

Find your system type in the following figure and refer to the MAP indicated.

System Type	MAP
Personal Computer.....	MAP 1200: Alternate Asynchronous Communications Adapter
Personal Computer XT.....	MAP 1200: Alternate Asynchronous Communications Adapter
Personal Computer XT (5162)	MAP 1200: Alternate Serial/Parallel Adapter - Serial Port
Portable PC.....	MAP 1200: Alternate Asynchronous Communications Adapter
Personal Computer AT	MAP 1200: Alternate Serial/Parallel Adapter -Serial Port

Figure 1. System Identification

Notes:

MAP 1200: Alternate Asynchronous Communications Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 12XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The adapter is failing.• The communications cable is failing.• Jumpers are set incorrectly.• The power supply is failing.

Ensure the following conditions exist:

1. An adapter is set for primary asynchronous communications adapter operation.

Note: The J13 jumper must be installed if the adapter is in slot 8 of an IBM Personal Computer XT.

2. A second asynchronous communications adapter is installed, and is set for alternate asynchronous communications adapter operation.
3. All asynchronous communications adapters must be set for RS232-C operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Alternate Asynchronous Communications Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug.

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

WERE YOU INSTRUCTED TO REPLACE THE ADAPTER?

Yes No

004

Replace the adapter cable.

005

- Check for a voltage of -10.8 to -12.9 Vdc between pins 4 and 8 (ground) at the system board power connector, Figure 1.

DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4 AND 8?

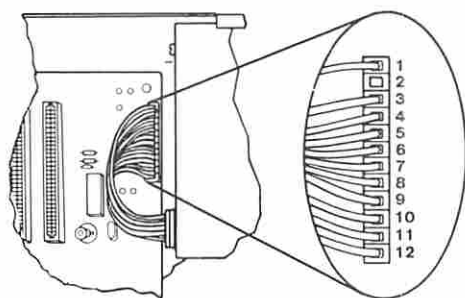


Figure 1. System Board Power Connectors

Yes No

006

Replace the power supply.

007

(Step 007 continues)

007 (continued)
Replace the adapter.

Notes:

MAP 1200: Alternate Serial/Parallel Adapter - Serial Port

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 12XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The alternate Serial/Parallel Adapter is failing.• The adapter cable is failing.• The power supply is failing.

Ensure the following conditions exist:

1. A Serial/Parallel Adapter is set for "Primary Serial Port" operation.
2. A second Serial/Parallel Adapter is installed and is set for "Alternate Serial Port" operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Run the Alternate Serial/Parallel Adapter - Serial Port tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Notes:

1. Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug on the cable.
2. Use wrap plug (IBM Part 62X1084) when instructed to install the wrap plug on the adapter.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

DID THE ERROR MESSAGE INSTRUCT YOU TO REPLACE THE CABLE?

Yes No

004

Go to Step 006 in this MAP.

005

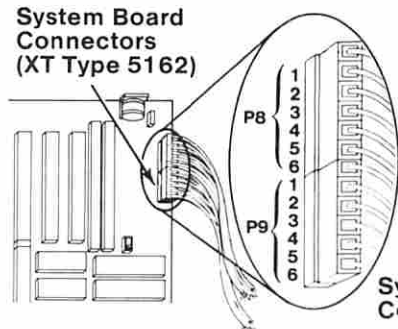
Replace the adapter cable.

006

(From Step 004 in this MAP)

- Check for a voltage of -10.8 to -12.9 Vdc between pins 4 and 5 (ground) of system board power connector P8, Figure 1 on page 1200-3.

**System Board
Connectors
(XT Type 5162)**



**System Board
Connectors (AT)**

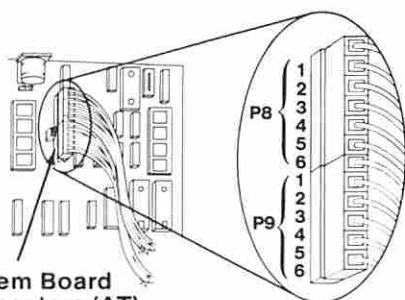


Figure 1. System Board Power Connectors

**DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4
AND 5?**

Yes No

007

Replace the power supply.

008

Replace the adapter.

Notes:

MAP 1300: Game Control Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 13XX error message, or suspect a problem with the Game Control Adapter.	<ul style="list-style-type: none"> The Game Control Adapter is failing. A joystick or paddle is failing.

Note: A joystick or paddle must be installed to run this test.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Game Control Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

Continue with Step 004 in this MAP.

003

Replace the Game Control Adapter.

004

(From Step 002 in this MAP)

- Follow the instructions on the screen and press **Y** or **N** when ready to continue.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

005

Go to Step 007 in this MAP.

006

Replace the Game Control Adapter.

007

(From Step 005 in this MAP)

- If one or more of the joystick or paddle images displayed on the screen appear in reverse video, check the connectors before continuing.
- Move all installed paddles or joysticks in all directions. Ensure the letter inside the box on the screen moves in all directions.

WERE YOU ABLE TO COMPLETE THE TEST SUCCESSFULLY?

Yes No

008

If a joystick or paddle image will not move and stays in reverse video, replace it.

- or -

If a joystick or paddle image does move but stays in reverse video, replace the Game Control Adapter.

Note: Your joystick or paddle may have a fine tuning control. If one or more joysticks or paddles appears in reverse video, adjust the fine tuning control and repeat the test.

009

- Press and release all buttons on the joysticks or paddles. All buttons must be pressed or an invalid error code will appear. When a button is pressed, the corresponding prompt on the

screen changes from **RELEASED** to **PRESSED**.

- After pressing all buttons on the joysticks or paddles, press any key on the keyboard to continue.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

|

010

If all buttons showed **PRESSED** when tested, replace the Game Control Adapter. If one or more of the buttons did not show **PRESSED** when tested, replace the joysticks or paddles.

011

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

Notes:

MAP 1400: Graphics Printer

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 14XX error message, or you suspect a problem with the Graphics Printer.	<ul style="list-style-type: none">• The power cord is improperly connected.• The printer cable is improperly connected.• The power switch is set to Off.• The graphics printer is failing.

001

- Ensure the printer power cord is plugged into a functioning, properly grounded electrical outlet.
- Ensure the printer is powered on.
- Repeat the operation or diagnostic test that failed.

DID YOU RECEIVE A 14XX ERROR CODE, OR DO YOU HAVE A PROBLEM WITH THE GRAPHICS PRINTER?

Yes No

002

Repeat the operation or diagnostic test to ensure the printer is functioning properly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Refer to the service manual for your printer to run further diagnostic tests.

Note: Be sure to run the tests for the printer adapter (parallel port) installed in the system before referring to any other service manuals.

Notes:

MAP 1500: Synchronous Data Link Control (SDLC) Communications Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 15XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The SDLC adapter is failing.• The adapter cable is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the SDLC Communications Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the FRU indicated on the display.

Notes:

MAP 1700: Fixed Disk Drive Start

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 17XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The fixed disk drive is failing.• The Fixed Disk Drive Adapter is failing.• The control/data cable is failing.• The system board is failing.• The power supply is failing.

001

Find your system type in the following figure and refer to the MAP indicated.

System Type	MAP
Personal Computer.....	MAP 1700: Fixed Disk Drive (PC)
Personal Computer XT	MAP 1700: Fixed Disk Drive (PC)
Personal Computer XT (5162).....	MAP 1700: Fixed Disk Drive (AT)
Portable PC.....	MAP 1700: Fixed Disk Drive (PC)
Personal Computer AT	MAP 1700: Fixed Disk Drive (AT)

Figure 1. System Identification

Notes:

MAP 1700: Fixed Disk Drive (PC)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 17XX error message, or you suspect a problem with the fixed disk drive, or Fixed Disk Drive Adapter.	<ul style="list-style-type: none">• A fixed disk drive is failing.• The Fixed Disk Drive Adapter is failing.• The control/data cable is failing.• The system board is failing.

Warning:

Normal shipping and handling can result in permanent loss of all data and formatting on the fixed disk drive; refer to the operating system manual and back up all information.

This MAP may instruct you to remove the fixed disk drive to measure voltages on the fixed disk drive. If the drive is functioning, run the **(PREPARE SYSTEM FOR RELOCATION)** option of the Advanced Diagnostics diskette before removing the drive from the system.

Notes:

1. A terminating resistor must be installed on drive C. Drive D should not have a terminating resistor installed.
2. If the installed Fixed Disk Drive Adapter is equipped with switches, ensure they are set for the correct fixed disk drive type.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

Note: You may receive a 17XX error code, disregard the error and continue with the POST.

(Step 001 continues)

001 (continued)

- When the Advanced Diagnostics menu appears, run the Fixed Disk Drive and Adapter tests. Use the **(RUN TESTS ONE TIME)** option. The following menu should appear.

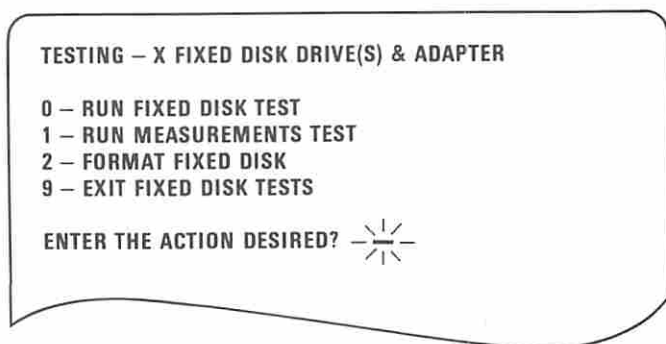


Figure 1. Fixed Disk Drive Tests

DID THE MENU APPEAR ON THE SCREEN (Figure 1)?

Yes No

002

Replace the fixed disk drive adapter.

003

ARE TWO FIXED DISK DRIVES INSTALLED?

Yes No

004

Go to Step 010 in this MAP.

005

- Power off the system.
- Disconnect the control/data cable from fixed disk drive D.
- Power on the system.
- Run the Fixed Disk Drive and Adapter tests on drive C. Use the **(RUN TESTS MULTIPLE TIMES)** option.

(Step 005 continues)

005 (continued)

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

006

Go to Step 013 in this MAP.

007

- Power off the system.
- Connect the control/data cable to drive D.
- Power on the system.
- Run the Fixed Disk Drive and Adapter tests on drive D. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID THE TESTS RUN WITHOUT AN ERROR?

Yes No

008

Go to Step 016 in this MAP.

009

Go to Step 021 in this MAP.

010

(From Step 004 in this MAP)

- Press 9 (**EXIT FIXED DISK TESTS**).
- Run the Fixed Disk Drive and Adapter tests on drive C. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID THE TEST RUN WITHOUT AN ERROR?

Yes No

011

Go to Step 013 in this MAP.

012

Go to Step 018 in this MAP.

013

(From Steps 006 and 011 in this MAP)

**WAS THE MESSAGE "CHECK DRIVE C: AND ADAPTER"
DISPLAYED?**

Yes No

014

Go to Step 052 in this MAP.

015

Go to Step 018 in this MAP.

016

(From Step 008 in this MAP)

**WAS THE MESSAGE "CHECK DRIVE D: AND ADAPTER"
DISPLAYED?**

Yes No

017

Go to Step 052 in this MAP.

018

(From Steps 012 and 015 in this MAP)

- Compare the 17XX error code displayed on the screen with the error codes listed in Figure 2.

Error Code	Action
1701 1702 1703 1704 1706 1708	Replace the Fixed Disk Drive
1730 1731 1732	Replace the Fixed Disk Drive Adapter

Figure 2. Error Codes

(Step 018 continues)

018 (continued)

IS THE ERROR CODE LISTED (Figure 2 on page 1700-4)?

Yes	No
-----	----

019

Go to Step 021 in this MAP.

020

Take the action indicated for the error code as shown in Figure 2 on page 1700-4.

021

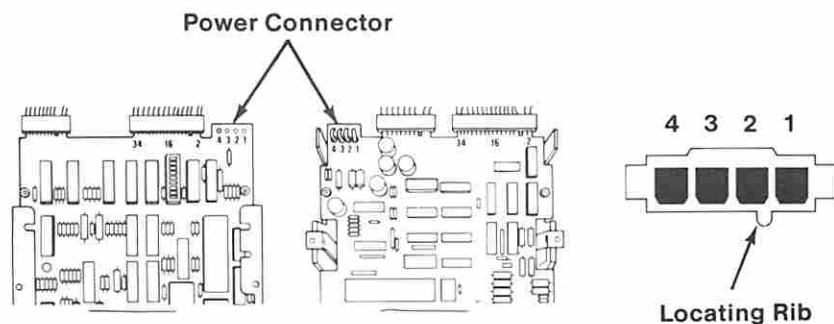
(From Steps 009 and 019 in this MAP)

- Power off the system.
- Remove the failing fixed disk drive and place it on top of the power supply (logic board side up).
- Connect all cables to the drive.
- Power on the system.
- Run the Fixed Disk Drive and Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- When the menu appears press **1 (RUN MEASUREMENTS TEST)**.
- Press **C or D (ENTER THE DRIVE ID)** to indicate the drive you removed.

Measurement Test 1 is now running.

(Step 021 continues)

- Refer to Figure 3 and measure the voltages indicated.



