



*IBM 3270*  
*Personal Computer*

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# Maintenance Information



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*Personal Computer*

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# Maintenance Information

## **Federal Communications Commission (FCC) 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.**

### **IBM Statement**

The FCC statement is required for those machines that are used in the United States.

### **CAUTION**

**This product is equipped with a line cord and plug designed to avoid electrical shock. To insure electrical safety, the user MUST supply a properly grounded power receptacle.**

### **Third Edition (October, 1984)**

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# Safety Procedures

This section provides safety practices for service personnel, a listing of the safety notices that appear in this manual, and a safety inspection checklist for the 3270 Personal Computer.

## Service Personnel Safety Practices

These safety practices include suggested safety guidelines for service personnel working on machines, first-aid if an accident occurs, and reporting of accidents.

## Rules for Safety

If (1) you know the safety rules for working with electrical and mechanical equipment and (2) you observe these rules, you can work safely with IBM equipment.

*Do not fear electricity, but respect it.*

While you are maintaining IBM equipment:

1. Observe every safety precaution possible
2. Observe the following safety rules.

# Work Environment

- Do not work alone under hazardous conditions or near equipment that has dangerous voltages. Always inform your supervisor if the conditions or voltages are a possible problem.
- Remove all power ac and dc when removing or assembling major components, when working in the immediate area of power supplies, when performing mechanical inspection of power supplies, and when installing changes in machine circuitry. Pull the power cable plug from the receptacle to remove the power source.
- Always look for possible hazards in your work environment. Examples of hazards are moist floors, non-grounded extension cables, power surges, and missing safety grounds.
- Do not perform any action that makes the product unsafe or that causes hazards in the work environment.
- Before you start the equipment, make sure that other service personnel or employees are not in a hazardous position.
- Do not wear loose clothing that can be caught in the moving parts of a machine. Make sure that the sleeves of your clothing are fastened or are rolled above the elbow. If your hair is long, or if you wear a neck scarf, fasten it to make it safe.
- Insert your necktie into your clothing or fasten it with a clip (preferably non-conductive) at approximately 8 centimeters (3 inches) from its end.

- Lift the equipment or parts by standing or pushing up with your leg muscles; this action removes the strain from the muscles in your back. Do not lift any equipment or parts that are too heavy for you.

The maximum load to be lifted is that which, in your opinion and management's, does not jeopardize your own health or well-being, or that of other employees.

- Put removed machine covers in a safe place while you are servicing the machine. Reinstall the covers before returning the machine to normal operations.
- Always keep tools, tool kits and other service items away from walk areas so that other persons cannot trip over it. For example, keep the kit under a desk or table.
- Observe good housekeeping practices in the area of the machines while you are performing maintenance and after completing it.
- After maintenance, reinstall all safety devices, such as guards, shields, labels, and ground wires. Exchange safety devices that are worn or defective. (*Remember: the safety devices protect you from a hazard. You destroy their purpose if you do not reinstall them when you have completed the servicing.*)

# Electrical Safety

- If possible, always unplug the power-supply cable before you work on a machine. When you switch off power at the wall box, lock the switch in the off position or attach a DO NOT OPERATE tag (Z229-0237) to the switch.

*Note:* A non-IBM attachment to an IBM machine may be powered from another source and may be controlled by a different switch or circuit breaker.

- Switch off all power before (1) removing or assembling the main units of the equipment, (2) working near power supplies, (3) inspecting power supplies, or (4) installing changes in machine circuits.
- Unless the maintenance documents specifically instruct you, do not service the following parts with power on *if the part is removed from its installed position in the machine*: power supplies, pumps, blowers, motor generators, and other units with voltages that are more than 30 Vac or 42.4 Vdc. (This rule ensures that correct grounding is maintained.)
- If you really need to work on equipment that has exposed live electrical circuits, observe the following precautions:
  - Ensure that another person who is familiar with the power-off controls is near you. Another person must be there to switch off the power if necessary.
  - Do not wear jewelry, chains, metal-frame eyeglasses, or other personal metal objects. (*Remember:* if the metal touches the machine, the flow of current increases because the metal is a conductor.)

- Use only insulated probe tips or extenders. (*Remember: worn or cracked insulation is unsafe.*)
  - Use only one hand while you are working on live equipment. Keep the other hand in your pocket or behind your back. (*Remember: there must be a complete circuit for an electrical shock to occur. This precaution prevents your body from completing the circuit.*)
  - When you use test equipment, set its controls correctly and use insulated probes that have the correct electrical specification.
  - Do not touch objects that are grounded, such as metal floor strips, machine frames, or other conductors. Use suitable rubber mats obtained locally, if necessary.
- Never assume that power has been removed from a circuit. First check to ensure that the circuit has been powered off.
  - Do not touch live electrical circuits with the surface of a plastic dental mirror. (*Remember: the surface of the dental mirror is conductive and can cause damage and personal injury.*)
  - If an electrical accident occurs:
    1. *Use caution: do not be a victim yourself.*
    2. *Switch off power.*
    3. *Instruct another person to get medical aid.*
    4. *If the victim is not breathing, perform mouth-to-mouth rescue breathing. See “Electrical Accidents” under “First Aid.”*



## **Mechanical Safety**

- Do not touch moving mechanical parts when you are:
  - Lubricating a part
  - Checking for play
  - Doing other similar work.
- When using a stroboscope, do not touch ANYTHING – it may be moving.

## **Safety Glasses**

Wear safety glasses when:

- Using a hammer to drive pins or similar parts
- Using a power drill
- Using a spring hook to attach or remove a spring
- Soldering parts
- Cutting wire or removing steel bands
- Using solvents, chemicals, or cleaners to clean parts
- Working under any other conditions that could injure your eyes.

# Tools, Test Equipment, and Field-Use Materials

- You should use approved tools and test equipment. Make sure that electrical hand tools, such as Wire-Wrap<sup>1</sup> tools and power drills, are inspected regularly.
- Do not use worn and broken tools and test equipment.
- Do not use solvents, cleaners, or oils that have not been approved by IBM.

## Summary

Prevention is the main aid to electrical safety. Always think about electrical safety and use good practice; for example:

- Make sure that the power receptacle used matches the IBM equipment specifications.
- Inspect power cables and plugs: check for loose, damaged, or worn parts.
- Review the procedure in the maintenance documents before you remove a part that can hold an electrical charge from the machine. Carefully discharge the necessary parts exactly as instructed by the procedure.
- Do not use a normal light (for example, a table lamp) as an extension trouble light at a machine.

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<sup>1</sup> Trademark of the Gardner-Denver Co.

Never assume that a machine or a circuit is safe. No machine is always completely safe. You may not know the exact condition of a machine, because, for example:

- The power receptacles could be wrongly wired.
- Safety devices or features could be missing or defective.
- The machine could have been damaged in shipment.
- The machine could be deteriorated because it is old or because it operates in an extreme environment.
- A part could have become defective, thereby causing a hazard.
- A part could be wrongly assembled.

Also:

- Make sure that all sales changes and engineering changes are correctly installed.

These are some of the ways that the condition of the machine could affect safety. *Before you begin a servicing procedure, use good judgment and extreme caution.*

# First Aid

## Serious Injury:

1. Summon medical aid.
2. Do not move the victim unless absolutely necessary, to remove him from danger.
3. Try to stop serious bleeding by using pressure points or a pressure bandage.
4. Loosen the victim's clothing, and keep the victim warm.

## Electrical Accidents

When performing rescue procedures for an electrical accident, do as follows:

- *Use caution:* If the victim is still in contact with an electrical-current source, remove the power; to do this, you may need to operate the room emergency power-off (EPO) switch or the disconnecting switch. If you cannot find the switch, use a dry wooden rod or other non-conductive object to pull or push the victim away from contact with the electrical-current source.
- *Work quickly:* If the victim is unconscious, he or she may need:
  - Mouth-to-mouth rescue breathing
  - External cardiac compression if the heart is not beating.

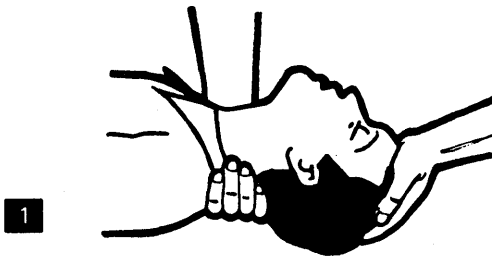
**INSTRUCT ANOTHER PERSON** to call for medical aid such as an ambulance, rescue service, or a hospital.

Determine whether the victim needs mouth-to-mouth rescue breathing. If he or she does, perform the following steps.

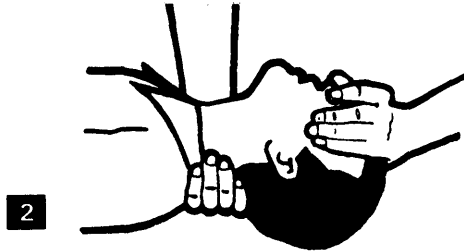
### CAUTION

Use extreme care when you perform rescue breathing for a victim who may have breathed-in toxic fumes. *Do not breathe-in air that the victim has breathed out.*

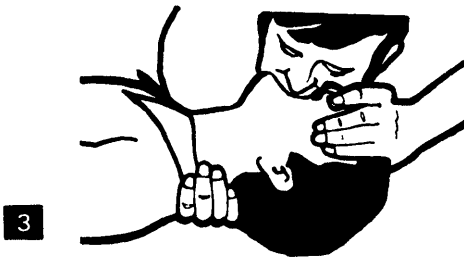
1. Prepare for rescue breathing:
  - a. Ensure that the victim's airway is open and that it is not obstructed; check the mouth for objects that may be obstructing the airway, such as chewing gum, food, dentures, or the tongue.
  - b. Place the victim on his or her back, put one hand behind the victim's neck, and put the other hand on the victim's forehead.
  - c. Lift the neck with one hand, and tilt the head backward by pressing on the forehead with the other hand **1**.



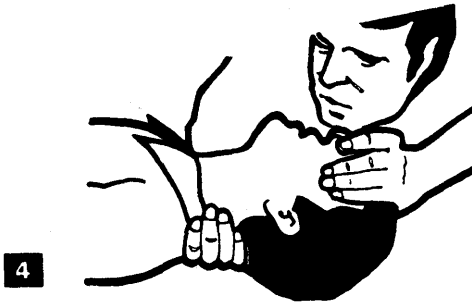
2. Look, listen, and feel to determine whether the victim is breathing freely:
  - a. Put your cheek near to the victim's mouth and nose.
  - b. Listen and feel for the breathing-out of air. At the same time, look at the victim's chest and upper abdomen to see whether they move up and down.
3. If the victim is not breathing correctly:
  - a. Keep the victim's head tilted backward (see **1**). Continue to press on the forehead with your hand; at the same time, rotate this same hand so that you can pinch together the victim's nostrils with your thumb and finger **2**.



- b. Open your mouth wide and take a deep breath. Make a tight seal with your mouth around the victim's mouth **3** and blow into the victim's mouth.



- c. Remove your mouth to let the victim breathe out, and check that the victim's chest moves down **4** .



- d. Repeat steps b and c once every 5 seconds either until the victim breathes for himself or herself or until medical aid comes.

## Reporting Accidents

Report, to your superior all electrical accidents, possible electrical hazards, and accidents that nearly occurred. (*Remember*: an accident that nearly occurs might be caused by a design problem; your immediate reporting ensures that the problem will be solved quickly.)

Report, also, all small electrical shocks. (*Remember*: a condition that causes a small shock need differ only slightly to cause serious injury.)

# Safety Notices

The safety notices that appear in this manual are CAUTION statements. Read these statements carefully to understand fully the risks involved and the instructions.

## **CAUTION**

**Do not connect or disconnect a coaxial cable during an electrical storm.**

## **CAUTION**

**This product is equipped with a line cord and plug designed to avoid electrical shock. To insure electrical safety, the user MUST supply a properly grounded power receptacle.**



# Preparation

- For IBM Customer Engineers, completion of one of the following is required:

“Electrical Safety Training Course for IBM Customer Engineers”

“Primary Power and Electrical Safety” (self-study course number 70701 or current level).

- Begin the checklist with the machine power off and the AC power cord(s) removed from the power outlet.
- References:

*3270 Personal Computer Guide to Operations*

*3270 Personal Computer Maintenance Information*

*Electrical Safety for IBM Customer Engineers (S229-8124)*

*Note:* It is possible that not all machine configurations (i.e. special features, RPQ's) are covered. If you should encounter a machine with features not described in this guide use the installation instructions for that feature. Otherwise use this guide and good judgment to obtain a safe machine. Also, be sure to remove any non-IBM OEM equipment from the machine before applying power.

# 3270 Personal Computer Safety Inspection Checklist

**Start all safety inspections here.**

- \_\_\_ Ensure that the work station is powered off and all power cords for the work station components are disconnected from the power outlets.
- \_\_\_ Remove all apparent OEM non-IBM additions before going any further with the safety check.
- \_\_\_ Check for any cracks or damaged areas on the face of the monitor CRT. Do not attempt to remove the covers from the monitor; the inside of the monitor is not to be accessed by service personnel.
- \_\_\_ Try to determine whether or not the system unit, monitor or keyboard have been tampered with. Make sure that the covers are not missing or damaged and are securely fastened. Check for exposed sharp edges that could cause possible injury.
- \_\_\_ Check for contamination, liquids, signs of fire, or smoke damage for the entire work station.
- \_\_\_ Check for worn, pinched, or frayed cables (especially the power cords).
- \_\_\_ Check to make sure the power outlet(s) match the work station components voltage tag requirements.
- \_\_\_ Check to make sure that you have less than 0.1 ohms between the ground pin and the system unit frame. Check also the continuity of the power cord receptacle for the

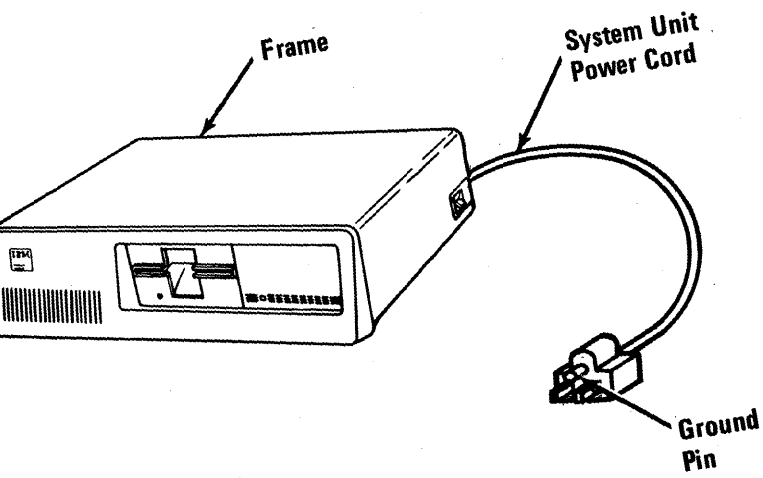
monochrome display; from ground pin to the frame the resistance should be less than 0.1 ohms (see figure 2.)

- If the work station has a color monitor, check the top and the bottom of the display to make sure the plastic screw covers are in place.
- Open the system unit by removing the larger screws on the back of the system unit and pulling the cover forward and up. Check to make sure that the power supply is securely fastened. (see figure 2).
- Try to determine whether or not the system unit power supply has been tampered with. Either a "pop rivet" or a "bristle screw" prevents access of the customer or service personnel to the inside of the power supply. Make sure that one or the other is in place. Do not attempt to open the power supply.
- Check the power cables for the presence of ground pins. For detachable power cables, check for continuity (less than 0.1 ohms) from end to end (See Fig. 1).
- Make sure that the "hazardous warning" label is intact on the system unit power supply.
- Remove any apparent non-IBM OEM equipment from the inside of the system unit.
- Check the inside of the system unit for printed circuit cards that have become unseated (out of their sockets).
- Check the inside of the system unit for wires or cables that have become pinched, frayed or worn.

- \_\_\_ Check the inside of the system unit for loose or open connectors.
- \_\_\_ Replace the cover on the system unit, and fasten securely using the five screws which were removed earlier.
- \_\_\_ If the workstation has a printer, check the continuity of the power cord from the ground pin to the frame. The resistance should be less than 0.1 ohms.
- \_\_\_ Install the power cord(s) and plug them into the power outlets.
- \_\_\_ Power up the workstation and observe the results of the POST test on the CRT screen. (See Section 1 of the *IBM 3270 Personal Computer Guide to Operations*)

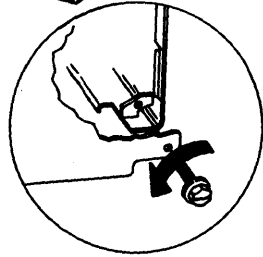
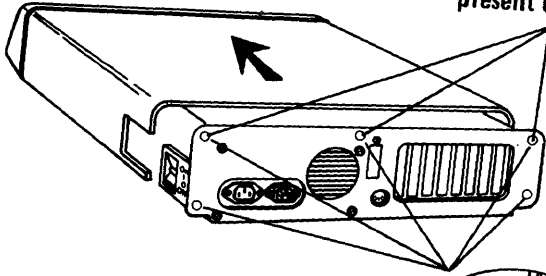
## Abbreviations

- CRT - cathode ray tube
- OEM - original equipment manufacturer
- POST - power on self test

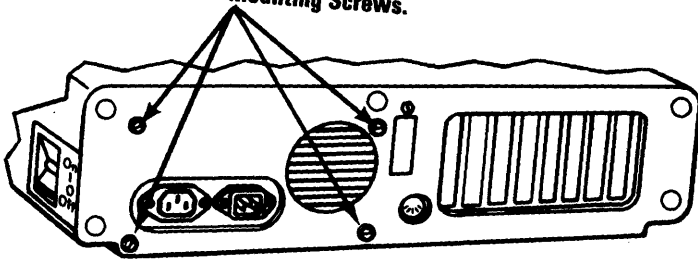


**Figure 1. System Unit Ground Check**

(These screws may not be present on your unit.)