Test Description	Fixed Disk	Response
Measurement Test 1	+ Lead Power 4 - Lead Power 2	+4.8 to 5.2 Vdc
	+ Lead Power 1 - Lead Power 3	+11.5 to 12.6 Vdc

Figure 3. Measurement Test 1 - Power Supply Voltage Check

ARE THE VOLTAGES CORRECT?

Yes No

022

Go to "MAP 0020: Power Start."

023

- With Measurement Test 1 still running, check the voltages in Tables A and B of Figure 4 on page 1700-7.

Notes:

1. Use the frame as ground.
2. J1 is the 34-pin connector. The locating key is between pins 4 and 6.

Test Description	Fixed Disk	Response
Measurement Test 1	J1-2*	0.1 to 0.5 Vdc (Low)
	J1-4	0.1 to 0.5 Vdc (Low)
	J1-14	0.1 to 0.5 Vdc (Low)
	J1-18	0.1 to 0.5 Vdc (Low)
	J1-26	0.1 to 0.5 Vdc (Low)
*Pin J1-2 may not be present on all fixed disk drives.		

Table A

Test Description	Fixed Disk	Response
Measurement Test 1	J1-8	0.1 to 0.5 Vdc (Low)
	J1-10	0.1 to 0.5 Vdc (Low)
	J1-12	2.5 to 3.0 Vdc (High)
	J1-22	0.1 to 0.5 Vdc (Low)

Table B

Figure 4. Measurement Test 1

ARE THE VOLTAGES CORRECT?

Yes No

024

Go to Step 032 in this MAP.

025

- Press the space bar once to begin Measurement Test 2.
- Refer to Figure 5 on page 1700-8 and measure the voltages in Tables C and D.

Notes:

1. Use the frame as ground.
2. J1 is the 34-pin connector. The locating key is between pins 4 and 6.

Test Description	Fixed Disk	Response
Measurement Test 2	J1-24	0.1 to 0.5 Vdc (Low)
	J1-26	0.1 to 0.5 Vdc (Low)
	J1-34	0.1 to 0.5 Vdc (Low)

Table C

Test Description	Fixed Disk	Response
Measurement Test 2	J1-10	2.5 to 3.0 Vdc (High)
	J1-12	2.5 to 3.0 Vdc (High)

Table D

Figure 5. Measurement Test 2

ARE THE VOLTAGES CORRECT?

Yes No

026

Go to Step 038 in this MAP.

027

- Press the space bar once to begin Measurement Test 3.
- Refer to Figure 6 on page 1700-9 and measure the voltages in Tables E and F.

Notes:

1. Use the frame as ground.
2. J1 is the 34-pin connector. The locating key is between pins 4 and 6.

Test Description	Fixed Disk	Response
Measurement Test 3	J1-6	0.1 to 0.5 Vdc (Low)

Table E

Test Description	Fixed Disk	Response
Measurement Test 3	J1-12	2.5 to 3.0 Vdc (High)

Table F

Figure 6. Measurement Test 3

ARE THE VOLTAGES CORRECT?

Yes	No
	028
	Go to Step 044 in this MAP.

029

The Measurement Tests failed to isolate a failure.

DID YOU RECEIVE A 17XX ERROR CODE WHEN YOU RAN THE FIXED DISK DRIVE AND ADAPTER TESTS?

Yes	No
	030
	You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

031

Replace the Fixed Disk Drive Adapter.

032

(From Step 024 in this MAP)

**DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS
FROM BOTH TABLES A AND B (Figure 3 page 1700-6)?**

Yes No

033

Go to Step 035 in this MAP.

034

Go to Step 049 in this MAP.

035

(From Step 033 in this MAP)

**DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS
FROM TABLE A ONLY (Figure 3 page 1700-6)?**

Yes No

036

An incorrect voltage measurement from Table B only, Figure 4 on page 1700-7, indicates that the fixed disk drive needs to be formatted. Go to Step 052 in this MAP to format the drive.

037

Go to Step 049 in this MAP.

038

(From Step 026 in this MAP)

**DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS
FROM BOTH TABLES C AND D (Figure 4 page 1700-7)?**

Yes No

039

Go to Step 041 in this MAP.

040

Go to Step 049 in this MAP.

041

(From Step 039 in this MAP)

DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS FROM TABLE C ONLY (Figure 4 page 1700-7)?

Yes No

042

An incorrect voltage in Table D only, Figure 5 on page 1700-8, indicates that the fixed disk drive needs to be formatted. Go to Step 052 in this MAP to format the drive.

043

Go to Step 049 in this MAP.

044

(From Step 028 in this MAP)

DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS FROM BOTH TABLES E AND F (Figure 5 page 1700-8)?

Yes No

045

Go to Step 047 in this MAP.

046

Go to Step 049 in this MAP.

047

(From Step 045 in this MAP)

DID YOU HAVE INCORRECT VOLTAGE MEASUREMENTS IN TABLE E ONLY (Figure 5 page 1700-8)?

Yes No

048

An incorrect voltage in Table F only, Figure 6 on page 1700-9, indicates that the fixed disk drive needs to be formatted. Go to Step 052 in this MAP to format the drive.

049

(Step 049 continues)

049 (continued)

(From Steps 034, 037, 040, 043, and 046 in this MAP)

- Check the continuity of the control/data cable.

DO ALL LINES HAVE CONTINUITY?

Yes No

050

Replace the control/data cable.

051

Replace the Fixed Disk Drive Adapter.

052

(From Steps 014, 017, 036, 042, and 048 in this MAP)

- Power off the system.
- Install any drives removed in previous steps.
- Make sure all cables are properly connected.

Use the following procedure to format the fixed disk drive:

Warning: All data on the fixed disk drive will be lost.

1. Insert the Advanced Diagnostics diskette into drive A.
2. Power on the system.

Note: If you receive an error during the POST, disregard the error and continue with the POST.

3. Run the Fixed Disk Drive and Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
4. When the menu appears, press **2 (FORMAT FIXED DISK DRIVE)**.
5. Press **C or D (ENTER DRIVE ID C/D)** to indicate the drive you want to format.
6. Press **Y (ARE YOU SURE YOU WANT TO CONTINUE)**.

Formatting may take up to ten minutes.
(Step 052 continues)

052 (continued)

**WERE YOU ABLE TO FORMAT THE DRIVE
SUCCESSFULLY?**

Yes No

053

Replace the fixed disk drive.

054

- Run the Fixed Disk Drive and Adapter tests on the drive you just formatted. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID THE DIAGNOSTIC TESTS RUN WITHOUT AN ERROR?

Yes No

055

Replace the fixed disk drive.

056

The fixed disk drive can now be prepared to accept data. Refer to an operating system manual for the needed commands. The backup data may then be loaded onto the fixed disk drive.

Notes:

MAP 1700: Fixed Disk Drive (AT)

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 17XX error message, or you suspect a problem with the fixed disk drive, or Fixed Disk and Diskette Drive Adapter.	<ul style="list-style-type: none">• The fixed disk drive is failing.• The Fixed Disk and Diskette Drive adapter is failing.• The signal cable is failing.• The data cable is failing.• The system board is failing.

Warning: Normal shipping and handling can result in permanent loss of all data and formatting on the fixed disk drive; refer to the operating system manual and back up all information, if possible.

Note: A terminating resistor must be installed on drive C. Drive D should not have a terminating resistor installed.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.

IS THE ADVANCED DIAGNOSTICS MENU DISPLAYED?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Step 009 in this MAP.

004

(From Step 002 in this MAP)

IS A 17XX ERROR CODE DISPLAYED?

Yes No

005

Go to "MAP 0020: Power Start."

006

IS THE ERROR CODE 1790 OR 1791?

Yes No

007

Go to Step 017 in this MAP.

008

Press the **F1** key and continue with Step 009 in this MAP.

009

(From Steps 003 and 008 in this MAP)

- Run the Fixed Disk Drives and Adapter tests. Use the (**RUN TESTS ONE TIME**) option.

IS THE FIXED DISK DIAGNOSTIC MENU DISPLAYED ON THE SCREEN?

Yes No

010

Go to Step 017 in this MAP.

011

(From Step 019 in this MAP)

- Run all tests on the suspected failing drive.
- Make a note of any error messages displayed.

DID YOU RECEIVE A 17XX ERROR MESSAGE?

Yes No

012

Go to Step 018 in this MAP.

(Step 013 continues)

013

(From Step 020 in this MAP)

- Check the voltages at the failing fixed disk drive power connector as shown in Figure 1.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+ 4.8	+ 5.2	2	4
+11.5	+12.6	3	1

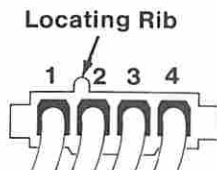


Figure 1. Power Connector

ARE THE VOLTAGES CORRECT?

Yes No

014

Go to "MAP 0020: Power Start."

015

- Check the fixed disk drive data and signal cables for continuity. The line numbers at one end of the cable match the line numbers at the other end, except for those listed in Figure 2 on page 1700-4

Diskette Drive C Signal Cable Connector		Diskette Drive D Signal Cable Connector	
Pin Numbering		Pin Numbering	
Drive End	Adapter End	Drive End	Adapter End
25	29	29	29
26	28	28	28
27	27	27	27
28	26	26	26
29	25	25	25

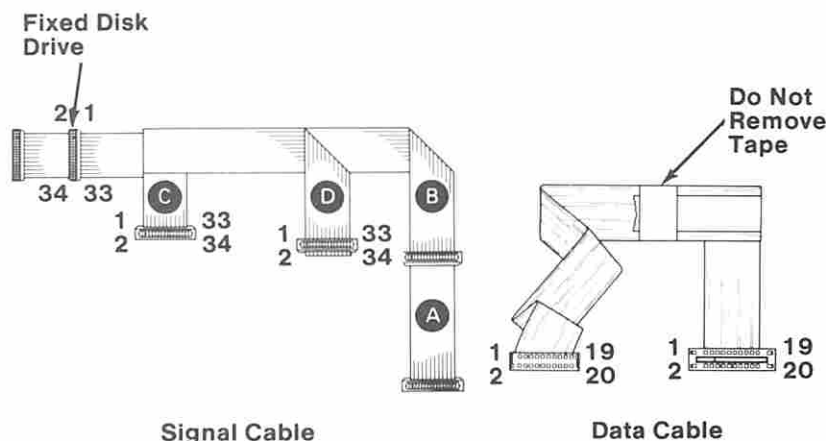


Figure 2. Data and Signal cables

DO ALL LINES HAVE CONTINUITY?

Yes No

016

Replace the failing cable.

017

(From Steps 007 and 010 in this MAP)

- Find the error code in Figure 3, and go to the step indicated.

Error Code	Go to:
1701	Step 021 in this MAP.
1702	Step 026 in this MAP.
1703	Step 031 in this MAP.
1704	Step 026 in this MAP.
1705	Step 031 in this MAP.
1706	Step 031 in this MAP.
1707	Step 031 in this MAP.
1708	Step 031 in this MAP.
1709	Step 031 in this MAP.
1710	Step 026 in this MAP.
1711	Step 031 in this MAP.
1712	Step 031 in this MAP.
1713	Step 031 in this MAP.
1714	Step 021 in this MAP.
1780	Step 021 in this MAP.
1781	Step 021 in this MAP.
1782	Step 026 in this MAP.

Figure 3. Error Codes

018

(From Step 012 in this MAP)

- The Fixed Disk Drives and Adapter multiple tests have finished without an error.
- Run the Fixed Disk Drives and Adapter tests. Use the (RUN TEST ONE TIME) option.
- Select tests 1, 2, 3, and 4.

(Step 018 continues)

018 (continued)

DID YOU RECEIVE A 17XX ERROR MESSAGE?

Yes No

019

The Advanced Diagnostic tests could not find a failure with the drive selected. If a second fixed disk drive is installed and you have not already tested it, go to Step 011 in this MAP and test the other drive.

If all fixed disk drives have been tested and you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

020

Go to Step 013 in this MAP.

021

(From Step 017 in this MAP)

Error codes: **1701, 1714, 1780, or 1781**

- Check that all electrical connections are secure by disconnecting then reconnecting them.
- Reseat the Fixed Disk and Diskette Drive Adapter.
- Repeat the operation or diagnostic test that failed.

DID THE SAME FAILURE OCCUR?

Yes No

022

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

023

- Replace the failing fixed disk drive.

Note: Format the new fixed disk drive before running any diagnostic test or you will receive an invalid error.

- Repeat the operation or diagnostic test that failed.

(Step 023 continues)

023 (continued)

DID THE SAME FAILURE OCCUR?

Yes No

024

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

025

Replace the fixed disk adapter (Fixed Disk and Diskette Drive Adapter).

026

(From Step 017 in this MAP)

Error codes: **1702, 1704, 1710, or 1782.**

- Check that all electrical connections are secure by disconnecting then reconnecting them.
- Reseat the Fixed Disk and Diskette Drive Adapter.
- Repeat the operation or diagnostic test that failed.

DID THE SAME FAILURE OCCUR?

Yes No

027

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

028

- Replace the fixed disk adapter (Fixed Disk and Diskette Drive Adapter).
- Repeat the operation or diagnostic test that failed.

DID THE SAME FAILURE OCCUR?

Yes No

029

(Step 029 continues)

029 (continued)

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

030

Replace the system board.