Power Supply  
Mounting Screws.



(Rear View)

Figure 2. Power Supply Check

# Preface

The *Maintenance Information Manual* is the publication used to isolate and repair any failure of a Field Replaceable Unit (FRU).

The user should have training on the IBM 3270 Personal Computer and be familiar with the Triplet Model 310 Multimeter (or equivalent).<sup>2</sup>

This manual is organized into eight major sections:

- Section 1. Introduction
- Section 2. Introduction to Diagnostics
- Section 3. Problem Isolation Charts
- Section 4. Locations
- Section 5. Removal/Replacement and Adjustments.
- Section 6. Switch Settings
- Section 7. Parts Catalog

The “Introduction to Diagnostics” section gives an explanation of the Power-on Self Test (POST), the menus for the diagnostics, and how to load the Diagnostics diskette. If you have a failure symptom, this section will help you to choose the proper Problem Isolation Chart (PIC).

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<sup>2</sup> Manufactured by Triplet Corporation, Bluffton, Ohio  
45817

The “Problem Isolation Chart” section provides step-by-step instructions that aid in identifying the failing FRU. When the FRU has been identified, the “Removal/Replacement and Adjustments” section provides all the necessary information to complete the repair.

This manual also provides operational instructions and hardware and design information to the extent necessary to locate the failing FRU. Complete operating instructions can be found in the “*Guide to Operations.*” the manual.





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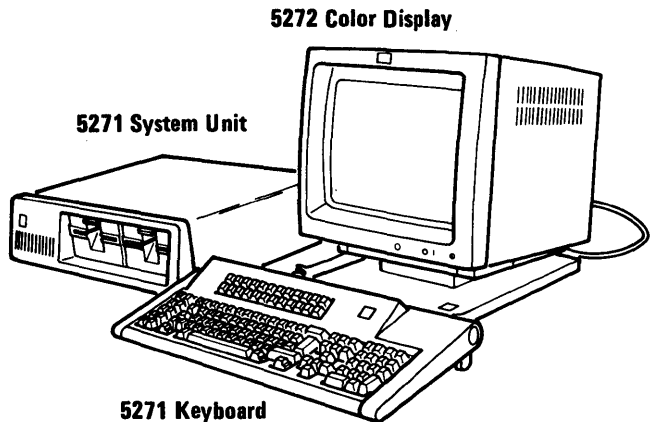


# Section 1. Introduction

The IBM 3270 Personal Computer is a powerful small computer which offers a wide variety of options to give the user the ability to tailor his system to meet his needs now, and growth potential for the future.

The system unit contains the 8088 processor, 256KB or 384KB of memory, the distributed function communications adapter, display adapter and diskette adapter. In addition, depending on the model, your system unit may contain a 10 megabyte fixed disk drive, one or two diskette drives, and a printer port.

Input to the system is via a 122-key keyboard which includes a numeric keypad and 24 program function keys. The keyboard is connected with a coiled cable which allows the keyboard to be moved to a comfortable operating position.



In addition to the base components, these are some of the options available for your IBM 3270 Personal Computer.

- IBM Monochrome Display
- IBM 3270 Personal Computer Color Display
- IBM Math Coprocessor
- Asynchronous Communications Adapter
- Alternate Asynchronous Communications Adapter
- Memory Expansion Options
- Expansion Unit
- Printer Adapter
- IBM 80 CPS Graphics Printer
- IBM Color Printer

## Section 2. Introduction to Diagnostics

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## **Notes:**

# Introduction

This section explains the three main diagnostic aids: Power-On Self-Test (POST), diagnostic tests, and Problem Isolation Charts (PICs). You do not have to read this entire section on every service call, but it will be a useful reference until you understand the use of POST, the diagnostic tests, and the PICs.

*Note:* We recommend that you do the POST and diagnostic tests each time you service the IBM 3270 Personal Computer or add an option.

## Power-On Self-Test

POST runs each time power to the system unit is switched on and takes 13 to 90 seconds, depending on the amount of memory installed. It checks the operation of the following:

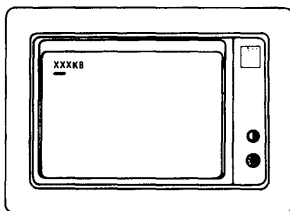
- Diskette Drive
- Display Adapter
- Distributed Function Communications Adapter
- Expansion Unit
- Fixed Disk Drive
- Keyboard and Keyboard/Timer Adapter
- Memory
- System Board

1. Set the Power switch on the expansion unit (if attached) to On.
2. If your display has a Power switch, be sure that it is set to On.
3. If your display has brightness or contrast controls, make sure they are turned fully clockwise.
4. Set the system unit Power switch to On.

5. Watch (and listen) for the following responses:
- a. While the memory in the system unit is being tested, the memory size appears in the top left corner of the screen and increases in 16K increments. The cursor blinks under the first number until all memory is tested. (Check the "Installed Devices Chart" in the *Guide to Operations* for the amount of memory installed in the system unit.)
  - b. One short "beep" sounds at the completion of POST.
  - c. The IBM Personal Computer BASIC screen will appear if a diskette is not loaded or an operating system is not automatically loaded from the fixed disk drive.

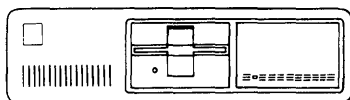
*Note:* These three responses mean POST was successful.

a.



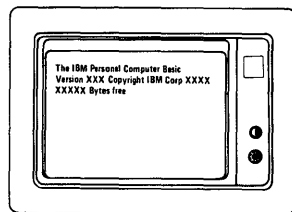
Memory Test

b.



One Short Beep

c.



IBM 3270 Personal Computer  
Basic Screen

If the system unit fails to complete POST, you could receive an incorrect audio response, a blank screen, or an error message that will remain on the screen. Make a note of any error message as soon as it appears. If multiple errors occur, troubleshoot the one that appears first.

## POST Errors

Whenever a POST failure occurs, make sure that all cables are properly connected and all switches are properly set. Section 4, "Locations," shows where the switches are, and Section 6, "Switch Settings," shows how they should be set.

Following is a list of some errors you may receive during POST. In the examples below, X can be any number.

- A blank display
- An incorrect audio response (no beep or more than one beep)
- A error message like:

```
601  
XXXXX XX201
```

or

```
1701
```

or even a combination like:

```
300000 00 201  
601
```

After an error message appears on the screen, the next line displayed is:

**"ERROR(Resume = "F1" Key)"**

If you press the PF1 key, the system unit will bypass the error and attempt to complete POST. The completion of POST may or may not be possible, depending on the error. If POST is able to finish, you may be able to load the diagnostics program. This is very important because many of the PICs specify that diagnostic testing be done.

*Note:* If you receive any error indications during or at the completion of POST, make a note of the error and then go to the "Start" page in Section 3.

# Problem Isolation Charts (PICs)

## How To Use



Always begin with "Start" on Page 3-5-1.



**START**

This is the entry point for using all of the PICs. You may have an error code, an audio error during power on self test (POST), an undetermined problem, or a problem related to one device.

"Start" will direct you to the PIC appropriate to your failure indication.



**Printer**

**System Board**

You have entered this PIC because you were unable to complete the POST or you have an intermittent problem. It is assumed that you have a functional wall outlet and line cord.

**Undetermined Problems**

You have entered this PIC because you were unable to complete the POST or you have an intermittent problem. It is assumed that you have a functional wall outlet and line cord.

Printer

Move print head to left. Power switch to ON. and Online lights on?

em unit (and expansion

These PICs will guide you through a series of steps and the use of the Diagnostics diskette to identify the failing FRU.

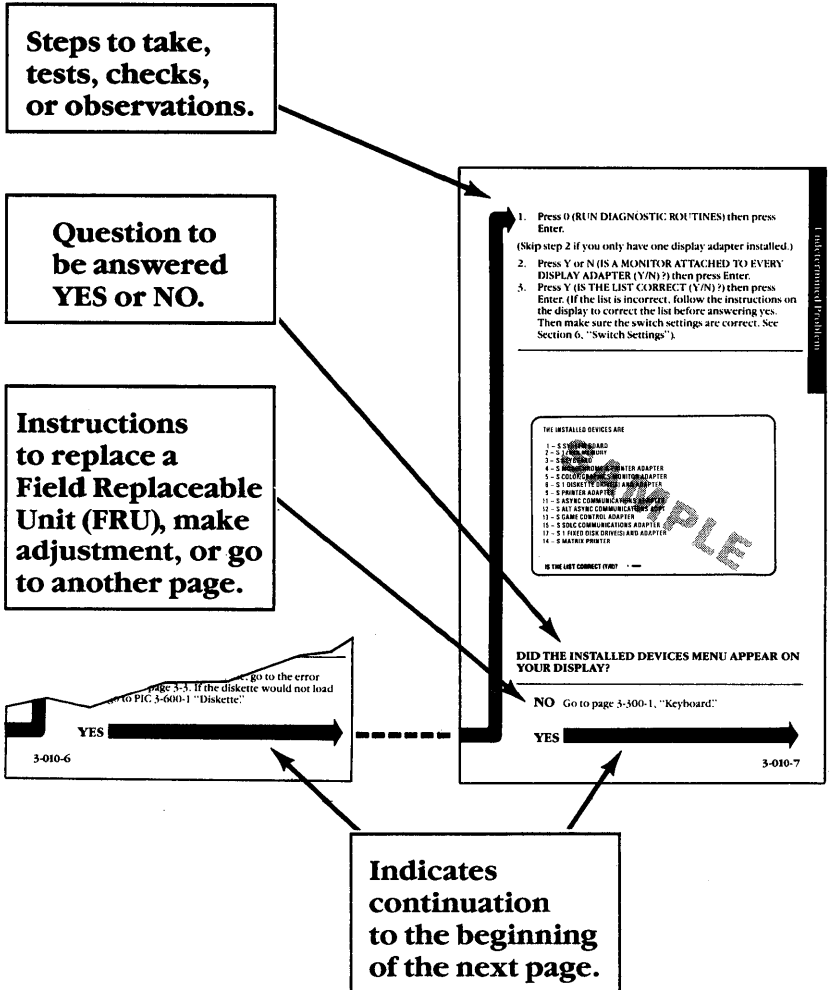


**SECTION 5. REMOVAL/  
REPLACEMENT AND  
ADJUSTMENTS**

To use this section... assembly... in the

The "Removal/Replacement and Adjustments" section will help you to complete the repair.

The example below shows a representative page from the PICs.





# Diagnostics

The Diagnostics diskette is located at the back of the *Guide to Operations* manual. We recommend that you make a copy of this diskette, and store the original.

To load the diagnostics program:

1. Insert the Diagnostics diskette into drive A and close the diskette drive door.
2. Set the Power switch on the expansion unit (if attached) to On.
3. Set the Power switch on the system unit to On.

After POST, the diagnostic program loads, and Menu 1 appears on the screen.

## Special Key Functions

The following keys have special functions for the diagnostic tests:

**Ctrl + P** Directs screen output to the printer.

**Ctrl + N** Cancels output to the printer.

# Diagnostic Menu Reference

**SELECT AN OPTION**  
0-RUN DIAGNOSTIC ROUTINES  
1-FORMAT DISKETTE  
2-COPY DISKETTE  
3-PREPARE SYSTEM FOR RELOCATION  
9-EXIT TO SYSTEM DISKETTE  
ENTER THE ACTION DESIRED  
? 0 \_

Menu 1

**NOTE:** The "S" in front of each option will be an "E" if that option is installed in the expansion unit.

THE INSTALLED DEVICES ARE

- 1 - S SYSTEM BOARD
- 2 - S XXXKB MEMORY
- 3 - S KEY BOARD/TIMER
- 6 - S FLOPPY DISKETTE DRIVE(S) & ADAPTER
- 9 - S PRINTER ADAPTER
- 11 - S ASYNC COMMUNICATIONS ADAPTER
- 12 - S ALT ASYNC COMMUNICATIONS ADPT
- 17 - S 1 FIXED DISK DRIVE(S) & ADAPTER
- 28 - S DISTRIBUTED FUNCTION COMMUNICATION
- 32 - S DISPLAY ADAPTER
- 14 - S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)?

Menu 2

**SYSTEM CHECKOUT**  
0-RUN TESTS ONE TIME  
1-RUN TESTS MULTIPLE TIMES  
2-LOG UTILITIES  
9-EXIT DIAGNOSTIC ROUTINES  
ENTER THE ACTION DESIRED  
? \_

Menu 3

- 1 - S SYSTEM BOARD
- 2 - S XXXKB MEMORY
- 3 - S KEY BOARD/TIMER
- 6 - S FLOPPY DISKETTE DRIVE(S) & ADAPTER
- 9 - S PRINTER ADAPTER
- 11 - S ASYNC COMMUNICATIONS ADAPTER
- 12 - S ALT ASYNC COMMUNICATIONS ADPT
- 17 - S 1 FIXED DISK DRIVE(S) & ADAPTER
- 28 - S DISTRIBUTED FUNCTION COMMUNICATION
- 32 - S DISPLAY ADAPTER
- 14 - S MATRIX PRINTER

ENTER THE NUMBER(S) OF OPTIONS TO TEST OR PRESS ENTER TO SELECT ALL OPTIONS  
? \_

Menu 4

**LOG UTILITIES**  
0-START ERROR LOG  
1-STOP ERROR LOG  
2-LIST LOG  
3-SET TIME OF DAY  
4-DISPLAY TIME OF DAY  
9-RETURN FROM UTILITIES  
ENTER THE ACTION DESIRED  
? \_

Menu 5

# Menu 1 (Select an Option)

<p>SELECT AN OPTION</p> <p>0 - RUN DIAGNOSTIC ROUTINES 1 - FORMAT DISKETTE 2 - COPY DISKETTE 3 - PREPARE SYSTEM FOR RELOCATION 9 - EXIT TO SYSTEM DISKETTE</p> <p>ENTER THE ACTION DESIRED</p>
--

**0 - RUN DIAGNOSTIC ROUTINES** - Starts the system checkout procedure (goes to menu 2).

**1 - FORMAT DISKETTE** - Formats a diskette for use with diagnostics only.

**2 - COPY DISKETTE** - Copies the Diagnostics diskette to another diskette.

**3 - PREPARE SYSTEM FOR RELOCATION** - Places the fixed disk drive head in the park position for moving the system.

**9 - EXIT TO SYSTEM DISKETTE** - Loads the program from the diskette in drive A.

*Note:* Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.

## Menu 2 (Installed Devices)

The path to Menu 2 is:

● Menu 1

This menu displays the options and devices that are installed in your system. The figure shown below is an example. An **S** next to the item means the adapter is installed in the system unit and an **E** means the adapter is installed in the expansion unit.

```
THE INSTALLED DEVICES ARE

1 - S SYSTEM BOARD
18 - S EXPANSION OPTION
2 - S 384KB MEMORY
3 - S KEYBOARD/TIMER
6 - S 1 DISKETTE DRIVE(S) & ADAPTER
9 - S PRINTER ADAPTER
11 - S ASYNC COMMUNICATIONS ADAPTER
12 - S ALT ASYNC COMMUNICATIONS ADAPTER
17 - E 1 FIXED DISK DRIVE(S) AND ADAPTER
28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
32 - S DISPLAY ADAPTER, APA
14 - S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)?
```

**Y** - Advances to System Checkout (Menu 3).

**N** - Allows you to add or delete items from the Installed Devices list.

*Note:* If you enter N, the installed devices list error "199" will appear on the screen. Disregard the error and continue adding or deleting the options in question.

After attempting to add or delete options, enter Y to continue with the diagnostic tests. If you cannot correct the list, you still must enter Y to continue.

# Menu 3 (System Checkout)

The path to Menu 3 is:

- Menu 1
- Menu 2

SYSTEM CHECKOUT

0 - RUN TESTS ONE TIME  
1 - RUN TESTS MULTIPLE TIMES  
2 - LOG UTILITIES  
9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED  
? \_

**0 - RUN TESTS ONE TIME** - Performs the diagnostic tests once for problem isolation (goes to Menu 4).

**1 - RUN TESTS MULTIPLE TIMES** - Performs the diagnostic tests once or several times without operator intervention. This is a system test to detect intermittent problems (goes to Menu 4).

**2 - LOG UTILITIES** - Allows you to use the error log and time-of-day functions (goes to Menu 5).

**9 - EXIT DIAGNOSTIC ROUTINES** - Returns to Menu 1.

# Menu 4 (Test Select)

The path to Menu 4 is:

- Menu 1
- Menu 2
- Menu 3

1 - S SYSTEM BOARD  
18 - S EXPANSION OPTION  
2 - S 384KB MEMORY  
3 - S KEYBOARD/TIMER  
6 - S 1 DISKETTE DRIVE(S) & ADAPTER  
9 - S PRINTER ADAPTER  
11 - S ASYNC COMMUNICATIONS ADAPTER  
12 - S ALT ASYNC COMMUNICATIONS ADAPTER  
17 - E 1 FIXED DISK DRIVE(S) AND ADAPTER  
28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
32 - S DISPLAY ADAPTER, APA  
14 - S MATRIX PRINTER

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

? \_

Select the options to be tested by typing the corresponding numbers, separated by commas or spaces, then press Enter. To select all options, press Enter.