031

(From Step 017 in this MAP)

Error Codes: **1703, 1705, 1706, 1707, 1708, 1709, 1711, 1712, or 1713.**

- Check that all electrical connections are secure by disconnecting then reconnecting them.
- Reseat the Fixed Disk and Diskette Drive Adapter.
- Repeat the operation or diagnostic test that failed.

DID THE SAME FAILURE OCCUR?

Yes No

032

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

033

- Power off the system.
- Use the following procedure to format the fixed disk drive.

Warning: Formatting results in a complete loss of data on the fixed disk drive; refer to the operating system manual and back up all information, if possible.

1. Insert the Advanced Diagnostics diskette into drive A.
2. Power on the system.

Note: If you receive an error during the POST, press the **F1** key to continue.

3. Run the Fixed Disk Drives and Adapter tests. Use the **(RUN TESTS ONE TIME)** option.

4. When the Fixed Disk Diagnostic menu appears, select option **7 (FORMAT MENU)**.
5. Select option **1 (CONDITIONAL FORMAT)**, and select the drive to be formatted (C or D).
6. Press **Y** or **N** (**ALL DEFECTS WILL BE SHOWN ON THE DISPLAY, THEY CAN ALSO BE PRINTED ON LPT1. IS A HARD COPY NEEDED?**) then **Enter**.
7. Press **Y** (**DO YOU WANT TO CONTINUE Y/N?**) then **Enter**.
8. Press **Y** (**THIS IS YOUR LAST CHANCE TO CANCEL**) then **Enter**.

Formatting may take up to 15 minutes.

WERE YOU ABLE TO FORMAT THE DRIVE SUCCESSFULLY?

Yes No

034

Replace the fixed disk drive then go to Step 038 in this MAP.

Note: Format the new fixed disk drive before running any diagnostic tests or you will receive an invalid error.

035

- Run the Fixed Disk Drive and Adapter tests on the drive you just formatted. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID THE DIAGNOSTIC TESTS RUN WITHOUT AN ERROR?

Yes No

036

Replace the fixed disk drive then go to Step 038 in this MAP.

Note: Format the new fixed disk drive before running any diagnostic tests or you will receive an invalid error.

037

(Step 037 continues)

037 (continued)

The fixed disk drive can now be prepared to accept data.

Note: The Advanced Diagnostics Format program is different from the operating system Format program. Before transferring information from backup diskettes to the fixed disk drive, format the fixed disk drive using the operating system diskette. Refer to the operating system manual for a description of the Format commands.

038

(From Steps 034 and 036 in this MAP)

- Repeat the operation or diagnostic test that failed.

DID THE SAME FAILURE OCCUR?

Yes No

039

You have successfully completed the Advanced Diagnostic tests. The fixed disk drive can now be prepared to accept data.

Note: The Advanced Diagnostics Format program is different from the operating system Format program. Before transferring information from backup diskettes to the fixed disk drive, format the fixed disk drive using the operating system diskette. Refer to the operating system manual for a description of the Format commands.

If you suspect an intermittent problem, start an error log.
If you need instructions, refer to the Reference manual.

040

Replace the fixed disk adapter (Fixed Disk and Diskette Drive Adapter).

MAP 1800: Expansion Unit

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 18XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The extender card is failing.• The receiver card is failing.• The power supply is failing.• A fixed disk drive is failing.

001

(From Step 006 in this MAP)

- Check that all cable connectors are seated correctly.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Disregard an 1801 error code and continue with the POST.
- Run the Expansion Option tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE AN 18XX ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

DID YOU RECEIVE AN 1819 ERROR CODE?

Yes No

004

Go to Step 008 in this MAP.

(Step 005 continues)

005

- Check that the switch settings on the extender card correctly reflect the "Memory Segment."

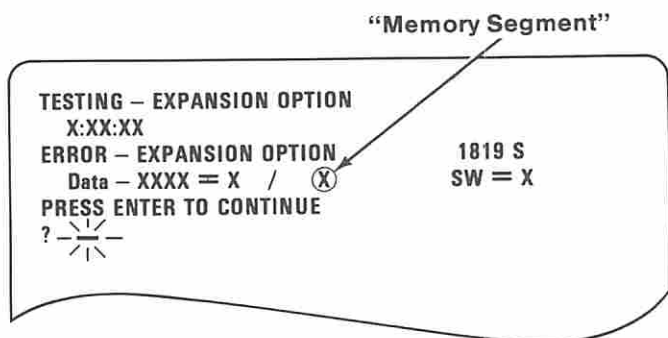


Figure 1. Memory Segment Screen

ARE THE EXTENDER CARD SWITCH SETTINGS CORRECT?

Yes No

006

Correct the switch settings and return to Step 001 in this MAP.

007

Replace the extender card.

008

(From Step 004 in this MAP)

DID YOU RECEIVE AN 1820 OR 1821 ERROR CODE?

Yes No

009

Go to Step 011 in this MAP.

010

Go to Step 013 in this MAP.

011

(From Step 009 in this MAP)

- Power off the system.
- Disconnect the expansion cable at the system unit.
- Power on the system.
- Disregard an 1801 error code and continue with the POST.
- Run the Expansion Option tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE AN 1820 ERROR CODE?

Yes	No
|	012
|	Replace the extender card.

013

(From Step 010 in this MAP)

- Power off the system.
- Connect the expansion cable at the system unit, if removed in an earlier step.
- Remove all option adapters from the expansion unit, except the receiver card.
- Power on the system.
- Run the Expansion Option tests. Use the **(RUN TESTS ONE TIME)** option.

DID YOU RECEIVE AN 18XX ERROR CODE?

Yes	No
|	014
|	Go to Step 027 in this MAP.

015

- Check the voltages at the expansion board power connector, refer to Figure 2 on page 1800-4.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+2.4	+5.2	5	1
+4.8	+5.2	5	10

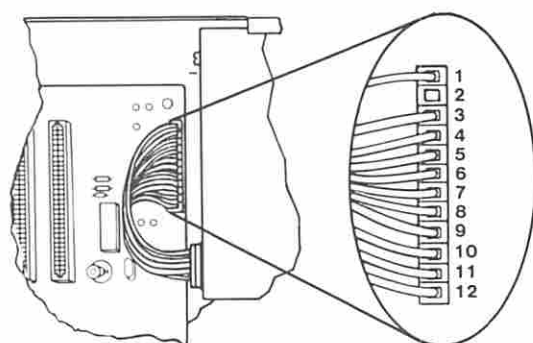


Figure 2. Expansion Board Power Connectors

ARE THE VOLTAGES CORRECT?

Yes No

016

Go to Step 018 in this MAP.

017

Replace the receiver card.

018

(From Step 016 in this MAP)

- Power off the system.
- Disconnect the power connectors from the fixed disk drives.
- Power on the system.
- Check the voltages at the expansion board power connector, refer to Figure 3 on page 1800-5.

Voltage (Vdc)		Pins	
Minimum	Maximum	-Lead	+Lead
+2.4	+5.2	5	1
+4.8	+5.2	5	10

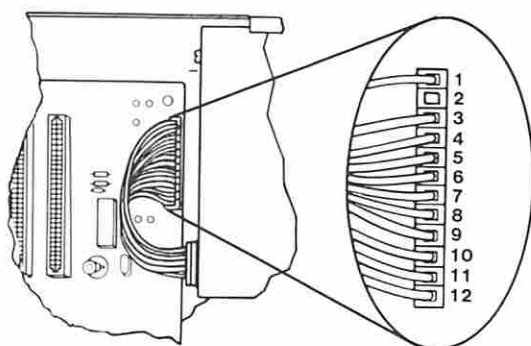


Figure 3. Expansion Board Power Connectors

ARE THE VOLTAGES CORRECT?

Yes No

019

Go to Step 021 in this MAP.

020

- Power off the system.
- Reconnect one fixed disk drive at a time until the symptom returns.

Replace the failing fixed disk drive.

021

(From Step 019 in this MAP)

- Remove the receiver card from the Expansion Unit.
- Check the voltages at the expansion board power connector, refer to Figure 3.

ARE THE VOLTAGES CORRECT?

Yes No

(Step 022 continues)

022

Go to Step 024 in this MAP.

023

Replace the receiver card.

024

(From Step 022 in this MAP)

- Power off the system.
- Ensure all option adapters are removed from the expansion unit, including the receiver card.
- Disconnect the expansion board power connectors and take resistance measurements on the expansion board pins listed in Figure 4.

Pins		Minimum Resistance
-Lead	+Lead	
5	3	50 Ohms
6	4	50 Ohms
7	9	50 Ohms
8	10	50 Ohms
8	11	50 Ohms
8	12	50 Ohms

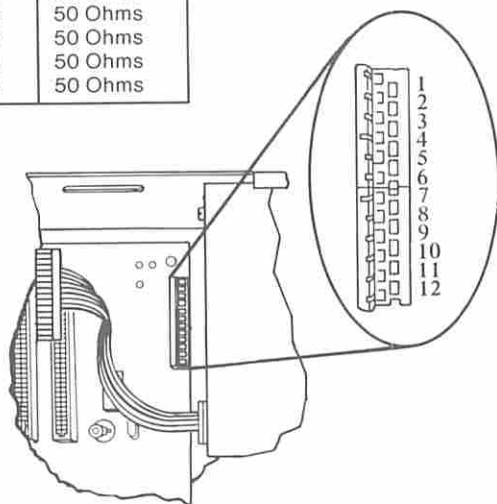


Figure 4. Resistance Check

ARE ANY OF THE RESISTANCES BELOW THE MINIMUM INDICATED IN THE CHART?

Yes No

(Step 025 continues)

025

Replace the power supply.

026

Replace the expansion board.

027

(From Steps 014 and 028 in this MAP)

- Power off the system.
- Install one option adapter.
- Power on the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Disregard an 1801 error code and continue with the POST.
- Run the Expansion Option tests. Use the **(RUN TESTS ONE TIME)** option.

DID THE SYMPTOM RETURN?

Yes No

028

Repeat Step 027 in this MAP until the failing symptom returns. Replace the adapter that causes the symptom.

029

Replace the last adapter installed.

Notes:

MAP 2000: Binary Synchronous Communications (BSC) Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 20XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The BSC Adapter is failing.• The adapter cable is failing.

Ensure the following conditions exist:

1. An adapter is set for primary BSC Adapter operation.
2. If a second BSC Adapter is installed, it is set for alternate BSC Adapter operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the BSC Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the FRU indicated on the display.

MAP 2100: Alternate Binary Synchronous Communications (Alt BSC) Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 21XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The alternate BSC Adapter is failing.• The adapter cable is failing.• Jumpers are incorrectly set.

Ensure the following conditions exist:

1. An adapter is set for primary BSC Adapter operation.
2. A second BSC Adapter is installed and is set for alternate BSC Adapter operation.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Alternate BSC Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 62X1083) when instructed to install the wrap plug.

(Step 001 continues)

001 (continued)

DID YOU RECEIVE AN ERROR MESSAGE?

Yes	No
------------	-----------

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Replace the FRU indicated on the display.

MAP 2200: Cluster Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 22XX error message, or you suspect a Cluster Adapter problem.	<ul style="list-style-type: none">• The switch settings are incorrect.• The Cluster Adapter is failing.• The terminating plug is failing.

001

(From Step 006 in this MAP)

Obtain from the operator: the station address, number of adapters, and remote IPL Status.

Ensure the Cluster Adapter switch settings are correct.

Note: Before removing a Cluster Adapter, make a note of the location (system and slot number) of the adapter.

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Cluster Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Follow the instructions on the screen. Do not power off the system during the tests.

Note: Use terminating plug (IBM Part 6323481) when instructed to install the terminating plug.

(Step 001 continues)

0:02:51
ERROR —
XS/XE CLUSTER ADAPTER(S) 22XX X
ADAPTER SELECT SET INCORRECTLY

PRESS ENTER TO CONTINUE
?

Figure 1. Adapter Select Set Error

**DID YOU RECEIVE THE ERROR MESSAGE SHOWN
(Figure 1)?**

Yes No

002

Go to Step 004 in this MAP.

003

The adapter has more than one adapter number switch set to the On position. Check the switch settings and correct any errors. If all switch settings are correct, replace the failing Cluster Adapter and terminating plug.

004

(From Step 002 in this MAP)

**ARE THE DISPLAYED SWITCH SETTINGS CORRECT AND
DID THE TEST RUN WITHOUT AN ERROR MESSAGE?**

Yes No

005

Replace the Cluster Adapter and its terminating plug.

006

If you want to test the Cluster Adapter again or test a different Cluster Adapter, go to Step 001 in this MAP.

(Step 006 continues)

006 (continued)

DO YOU WANT TO DISPLAY THE CLUSTER STATUS?

Yes No

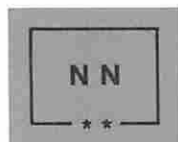
007

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

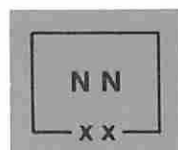
008

- Follow the instructions on the screen to display cluster status. Figure 2 on page 2200-4 explains the cluster status that may appear on the screen.

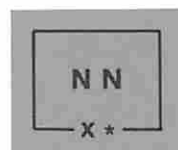
NN is any station address from 0 to 63.



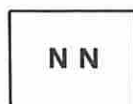
The system you are using is indicated on the screen in blinking reverse video, and the box is marked by two asterisks.



Stations in the cluster that are powered on are displayed in reverse video, and their boxes are marked by two Xs.



If another system has the same station address as you are testing, a long beep sounds every 3 seconds, and the box appears in blinking reverse video with an X and asterisk.



A station address not in the cluster is indicated by a box in normal video; the box has no Xs or asterisks.

A "**CLUSTER ACCESS ERROR**" message may appear in reverse video.

Figure 2. Cluster Status

The cluster-status screen presentation in Figure 3 on page 2200-5 shows 64 boxes that represent the stations in the cluster that are powered on and connected to the main coaxial bus.

0	1	2 xx	3 **	4 xx	5 xx	6 xx	7	8	9	
10	11	12	13	14	15	16	17	18	19	
20	21	22	23	24	25	26	27	28	29	
30	31	32	33	34	35	36	37	38	39	
40	41	42	43	44	45	46	47	48	49	
50	51	52	53	54	55	56	57	58	59	
60	61	62	63							

CLUSTER STATUS FOR ADAPTER X
PRESS ANY KEY TO EXIT

Figure 3. Cluster Status

DO ALL STATIONS IN THE CLUSTER APPEAR AND REMAIN ON THE SCREEN?

Yes No

009

Go to Step 011 in this MAP.

010

The cluster is operating properly. Press any key to end the test. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

011

(From Step 009 in this MAP)

You may have an error similar to the one shown in Figure 4 (a box in blinking reverse video with an X and asterisk, and a beep sounding every 3 seconds).

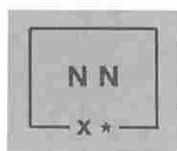


Figure 4. Error Symbol

DID YOU RECEIVE THE ERROR DESCRIBED (Figure 4)?

Yes No

012

Go to Step 014 in this MAP.

013

Another system has the same station address as the one you are testing. Compare the cluster map with the status screen presentation. Perform a diagnostic test of any system missing from the Cluster Status screen. Check the switch settings and correct any errors. If all switch settings are correct, replace the failing Cluster Adapter.

014

(From Step 012 in this MAP)

You may have an error similar to the one shown in Figure 5 on page 2200-7 (a box in normal video with no Xs or asterisks) for a station address that is in the cluster.

Note: Multiple grounds on the Cluster cables may cause stations to appear on the status screen presentation intermittently. Contact the installation manager.

Figure 5. Error Message

DID YOU RECEIVE THE ERROR SHOWN IN Figure 5?

Yes

No

015

Go to Step 017 in this MAP.

016

Go to Step 019 in this MAP.

017

(From Step 015 in this MAP)

X:XX:XX

ERROR —

X CLUSTER ADAPTER(S)

22XX X

CLUSTER ACCESS ERROR

PRESS ENTER TO CONTINUE

?

Figure 6. Cluster Access Error

DID YOU RECEIVE THE ERROR SHOWN (Figure 6)?

Yes

No

018

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

019

(Step 019 continues)

019 (continued)

(From Step 016 in this MAP)

You have a cluster access error, or the cluster map shows station addresses in the cluster that are not displayed on the Cluster Status screen. Do the following:

- Perform diagnostic tests on any station that has a cluster access error or that is not indicated on any status screen.
- If the diagnostic tests fail, replace the failing adapter.
- If the diagnostic tests pass, continue testing until all stations that had a cluster access error or did not appear in any status screen presentation are tested.
- If the Cluster Adapters check good and stations still have cluster access errors or do not appear in the Cluster status screen presentations, notify the installation manager that you suspect a problem with a coaxial cable or terminating plug.

If you have followed these procedures and still have an unsolved problem, request technical assistance.

MAP 2400: Enhanced Graphics Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you suspect a problem with the display connected to the Enhanced Graphics Adapter, you received an audible error code, or you have an error message indicating an Enhanced Graphics Adapter problem.	<ul style="list-style-type: none">• The Enhanced Graphics Adapter is failing.• The display is failing.• The Graphics Memory Expansion Card is failing.• A Graphics Memory Module is failing.

001

If two display adapters are installed in the system, continue with this MAP. If a failure is not found, continue with the MAP for the second display adapter.

- Power off the system.
- Ensure any switches or jumpers are set correctly for the configuration.
- Insert the Advanced Diagnostics diskette into drive A.
- Turn the brightness and contrast controls fully clockwise.
- Power on the system.
- Note any audio responses during the POST.

DID YOU HEAR ONE LONG AND THREE SHORT BEEPS?

Yes No

002

Go to Step 008 in this MAP.

003

(Step 003 continues)

003 (continued)

**IS A GRAPHICS MEMORY EXPANSION CARD
INSTALLED?**

Yes No

004

Replace the Enhanced Graphics Adapter.

005

- Power off the system.
- Remove the Graphics Memory Expansion Card from the Enhanced Graphics Adapter.
- Install the Enhanced Graphics Adapter without the expansion card.
- Power on the system.

**DOES THE SAME FAILURE OCCUR WITH THE
EXPANSION CARD REMOVED?**

Yes No

006

Go to Step 196 in this MAP.

007

Replace the Enhanced Graphics Adapter.

008

(From Step 002 in this MAP)

The Advanced Diagnostics menu should be displayed on the screen.

IS THE MENU READABLE?

Yes No

009

Go to Step 011 in this MAP.

010

- Run the Enhanced Graphics Adapter tests. Use the **(RUN TESTS ONE TIME)** option.

(Step 010 continues)

010 (continued)

- Continue with Step 011 in this MAP.

011

(From Steps 009 and 010 in this MAP)

IS THE SCREEN DARK (NO ILLUMINATION)?

Yes No

012

Refer to the step indicated for the type of display attached to the Enhanced Graphics Adapter.

- IBM Enhanced Color Display - Step 024 in this MAP.
- IBM Color Display - Step 083 in this MAP.
- IBM Monochrome Display - Step 126 in this MAP.
- Non-IBM display - Step 152 in this MAP.

013

DO YOU HAVE AN IBM MONOCHROME DISPLAY ATTACHED TO THE ENHANCED GRAPHICS ADAPTER?

Yes No

014

Go to Step 016 in this MAP.

015

Go to Step 152 in this MAP.

016

(From Step 014 in this MAP)

- Power on the display.

IS THE POWER-ON INDICATOR LIT?

Yes No

017

Go to Step 021 in this MAP.

018

(Step 018 continues)

018 (continued)

- Power off the system.
- Power off the display.
- Disconnect the display signal cable from the back of the Enhanced Graphics Adapter.
- Power on the display.

IS THE DISPLAY STILL DARK (NO ILLUMINATION)?

Yes No

019

Go to Step 191 in this MAP.

020

Replace the display.

021

(From Step 017 in this MAP)

- Check the continuity of the display power cord.

DOES THE POWER CORD HAVE CONTINUITY?

Yes No

022

Replace the power cord.

023

Replace the display.

024

(From Step 012 in this MAP)

IS THE COLOR DISPLAY AND ENHANCED GRAPHICS ADAPTER TEST MENU STABLE?

Yes No

025

Go to Step 152 in this MAP.

026

(Step 026 continues)

026 (continued)

IS THE SCREEN READABLE?

Yes No

027

Go to Step 191 in this MAP.

028

IS THE CURSOR VISIBLE AND POSITIONED AT THE END OF THE LAST LINE OF THE MENU?

Yes No

029

Go to Step 191 in this MAP.

030

IS THE VERTICAL SIZE OF THE IMAGE ON THE SCREEN CORRECT?

Yes No

031

Adjust the vertical size, then continue with Step 032 in this MAP.

032

(From Step 031 in this MAP)

IS THE IMAGE ON THE SCREEN DISTORTED OR THE WRONG SIZE? (Figure 1 on page 2400-6)

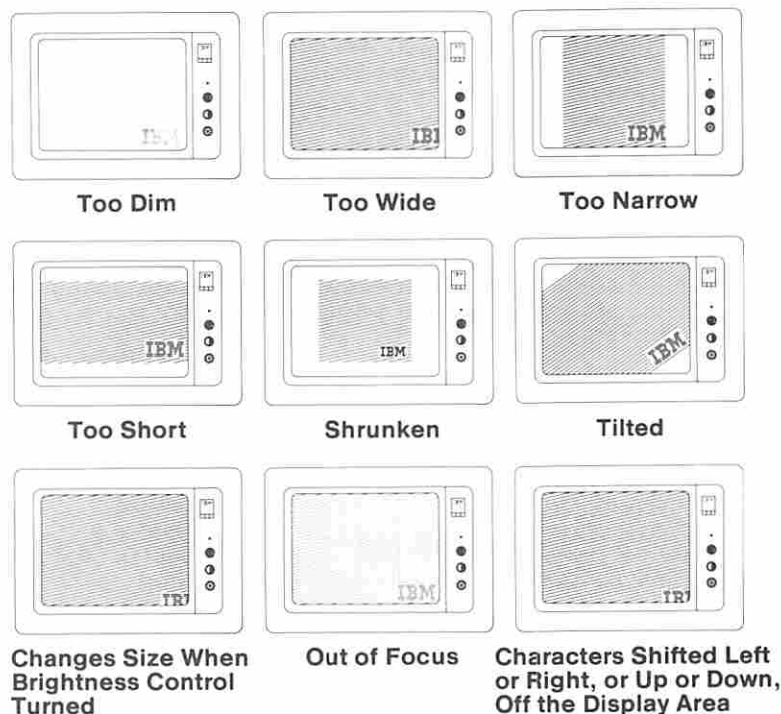


Figure 1. Distorted Images

Yes No

033

Go to Step 035 in this MAP.

034

Replace the display.

035

(From Step 033 in this MAP)

- Select **10** then press **Enter**.

IS THE AMOUNT OF GRAPHICS MEMORY DISPLAYED CORRECT?

Yes No

036

- Press **N** then **Enter**.
- Type in the correct amount of memory installed, then press **Enter**.

Go to Step **037** in this MAP.

037

(From Step 036 in this MAP)

- Press **Y** then **Enter**.

The display adapter and memory test should run without an error code. If this test runs successfully, the Display Attributes screen appears.

DID YOU RECEIVE AN ERROR CODE?

Yes No

038

Go to Step **040** in this MAP.

039

Go to Step **188** in this MAP.

040

(From Step 038 in this MAP)

- Turn the Brightness control counterclockwise. The brightness should decrease.
- Turn the Brightness control clockwise. The brightness should increase.
- Pull out and turn the Contrast control counterclockwise. The brightness of the characters should decrease.
- Turn the Contrast control clockwise. The brightness of the characters should increase.
- Push the Contrast control in. The screen should return to a preset value.

(Step 040 continues)

040 (continued)

DO THE CONTROLS WORK PROPERLY?

Yes	No

041

Replace the Enhanced Color Display.

042

The Display Attributes screen should be displayed.

- Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.
- Check the following items on the first Display Attributes screen:
 - The appearance of each line on the display should match the description on that same line.
 - The red bar should display light red, red, and dark red, from left to right.
 - The green bar should display light green, green and dark green, from left to right.
 - The blue bar should display light blue, blue, and dark blue from left to right.
 - The gray bar should display light gray, gray and white from left to right.

IS THE FIRST DISPLAY ATTRIBUTES SCREEN CORRECT?

Yes	No

043

Go to Step 045 in this MAP.

044

Go to Step 048 in this MAP.

045

(From Step 043 in this MAP)

You indicated that there was a problem with the first Display Attributes screen.

(Step 045 continues)

045 (continued)

IS THE PROBLEM WITH THE COLORS?

Yes	No

046

Go to Step 191 in this MAP.

047

Replace the display.

048

(From Step 044 in this MAP)

- Press **Y** then **Enter**.

The second Display Attributes screen should appear.

- Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.
- Check the following items on the second Display Attributes screen:
 - All colors should be present and of the correct hue.
 - The appearance of each line on the display should match the description on that same line.
 - Each color bar should display two shades of the color.

Note: The BROWN color bar displays brown over yellow. The WHITE color bar displays gray over white.

IS THE SECOND DISPLAY ATTRIBUTES SCREEN CORRECT?

Yes	No

049

Go to Step 051 in this MAP.

050

Go to Step 054 in this MAP.

051

(From Step 049 in this MAP)

You indicated that there was a problem with the second Display Attributes screen.

IS THE PROBLEM WITH THE COLORS?

Yes No

052

Go to Step 191 in this MAP.

053

Replace the display.

054

(From Step 050 in this MAP)

- Press **Y** then **Enter**.

IS THE BORDER BLACK AND ARE CHARACTERS OF THE CHARACTER SET SCREEN PRESENT AND COMPLETE?

Yes No

055

Go to Step 191 in this MAP.

056

- Press **Y** then **Enter**.

IS THE BORDER BLACK AND ARE THE CHARACTERS OF THE 80X25 DISPLAY SCREEN PRESENT AND COMPLETE?

Yes No

057

Go to Step 191 in this MAP.

058

- Press **Y** then **Enter**.

(Step 058 continues)

058 (continued)

IS THE BORDER BLACK AND ARE THE CHARACTERS OF THE 40X25 DISPLAY SCREEN PRESENT AND COMPLETE?

Yes No

059

Go to Step 191 in this MAP.

060

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 0 screen appears.

The background should be dark cyan. From left to right the boxes should be intensified green, intensified red, and intensified yellow. The characters should be intensified yellow.

IS THE GRAPHICS DISPLAY CORRECT?

Yes No

061

Go to Step 191 in this MAP.

062

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 1 screen appears.