**1 - SYSTEM BOARD** - Tests the main elements of the system board.

**18 - EXPANSION OPTION** - Tests the expansion unit, cable, extender card, and receiver card. The expansion unit is tested second because it is actually an extension of the system board bus.

**2 - XXXKB MEMORY** - Tests all random access memory and verifies correct addressing.

**3 - KEYBOARD/TIMER** - Tests all key positions, the keyboard cable, and the reset function.

**6 - X DISKETTE DRIVE(S) & ADAPTER** - Selects the Diskette Drive Adapter menu (Menu 6).

**7 - MATH COPROCESSOR** - Tests the Math Coprocessor.

**9 - PRINTER ADAPTER** - Tests the Printer Adapter with wrap plug (IBM Part 8529228).

**11 - ASYNC COMMUNICATIONS ADAPTER** - Tests the Asynchronous Communications Adapter with either the RS-232 Mode Wrap Plug (IBM Part 8529280) or the Current-Loop Mode Wrap Plug (IBM Part 6423197).

**12 - ALT ASYNC COMMUNICATIONS ADAPTER** - Tests the Alternate Asynchronous Communications Adapter with either the RS-232 Mode Wrap Plug (IBM Part 8529280) or the Current-Loop Mode Wrap Plug (IBM Part 6423197).

**17 - X FIXED DISK DRIVE(S) AND ADAPTER** - Tests the Fixed Disk Drives and Adapter (Menu 7).

**28 - DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER** - Tests the Distributed Function Communications Adapter and the connection up to the controller.

**32 - DISPLAY ADAPTER** - Tests the Display Adapter and the All Points Addressable and Programmed Symbols Adapter (if present) and supplies character and patterns to test the display.

**14 - GRAPHICS PRINTER** - Tests the printer cable and prints character sets on the IBM 5152 Graphics Printer.

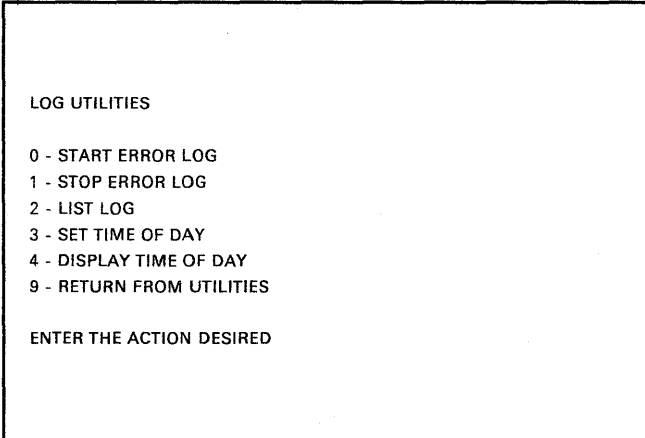
**29 - COLOR PRINTER** - Tests the printer cable and prints character sets on the IBM 5182 Color Printer.



# Menu 5 (Log Utilities)

The path to Menu 5 is:

- Menu 1
- Menu 2
- Menu 3



**0 - START ERROR LOG** - Starts a record of failures detected by diagnostic tests. You can choose to log to diskette or printer. If logging to diskette, use a copy of the Diagnostics diskette that is not write-protected.

**1 - STOP ERROR LOG** - Stops recording failures detected by diagnostic tests.

**2 - LIST LOG** - Lists, on the screen, the failures logged on diskette.

*Note:* The remaining utilities descriptions continue on the next page.

**3 - SET TIME OF DAY** - Allows you to set the current time of day, using a 24-hour clock.

**4 - DISPLAY TIME OF DAY** - If no time was set, displays elapsed time since the diagnostic program was loaded.

**9 - RETURN FROM UTILITIES** - Returns to System Checkout (Menu 3).

# Menu 6 (Diskette Drive and Adapter)

The path to Menu 6 is:

- Menu 1
- Menu 2
- Menu 3
- Menu 4

TESTING - 1 DISKETTE DRIVE & ADAPTER	
DISKETTE DIAGNOSTIC MENU	
OPTION	DRIVE
1 - SEQUENTIAL ACCESS	ONE DRIVE
2 - RANDOM SEEK	ONE DRIVE
3 - VERIFY DISKETTE	ONE DRIVE
4 - SPEED TEST	ONE DRIVE
9 - RETURN TO CONTROL PROGRAM	
FOR OPTION 9 ENTER "9" AND "ENTER"	
FOR OTHER OPTIONS (1 THRU 4)	
ENTER OPTION, DRIVE, AND "ENTER"	

**1 - SEQUENTIAL ACCESS ONE DRIVE -** Tests the basic diskette operations as well as a sequential write, read, and compare of data on all sectors of the diskette.

**2 - RANDOM SEEK ONE DRIVE -** Tests the basic diskette operations and does a series of 50 random seeks each followed by a write, read, and compare of data.

**3 - VERIFY DISKETTE ONE DRIVE -** Verifies each sector; also verifies that access to data can be gained without an error.

**4 - SPEED TEST ONE DRIVE -** Measures the time required for one revolution of the diskette. The range is from 197 to 203 milliseconds.

**9 - RETURN TO CONTROL PROGRAM -** Returns to System Checkout (Menu 3) or continues other tests.

# Menu 7 (Fixed Disk Drive and Adapter)

The path to Menu 7 is:

- Menu 1
- Menu 2
- Menu 3 (run tests once)
- Menu 4

ENTER THE ACTION DESIRED  
TESTING - 2 FIXED DISK DRIVE(S) & ADAPTER

0 - RUN FIXED DISK TEST  
1 - RUN MEASUREMENTS TEST  
2 - FORMAT FIXED DISK  
9 - EXIT FIXED DISK TESTS

ENTER THE ACTION DESIRED?

**0 - RUN FIXED DISK TEST** - Tests the fixed disk adapter and the fixed disk drive (C or D) read and write operation.

**1 - RUN MEASUREMENTS TEST** - Provides a test signal to measure voltage levels at selected test points.

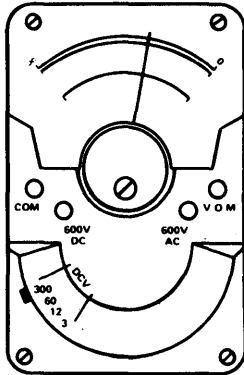
**2 - FORMAT FIXED DISK** - Formats the fixed disk drive. All data on the fixed disk drive is destroyed when this option is selected.

**9 - EXIT FIXED DISK TESTS** - Returns to System Checkout (Menu 3).

# Special Tools

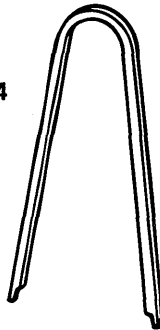
The following special tools are required to service the IBM 3270 Personal Computer.

1. A meter similar to the Triplet Model 310.<sup>1</sup>



2. A tweezer-like module puller similar to the one shown below (used to remove the memory modules).

Part Number 9900764



---

<sup>1</sup> Manufactured by Triplet Corporation, Bluffton, Ohio 45817

## **Notes:**

# Section 3. Problem Isolation Charts

Start 5	3-5-1
Power-On Self-Test 10	3-10-1
POST Error Chart 15	3-15-1
Keyboard Check 20	3-20-1
Display Check 25	3-25-1
Coprocessor Check 85	3-85-1
Diagnostic Testing 90	3-90-1
Diagnostic Error Chart 95	3-95-1
ROM Error Table	3-95-3
System Board 100	3-100-1
Memory 200	3-200-1
Keyboard/Timer 300	3-300-1
Continuity Check	3-300-15
5-1/4 Inch Diskette Drive Assembly	
600	3-600-1
Math Coprocessor	3-700-1
Printer Adapter 900	3-900-1
Asynchronous Communications	
Adapter 1100	3-1100-1
IBM 5152 Graphics Printer 1400	3-1400-1
Fixed Disk Drive 1700	3-1700-1
Expansion Unit 1800	3-1800-1
Distributed Function	
Communications Adapter 2800	3-2800-1
IBM Color Printer 2900	3-2900-1
Display Adapter 3200	3-3200-1
Undetermined Problems	3-9999-1



# Notes:

# Start 5

This is the entry point for using all of the Problem Isolation Charts (PICs). At this point, you have one or a combination of the following:

- An error code
- An audio error during the Power-On Self-Test (POST)
- An undetermined problem
- A problem related to one device

*Note:*

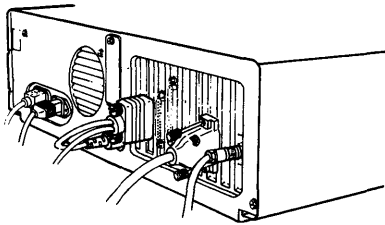
For all problems, if you are entering this procedure for the first time, begin with "Checking Cable Connections" on the following page.

If you are returning here from a PIC without solving your problem and your symptom has not changed, go to "Undetermined Problems" on page 3-9999-1.

# Checking Cable Connections

1. Before you begin, check that Power switches for all attached devices are set to Off (O).
  2. Unplug all work station devices from the power outlets and check the outlets for the correct power.
  3. Remove all non-IBM devices and modified options.
  4. Ensure that the power cords for all work station devices are securely connected **at the device end**.
  5. Verify that all connectors are installed securely in their correct locations.
  6. Replace any damaged connectors.
- 

## System Unit Cables



Keyboard Cable



Power Cord

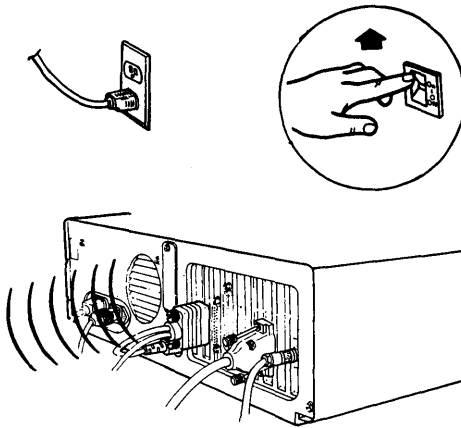


---

CONTINUE



1. Plug the power cords for all work station components into functioning, grounded power outlets.
2. If your display has an On/Off (I/O) switch, set the switch to On (I).
3. Set the Power switch for the system unit (and expansion unit, if attached) to On (I), and check to see if the power supply fan is running.



---

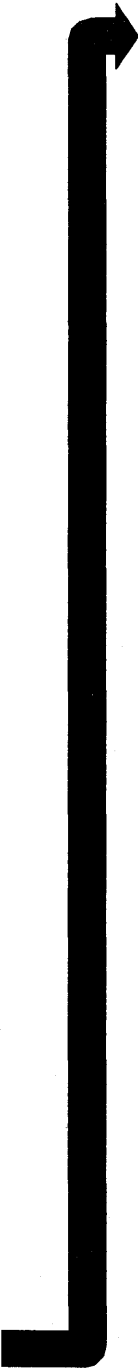
### IS THE SYSTEM UNIT POWER SUPPLY FAN RUNNING?

---

**NO** If the system unit works properly except for the fan not running, replace the power supply. See Section 5, "Removal, Replacement and Adjustments."

If the system unit does not work properly, check the system unit power cord for continuity. If the continuity is good, go to "Undetermined Problems." on page 3-9999-1.

**YES** 

- 
1. Set the Power switch for the system unit (and expansion unit, if attached) to Off (O).
  2. Set all other attached devices to Off (O).
  3. Unplug all work station unit power cords from the power outlets.
  4. Remove the system unit cover (see Section 5).
  5. Verify that all adapter cards (and top card connectors, if present) are seated properly.
  6. Determine the amount of memory installed in the system unit. Refer to the IBM 3270 Personal Computer Components Record in your *Guide to Operations*.
  7. Refer to Section 6 and verify that the switch settings on the system board and on the adapter cards are correct for the features and memory installed.
  8. Correct any switch settings that are wrong.
  9. Reinstall the system unit cover (see Section 5).
  10. Plug all work station power cords into properly grounded power outlets and proceed with "Power-On Self-Test" on the next page.
- 
- 

**CONTINUE**



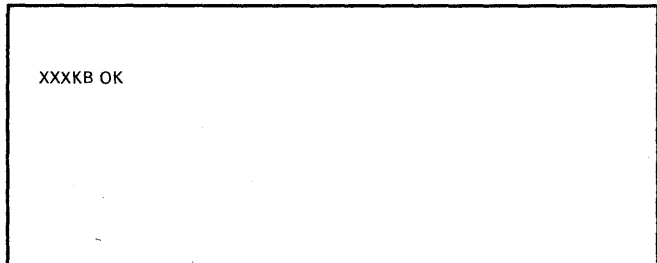
# Power-On Self-Test 10

If you are entering this procedure for the first time or are unfamiliar with the correct and incorrect Power-On Self-Test (POST) responses, read the following before continuing with "Running POST" on page 3-10-3.

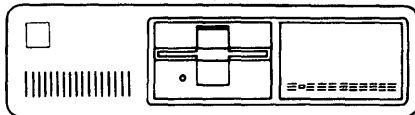
## Correct Responses

When the system unit is powered on, there are three correct responses:

**First:** A number appears in the top left corner of the screen, with the cursor under the first digit of this number. While the memory is tested, the number increases in 16K increments until it equals the amount of memory installed in your system unit.



**Second:** One short beep is heard when the test is completed successfully.



**Third:** The initial screen of your operating system appears. This screen will be the "IBM Personal Computer BASIC," if your disk drive is empty and an operating system has not been loaded from a fixed disk. (The initial screen will be different if a diskette is present or if an operating system has been loaded.)

```
The IBM Personal Computer Basic
Version X.XX Copyright IBM Corp. XXXX
XXXX Bytes Free
OK
-

1LIST 2RUN 3LOAD 4SAVE 5CONT 6LPT1 7TRON 8TROFF 9KEY 0SCREEN
```

## Incorrect Responses

When a failing system is powered on, there may be one or more of the following responses:

- A blank display
- An incorrect audio response
- An error message like:  
601  
or  
XXXXXX XX201  
(X means any number)  
or  
1701  
or even a combination like:  
601  
1701

# Running POST

1. Set the Power switch for the system unit (and expansion unit, if attached) to Off (O).
2. If your display has an On/Off (I/O) switch, make sure that it is set to On (I).
3. If your display has brightness or contrast controls, make sure that they are turned fully clockwise.
4. If you have an expansion unit attached, set the Power switch to On (I).

*Note:* If you have an expansion unit, you must turn it on before the system unit or you may receive error messages.

5. Set the Power switch for the system unit to On (I) and watch and listen for the three correct responses.

*Note:* Pressing a key during POST may be interpreted, by the test, as an error. Make sure that no keys are pressed while this test is running.

---

## **DID ALL THREE CORRECT RESPONSES OCCUR?**

---

**YES** Go to "Diagnostic Testing 90" on page 3-90-1.

**NO** Go to "POST Error Chart 15" on page 3-15-1.



## **Notes:**

# POST Error Chart 15

In the following chart, find the error that you received during POST and go to the page indicated to solve your problem.

- *If you cannot load the diagnostic for a PIC, replace the adapter associated with that PIC.*
- If your problem persists, go to page 3-9999-1.
- If you have multiple error codes, troubleshoot the error code that appears first unless instructed to do otherwise.

<b>Error Indication</b>	<b>PIC Title</b>	<b>Page</b>
No beep	Undetermined Problems	3-9999-1
Continuous beep	Undetermined Problems	3-9999-1
Repeating short beeps	Undetermined Problems	3-9999-1
Memory size <sup>1</sup> incorret or not displayed. (Not a blank screen.)	Memory	3-200-1
Monochrome or Color Display with a blank, incorrect, or unreadable screen, and any audio response.	Display Check	3-25-1
1XX	System Board	3-100-1
XXXXX XX 201	Memory	3-200-1
Any Parity Check	Memory	3-200-1
3XX or 03XX	Keyboard Check	3-20-1
601	Diskette Drive	3-600-1
18XX	Expansion Unit	3-1800-1
1701 <sup>2</sup>	Fixed Disk Drive	3-1700-1

---

<sup>1</sup> If you are uncertain of the amount of memory installed, check the IBM 3270 Personal Computer Components Record in the *Guide to Operations*.

<b>Error Indication</b>	<b>PIC Title</b>	<b>Page</b>
28XX	Distributed Function Communications Adapter	3-2800-1
32XX	Display Adapter	3-3200-1
XXXXX (ROM)	ROM Error Table	3-95-3

- 
- 2 If this adapter is installed in an expansion unit, go to page 3-1800-1 and follow directions to test the expansion unit. If a problem is found, follow the action indicated. If no problem is found, go to the PIC indicated in the chart above.

# Notes:

# Keyboard Check 20

If a 3XX or 03XX error is present, record the error message exactly as it is shown on the screen. This information is required to use the error code chart on page 3-20-5.

---

XXXXKB OK  
0303

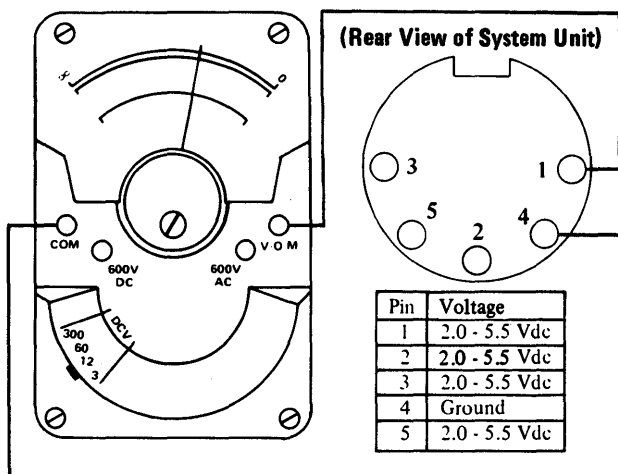
**IS A POST 0303 ERROR DISPLAYED?**

---

**YES** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments."

**NO** 

1. Set the Power switch for the system unit (and expansion unit, if attached) to Off (O).
2. Set the Power switch for the system unit (and expansion unit, if attached) to On (I).
3. Wait 90 seconds for the Power-On Self Test to complete.
4. Remove the keyboard adapter cable from the system unit.
5. Check the 5-pin keyboard connector at the system unit for the appropriate voltages, as shown below.

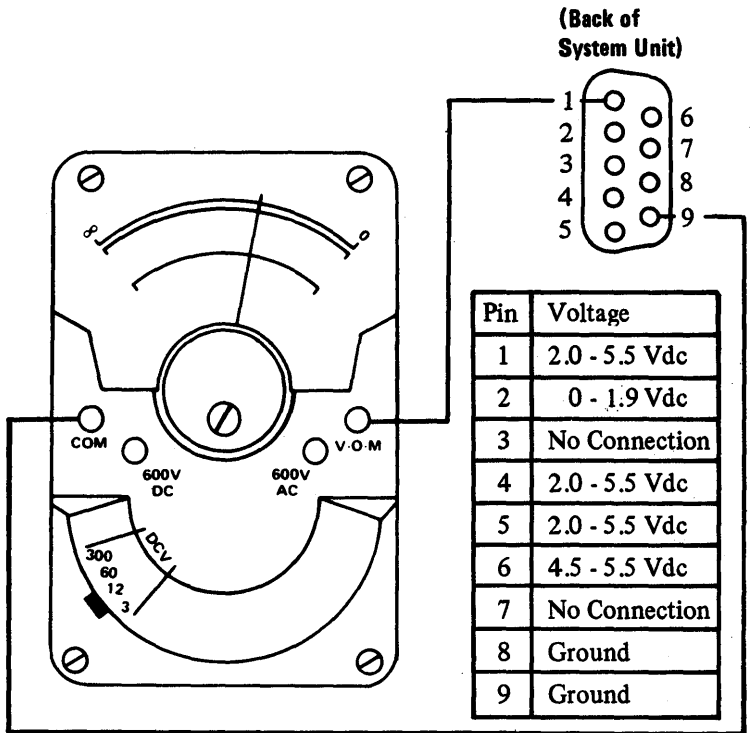


### ARE THE VOLTAGES CORRECT?

**NO** Replace the system board. See Section 5, "Removal/Replacement and Adjustments."

**YES** 

Check the 9-pin keyboard connector at the system unit for the appropriate voltages, as shown below.



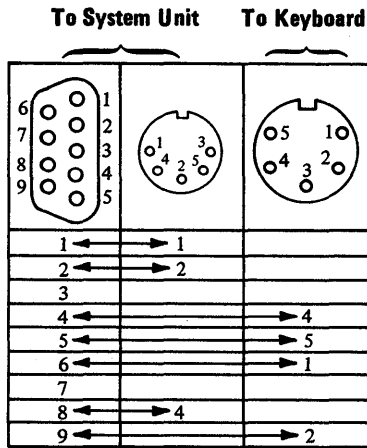
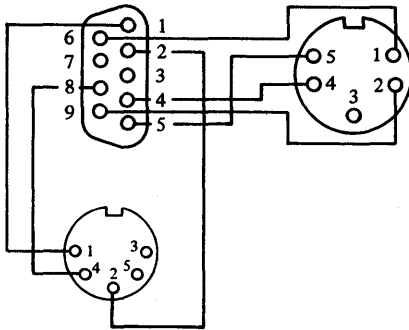
### ARE THE VOLTAGES CORRECT?

**NO** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES** 




1. Disconnect the keyboard adapter cable from the keyboard cable.
2. Check the continuity of the keyboard adapter cable.



**IS THE CONTINUITY GOOD?**

**NO** Replace the keyboard adapter cable. See Section 5, "Removal/Replacement and Adjustments."

**YES** 



Find your error code in the following chart and replace the FRU indicated (see Section 5, "Removal/Replacement and Adjustments").

If you have multiple error codes, replace the FRUs in the order that the errors appear.

<b>Error Code</b>	<b>FRU</b>
301 XXX KB OK	System Board
301 XXX KB OK 03XX	Keyboard/Timer Adapter
301 XXX KB OK 03XX 03XX	Keyboard/Timer Adapter
301 XXX KB OK 03XX 03XX 03XX	Keyboard/Timer Adapter
XXX KB OK 0301	Keyboard/Timer Adapter
XXX KB OK 0302	Keyboard
XXX KB OK 0303	Keyboard/Timer Adapter

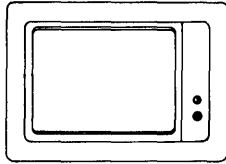
*Note:* X means any number.

# Notes:

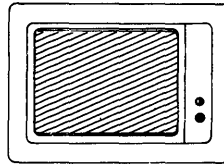
# Display Check 25

Use this procedure only if your screen is blank, unreadable, unstable, incorrect, or if it matches one of the following screens. If your display is readable, go to "Diagnostic Testing 90" on page 3-90-1.

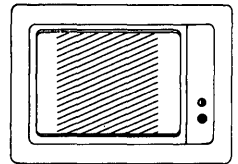
---



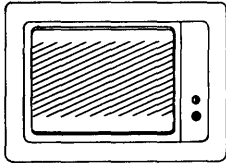
**Too Dim**



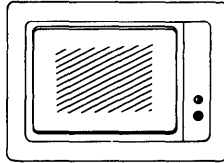
**Too Wide**



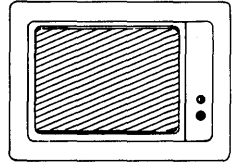
**Too Narrow**



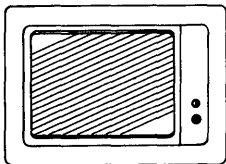
**Too Short**



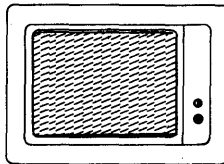
**Shrunk**



**Changes Size When  
Brightness Control  
Turned**



**Tilted**



**Out of Focus**

---

**DO YOU HAVE AN IBM COLOR DISPLAY?**

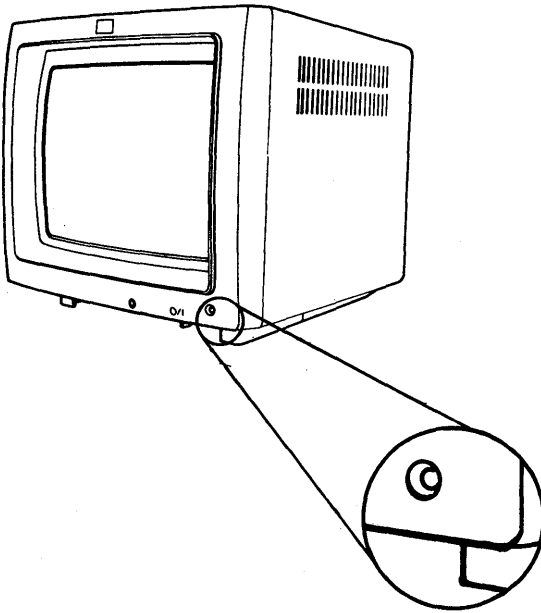
---

**NO**    Go to page 3-25-4.

**YES**    

Check the power indicator on the front of the display.

---




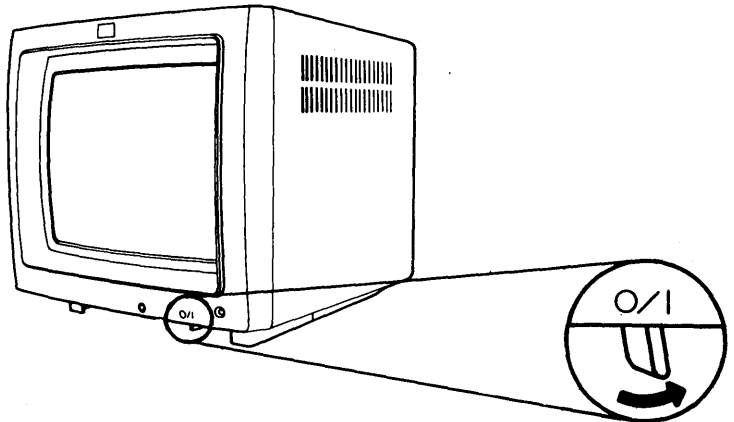
**IS THE POWER INDICATOR LIT?**

---

**YES** Go to page 3-25-6.

**NO** 

- 
1. Check the On/Off I/O switch on your display and make sure that it is set to On (I).
  2. Check the power outlet by plugging in a working lamp.
  3. Check the display power cord for continuity.
- 




**WAS THERE A PROBLEM WITH ANY OF THE ABOVE?**

---

**YES** Correct the problem.

**NO** Replace the display. See Section 5, "Removal/Replacement and Adjustments."



Check your monochrome display screen.

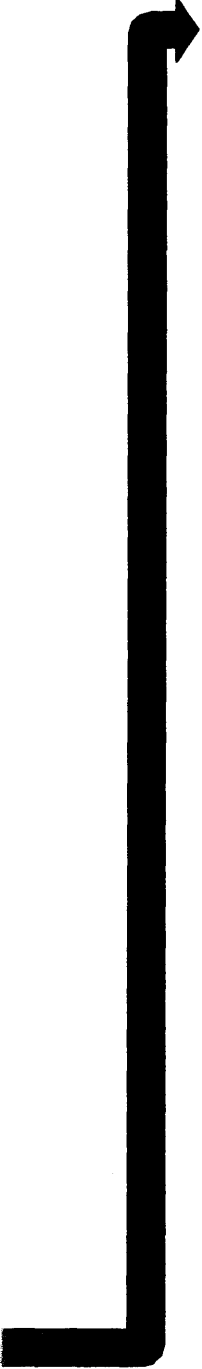
---

**IS YOUR MONOCHROME DISPLAY SCREEN  
BLANK?**

---

**NO** Go to page 3-25-6.

**YES** 

- 
1. Unplug the display power cord from the back of the system unit.
  2. Check the power plug at the system unit for power.
- 


**IS POWER PRESENT?**

---

**NO** Replace the power supply. See Section 5, "Removal/Replacement and Adjustments."

**YES** 





Check the Installed Devices Chart on the IBM 3270 Personal Computer Components Record in your *Guide to Operations* to determine if you have the programmed symbols (PS) adapter and the all points addressable (APA) adapter installed.


---

**IS THE PS ADAPTER INSTALLED?**

---

**NO**    Go to page 3-25-8.

**YES**    



Remove the PS adapter. See Section 5,  
"Removal/Replacement and Adjustments."

---

**IS THE PROBLEM STILL PRESENT?**

---

**NO**    Go to page 3-25-10.

**YES**    



Reinstall the PS adapter if it was removed.


---

**IS THE APA ADAPTER INSTALLED?**

---

**NO**    Go to page 3-25-11.

**YES** 



Remove the APA adapter. See Section 5,  
"Removal/Replacement and Adjustments."

---

**IS THE PROBLEM STILL PRESENT?**

---

**YES** Reinstall the APA adapter and go to page  
3-25-11.

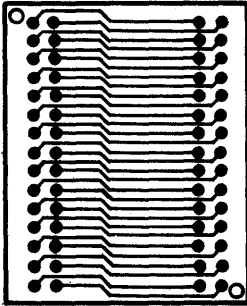
**NO** 

Check the continuity of the top card connector(s).

---



**End View**




**Bottom View**

---

### IS THE CONTINUITY GOOD?

---

- NO** Replace the top card connector. See Section 5, "Removal/Replacement and Adjustments."
- YES** Replace the appropriate (PS and/or APA) adapter card(s). See Section 5, "Removal/Replacement and Adjustments."

- 
1. Get the Diagnostics diskette from the back of this manual.
  2. Insert the Diagnostics diskette into drive A and push the load lever down.
  3. Set the Power switch for the system unit (and expansion unit, if attached) to Off (O) and wait five seconds.
  4. If you have an expansion unit, set its Power switch to On (I).
  5. Set the Power switch for the system unit to On (I).
- 

**DID YOU GET A LONG PAUSE AND ONLY ONE BEEP?**

---

**YES** Go to "Coprocessor Check 85" on page 3-85-1.

**NO** 



Recall your POST response.

---

**DID YOU GET ONE LONG AND TWO SHORT BEEPS?**


*Note:* You may hear other beeps after those described above. If so, answer this question **YES**.

---

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

If the problem persists after replacing the display adapter, replace the keyboard/timer adapter.

**NO** 



Perform the following steps in the sequence listed and listen for the beep each time you press Enter:

1. Press 0, then Enter. One beep should be heard after approximately 30 seconds.
  2. Press Y, then Enter. One beep should be heard after approximately one second.
  3. Press 0, then Enter. One beep should be heard after approximately one second.
  4. Press 3, then 2, then Enter. One beep should be heard after approximately 60 seconds.
- 

**DID YOU COMPLETE THE PREVIOUS  
STEPS AND GET THE CORRECT AUDIO  
RESPONSES?**

---

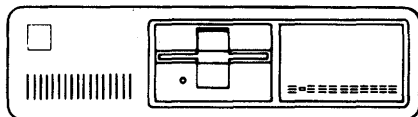
**YES** Go to page 3-25-15.

**NO** 



You did not get the correct audio responses.

---



### DID YOU GET ANY AUDIO RESPONSE?

---

- NO** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments."
- YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

Recall your original POST symptom.

---


**WAS YOUR ORIGINAL POST SYMPTOM A  
BLANK SCREEN?**

---

**NO**    Go to page 3-25-17.

**YES**





Your original POST symptom was a blank screen.

---

**IS YOUR SCREEN STILL BLANK?**

---

**NO** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES** Go to page 3-25-18.

Carefully examine your screen now.

---

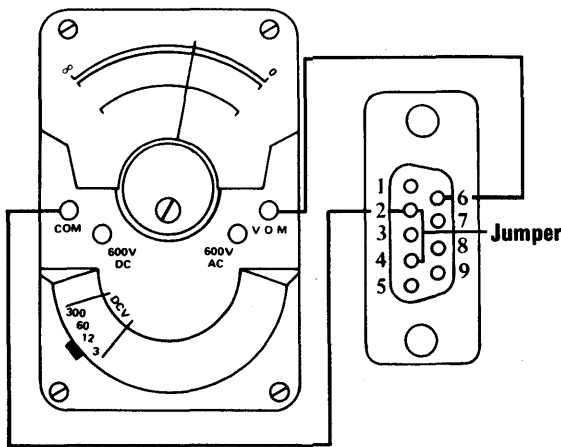
**DOES YOUR SCREEN CONTAIN  
UNREADABLE OR INCORRECT  
CHARACTERS?**

---


**YES** Replace the display adapter. See Section  
5, "Removal/Replacement and  
Adjustments."

**NO** 

1. Press Y, then Enter. You should hear one short beep.
2. Again press Y, then Enter. You should hear one short beep.
3. Remove the display signal cable from the system unit.
4. Place a jumper between pin 2 and pin 4 of the display signal cable connector on the system unit.



CONTINUE



Measure the voltage between pin 2 and the pins listed in the following chart.

---

Pin	Name	Voltage
5*	Green	1.2 to 2.4 Vdc
6	Blue/Intensity	1.2 to 2.4 Vdc
7	Red/Video	1.2 to 2.4 Vdc
8	Horizontal Sync	2.3 to 5.0 Vdc
9	Vertical Sync	2.3 to 5.0 Vdc

\*Pin 5 is for the color display only.

### ARE THE VOLTAGES CORRECT?

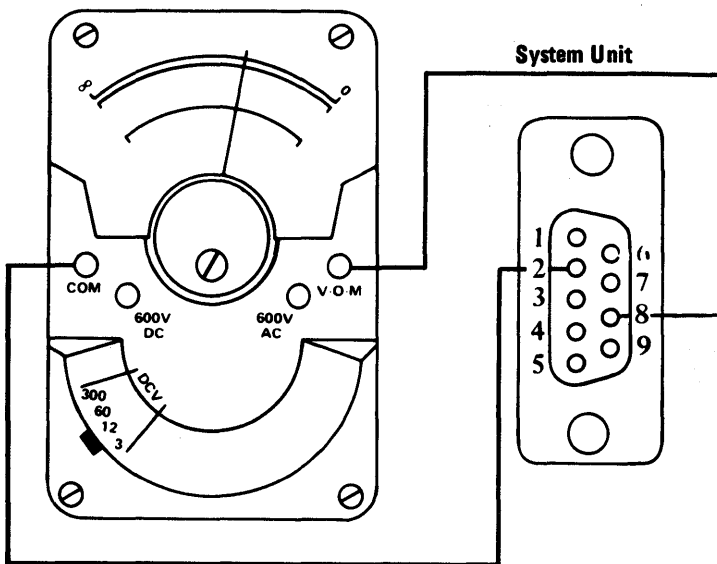
---

**NO**    Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**    

1. Remove the jumper that is between pin 2 and pin 4 of the display signal connector.
2. Measure the voltage between pin 2 and pin 8. The correct voltage is shown below.

Pin	Name	Voltage
8	Horizontal Sync	0.0 to 1.2 Vdc



### IS THE VOLTAGE CORRECT?

- YES** Replace the display unit. See Section 5, "Removal/Replacement and Adjustments."
- NO** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

# Coprocessor Check 85

If you have a coprocessor installed, it may be faulty.