The background should be intensified red. From left to right the boxes should be dark cyan, dark magenta, and non-intensified white (light gray).

The characters should be dark magenta.

IS THE GRAPHICS DISPLAY CORRECT?

Yes No

063

Go to Step 191 in this MAP.

064

- Press **Y** then **Enter**.

The 640X200 Graphics screen appears.

The background should be black. From left to right the boxes should be gray, gray, and white.

The characters are printed in white.

(Step 064 continues)

064 (continued)

IS THE GRAPHICS DISPLAY CORRECT?

Yes	No

065

Go to Step 191 in this MAP.

066

- Press **Y** then **Enter**.

The 640X200 16-color Graphics screen appears.

The background should be black.

Each color bar should match the description beneath it.

IS THE GRAPHIC DISPLAY CORRECT?

Yes	No

067

Go to Step 191 in this MAP.

068

**DO YOU HAVE A GRAPHICS MEMORY EXPANSION CARD
INSTALLED?**

Yes	No

069

Go to Step 071 in this MAP.

070

Go to Step 074 in this MAP.

071

(From Step 069 in this MAP)

- Press **Y** then **Enter**.

The 640X350 4-Color Graphics screen appears.

The background should be black.

From left to right the boxes should be blue, red, and white.

IS THE GRAPHICS DISPLAY CORRECT?

Yes	No

(Step 072 continues)

072

Go to Step 191 in this MAP.

073

Go to Step 076 in this MAP.

074

(From Step 070 in this MAP)

- Press **Y** then **Enter**.
 - The 640X350 16-Color Graphics screen appears.
- The background should be black.

The 16 color bars should match the description written below them.

IS THE GRAPHIC DISPLAY CORRECT?

Yes No

075

Go to Step 191 in this MAP.

076

(From Step 073 in this MAP)

- Press **Y** then **Enter**.
- The Light Pen Test screen appears.

DO YOU HAVE A LIGHT PEN INSTALLED?

Yes No

077

Press **N** then **Enter** then go to Step 080 in this MAP.

078

This is a timed test. If you wait longer than 60 seconds to respond or if you are not careful where you place the tip of the pen before you push it, you may receive an error message.

- Press **Y** then **Enter** to start the test.
- Position the tip of the light pen in the center of the block and press the pen toward the display.

The displayed block will be replaced by an asterisk.

- Repeat this procedure for each new block that appears.

(Step 078 continues)

078 (continued)

WERE YOU ABLE TO COMPLETE THE LIGHT PEN TEST?

Yes No

079

Replace the light pen.

080

(From Step 077 in this MAP)

Video Page 0 is displayed.

- Press any key to display the next page.
- Repeat the preceding step until eight pages have been displayed.

WERE ALL EIGHT PAGES DISPLAYED?

Yes No

081

Go to Step 191 in this MAP.

082

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

083

(From Step 012 in this MAP)

**IS THE COLOR DISPLAY AND ENHANCED GRAPHICS
ADAPTER TEST MENU STABLE?**

Yes No

084

Adjust the vertical hold. If you do not have a stable screen after adjusting the vertical hold, go to Step 152 in this MAP.

085

(Step 085 continues)

085 (continued)

IS THE SCREEN READABLE?

Yes No

086

Go to Step 191 in this MAP.

087

IS THE CURSOR VISIBLE AND POSITIONED AT THE END OF THE LAST LINE OF THE MENU ON THE DISPLAY?

Yes No

088

Go to Step 191 in this MAP.

089

IS THE VERTICAL SIZE OF THE IMAGE ON THE SCREEN CORRECT?

Yes No

090

Adjust the vertical size, then continue with Step 091 in this MAP.

091

(From Step 090 in this MAP)

IS THE IMAGE ON THE SCREEN DISTORTED OR THE WRONG SIZE? (Figure 2 on page 2400-16)

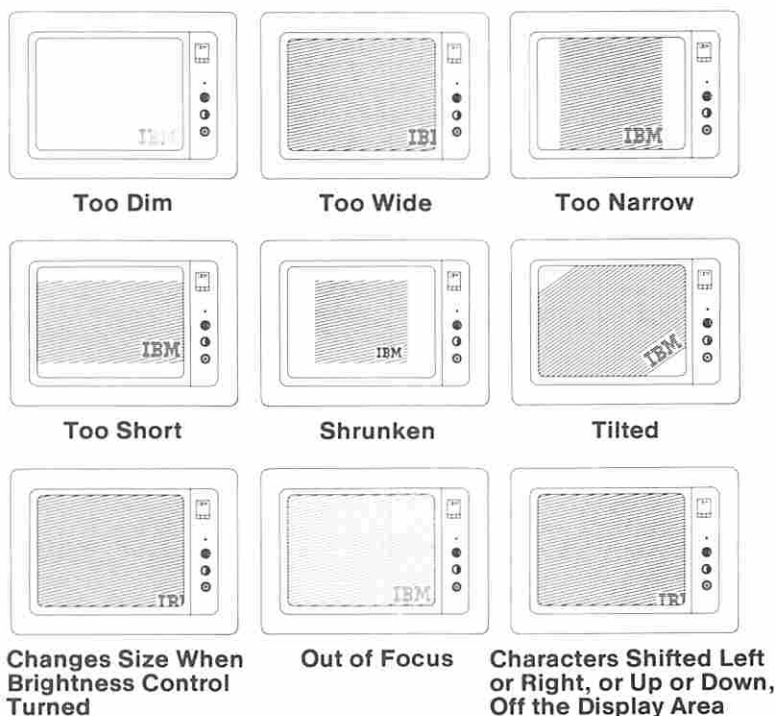


Figure 2. Distorted Images

Yes No

092

Go to Step 094 in this MAP.

093

Replace the display.

094

(From Step 092 in this MAP)

- Select **10** then press **Enter**.

(Step 094 continues)

094 (continued)

**IS THE AMOUNT OF GRAPHICS MEMORY DISPLAYED
CORRECT?**

Yes No

095

- Press **N** then **Enter**..
- Type in the correct amount of memory installed then press **Enter**.

Go to Step 096 in this MAP.

096

(From Step 095 in this MAP)

- Press **Y** then **Enter**..

The display adapter and memory test should run without an error code being displayed. If this test runs successfully, the Display Attributes screen appears.

DID YOU RECEIVE AN ERROR CODE?

Yes No

097

Go to Step 099 in this MAP.

098

Go to Step 188 in this MAP.

099

(From Step 097 in this MAP)

The Display Attributes screen should appear.

- Check the following items on the Display Attributes screen:

- All colors should be present and of the correct hue.
- Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.
- The appearance of each line on the display should match the description on that same line.
- Each color bar should display two shades of the color.

Note: The BROWN color bar displays brown over yellow. The WHITE color bar displays gray over white.

(Step 099 continues)

099 (continued)

IS THE DISPLAY ATTRIBUTES SCREEN CORRECT?

Yes No

100

Go to Step 102 in this MAP.

101

Go to Step 105 in this MAP.

102

(From Step 100 in this MAP)

**IS THE PROBLEM WITH THE FIRST DISPLAY
ATTRIBUTES SCREEN THE COLORS?**

Yes No

103

Go to Step 191 in this MAP.

104

Replace the display.

105

(From Step 101 in this MAP)

- Press Y then Enter.

**ARE ALL CHARACTERS OF THE CHARACTER SET
SCREEN PRESENT AND COMPLETE?**

Yes No

106

Go to Step 191 in this MAP.

107

- Press Y then Enter.

**IS THE BORDER OF THE 80X25 DISPLAY SCREEN BLACK
AND ARE THE CHARACTERS PRESENT AND COMPLETE?**

Yes No

(Step 108 continues)

108

Go to Step 191 in this MAP.

109

- Press **Y** then **Enter**.

IS THE BORDER OF THE 40X25 DISPLAY SCREEN BLACK AND ARE THE CHARACTERS PRESENT AND COMPLETE?

Yes No

110

Go to Step 191 in this MAP.

111

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 0 screen appears.

The background should be dark cyan. From left to right the boxes should be intensified green, intensified red, and intensified yellow. The characters should be intensified yellow.

IS THE GRAPHICS DISPLAY CORRECT?

Yes No

112

Go to Step 191 in this MAP.

113

- Press **Y** then **Enter**.

The 320X200 Graphics Color Set 1 screen appears.

The background should be intensified red. From left to right the boxes should be dark cyan, dark magenta, and non-intensified white (light gray).

The characters should be dark magenta.

IS THE GRAPHICS DISPLAY CORRECT?

Yes No

114

Go to Step 191 in this MAP.

115

(Step 115 continues)

115 (continued)

- Press **Y** then **Enter**.

The 640X200 Graphics screen appears.

The background should be black. From left to right the boxes should be gray, gray, and white.

The characters are printed in white.

IS THE GRAPHICS DISPLAY CORRECT?

Yes No

116

Go to Step 191 in this MAP.

117

- Press **Y** then **Enter**.

The 640X200 16 of 64 Color Graphics screen appears.

The background should be black.

Each color bar should match the description beneath it.

IS THE GRAPHIC DISPLAY CORRECT?

Yes No

118

Go to Step 191 in this MAP.

119

- Press **Y** then **Enter**.

The Light Pen Test screen appears.

DO YOU HAVE A LIGHT PEN INSTALLED?

Yes No

120

Press **Y** then **Enter** then go to Step 123 in this MAP.

121

This is a timed test. If you wait longer than 60 seconds to respond or if you are not careful where you place the tip of the pen before you push it, you may receive an error message.

- Press **N** then **Enter** to start the test.
- Position the tip of the light pen in the center of the block and press the pen toward the display.

(Step 121 continues)

121 (continued)

The displayed block will be replaced by an asterisk.

- Repeat this procedure for each new block that appears.

WERE YOU ABLE TO COMPLETE THE LIGHT PEN TEST?

Yes No

122

Replace the light pen.

123

(From Step 120 in this MAP)

Video Page 0 is displayed.

- A total of eight video pages will be displayed. Press any key to display the next page.

WERE ALL EIGHT PAGES DISPLAYED?

Yes No

124

Go to Step 191 in this MAP.

125

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

126

(From Step 012 in this MAP)

IS THE IBM MONOCHROME DISPLAY AND ENHANCED GRAPHICS ADAPTER TEST MENU STABLE?

Yes No

127

Go to Step 152 in this MAP.

128

(Step 128 continues)

128 (continued)

IS THE SCREEN READABLE?

Yes No

129

Go to Step 191 in this MAP.

130

IS THE CURSOR VISIBLE AND POSITIONED AT THE END OF THE LAST LINE OF THE MENU?

Yes No

131

Go to Step 191 in this MAP.

132

IS THE IMAGE ON THE SCREEN DISTORTED OR THE WRONG SIZE? (Figure 3 on page 2400-23)

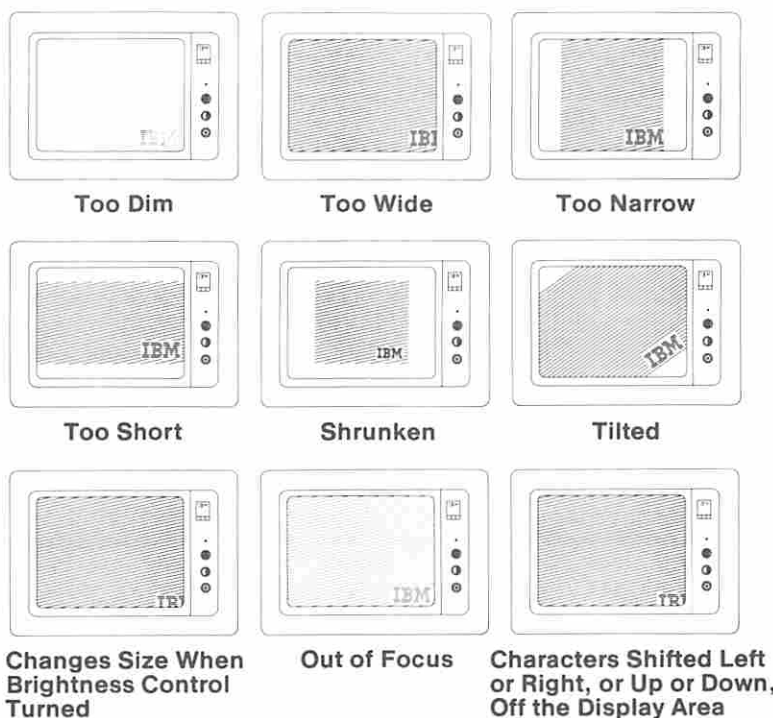


Figure 3. Distorted Images

Yes	No
	133
	Go to Step 135 in this MAP.
134	
Replace the display.	

135

(From Step 133 in this MAP)

- Select **10** then press **Enter**.

IS THE AMOUNT OF GRAPHICS MEMORY DISPLAYED CORRECT?

Yes No

136

- Press **N** then **Enter**.
- Type in the correct amount of memory installed, then press **Enter**

Go to Step 138 in this MAP.

137

Press **Y** then **Enter**. Go to Step 138 in this MAP.

138

(From Steps 136 and 137 in this MAP)

The display adapter and memory test should run without an error code being displayed. If this test runs successfully, the Display Attributes screen appears.

DID YOU RECEIVE AN ERROR CODE?

Yes No

139

Go to Step 141 in this MAP.

140

Go to Step 188 in this MAP.