---


**IS AN IBM MATH COPROCESSOR  
INSTALLED IN YOUR SYSTEM UNIT?**

---

**NO** Go to page 3-600-1.

**YES** 



- 
1. Set the Power switch for the system unit to Off (O).
  2. Remove the math coprocessor from the system unit. See Section 5, "Removal/Replacement and Adjustments."
  3. Set the Power switch for the system unit to On (I).
- 

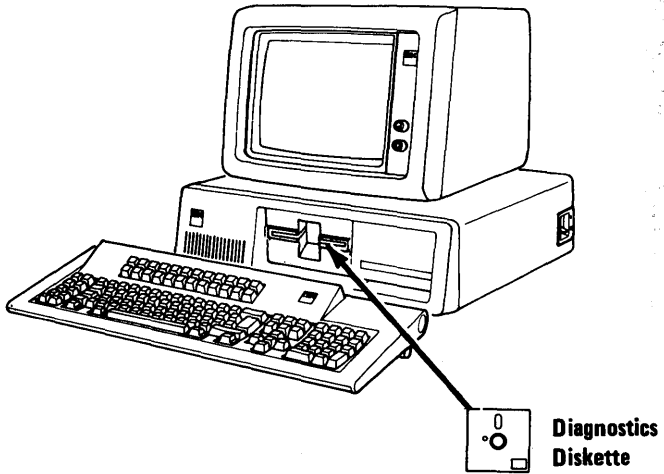
#### **DID THE SYMPTOM REMAIN?**

---

- NO** Replace the IBM Math Coprocessor and the 8088 Processor. See Section 5, "Removal/Replacement and Adjustments."
- YES** Reinstall the math coprocessor; if you need help, see Section 5. Set system board switch number 6 to Off. See Section 6, "Switch Setting." Then go to page 3-600-1.


# Diagnostic Testing 90

1. Insert the Diagnostics diskette into drive A and push the load lever down.
  2. Set the Power switches for all devices (printer, expansion unit, display, etc.) to On (I).
  3. Set the Power switch for the system unit to Off (O) for five seconds.
  4. Set the Power switch for the system unit to On (I).
- 



---

**CONTINUE** 



Your diagnostics should be loaded and the following menu should appear.

---

The IBM 3270 Personal Computer  
DIAGNOSTICS  
Version X.XX (C) Copyright IBM Corp XXXX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES
- 2 - FORMAT DISKETTE
- 3 - PREPARE SYSTEM FOR RELOCATION
- 9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED

?\_


---

**DID THE ABOVE MENU APPEAR ON YOUR SCREEN?**

---

**NO** If you received an error indication, go to "POST Error Chart 15" on page 3-15-1. If you did not receive an error, go to "Coprocessor Check 85" on page 3-85-1.

**YES** 



Your display may function properly except for the cursor, which may be missing or out of its normal position. Check your screen for the cursor.

---

The IBM 3270 Personal Computer  
DIAGNOSTICS  
Version X.XX (C) Copyright IBM Corp XXXX, XXXX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES
- 2 - FORMAT DISKETTE
- 3 - PREPARE SYSTEM FOR RELOCATION
- 9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED

?\_

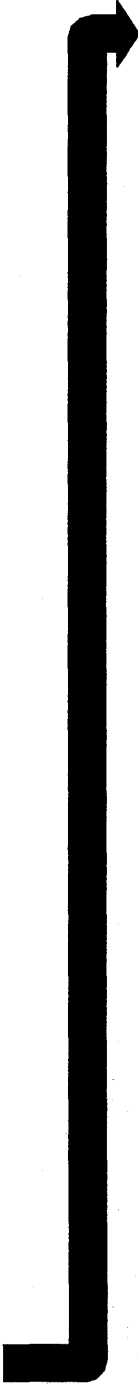
---

**IS THE CURSOR IN THE CORRECT LOCATION ON THE SCREEN?**

---

**NO**    Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**    



Press 0 (RUN DIAGNOSTIC ROUTINES), then Enter. After 30 seconds, a menu similar to the one below will appear. The exact menu that appears depends upon the options that are installed.

---

THE INSTALLED DEVICES ARE

- 1 - S SYSTEM BOARD
- 18 - S EXPANSION OPTION
- 2 - S 384KB MEMORY
- 3 - S KEYBOARD/TIMER
- 6 - S 1 DISKETTE DRIVE AND ADAPTER
- 9 - S PRINTER ADAPTER
- 11 - E ASYNC COMMUNICATIONS ADAPTER
- 28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
- 32 - S DISPLAY ADAPTER
- 14 - S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)? \_

*SAMPLE*


**DID THE INSTALLED DEVICES MENU  
APPEAR ON YOUR DISPLAY?**

*Note:* Do not verify that the screen is correct at this time.

---

**YES** Go to page 3-90-6.

**NO** 



You pressed 0, but the menu did not appear.  
Press the other numeric keys at the top of the  
keyboard.

---

**ARE ANY OF THE NUMERIC KEYS AT THE  
TOP OF THE KEYBOARD FUNCTIONING?**

---

- YES** Replace the keyboard. See Section 5,  
"Removal/Replacement and Adjustments."
- NO** Replace the keyboard/timer adapter. See  
Section 5, "Removal/Replacement and  
Adjustments."

Compare the Installed Devices Menu on your screen with the Installed Devices Chart on the 3270 Personal Computer Components Record in your *Guide to Operations*.

**Chart**

**IBM** IBM 3270 Personal Computer Components Record

Installed Devices Chart Serial Number \_\_\_\_\_

Model 2

SYSTEM BOARD  
 KB MEMORY  
 KEYBOARD/TIMER  
 1 DISKETTE DRIVE(S) & ADAPTER  
 PRINTER ADAPTER  
 ASYNC COMMUNICATIONS ADAPTER  
 1 FIXED DISK DRIVE(S) & ADAPTER  
 DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
 DISPLAY  PS  APA  
 MATRIX PRINTER

---

Model 4

SYSTEM BOARD  
 KB MEMORY  
 KEYBOARD/TIMER  
 2 DISKETTE DRIVE(S) & ADAPTER  
 PRINTER ADAPTER  
 ASYNC COMMUNICATIONS ADAPTER  
 1 FIXED DISK DRIVE(S) & ADAPTER  
 DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
 DISPLAY  PS  APA  
 MATRIX PRINTER

---

Model 6

SYSTEM BOARD  
 KB MEMORY  
 KEYBOARD/TIMER  
 1 DISKETTE DRIVE(S) & ADAPTER  
 PRINTER ADAPTER  
 ASYNC COMMUNICATIONS ADAPTER  
 1 FIXED DISK DRIVE(S) & ADAPTER  
 DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
 DISPLAY  PS  APA  
 MATRIX PRINTER

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**Menu**

THE INSTALLED DEVICES ARE

1-S SYSTEM BOARD  
 2-S 320KB MEMORY  
 3-S KEYBOARD/TIMER  
 6-S 2 DISKETTE DRIVE(S) AND ADAPTER  
 9-S PRINTER ADAPTER  
 11-S ASYNC COMMUNICATIONS ADAPTER  
 28-S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
 32-S DISPLAY,PS,APA  
 14-S MATRIX PRINTER


IS THE LIST CORRECT (Y/N)?...

**IS THE MENU CORRECT?**

**YES** Go to page 3-90-18.

**NO**





The Installed Devices Chart and the menu do not agree. Examine item 32 (DISPLAY ADAPTER) on your screen.

- If you have only the display adapter installed, item 32 should look like this:

32 - S DISPLAY ADAPTER

- If you have the display adapter and the programmed symbols (PS) adapter installed, item 32 should look like this:

32 - S DISPLAY ADAPTER, PS

- If you have the display adapter and the all point addressable (APA) adapter installed, item 32 should look like this:

32 - S DISPLAY ADAPTER, APA


- If you have all three adapters installed, item 32 should look like this:

32 - S DISPLAY ADAPTER, PS, APA

---

CONTINUE 





**Make sure item 32 is correct for your work station.**

---

**IS ITEM 32 OF THE MENU CORRECT?**

---

**YES** If you haven't already done so, make sure all your switch settings as correct. Then go to page 3-90-12.

**NO** 

You have compared Item 32 of the menu with the Installed Devices Chart.

### Chart

**IBM** IBM 3270 Personal Computer  
Components Record

Installed Devices Chart Serial Number \_\_\_\_\_

Model 2

<input checked="" type="checkbox"/>	SYSTEM BOARD
<input type="checkbox"/>	KB MEMORY
<input type="checkbox"/>	KEYBOARD/TIMER
<input checked="" type="checkbox"/>	1 DISKETTE DRIVE(S) & ADAPTER
<input type="checkbox"/>	PRINTER ADAPTER
<input type="checkbox"/>	ASYNC COMMUNICATIONS ADAPTER
<input type="checkbox"/>	1 FIXED DISK DRIVE(S) & ADAPTER
<input type="checkbox"/>	DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
<input checked="" type="checkbox"/>	DISPLAY <input type="checkbox"/> PS <input type="checkbox"/> APA
<input type="checkbox"/>	MATRIX PRINTER

---

Model 4

<input checked="" type="checkbox"/>	SYSTEM BOARD
<input type="checkbox"/>	KB MEMORY
<input checked="" type="checkbox"/>	KEYBOARD/TIMER
<input checked="" type="checkbox"/>	2 DISKETTE DRIVE(S) & ADAPTER
<input type="checkbox"/>	PRINTER ADAPTER
<input type="checkbox"/>	ASYNC COMMUNICATIONS ADAPTER
<input type="checkbox"/>	1 FIXED DISK DRIVE(S) & ADAPTER
<input type="checkbox"/>	DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
<input checked="" type="checkbox"/>	DISPLAY <input type="checkbox"/> PS <input type="checkbox"/> APA
<input type="checkbox"/>	MATRIX PRINTER

---

Model 6

<input checked="" type="checkbox"/>	SYSTEM BOARD
<input type="checkbox"/>	KB MEMORY
<input type="checkbox"/>	KEYBOARD/TIMER
<input checked="" type="checkbox"/>	1 DISKETTE DRIVE(S) & ADAPTER
<input type="checkbox"/>	PRINTER ADAPTER
<input type="checkbox"/>	ASYNC COMMUNICATIONS ADAPTER
<input checked="" type="checkbox"/>	1 FIXED DISK DRIVE(S) & ADAPTER
<input type="checkbox"/>	DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
<input checked="" type="checkbox"/>	DISPLAY <input type="checkbox"/> PS <input type="checkbox"/> APA
<input type="checkbox"/>	MATRIX PRINTER

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### Menu

#### THE INSTALLED DEVICES ARE

- 1-S SYSTEM BOARD
- 2-S 320KB MEMORY
- 3-S KEYBOARD/TIMER
- 6-S 2 DISKETTE DRIVE(S) AND ADAPTER
- 9-S PRINTER ADAPTER
- 11-S ASYNC COMMUNICATIONS ADAPTER
- 28-S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
- 32-S DISPLAY,PS,APA
- 14-S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)?...

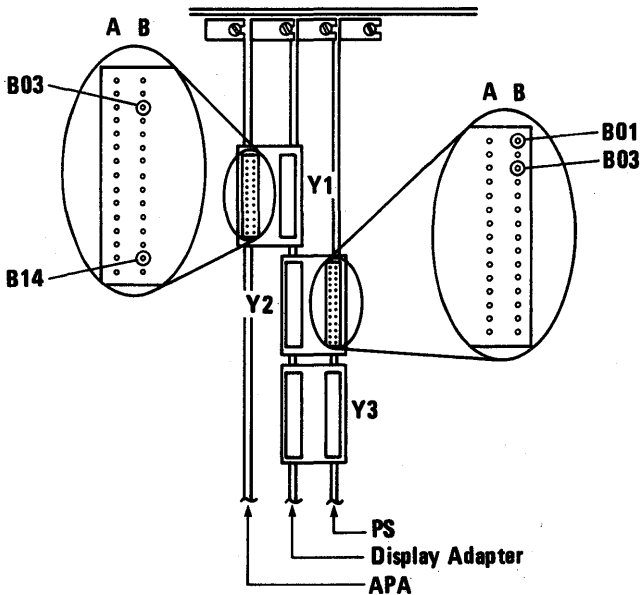
**DOES THE MENU LIST A PS AND/OR AN APA ADAPTER THAT IS NOT INSTALLED IN THE SYSTEM UNIT?**

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**NO**

The PS and/or the APA adapter is installed in the system unit, but is not listed in the menu.

1. Set the Power switch on the system unit to Off (O).
2. Remove the system unit cover. (See Section 5).
3. Check the continuity between the pins shown below at the appropriate (PS and/or APA) adapter-card side of the top card connector to ground.



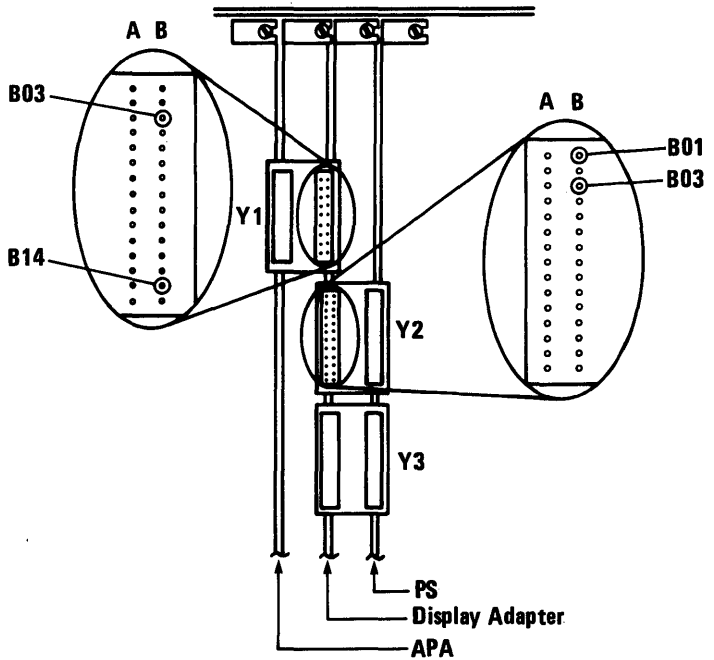
**IS THE CONTINUITY GOOD?**

**NO** Replace the appropriate adapter card. See Section 5, "Removal/Replacement and Adjustments."

**YES** 

Check the continuity between the pins shown below at the *display-adapter* side of the top card connector to ground for the appropriate (PS and/or APA) adapter.

---



---

### IS THE CONTINUITY GOOD?

---

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**NO** Replace the top card connector.

Check your screen for devices missing from your menu.


---

**ARE THERE DEVICES MISSING FROM THE MENU?**

---

**NO**    Go to page 3-90-16.


**YES**    

- 
1. Press N, then Enter and an error message will appear.
  2. Press A, then Enter to add items to the list.
- 

---

**CONTINUE**





Check the list for the missing item or items.

- The “29 - COLOR/GRAPHICS PRINTER” on the list refers to the IBM 5182 Color Printer only. If you have any other color printer attached, follow the NO path below and go to the next page.
- If an item that is installed in the expansion unit is missing from the list, go to 3-1800-1 and run the expansion unit test first.

---

2 - S CORRECT MEMORY SIZE  
18 - S EXPANSION OPTION  
7 - S MATH COPROCESSOR  
11 - S ASYNC COMMUNICATIONS ADAPTER  
12 - S ALT ASYNC COMMUNICATIONS ADAPTER  
13 - S GAME ADAPTER  
15 - S SDLC ADAPTER  
20 - S BSC ADAPTER  
21 - S ALT BSC ADAPTER  
29 - S COLOR/GRAPHICS PRINTER

ENTER THE ITEMS TO ADD


SAMPLE

**ARE THE ITEMS YOU WANT TO ADD LISTED ON THE SCREEN?**

---

**YES** Enter the number of the item you want to add. If you are adding more than one item, separate your entries with a comma. Then go to page 3-90-18.

**NO** 



The Diagnostic diskette does not contain a diagnostic procedure for your option or device.

If you entered problem determination because of a problem with a different device, go to page 3-90-18.

If you entered problem determination because of you suspect a problem with the missing option or device, do the following:

1. Check power sources, power switches and cable connections if your option has them.
  2. If there are separate problem determination procedures for your option or device, go to those procedures to locate the problem.
  3. If separate diagnostic procedures do not exist or they fail to isolate the problem, disconnect the option and go to 3-90-1 and rerun these procedures.
- 

---

If you fail to isolate the problem after rerunning these procedures, have the option or device serviced.



You have an option listed that is not installed.


1. Press N, then Enter and an error message will appear.
2. Press D, then Enter to delete an option from the list.

---

1 - S SYSTEM BOARD  
2 - S 384KB MEMORY  
18 - S EXPANSION OPTION  
3 - S KEYBOARD/TIMER  
6 - S 1 DISKETTE DRIVE(S) AND ADAPTER  
9 - S PRINTER ADAPTER  
13 - S GAME ADAPTER  
17 - S 1 FIXED DISK DRIVE(S) AND ADAPTER  
28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
32 - S DISPLAY ADAPTER

---


**CONTINUE** 

- 
1. Type the number of the item(s) you want to delete then press Enter.
  2. When the installed devices menu is listed again, if it is still wrong, follow the screen instructions to add or delete items until the list is correct.
  3. When the screen is correct, continue with the next page.
- 

---

**CONTINUE**





Press Y then Enter.

The System Checkout Menu should appear:

---

SYSTEM CHECKOUT

- 0 - RUN TESTS ONE TIME
- 1 - RUN TESTS MULTIPLE TIMES
- 2 - LOG UTILITIES
- 9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED


? \_

**DO YOU NEED AN EXPLANATION OF THIS MENU?**

---

**NO** Choose the type of test you want to perform, and go to page 3-90-20.

**YES** 



0 - RUN TESTS ONE TIME - Runs a functional test of the installed devices.