141

(From Step 139 in this MAP)

The Display Attributes screen should be displayed.

- Adjust the brightness and contrast controls until the intensified lines is brighter than the other lines.

The appearance of each line should match the description on that same line.

(Step 141 continues)

141 (continued)

IS THE DISPLAY ATTRIBUTES SCREEN CORRECT?

Yes No

142

Go to Step 191 in this MAP.

143

- Press **Y** then **Enter**.

**ARE ALL CHARACTERS OF THE CHARACTER SET
SCREEN PRESENT AND COMPLETE?**

Yes No

144

Go to Step 191 in this MAP.

145

- Press **Y** then **Enter**.

**ARE THE CHARACTERS OF THE 80X25 DISPLAY SCREEN
PRESENT AND COMPLETE?**

Yes No

146

Go to Step 191 in this MAP.

147

- Press **Y** then **Enter**.

The 640X350 Graphics screen should appear.

The background should be black.

From left to right the boxes should be green, green, and blinking.

The characters are green.

IS THE GRAPHIC DISPLAY CORRECT?

Yes No

148

Go to Step 191 in this MAP.

149

(Step 149 continues)

149 (continued)

- Press **Y** then **Enter**.

Video Page 0 is displayed.

- A total of eight video pages will be displayed. Press any key to display the next page. Look for any discrepancy in the sequence of numbers on the display.

WERE ALL EIGHT PAGES DISPLAYED CORRECTLY?

Yes No

150

Go to Step 191 in this MAP.

151

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

152

(From Steps 012, 015, 025, 084, and 127 in this MAP)

- Power off the system.
- Disconnect all cables, devices, and wrap plugs from the asynchronous and alternate asynchronous adapters or other serial ports (if attached).
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Wait for the diskette to load.

Note: Use the numbers on the top row of the keyboard; do not use the numeric keypad.

- Press **0**.
- Press **Enter**.
- Wait for the Advanced Diagnostics program to load from the diskette.

DID YOU HEAR ONE BEEP?

Yes No

153

Go to "MAP 0020: Power Start."

(Step 154 continues)

154

**IS THE ENHANCED GRAPHICS ADAPTER THE ONLY
DISPLAY ADAPTER INSTALLED?**

Yes No

155

Go to Step 157 in this MAP.

156

Go to Step 162 in this MAP.

157

(From Step 155 in this MAP)

IS A DISPLAY ATTACHED TO BOTH DISPLAY ADAPTERS?

Yes No

158

Press **N** then **Enter**. Go to Step 160 in this MAP.

159

Press **Y** then **Enter**. Go to Step 160 in this MAP.

160

(From Steps 158 and 159 in this MAP)

DID YOU HEAR ONE BEEP?

Yes No

161

Go to "MAP 0020: Power Start."

162

(From Step 156 in this MAP)

- Press **Y**, then press **Enter**.

DID YOU HEAR ONE BEEP?

Yes No

163

Go to "MAP 0020: Power Start."

(Step 164 continues)

164

- Press **O**, then press **Enter**.

DID YOU HEAR ONE BEEP?

Yes No

165

Go to "MAP 0020: Power Start."

166

- Type **24**, then press **Enter**.

DID YOU HEAR TWO BEEPS?

Yes No

167

Replace the Enhanced Graphics Adapter.

168

IS A COLOR DISPLAY ATTACHED TO THE ENHANCED GRAPHICS ADAPTER?

Yes No

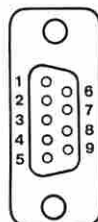
169

Go to Step 179 in this MAP.

170

- Disconnect the display signal cable.
- Type **11** then press **Enter**.
- Measure the voltage present at the 9-pin connector on the adapter between pin 1 (ground) and the pins shown in Figure 4 on page 2400-29.

Pin	Color	Enhanced in Normal Color	Enhanced in Enhanced Color
3	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc
4	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc
5	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc
6	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc	2.5 - 5.5 Vdc



Adapter

Figure 4. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

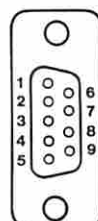
171

Go to Step 191 in this MAP.

172

- Press Enter.
- Measure the voltage present at the 9-pin connector on the adapter between pin 1 (ground) and the pins shown in Figure 5.

Pin	Color	Enhanced in Normal Color	Enhanced in Enhanced Color
2	Ground	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc
3	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc
4	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc
5	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc
6	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc
7	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc	0.0 - 0.5 Vdc



Adapter

Figure 5. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

(Step 173 continues)

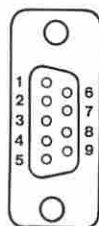
173

Go to Step 191 in this MAP.

174

- Press 9 and wait for two beeps.
- Measure the voltage present at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 6.

Pin	Color	Enhanced in Normal Color	Enhanced in Enhanced Color
8	0.0 - 0.7 Vdc	0.0 - 0.7 Vdc	0.0 - 0.7 Vdc
9	0.0 - 0.4 Vdc	2.4 - 5.5 Vdc	2.4 - 5.5 Vdc



Adapter

Figure 6. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes **No**

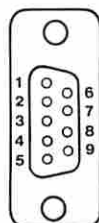
175

Go to Step 191 in this MAP.

176

- Type 12 then press Enter.
- Measure the voltage present at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 7 on page 2400-31.

Pin	Color	Enhanced in Normal Color	Enhanced in Enhanced Color
8	0.8 - 1.5 Vdc	1.5 - 2.5 Vdc	1.5 - 2.5 Vdc
9	0.5 - 1.0 Vdc	0.5 - 1.0 Vdc	2.4 - 5.5 Vdc



Adapter

Figure 7. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

177

Go to Step 191 in this MAP.

178

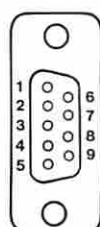
Replace the color display.

179

(From Step 169 in this MAP)

- Disconnect the monochrome display signal cable.
- Type **11** then press **Enter**.
- Measure the voltage at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 8 on page 2400-32.

Pins	Voltage
6	2.4 - 3.8 Vdc
7	2.4 - 3.8 Vdc



Adapter

Figure 8. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

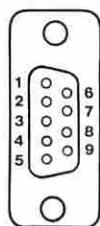
180

Go to Step 191 in this MAP.

181

- Press **Enter**.
- Measure the voltage present at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 9.

Pins	Voltage
6	0.0 - 0.5 Vdc
7	0.0 - 0.5 Vdc



Adapter

Figure 9. Enhanced Graphics Adapter Tests

(Step 181 continues)

181 (continued)

ARE THE VOLTAGES CORRECT?

Yes No

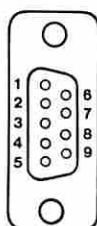
182

Go to Step 191 in this MAP.

183

- Press **Enter** and wait for two beeps.
- Measure the voltage at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 10.

Pins	Voltage
8	0.4 - 1.1 Vdc
9	3.0 - 4.2 Vdc



Adapter

Figure 10. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

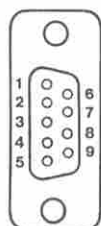
184

Go to Step 191 in this MAP.

185

- Select **12** then press **Enter**.
- Measure the voltage at the 9-pin connector on the adapter, between pin 1 (ground) and the pins shown in Figure 11 on page 2400-34.

Pins	Voltage
8	0.4 - 1.1 Vdc
9	3.0 - 4.2 Vdc



Adapter

Figure 11. Enhanced Graphics Adapter Tests

ARE THE VOLTAGES CORRECT?

Yes No

186

Go to Step 191 in this MAP.

187

Replace the monochrome display.

188

(From Steps 039, 098, and 140 in this MAP)

You may have received an error message containing the phrase "FAILING GRAPHICS MEMORY XXX XXX" (XXX XXX is a six-digit number).

DID YOU RECEIVE THIS ERROR MESSAGE?

Yes No

189

Go to Step 191 in this MAP.

190

Go to Step 206 in this MAP.

191

(From Steps 019, 027, 029, 046, 052, 055, 057, 059, 061, 063, 065, 067, 072, 075, 081, 086, 088, 103, 106, 108, 110, 112, 114, 116, 118, 124, 129, 131, 142, 144, 146, 148, 150, 171, 173, 175, 177, 180, 182, 184, 186, and 189 in this MAP)

DO YOU HAVE A GRAPHICS MEMORY EXPANSION CARD INSTALLED?

Yes No

192

Replace the Enhanced Graphics Adapter.

193

- Remove the Graphics Memory Expansion Card from the Enhanced Graphics Adapter.
- Install the Enhanced Graphics Adapter without the Graphics Memory Expansion card.
- Power on the system.
- Rerun the failing diagnostic test.

DID THE SAME FAILURE OCCUR WITH THE EXPANSION CARD REMOVED?

Yes No

194

Go to Step 196 in this MAP.

195

Replace the Enhanced Graphics Adapter.

196

(From Steps 006 and 194 in this MAP)

- Refer to Figure 12 on page 2400-37 and remove the memory modules from bank 03.

DID THE SAME FAILURE OCCUR WITH THE MODULES REMOVED?

Yes No

(Step 197 continues)

197

Replace the eight memory modules in bank 03. Rerun the diagnostic tests to verify the fix. If this does not correct the problem, replace the Graphics Memory Expansion Card.

198

- Refer to Figure 12 on page 2400-37 and remove the modules installed in bank 02.

DID THE SAME FAILURE OCCUR WITH THE MODULES REMOVED?

Yes No

|

199

Replace the eight memory modules in bank 02. Rerun the diagnostic tests to verify the fix. If this does not correct the problem, replace the Graphics Memory Expansion Card.

200

- Refer to Figure 12 on page 2400-37 and remove the modules installed in bank 01.

DID THE SAME FAILURE OCCUR WITH THE MODULES REMOVED?

Yes No

|

201

Replace the eight memory modules in bank 01. Rerun the diagnostic tests to verify the fix. If this does not correct the problem, replace the Graphics Memory Expansion Card.

202

Replace the Graphics Memory Expansion Card.

203

(From Step 210 in this MAP)

You have received a **"FAILING GRAPHICS MEMORY"** error message followed by a six-digit error code. If the first two digits are **00** or the last two digits are **11**, it indicates a failure on the Enhanced Graphics Adapter.

(Step 203 continues)

203 (continued)

ARE THE FIRST TWO DIGITS OF THE ERROR CODE 00,
OR THE LAST TWO DIGITS 11?

Yes No

204

Go to Step 206 in this MAP.

205

Replace the Enhanced Graphics Adapter.

206

(From Steps 190 and 204 in this MAP)

The first two digits of the error code identify the bank that has the failing module. The third and fourth digits identify the row. The last two digits identify the position (left or right) of the module.

For example, error code **020301** corresponds to a failing module identified as being in bank **02** row **03**, in the **right** (01) module position. This is shown by the arrow in Figure 12.

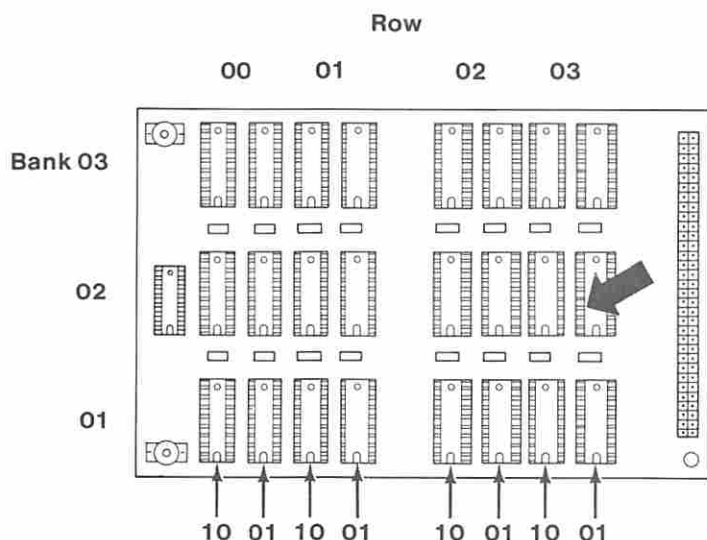


Figure 12. Module Location

(Step 206 continues)

206 (continued)

Replace the failing graphics memory module. Go to Step 001 in this MAP and rerun the Enhanced Graphics Adapter diagnostic tests. After the tests are complete, continue with Step 207 in this MAP.

207

(From Step 206 in this MAP)

DID YOU RECEIVE A GRAPHICS MEMORY ERROR CODE?

Yes No

|
208

The system is functioning correctly.

209

IS THE NEW ERROR CODE IDENTICAL TO THE PREVIOUS ERROR CODE?

Yes No

|
210

There is another failing Graphics Memory Module. Go to Step 203 in this MAP and follow that procedure again.

211

Replace the Graphics Memory Expansion Card.

MAP 2900: Color Printer

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 29XX error message, or you suspect a problem with the Color Printer.	<ul style="list-style-type: none">• The power cord is connected improperly.• The power switch is set to Off.• The Color Printer is failing.

001

- Ensure the printer power cord is plugged into a functioning, properly grounded electrical outlet.
- Ensure the printer cable is connected properly.
- Power on the printer.
- Repeat the operation or diagnostic test that failed.

DID YOU RECEIVE A 29XX ERROR CODE, OR HAVE A PROBLEM WITH THE COLOR PRINTER?