1 - RUN TESTS MULTIPLE TIMES - Repeats the functional test as many times as you choose. This does not run manual intervention portions of the diagnostic, so some problems may be missed if this is selected.

2 - LOG UTILITIES - Allows the user to choose one of the following from the utilities program:

START AND STOP ERROR LOG - Allows the user to log the errors that the diagnostics find. (Errors can then be printed or written to a diskette.)

SET TIME OF DAY - Allows the user to set the time of day.


DISPLAY TIME OF DAY - Allows the user to display the time of day.

The machine has a clock function that updates the time and displays it on request. When the system is powered off, the clock stops. When the system is powered on, and each time POST is run, the clock restarts at 0.

RETURN FROM UTILITIES - Allows the user to exit the utilities program and return to the System Checkout Menu.

9 - EXIT DIAGNOSTIC ROUTINES - Allows the user to return to the first diagnostic menu.

You are now ready to choose a test from the System Checkout Menu. Go to the next page.

- 
1. Press 0 or 1 to choose the test you want, and then press Enter. A menu similar to the one below will appear on your screen.
  2. Follow the instructions on the screen to select the device(s) you want to test, or press Enter to test all installed devices.

*Note:* Depending on where your option is located, you should run the system board or expansion board tests in addition to the other item(s) you select to test.

---

1 - S SYSTEM BOARD  
2 - S 384KB MEMORY  
3 - S KEYBOARD/TIMER  
6 - S 1 DISKETTE DRIVE AND ADAPTER  
9 - S PRINTER ADAPTER  
28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
32 - S DISPLAY  
14 - S MATRIX PRINTER

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
? \_

### **DID YOU SELECT A SINGLE DEVICE TO TEST?**

---

**YES** Go to the appropriate PIC for the device you are testing.

**NO** You are testing more than one device. If you receive an error message, refer to the PIC corresponding to the error message. If you do not receive an error message, you may have an intermittent problem. Start an error log (see Section 2 for details) and rerun the diagnostics to try to find an error symptom. Then go to the Diagnostic Error Chart on page 3-95-1.

# Diagnostic Error Chart 95

Find your error code in the left column of the chart and then go to the corresponding PIC. If the last two digits of a code are zeros, the device tested successfully.

Note that in the chart below X means any number.

<b>Error Code</b>	<b>PIC Title</b>	<b>Page</b>
	Undetermined Problems	3-9999-1
1XX	System Board	3-100-1
20X or XXXXX XX20X	Memory	3-100-1
3XX	Keyboard/Timer Adapter	3-300-1
6XX	Diskette Drive	3-600-1
7XX	Math Coprocessor	3-700-1
9XX <sup>3</sup>	Printer Adapter	3-900-1
11XX <sup>3</sup>	Asynchronous Comm.	3-1100-1
12XX <sup>3</sup>	Alt. Asynchronous Comm.	3-1200-1
14XX	Printer	3-1400-1
17XX <sup>3</sup>	Fixed Disk Drive	3-1700-1
18XX	Expansion Option	3-1800-1

<b>Error Code</b>	<b>PIC Title</b>	<b>Page</b>
29XX <sup>4</sup>	Color Printer	See footnote
28XX or ERROR-NOT CONNECTED TO CONTROL UNIT	Distributed Function Comm. Adapter	3-2800-1
32XX	Display	3-3200-1
XXXXX (ROM)	ROM Error Table	"ROM Error Table" on page 3-95-3

- 
- <sup>3</sup> If this adapter is installed in an expansion unit, go to page 3-1800-1 and follow directions to test the expansion unit. If a problem is found, follow the action indicated. If no problem is found, go to the PIC indicated in the chart above.
- <sup>4</sup> If you want detailed problem determination information for the IBM 5182 Color Printer (the 5182 is a dot matrix color printer), see the *IBM Personal Computer Hardware Maintenance and Service for the Color Printer* part number 1502383.

# ROM Error Table

<b>Error Code</b>	<b>Action</b>
C0000	Replace the Keyboard/Timer Adapter
CA000	Replace the Keyboard/Timer Adapter
C8000	Replace the Fixed Disk Adapter
F0000 F1000 F2000 F3000 F4000 F5000 F6000 F7000 F8000 F9000 FA000 FB000 FC000	Replace the System Board.





# System Board 100

You have entered this PIC because your system was unable to complete POST, or you have an error message that indicates a system board failure.


1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Insert the Diagnostics diskette in drive A.
  3. Set the Power switch on the expansion unit (if attached) and the system unit to On.
- 

**DID THE POST FINISH WITHOUT A 1XX  
ERROR MESSAGE?**

---

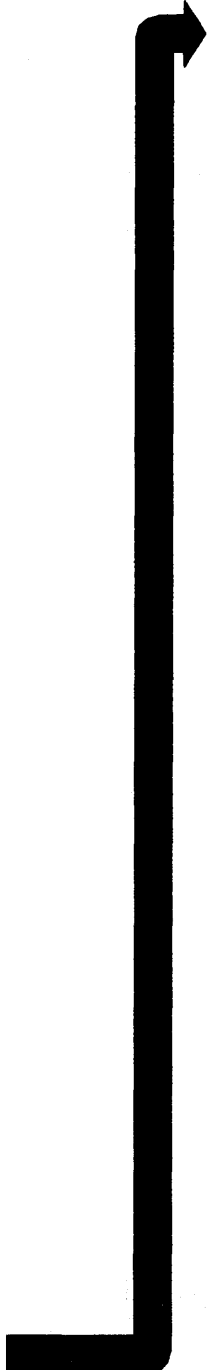
**NO**    Replace the system board (see Section 5, "Removal/Replacement and Adjustments").

**YES**    

- 
1. Press 0 (RUN DIAGNOSTIC ROUTINES) then press Enter.
  2. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?) then press Enter. (If the list is incorrect, follow the instructions on the screen to correct the list before answering yes.)
- 

---

CONTINUE 

- 
1. Press 0 (RUN TESTS ONE TIME) then press Enter.
  2. Press 1 (SYSTEM BOARD) then press Enter.
- 

TESTING - SYSTEM BOARD

SYSTEM BOARD 100 S

---


**DID THE TEST FINISH WITHOUT A 1XX  
ERROR MESSAGE?**

---

**NO** Replace your system board (see Section 5, "Removal/Replacement and Adjustments").

*Note:* A 199 error message indicates you answered "No" to the question about the installed devices list. Do not replace the system board. Refer to 3-9999-1, "Undetermined Problem PIC," and verify the installed devices.

**YES** 



You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "LOG UTILITIES" in the System Checkout menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

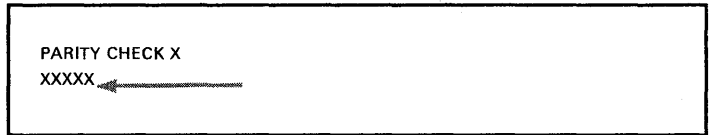
---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

# Memory 200

You have entered this PIC because you were unable to complete POST correctly, the memory size message was incorrect, there was a memory parity check, or you have an error message indicating a memory failure.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Insert the Diagnostics diskette in drive A.
3. If you have an expansion unit, set the Power switch to On.
4. Set the Power switch on the system unit to On and if it appears, watch to see that the final memory size displayed matches the amount installed in the system unit.
5. You may receive a parity check similar to the example shown below. If you do, write down the five character error code (indicated by the arrow in the example below).




**DID YOU COMPLETE POST WITH AN ERROR MESSAGE SIMILAR TO THE EXAMPLE ABOVE?**

---

**YES** Go to page 3-200-38

**NO** 



You may receive an error code similar to the example shown below. If you do, write down the 7 character error code (indicated by the arrow in the example below.)

---

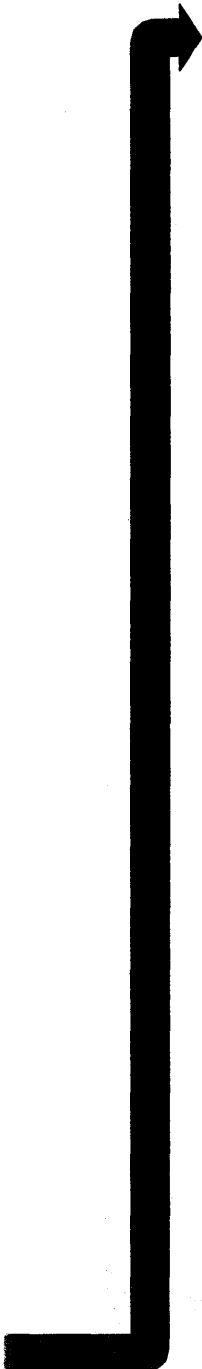
XXXXB OK  
XXXXX XX 201 ←  
XXXX  
ERROR-(RESUME="F1" KEY)

**DID YOU COMPLETE POST WITH AN  
ERROR MESSAGE SIMILAR TO THE  
EXAMPLE ABOVE?**

---

**YES** Press the PF1 Key and continue on the next page.

**NO** 



Your diagnostics diskette should be loaded and the first menu displayed.

---

The IBM 3270 Personal Computer  
DIAGNOSTICS  
Version X.XX (C) Copyright IBM Corp XXXX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES
- 1 - FORMAT DISKETTE
- 2 - COPY DISKETTE
- 3 - PREPARE SYSTEM FOR RELOCATION
- 9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED

?\_


**DID THE SCREEN SHOWN ABOVE  
APPEAR?**

---

**NO**    Go to page 3-600-1

**YES**    



- 
1. Press 0 (RUN DIAGNOSTIC ROUTINES) then press Enter.
  2. The installed devices list should be displayed. Compare amount of memory listed on your screen with the amount installed in your system.

---

THE INSTALLED DEVICES ARE

- 1 - S SYSTEM BOARD
- 2 - S 384KB MEMORY ←
- 3 - S KEYBOARD/TIMER
- 6 - S 1 DISKETTE DRIVE(S) AND ADAPTER
- 9 - S PRINTER ADAPTER
- 11 - S ASYNC COMMUNICATIONS ADAPTER
- 17 - S 1 FIXED DISK DRIVE(S) & ADAPTER
- 28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
- 32 - S DISPLAY
- 14 - S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)?\_

SAMPLE


---

**DOES THE AMOUNT OF MEMORY LISTED  
MATCH THE AMOUNT OF MEMORY IN  
YOUR SYSTEM?**

---

**NO**    Go to page 3-200-27

**YES**    

- 
1. Press Y (IS THE LIST CORRECT) then press Enter.
  2. Press 0 (RUN TEST ONE TIME) then press Enter.
  3. Press 2 (XXXXKB MEMORY) then press Enter.

You may receive an error message similar to the example below. If you do, write down the seven character error code (indicated by the arrow in the example below.)

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S  
FAILING ADDRESS - SPACE/MODULE XXXXX XX ←


PRESS ENTER TO CONTINUE  
?\_

**DID YOU RECEIVE AN ERROR MESSAGE  
SIMILAR TO THE EXAMPLE ABOVE?**

---

**NO**    Go to page 3-200-57

**YES**    



The failure in the memory will cause a seven character error code similar to the one shown below.

If the first character of the seven character code is 0, 1, 2, or 3, the failure is on the system board.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S     ↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX


PRESS ENTER TO CONTINUE  
?\_

**WAS THE 1ST CHARACTER OF THE SEVEN CHARACTER CODE 0, 1, 2 or 3?**

---

**NO**    Go to page 3-200-16

**YES**    



The failure exists on the system board.

When the sixth and seventh characters of the error code are 00, 01, 02, 04, 08, 10, 20, 40, or 80 the failure is one of the memory modules that plug into the system board.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S      ↓↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

**ARE THE SIXTH AND SEVENTH  
CHARACTERS OF THE ERROR CODE 00, 01,  
02, 04 08, 10, 20, 40, OR 80?**

---

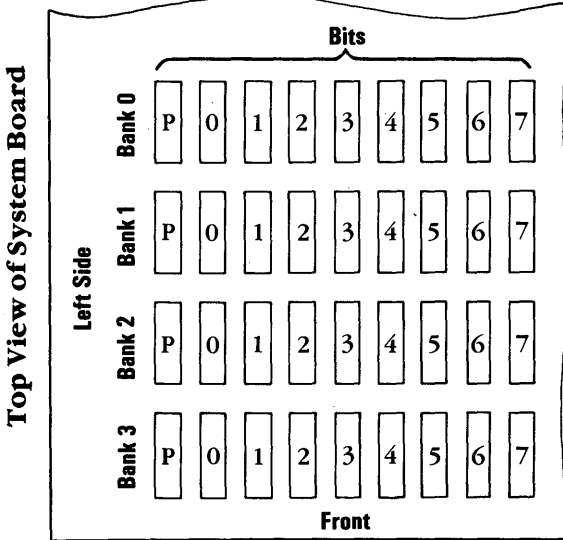
**YES**    Go to page 3-200-10

**NO**      

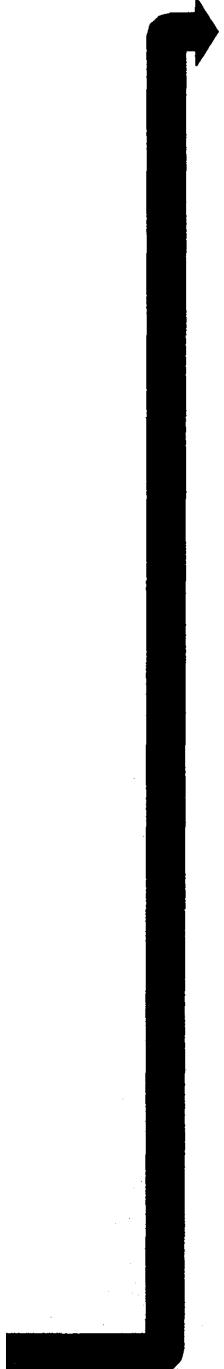
1. Replace all nine modules in the bank indicated by the first character of the error code.

**First Character of Error Code** ..... 0      1      2      3  
**Bank** ..... **Bank 0** **Bank 1** **Bank 2** **Bank 3**

**Sixth and Seventh Characters of Error Code** ..... 00 01 02 04 08 10 20 40 80  
**Bit (module)** ..... P 0 1 2 3 4 5 6 7



**CONTINUE**



2. Rerun the diagnostics (see page 3-200-55).

If you receive the same error code,\* replace another nine modules from a different bank and run the diagnostics again (see page 3-200-55). Repeat this process until either the problem\* is solved or all the modules on the system board have been replaced.

If you receive the same error code\* after all four banks have been changed:

- a. Replace the system board.
  - b. Remove all the 64K modules from the old system board and install them on the new system board. See Section 5, "Removal/Replacement and Adjustments."
  - c. Rerun the diagnostics (see page 3-200-55).
- 

---

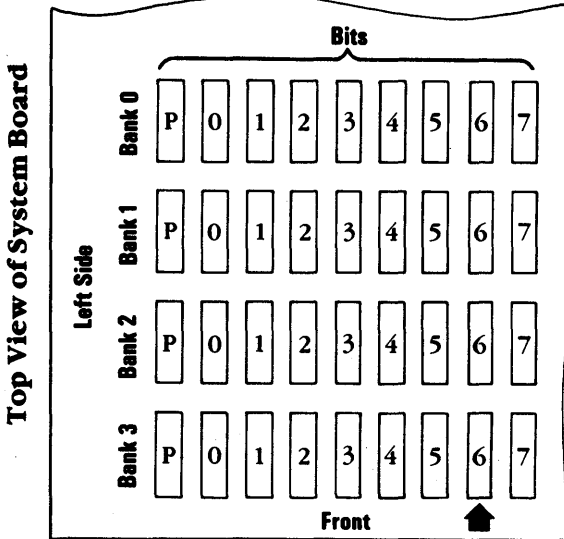
\* *Note:* If you receive a new error code at any time during the procedure go to page 3-200-1 and follow the PIC again.

There is a failing module on the system board.


The first character of the error code indicates which bank has the failing module. The sixth and seventh characters of the seven character error code indicate which bit (module) of the bank failed (P, 0, 1, 2, 3, 4, 5, 6, or 7). For example, error code 3C000 40 201 corresponds to the failing module indicated by the arrow in bank 3, bit 6.

Replace the failing 64K module. See Section 5, "Removal/Replacement and Adjustments."

<b>First Character of Error Code</b> .....	0	1	2	3					
<b>Bank</b> .....	<b>Bank 0</b>	<b>Bank 1</b>	<b>Bank 2</b>	<b>Bank 3</b>					
<b>Sixth and Seventh Characters of Error Code</b> .....	00	01	02	04	08	10	20	40	80
<b>Bit (module)</b> .....	P	0	1	2	3	4	5	6	7



CONTINUE



After replacing the failing module, run the diagnostics again (see page 3-200-55). then return to this page and answer the question below.

---

**DID THE DIAGNOSTIC RUN  
SUCCESSFULLY?**

---

**YES** The problem is resolved.

**NO** 



Compare this error code with the note you made when you ran the diagnostic tests on page 3-200-5. Disregard the second character in both codes.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XXXXXXXX  
ERROR - XXXKB MEMORY 201 S     ↓     ↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

**ARE THE FIRST, SIXTH AND SEVENTH  
CHARACTERS OF THE NEW ERROR CODE  
IDENTICAL TO THOSE OF THE PREVIOUS  
ERROR CODE?**

---

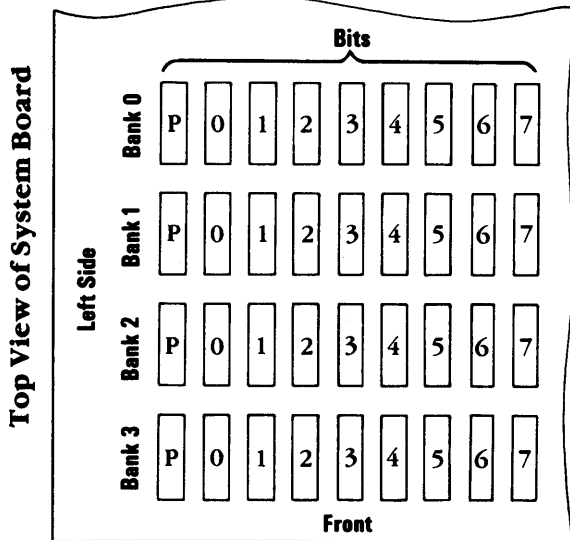
**NO**     The memory has another failure. Make a note of the new error code. Go to page 3-200-1 and follow the PIC again.

**YES**     

The system board memory still has a failing module. With this type of failure, the first character does not correctly identify the failing *bank*. But the sixth and seventh characters do correctly identify the failing *module*.

1. Replace the module in one of the banks that has not yet had a module replaced.
2. Rerun the diagnostics (see page 3-200-55), then return to this page and answer the question below.

Sixth and Seventh Characters of Error Code ..... 00 01 02 04 08 10 20 40 80  
 Bit (module)..... P 0 1 2 3 4 5 6 7



**DID THE DIAGNOSTICS RUN SUCCESSFULLY?**

**YES** Your system is functioning properly.

**NO**


Compare this error code with the note you made when you ran the diagnostic tests on page 3-200-5. Disregard the second character in both codes.

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S     ↓     ↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

**ARE THE FIRST, SIXTH AND SEVENTH  
CHARACTERS OF THE NEW ERROR CODE  
IDENTICAL TO THOSE OF THE PREVIOUS  
ERROR CODE?**

**NO**     The memory has another failure. Make a note of the new error code. Go to page 3-200-1 and follow the PIC again.

**YES**     



The failing module may be in one of the other banks that has not yet had a module replaced.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

---

**HAVE YOU REPLACED THE FAILING  
MODULE IN EACH OF THE FOUR BANKS?**

---

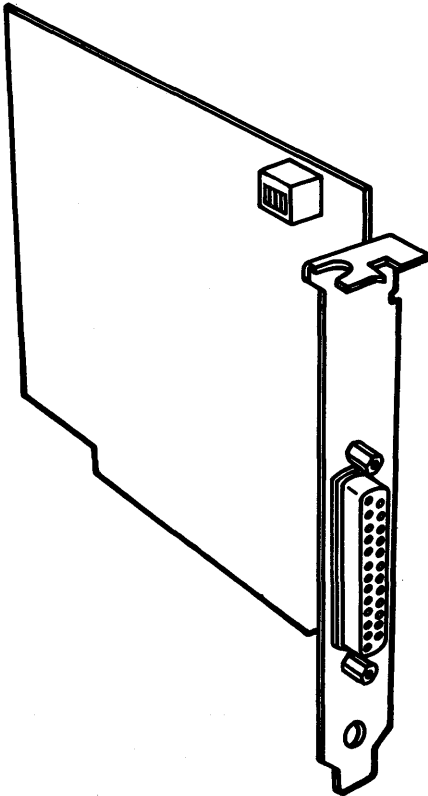
**NO** Go to page 3-200-13

**YES** Replace the system board. Remove all 64K modules from the old system board, and install them on the new system board. See Section 5, "Removal/Replacement and Adjustments." After installing the modules on the new system board, run the diagnostic again (see 3-200-55).

When the first character of the error code is a 4, 5, 6, 7, 8 or 9, the failure is on a memory expansion adapter.

---

### 128KB Memory-Printer Adapter




**DO YOU HAVE THE 128KB  
MEMORY-PRINTER ADAPTER  
INSTALLED?**

---

**YES** Go to page 3-200-29

**NO** 



You have only 64/256KB Memory Expansion Option card(s).

1. Use the table below to find the first character of your error code and the corresponding switch settings.
2. Compare these switch settings with those of the 64/256KB Memory Expansion Options in your system unit. The failing option is the one with the switch settings that match those in the table.

---


First Character of Error Code	64/256KB Expansion Option Switch Settings				
	1	2	3	4	5-8
4, 5, 6, or 7	On	Off	On	On	N/A
8 or 9	Off	On	On	On	N/A

**DOES YOUR SYSTEM HAVE A 64/256KB  
MEMORY EXPANSION ADAPTER WITH  
SWITCH SETTINGS THAT MATCH THOSE  
OF YOUR ERROR CODE?**

---

**NO** Compare your switch settings with the switch settings in the chart above. Make the necessary corrections then go to page 3-200-1 and follow the PIC again.

**YES** 



The 64/256KB Memory Expansion Option that matches the switch settings for your error code is failing.

When the sixth and seventh characters of the error code are 00, 01, 02, 04, 08, 10, 20, 40, or 80, the failure is one of the 64K memory modules.

---

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

PRESS ENTER TO CONTINUE  
?\_

**ARE THE SIXTH AND SEVENTH  
CHARACTERS OF THE ERROR CODE 00, 01,  
02, 04, 08, 10, 20, 40, OR 80?**

---

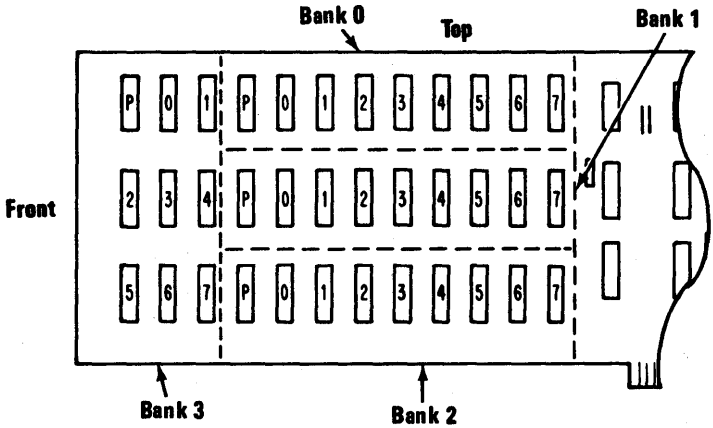
**YES** Go to page 3-200-21

**NO** 

1. Replace all nine modules in the bank indicated by the first character of the error code.


First Character of

Error Code ..... 4 or 8    5 or 9    6    7  
 Bank ..... Bank 0    Bank 1    Bank 2    Bank 3



CONTINUE





2. Rerun the diagnostics (see page 3-200-55).

If you receive the same error code,\* replace another nine modules from a different bank and run the diagnostics again (see page 3-200-55). Repeat this process until either the problem\* is solved or all the modules on the failing adapter have been replaced.

If you receive the same error code\* after all four banks have been changed:

- a. Replace the 64/256KB Memory Expansion Option Adapter.
  - b. Remove all the 64K modules from the failing adapter and install them on the new adapter. See Section 5, "Removal/Replacement and Adjustments."
  - c. Rerun the diagnostics (see page 3-200-55).
- 

---

*\* Note:* If you receive a new error code at any time during the above procedure go to page 3-200-1 and follow the PIC again.

The first character of your error code identifies the *bank* that contains the failing module. The sixth and seventh characters identify the failing *module*. For example, error code 70000 08 201 corresponds to a failing module identified by the arrow in bank 3, bit (module) 3.

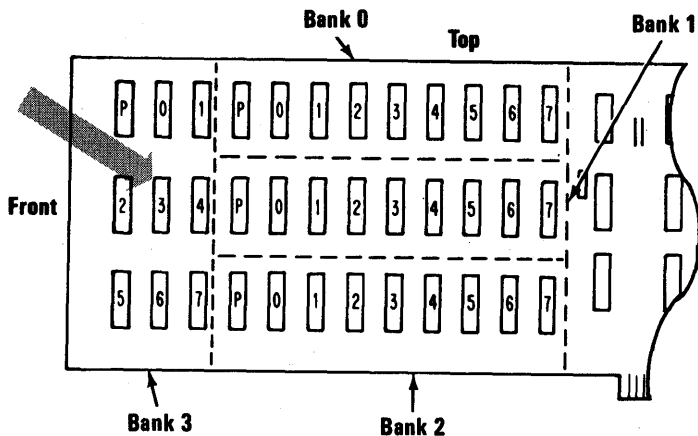
Replace the failing 64K module. See Section 5, "Removal/Replacement and Adjustments.."

**First Character of**


**Error Code** ..... 4 or 8    5 or 9    6    7  
**Bank** ..... Bank 0    Bank 1    Bank 2    Bank 3

**Sixth and Seventh**

**Characters of Error Code** ..... 00   01   02   04   08   10   20   40   80  
**Bit (module)** ..... P   0   1   2   3   4   5   6   7



**CONTINUE** 



Rerun the diagnostics (see page 3-200-55). After the diagnostics are complete, return to this page and answer the question below.


---

**DID THE DIAGNOSTICS RUN  
SUCCESSFULLY?**

---

**YES** Your system is functioning properly.

**NO** 



Compare this error code with the note you made when you ran the diagnostic tests on page 3-200-5. Disregard the second character in both codes.

---

TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S      ↓      ↓↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

**ARE THE FIRST, SIXTH AND SEVENTH CHARACTERS OF THE NEW ERROR CODE IDENTICAL TO THOSE OF THE PREVIOUS ERROR CODE?**

---

**NO**    The memory has another failure. Make a note of the new error code. Go to page 3-200-1 and follow the PIC again.

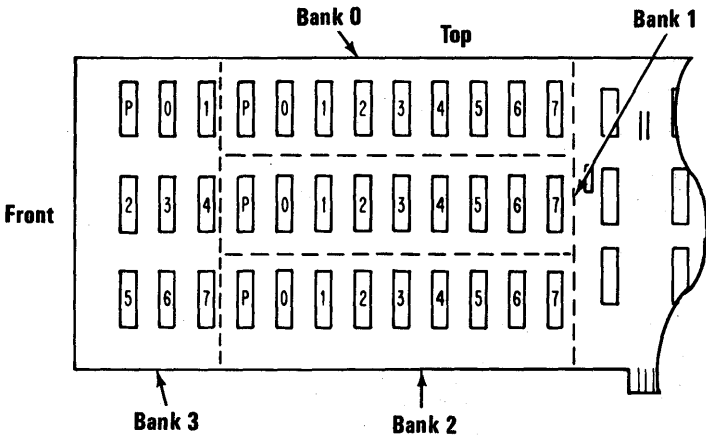
**YES**    

The same 64/256KB Memory Expansion Option still has a failing module. With this type of failure, the first character does not correctly identify the failing bank. However the sixth and seventh characters do correctly identify the failing module.

1. Replace the module in one of the banks that has not yet had a module replaced.
2. Rerun the diagnostics (see page 3-200-55), then return to this page and answer the question below.

**Sixth and Seventh**


Characters of Error Code ..... 00 01 02 04 08 10 20 40 80  
 Bit (module) ..... P 0 1 2 3 4 5 6 7



**DID THE DIAGNOSTICS RUN SUCCESSFULLY?**

**YES** Your system is functioning properly.

**NO** 



Compare this error code with the note you made when you ran the diagnostic tests on page 3-200-5. Disregard the second character in both codes.

---


TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S     ↓     ↓↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

**ARE THE FIRST, SIXTH AND SEVENTH CHARACTERS OF THE NEW ERROR CODE IDENTICAL TO THOSE OF THE PREVIOUS ERROR CODE?**

---

**NO**     Another memory failure exists. Make a note of the new error code. Go to page 3-200-1 and follow the PIC again.

**YES**     



The failing module is probably in one of the banks that has not yet had a module replaced.

---

**HAVE YOU REPLACED THE FAILING  
MODULE IN EACH OF THE FOUR BANKS?**

---

**NO** Go to page 3-200-24.

**YES** Replace the 64/256KB Memory Expansion Option. Remove all 64K modules from the failing adapter and install them on the new adapter. See Section 5, "Removal/Replacement and Adjustments." After you have installed all the modules on the new adapter, run the diagnostics again (see page 3-200-55).

Go to Section 6, "Switch Settings" and compare your switch settings with those in the charts. Then return to this page.

---

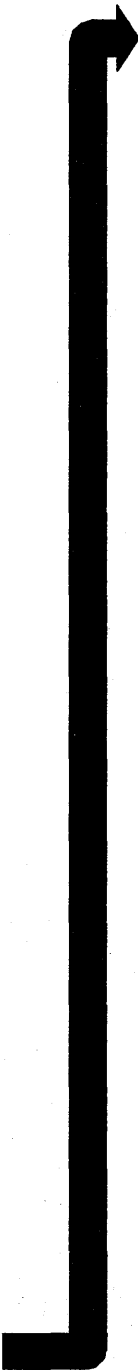
**WERE THE SWITCH SETTINGS CORRECT  
FOR THE AMOUNT OF MEMORY  
INSTALLED IN YOUR SYSTEM?**

---

**NO** Correct the switch settings, then and rerun the diagnostics (see page 3-200-55).

**YES** 





The memory on your display does not match the amount of memory installed in your system, but the switches are set correctly.

1. Press N, then press Enter.
2. Follow the instructions on the display to correct the amount of memory shown on the installed devices list.

---

THE INSTALLED DEVICES ARE

- 1 - S SYSTEM BOARD
- 2 - S 384KB MEMORY ←
- 3 - S KEYBOARD/TIMER
- 6 - S 1 DISKETTE DRIVE(S) AND ADAPTER
- 9 - S PRINTER ADAPTER
- 17 - S 1 FIXED DISK DRIVE(S) & ADAPTER
- 28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER
- 32 - S DISPLAY
- 14 - S MATRIX PRINTER

IS THE LIST CORRECT (Y/N)?\_

SAMPLE

**DOES THE AMOUNT OF MEMORY LISTED ON YOUR DISPLAY MATCH THE AMOUNT OF MEMORY IN YOUR SYSTEM?**

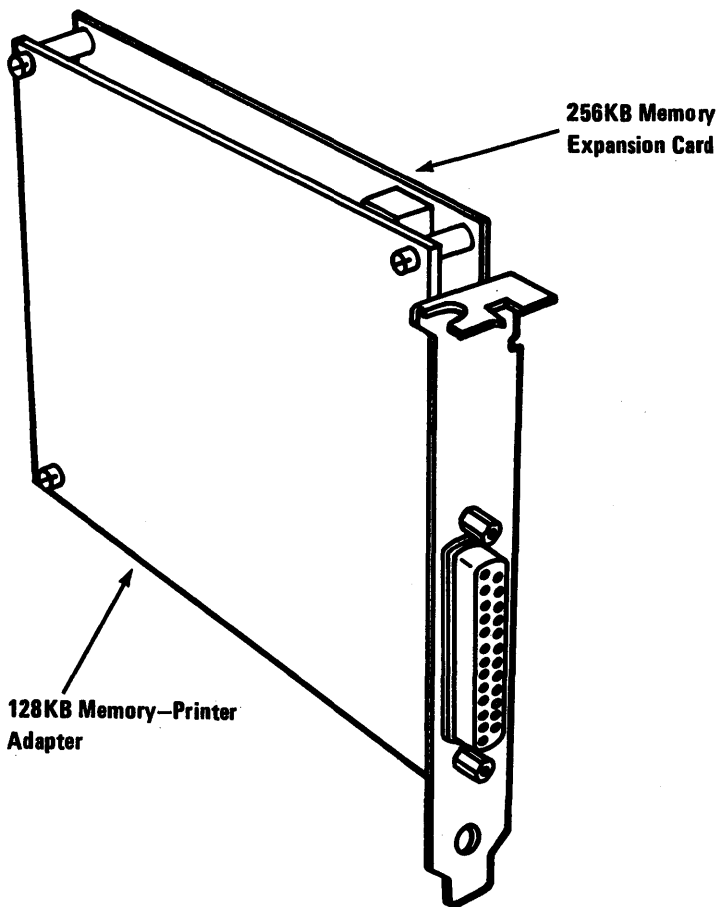
---

**NO** You have entered the wrong amount of memory. Follow the instructions on the display again and correct the amount of memory shown on the installed devices list.

**YES** Go to page 3-200-5.

The 256KB Memory Expansion Card attaches to the 128KB Memory-Printer Adapter.

---




**DO YOU HAVE THE 256KB MEMORY EXPANSION CARD INSTALLED IN YOUR SYSTEM UNIT?**

---

**NO**    Go to page 3-200-34

**YES**    



**Check the first character of your error code.**

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

?2

TESTING - XXXKB MEMORY

THIS TEST TAKES UP TO TWO MINUTES

PLEASE STAND BY

XX:XX:XX

ERROR - XXXKB MEMORY 201 S



FAILING ADDRESS - SPACE/MODULE XXXXX XX

PRESS ENTER TO CONTINUE

?\_

**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 4?**

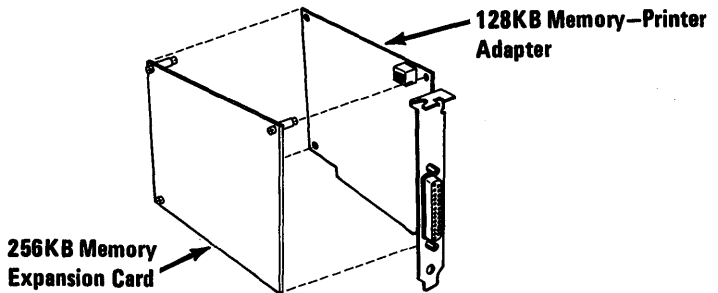
---

**NO**    Go to page 3-200-32

**YES**    

1. Remove the memory-printer adapter cards.
2. Separate the 256KB Memory Expansion Card from the 128KB Memory-Printer Adapter.
3. Reinstall the 128KB Memory-Printer.
4. Rerun the diagnostic (see page 3-200-55) to see if the 256KB Memory Expansion Card was the cause of the failure.