Yes No

002

Repeat the operation or diagnostic test to ensure the printer is functioning properly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Refer to the service manual for your printer to run further diagnostic tests.

Note: Be sure to run the tests for the printer adapter installed in the system before referring to any other service manuals.

Notes:

MAP 3000: PC Network Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you have a 30XX error code, IO ROM CC0000, CC0000 ROM error, or have identified a PC Network Adapter failure.	<ul style="list-style-type: none">• The PC Network Adapter is failing.• The PC Network is failing.

001

Ensure the covers are installed before running this test.

- Run the PC Network Adapter tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR CODE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, or are having network problems, refer to the service manual for the PC Network .

003

DID YOU RECEIVE A 3015 OR 3041 ERROR CODE?

Yes No

004

Go to Step 006 in this MAP.

005

Go to the service manual for the PC Network.

006

(From Step 004 in this MAP)

DID YOU RECEIVE A 3020 ERROR CODE?

Yes No

|
007

Replace the primary PC Network Adapter.

008

ARE TWO PC NETWORK ADAPTERS INSTALLED?

Yes No

|
009

Replace the PC Network Adapter.

010

Determine which PC Network Adapter has jumper W8 enabled (set to the On position) and replace the adapter.

MAP 3100: Alternate PC Network Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you have a 31XX error code, IO ROM CC0000, CC0000 ROM error, or have identified an Alternate PC Network Adapter failure.	<ul style="list-style-type: none">• The alternate PC Network Adapter is failing.• The PC Network is failing.

001

Ensure the covers are installed before running this test.

- Run the Alternate PC Network Adapter tests. Use the **(RUN TESTS MULTIPLE TIMES)** option.

DID YOU RECEIVE AN ERROR CODE?

Yes No

002

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, or are having network problems, refer to the service manual for the PC Network.

003

DID YOU RECEIVE A 3115 OR 3141 ERROR CODE?

Yes No

004

Go to Step 006 in this MAP.

005

(Step 005 continues)

005 (continued)

Go to the service manual for the PC Network.

006

(From Step 004 in this MAP)

DID YOU RECEIVE A 3120 ERROR CODE?

Yes No

|
|
007

Replace the Alternate PC Network Adapter.

008

ARE TWO PC NETWORK ADAPTERS INSTALLED?

Yes No

|
|
009

Replace the PC Network Adapter.

010

Determine which PC Network Adapter has jumper W8 enabled (set to the On position) and replace the adapter.

MAP 3300: Compact Printer

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 33XX error message, or you suspect a problem with the Compact Printer.	<ul style="list-style-type: none"> • Improper power cord connection. • The power switch is set to Off.

001

- Ensure the printer power cord is plugged into a functioning, properly grounded electrical outlet.
- Power on the printer.
- Repeat the operation or diagnostic test that failed.

DID YOU RECEIVE A 33XX ERROR CODE, OR HAVE A PROBLEM WITH THE COMPACT PRINTER?

Yes No

002

Repeat the operation or diagnostic test to ensure the printer is functioning properly. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

003

Refer to the service manual for your printer to run further diagnostic tests.

Note: Be sure to run the tests for the printer adapter installed in the system before referring to another service manual.

Notes:

MAP 3600: IBM General Purpose Interface Bus (GPIB) Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because the system has a 36XX error code or you have identified a problem with an IBM General Purpose Interface Bus Adapter.	<ul style="list-style-type: none">The IBM General Purpose Interface Bus Adapter is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the GPIB Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Compare the number of GPIB adapters displayed on the screen to the number of GPIB adapters installed in the system.

TESTING – X GPIB ADAPTER(S)

THE INSTALLED GPIB ADAPTER(S) ARE:

ADAPTER	DMA	INTERRUPT (IRQ)	UNIT
X	X	X	X

PRESS ENTER TO CONTINUE
?

Figure 1. Screen

(Step 001 continues)

001 (continued)

ARE ALL INSTALLED GPIB ADAPTERS LISTED?

Yes No

002

Check that all adapters are configured correctly. Replace the GPIB Adapter that is not listed. Before installing the new adapter, make sure its jumper configuration matches the adapter it is replacing.

003

- Press **Enter** and follow the directions on the screen.
- Select **X (TEST ALL GPIB ADAPTERS)**.

DID THE TEST FINISH WITHOUT AN ERROR?

Yes No

004

Replace the GPIB Adapter that failed. Before installing the new adapter, make sure its jumper configuration matches the adapter it is replacing.

005

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

MAP 3800: IBM Data Acquisition and Control Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because the system has a 38XX error code or you have identified a problem with an IBM Data Acquisition and Control Adapter.	<ul style="list-style-type: none">The IBM Data Acquisition and Control Adapter is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Data Acquisition Adapter tests. Use the **(RUN TESTS ONE TIME)** option.
- Compare the number of data acquisition adapters displayed on the screen to the number of data acquisition adapters installed in the system.

TESTING - X DATA ACQUISITION ADAPTER(S)

INSTALLED DATA ACQUISITION ADAPTER(S)

ADAPTER	INTERRUPT (IRQ) LEVEL	UNIT
---------	-----------------------	------

X	X	X
---	---	---

PRESS ENTER TO CONTINUE

?

Figure 1. Screen

(Step 001 continues)

001 (continued)

ARE ALL INSTALLED DATA ACQUISITION ADAPTERS LISTED?

Yes No

002

Check that all adapters are configured correctly. Replace the IBM Data Acquisition and Control Adapter that is not listed. Before installing the new adapter, make sure its jumper configuration matches the adapter it is replacing.

003

- Press **Enter** and follow the directions on the screen.
- Select **8 (TEST ALL DATA ACQUISITION ADAPTER(S))**.

DID THE TEST FINISH WITHOUT AN ERROR?

Yes No

004

Replace the IBM Data Acquisition and Control Adapter that failed. Before installing the new adapter, make sure its jumper configuration matches the adapter it is replacing.

005

You have successfully completed the Advanced Diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

MAP 3900: IBM Professional Graphics Controller

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because the POST did not finish, you visually detected an IBM Professional Graphics Controller or IBM Professional Graphics Display problem, or you have an error message indicating a controller or display problem.	<ul style="list-style-type: none">• The Professional Graphics Controller is failing.• The Professional Graphics Display is failing.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the Professional Graphics Display.
- Turn the brightness and contrast controls fully clockwise on the Professional Graphics Display.
- Listen to the audio response during the POST.
- Power on the system.

DID YOU HEAR ONE LONG AND TWO SHORT BEEPS?

Yes No

002

Go to Step 008 in this MAP.

003

If the Professional Graphics Display is the primary display, ensure the system board switch setting is set for color/graphics operation.

(Step 003 continues)

003 (continued)

IS THE SYSTEM BOARD SWITCH SETTING CORRECT?

Yes No

004

Correct the system board switch setting. Go to Step 001 in this MAP and repeat the diagnostic tests to verify system operation.

005

IS MORE THAN ONE DISPLAY ADAPTER INSTALLED?

Yes No

006

Replace the IBM Professional Graphics Controller, if that does not correct the problem replace the system board.

007

Replace the primary display adapter. If that does not correct the problem replace the system board.

008

(From Step 002 in this MAP)

- Run the Professional Graphics Controller tests. Use the **(RUN TESTS ONE TIME)** option.
- Ensure the brightness and contrast controls are turned fully clockwise.

IS THE SCREEN OF THE PROFESSIONAL GRAPHICS DISPLAY DARK (NO ILLUMINATION)?

Yes No

009

Go to Step 017 in this MAP.

010

IS THE DISPLAY'S POWER-ON INDICATOR LIT?

Yes No

011

(Step 011 continues)

011 (continued)
Go to Step 014 in this MAP.

012

- Power off the system.
- Power off the Professional Graphics Display.
- Disconnect the Professional Graphics Display signal cable from the IBM Professional Graphics Controller.
- Power on the Professional Graphics Display.

IS THE SCREEN STILL DARK (NO ILLUMINATION)?

Yes **No**

013

Replace the IBM Professional Graphics Controller.

014

(From Step 011 in this MAP)

- Power off the Professional Graphics Display.
- Disconnect the display power cord from the outlet, then from the display.
- Check the display power cord for continuity.

DOES THE POWER CORD HAVE CONTINUITY?

Yes **No**

015

Replace the IBM Professional Graphics Display power cord.

016

Replace the IBM Professional Graphics Display.

017

(From Step 009 in this MAP)

Notes:

1. If more than one display adapter is installed in the system, the information shown in Figure 1 on page 3900-4 may appear on the other display.
2. Depending on the position of the emulator jumper, Y or N may appear.

TESTING - PROFESSIONAL GRAPHICS CONTROLLER

EMULATOR MODE

Y

PRESS ENTER TO CONTINUE

Figure 1. Screen

IS THE PRESENTATION ON THE SCREEN THE SAME AS THE ONE SHOWN? (Figure 1)

Yes No

018

Replace the IBM Professional Graphics Controller.

019

- Press Enter.

DID YOU RECEIVE A U-XX ERROR MESSAGE INDICATING THE REPLACEMENT OF A MODULE?

Yes No

020

Continue with Step 022 in this MAP.

021

Go to Step 061 in this MAP.

022

(From Step 020 in this MAP)

DID YOU RECEIVE AN ERROR MESSAGE INDICATING THE REPLACEMENT OF THE PROFESSIONAL GRAPHICS CONTROLLER?

Yes No

(Step 023 continues)

023

Continue with Step 025 in this MAP.

024

Replace the IBM Professional Graphics Controller.

025

(From Step 023 in this MAP)

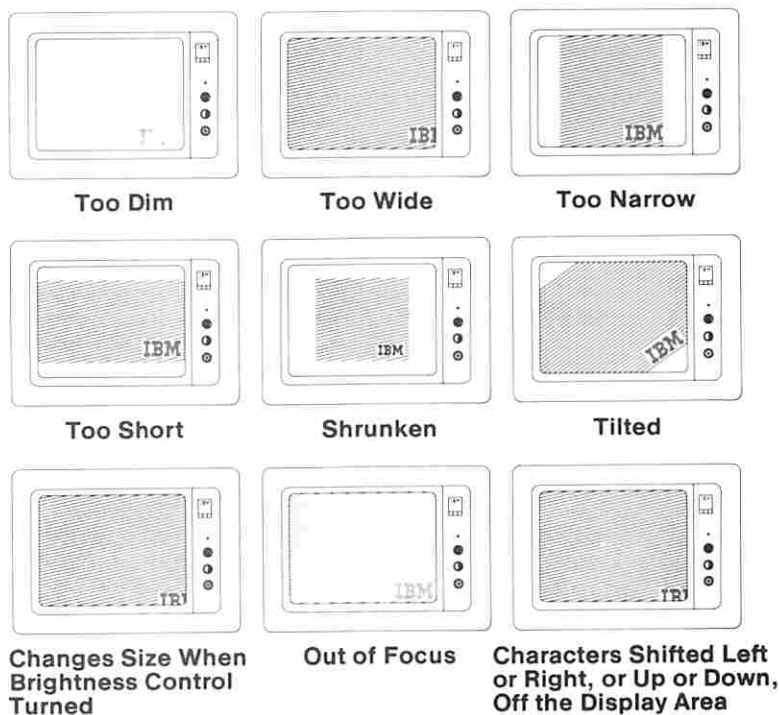


Figure 2. Screen Distortion

IS THE SCREEN UNSTABLE OR DISTORTED? (Figure 2)

Yes No

026

Continue with Step 028 in this MAP.

(Step 027 continues)

027

Replace the IBM Professional Graphics Display.

028

(From Step 026 in this MAP)

**DID THE VERTICAL DISPLAY SCREEN APPEAR WITH 42
EVENLY SPACED, VERTICAL, WHITE LINES?**

Yes No

029

Replace the IBM Professional Graphics Controller.

030

- Press **Y** then **Enter**.

**DID THE HORIZONTAL DISPLAY SCREEN APPEAR WITH
28 EVENLY SPACED, HORIZONTAL, WHITE LINES?**

Yes No

031

Replace the IBM Professional Graphics Controller.

032

- Press **Y** then **Enter**.

The Blank Display 1 screen appears. The title "**BLANK
DISPLAY 1**" should be at the top of the screen. The question
"**(IS THE SCREEN CORRECT (Y/N)?)**" should be at the
bottom of the screen.

DID IT APPEAR AS DESCRIBED?

Yes No

033

Replace the IBM Professional Graphics Controller.

034

- Press **Y** then **Enter**.

The Blank Display 2 screen appears. The title "**BLANK
DISPLAY 2**" should be at the top of the screen. The question
"**(IS THE SCREEN CORRECT (Y/N)?)**" should be at the
bottom of the screen.

034 (continued)

DID IT APPEAR AS DESCRIBED?

Yes No

035

Replace the IBM Professional Graphics Controller.

036

- Press Y then Enter.

DID THE CHECKERBOARD DISPLAY SCREEN APPEAR SHOWING A BLACK AND WHITE CHECKERBOARD PATTERN?

Yes No

037

Replace the IBM Professional Graphics Controller.

038

IS THE IBM PROFESSIONAL GRAPHICS CONTROLLER JUMPER SET TO THE EMULATOR MODE?

Yes No

039

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem start an error log. If you need instructions, refer to the Reference manual.

040

- Press Y then Enter

DID THE EMULATOR NUMERICAL DISPLAY SCREEN APPEAR SHOWING THE NUMBERS 0 THROUGH 9?

Yes No

041

Replace the IBM Professional Graphics Controller.

042

- Press Y then Enter.

(Step 042 continues)

042 (continued)

**DID THE EMULATOR CURSOR DISPLAY SCREEN APPEAR
SHOWING A WHITE BAR WITH A BLINKING BLACK
SQUARE IN THE MIDDLE?**

Yes No

043

Replace the IBM Professional Graphics Controller.

044

- Press **Y** then **Enter**.

The Emulator Attribute Display screen appears.

- Ensure the normal, intensified, reverse video, and blinking lines match their description.
- Ensure the colors are present and correct.

IS THE SCREEN CORRECT?

Yes No

045

Replace the IBM Professional Graphics Controller.

046

- Press **Y** then **Enter**.

**ARE ALL CHARACTERS PRESENT AND CORRECT ON THE
CHARACTER SET SCREEN (NO EXTRA DOTS IN
CHARACTER BOXES OR MISSING DOTS FROM
CHARACTER FIGURE)?**

Yes No

047

Replace the IBM Professional Graphics Controller.

048

- Press **Y** then **Enter**.

**ARE ALL CHARACTERS PRESENT AND CORRECT ON THE
CHARACTER SET SCREEN (NO EXTRA DOTS IN
CHARACTER BOXES OR MISSING DOTS FROM
CHARACTER FIGURE)?**

Yes No

(Step 049 continues)

049

Replace the IBM Professional Graphics Controller.

050

- Press **Y** then **Enter**.

IS EMULATOR VIDEO PAGE 0 DISPLAYED?

Yes No

051

Replace the IBM Professional Graphics Controller.

052

- Press any key. Video Page 1 appears. Continue to press any key for Video Pages 2 through 7 until Emulator Video Page 0 appears.

WERE ALL 8 VIDEO PAGES (0 THROUGH 7) DISPLAYED?

Yes No

053

Replace the IBM Professional Graphics Controller.

054

- Press **Y** then **Enter**.

The Emulator 320x200 Graphics Color Set 0 screen appears. The background should be dark cyan. The boxes, from left to right, should be intensified green, intensified red, and intensified yellow. The characters are displayed in intensified yellow.

DID IT APPEAR AS DESCRIBED?

Yes No

055

Replace the IBM Professional Graphics Controller.

056

- Press **Y** then **Enter**.

The Emulator 320x200 Graphics Color Set 1 screen appears. The background should be intensified red. The boxes, from left to right, should be dark cyan, dark magenta, and non-intensified white (light gray). The characters are displayed in dark magenta.

(Step 056 continues)

056 (continued)

DID IT APPEAR AS DESCRIBED?

Yes	No
------------	-----------

|	057

|	Replace the IBM Professional Graphics Controller.
--	---

058

- Press **Y** then **Enter**.

The Emulator 640x200 Graphics screen appears.

The background should be black. The boxes, from left to right, should be gray, gray, and white. The characters are displayed in white.

DID IT APPEAR AS DESCRIBED?

Yes	No
------------	-----------

|	059

|	Replace the IBM Professional Graphics Controller.
--	---

060

You have successfully completed the Advanced Diagnostics tests. If you suspect an intermittent problem start an error log. If you need instructions, refer to the Reference manual.

061

(From Step 021 in this MAP)

- Match the U-XX error code with the module location in the following illustration, then replace the memory module.

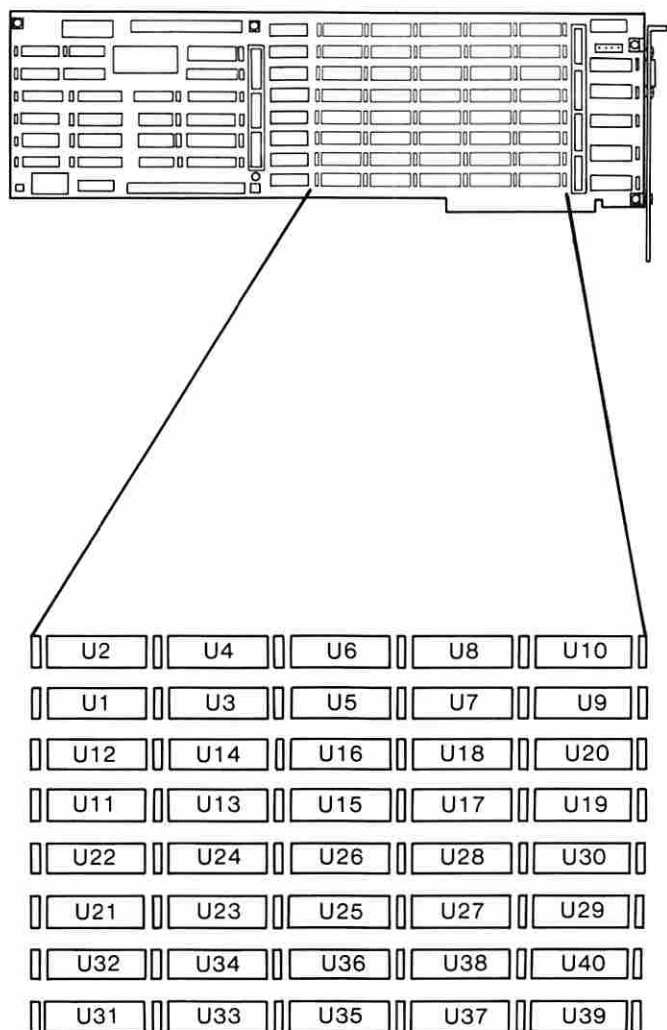


Figure 3. Module Location

Notes:

MAP 7100: Voice Communications Adapter

Symptom Explanation	Conditions That Could Cause This Symptom
You have entered this MAP because you received a 71XX error message, or you suspect a problem with the Voice Communications Adapter.	<ul style="list-style-type: none">• The Voice Communications Adapter is failing.• The telephone is failing.• A microphone is failing.• A speaker is failing.• A cable is failing.

Note: Verify that the Voice Communications Adapter jumpers are set correctly.

001

- Power off the system.
- Insert the Advanced Diagnostics diskette into drive A.
- Power on the system.
- Run the Voice Communications Adapter tests. Use the **(RUN TESTS ONE TIME)** option.

A testing screen appears as the basic tests are being performed. Upon the successful completion of the tests, the following message is displayed.

**BASIC TEST COMPLETED
VOICE COMMUNICATIONS ADAPTER SET FOR INTERRUPT
LEVEL. DO YOU WISH TO PERFORM THE EXTENDED
DIAGNOSTIC? (Y/N)**

Figure 1. Basic Test Completed Screen

001 (continued)

DID THE MESSAGE APPEAR ON THE SCREEN WITHIN 30 SECONDS OF STARTING THE TESTS (Figure 1 on

page 7100-1)?

Yes No

002

Replace the Voice Communications Adapter.

003

The following are required to run the extended diagnostic tests:

- Telephone
- Notched black telephone cable (IBM part 2684462)
- Notched white telephone cable (IBM part 2684487)
- Tabbed black telephone cable (IBM part 2684509)
- Tabbed white telephone cable (IBM part 2684514).

Notes:

1. Telephone-set cables have a notch on the dark connector.
2. Telephone-line cables have a tab on the dark connector.

DO YOU WANT TO RUN THE EXTENDED DIAGNOSTIC TESTS?

Yes No

004

Press **N** then **Enter**. The Voice Communications Adapter has passed the basic tests. To thoroughly test the Voice Communications Adapter, the extended diagnostic tests must be performed.

005

- Press **Y** then **Enter**. Follow the instructions as they appear on the screen.

Go to Step 006 in this MAP when you are instructed to perform the Wrap Test.

006

(From Step 005 in this MAP)

- Refer to Figure 2 and perform the Wrap-Test setup as follows:

1. Plug the notched connector of a telephone-set cable into the adapter phone jack.
2. Plug the other end into the telephone.
3. Plug the tabbed connector of a telephone-line cable into the adapter line 1 jack.
4. Plug the other end into the adapter line 2 jack.
5. Hang up the phone before starting this test.
6. Press **Y** then **Enter** to continue.

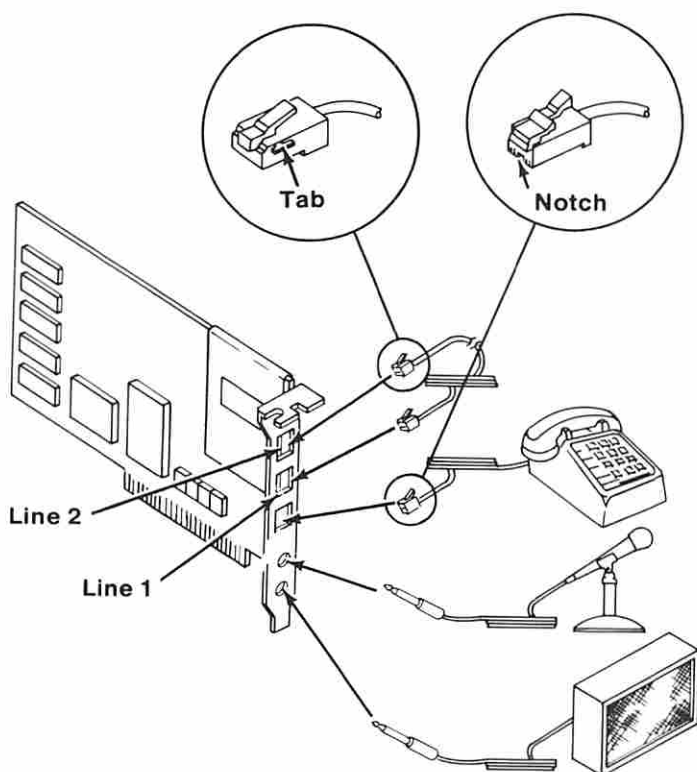


Figure 2. Wrap-Test Setup

(Step 006 continues)

006

- Follow the prompts on the screen and answer yes or no as required.

GO TO THE "APPLICATION SETUP" IN SECTION 3-7100 AND
CONNECT THE CABLES AS SHOWN. HANG UP THE TELEPHONE
HANDSET BEFORE STARTING THIS TEST.

PRESS ENTER TO CONTINUE

Figure 3. Application Setup Screen

DID THE APPLICATION SETUP SCREEN APPEAR

(Figure 3)?

Yes No

007

Go to Step 010 in this MAP.

008

- Refer to Figure 4 on page 7100-5 and perform the Application Setup as follows:
 1. Plug the notched connector of a telephone-set cable into the adapter phone jack.
 2. Plug the other end into the telephone.
 3. Plug the tabbed connector of a telephone-line cable into the adapter line 1 jack.
 4. Plug the other end into the wall jack.
 5. Hang up the phone before starting this test.
 6. Press **Y** then **Enter** to continue.

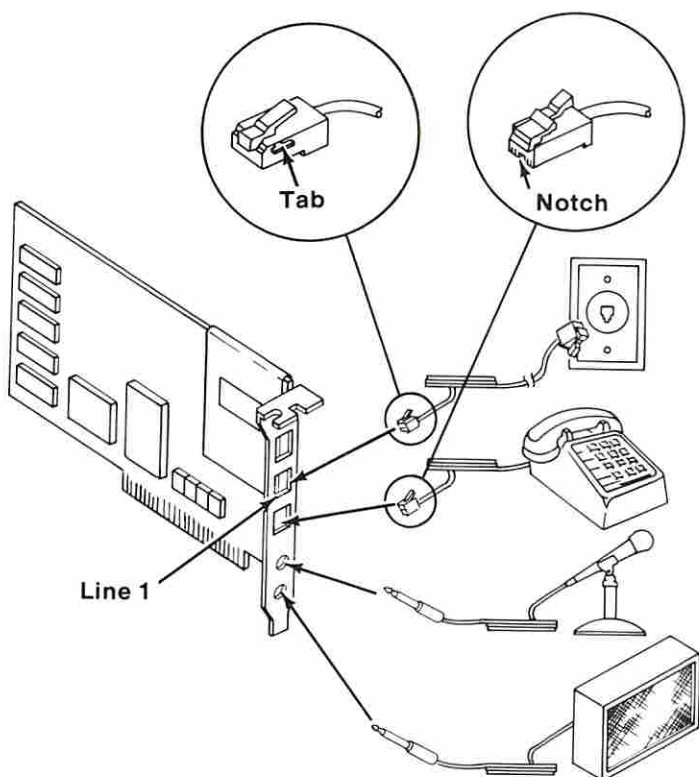


Figure 4. Application Setup

- Follow the prompts on the screen and answer yes or no as required. Replace any defective cables if prompted to do so.

DID ANY ERROR MESSAGES APPEAR?

Yes No

009

You have successfully completed the extended diagnostic tests. If you suspect an intermittent problem, start an error log. If you need instructions, refer to the Reference manual.

(Step 010 continues)

010

(From Step 007 in this MAP)

- Check the following:
 1. Check for continuity of the red and the green wires in each cable.
 2. Connect the telephone to a wall jack and dial another telephone to verify proper operation of the telephone and its lines.
 3. Use a known good microphone and speaker.
 - If the problem remains, replace the Voice Communications Adapter.
-

IBM United Kingdom
International Products Limited
PO Box 41, North Harbour
Portsmouth, PO6 3AU
England

Printed in Great Britain by Ben Johnson & Co. Ltd., York.

IBM