*Note:* It is **not** necessary to modify the switch settings for this temporary removal. Your memory will now be 384K during post.



---

### DID THE DIAGNOSTIC COMPLETE SUCCESSFULLY?

---

**YES** Replace the 256KB Memory Expansion Card. See Section 5, "Removal/Replacement and Adjustments."

**NO** If the first character is still 4, replace the 128KB Memory-Printer Adapter. See Section 5, "Removal/Replacement and Adjustments."

If The error code is not a 4, go to page 3-200-1 and follow the PIC again.

Check the first character of your error code.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S  
FAILING ADDRESS - SPACE/MODULE XXXXX XX


PRESS ENTER TO CONTINUE  
?\_

**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 5?**

---

**YES** Replace the 128KB Memory-Printer  
Adapter. See Section 5,  
"Removal/Replacement and Adjustments."

**NO** 



The first character of your error code is 6, 7, 8 or 9.

1. Check the for a secure connection between the 128KB Memory-Printer Adapter and the 256KB Memory Expansion Card.
    - If the connection is not secure, press the cards together to insure a good connection then go to step 2 below.
    - If the connection is secure, replace the 256KB Memory Expansion Card then go to step 2 below.
  2. Run the diagnostics again (see page 3-200-55), then return to this page and answer the question below.
- 

### **DID THE DIAGNOSTICS RUN SUCCESSFULLY?**

---

**YES** Your system is now functioning properly.

**NO** If you get the same failure, replace the 128KB Memory-Printer Adapter. See Section 5, "Removal/Replacement and Adjustments."

If you get new error go to page 3-200-1 and follow the PIC again.

If the first character of the error code is 4 or 5,  
the failure is on the 128KB Memory-Printer  
Adapter.

---

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

↓

PRESS ENTER TO CONTINUE  
?\_

**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 4 or 5?**

---

**YES** Replace the 128KB Memory-Printer  
Adapter and rerun the diagnostics (see  
page 3-200-55).

**NO** 

1. Use the table below to find the first character of the error code and the corresponding switch settings .
2. Compare these switch settings with those of all the 64/256KB Memory Expansion Adapters in your system. The failing option is the one with the switch settings that match those in the table.

---

<b>First Character of Error Code</b>	<b>64/256KB Expansion Option Switch Settings</b>				
6, 7, 8, or 9	1 On	2 Off	3 Off	4 On	5-8 N/A


**DOES YOUR SYSTEM HAVE A 64/256KB  
MEMORY EXPANSION ADAPTER WITH  
SWITCH SETTINGS THAT MATCH THOSE  
SHOWN ABOVE?**

---

**NO** Compare your switch settings with the switch settings in the chart above. Make the necessary corrections, then go to page 3-200-1 and follow the PIC again.

**YES** 





The failing 64/256KB Memory Expansion Option is the one with the switch settings that match those for your error code.

When the sixth and seventh characters of the error code are 00, 01, 02, 04, 08, 10, 20, 40, or 80, the failure is one of the 64K memory modules.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

?2

TESTING - XXXKB MEMORY

THIS TEST TAKES UP TO TWO MINUTES

PLEASE STAND BY

XX:XX:XX

ERROR - XXXKB MEMORY 201 SVV

FAILING ADDRESS - SPACE/MODULE XXXXX XX ←

PRESS ENTER TO CONTINUE

?\_

**ARE THE SIXTH AND SEVENTH  
CHARACTERS OF THE ERROR CODE 00, 01,  
02, 04 08, 10, 20, 40, OR 80?**

---

**NO**    Go to page 3-200-19.

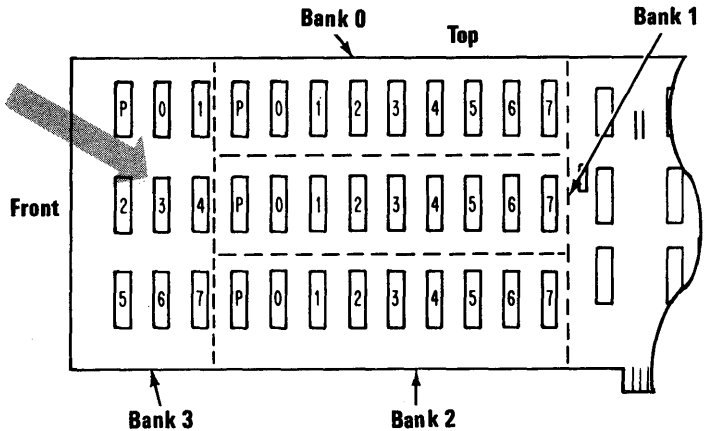
**YES**    

The first character of the error code identifies the bank that has the failing module. The sixth and seventh characters identify the failing bit (module). For example, error code 90000 08 201 corresponds to the failing module identified by the arrow in bank 3, bit (module) 3.

Replace the failing 64K module. See Section 5, "Removal/Replacement and Adjustments."

<b>First Character of Error Code</b> .....	4 or 8	5 or 9	6	7
<b>Bank</b> .....	<b>Bank 0</b>	<b>Bank 1</b>	<b>Bank 2</b>	<b>Bank 3</b>

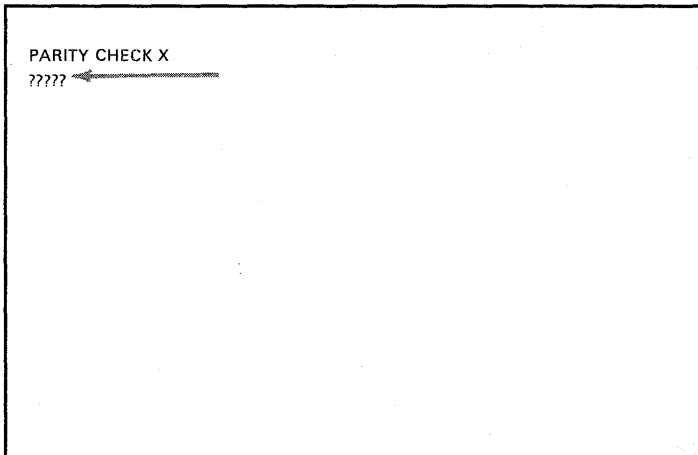
<b>Sixth and Seventh Characters of Error Code</b> .....	00	01	02	04	08	10	20	40	80
<b>Bit (module)</b> .....	P	0	1	2	3	4	5	6	7



Go to page 3-200-22.

After a parity check, the memory is scanned to see if the failing address can be identified. If identified, the address is displayed as a five character alphanumeric code under the parity check message.

If the failing address cannot be identified, five question marks are displayed under the parity check message.



**IS YOUR PARITY CHECK ERROR CODE  
ALL QUESTION MARKS?**

---

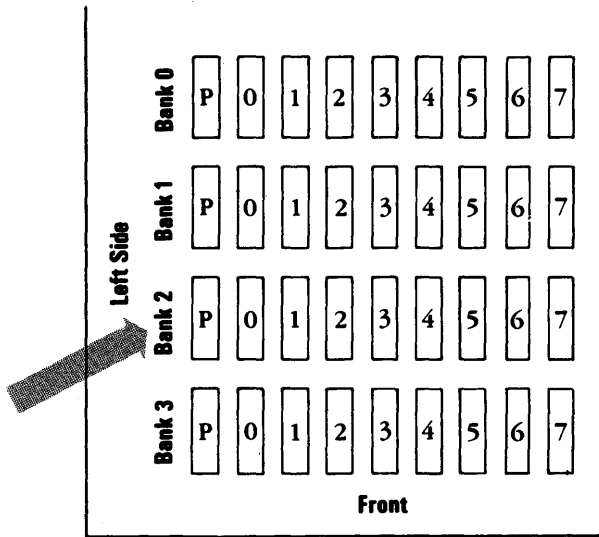
**YES** Go to page 3-200-57.

**NO** 

The five character error code of the parity check will help you determine whether a bank on the system board or which adapter is failing if the problem is on a memory expansion option.

The first character of the five character error code identifies the failing bank. For example, error code 2C000 would indicate that bank 2 is failing.

First Character of  
 Error Code ..... 0 1 2 3  
 Bank ..... Bank 0 Bank 1 Bank 2 Bank 3



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

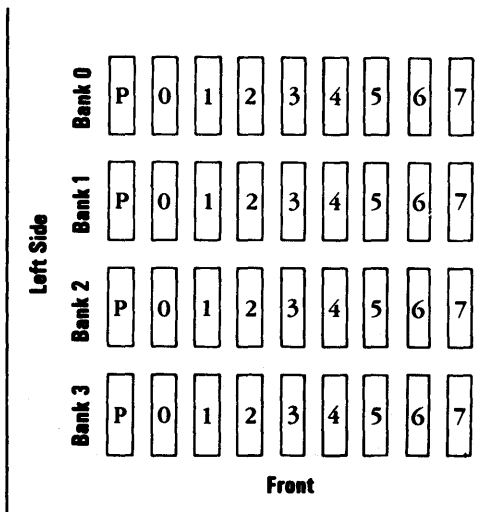
**NO** Go to page 3-200-42.

**YES** 


The failure exists in the system board.

1. Replace all nine modules in the bank indicated by the first character of the error code.

First Character of  
Error Code ..... 0 1 2 3  
Bank ..... Bank 0 Bank 1 Bank 2 Bank 3



CONTINUE



2. Rerun the diagnostics (see page 3-200-55).

If you receive the same error code,\* replace another nine modules from a different bank and run the diagnostics again (see page 3-200-55). Repeat this process until either the problem\* is solved or all the modules on the system board have been replaced.

If you receive the same error code\* after all four banks have been changed:

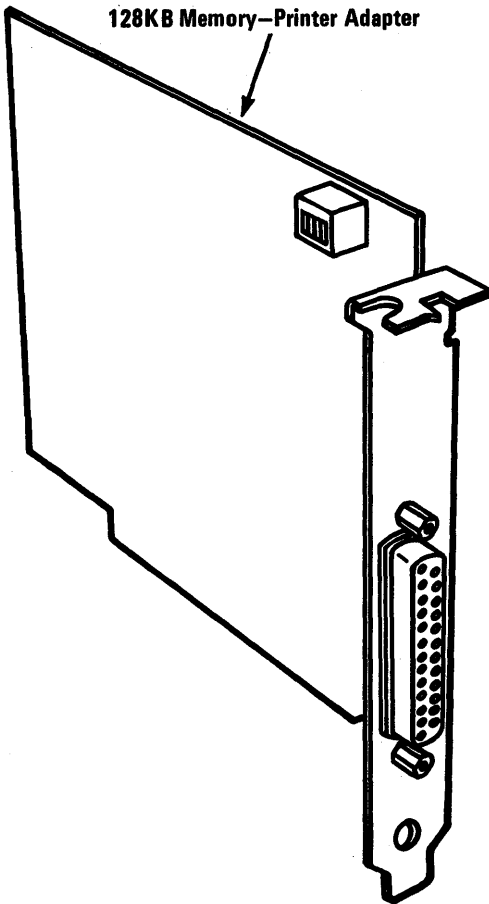
- a. Replace the system board.
  - b. Remove all the 64K modules from the old system board and install them on the new system board. See Section 5, "Removal/Replacement and Adjustments."
  - c. Rerun the diagnostics (see page 3-200-55).
- 

---

*\* Note:* If you receive a new error code at any time during the above procedure, go to page 3-200-1 and follow the PIC again.

The first character of your error code is 4, 5, 6, 7, 8, or 9. The failure is in a memory expansion adapter.

---



**DO YOU HAVE THE 128KB  
MEMORY-PRINTER ADAPTER?**

---

**YES** Go to page 3-200-46.

**NO** 



You have only 64/256KB Memory Expansion Options.

1. Use the table below to find the first character of your error code and the corresponding switch settings.
2. Compare these switch settings with those of all the 64/256KB Memory Expansion Option(s) in your system unit. The failing option is the one with the switch settings that match those in the table.

---

First Character of Error Code	64/256KB Expansion Option Switch Settings				
	1	2	3	4	5-8
4, 5, 6, or 7	On	Off	On	On	N/A
8 or 9	Off	On	On	On	N/A

**DOES YOUR SYSTEM HAVE A 64/256KB  
MEMORY OPTION WITH SWITCH  
SETTINGS THAT MATCH THOSE OF YOUR  
ERROR CODE?**

---

**NO** Compare your switch settings with the switch settings in the chart above. Make the necessary corrections, and go to page 3-200-1 and follow the PIC again.

**YES** 



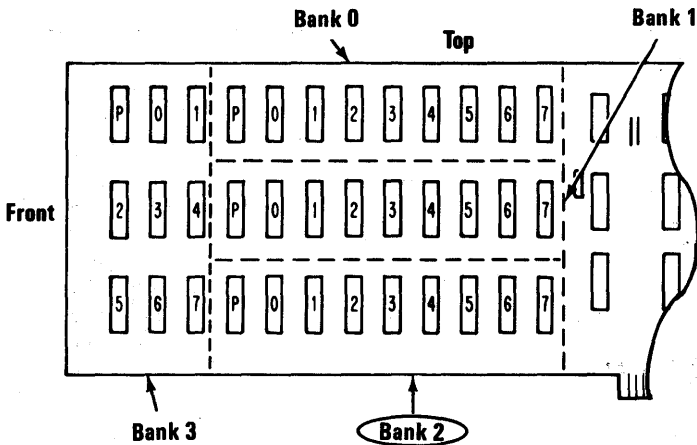
1. The 64/256KB Memory Expansion Option that matches the switch settings for your error code is failing. Use the first character of the parity error code and the chart below to determine the failing bank. For example, error code 8C00 would indicate that bank 2 is failing.
2. Replace all nine modules in the bank indicated by the first character of the error code.

---


<b>First Character of Error Code</b> .....	4 or 8	5 or 9	6	7
<b>Bank</b> .....	Bank 0	Bank 1	Bank 2	Bank 3

<b>Sixth and Seventh Characters of Error Code</b> .....	00	01	02	04	08	10	20	40	80
<b>Bit</b> .....	P	0	1	2	3	4	5	6	7



CONTINUE



3. Rerun the diagnostics (see page 3-200-55).

If you receive the same error code,\* replace another nine modules from a different bank and run the diagnostics again (see page 3-200-55). Repeat this process until either the problem\* is solved or all the modules on the system board have been replaced.

If you receive the same error code\* after all four banks have been changed:

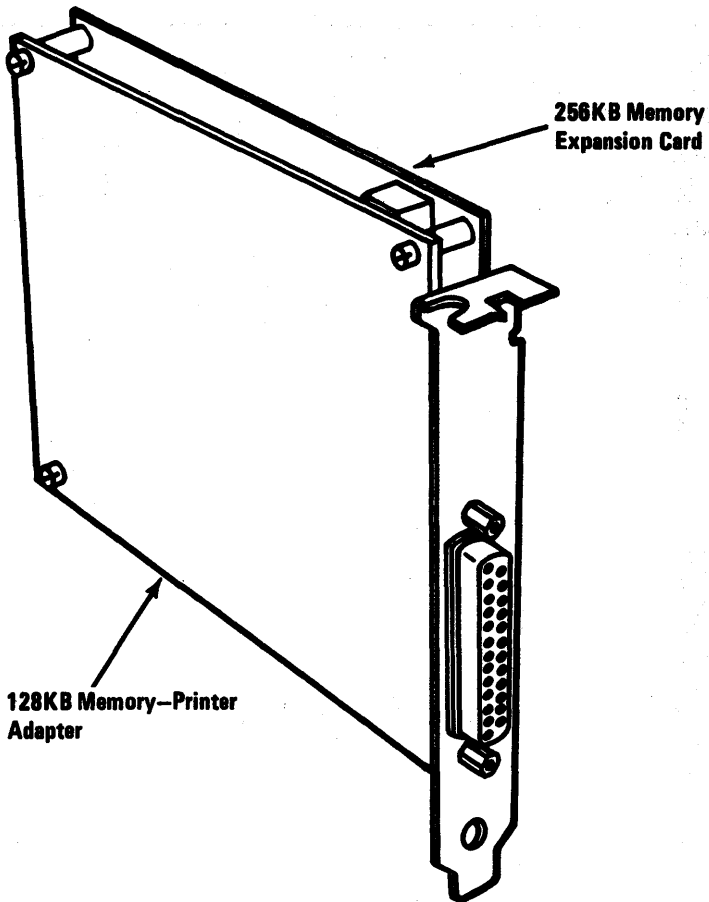
- a. Replace the 64/256KB Memory Expansion Option.
  - b. Remove all the 64K modules from the failing adapter and install them on the new adapter. See Section 5, "Removal/Replacement and Adjustments."
  - c. Rerun the diagnostics (see page 3-200-55).
- 

---

\* *Note:* If you receive a new error code at any time during the above procedure go to page 3-200-1 and follow the PIC again.

The 256KB Memory Expansion Card attaches to the 128KB Memory-Printer Adapter.

---



**DO YOU HAVE THE 256KB MEMORY EXPANSION CARD?**

---

**NO**    Go to page 3-200-51

**YES**    

**Check the first character of your error code.**

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

?2

TESTING - XXXKB MEMORY

THIS TEST TAKES UP TO TWO MINUTES

PLEASE STAND BY

XX:XX:XX

ERROR - XXXKB MEMORY 201 S

FAILING ADDRESS - SPACE/MODULE XXXXX XX

PRESS ENTER TO CONTINUE

?\_

**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 4?**

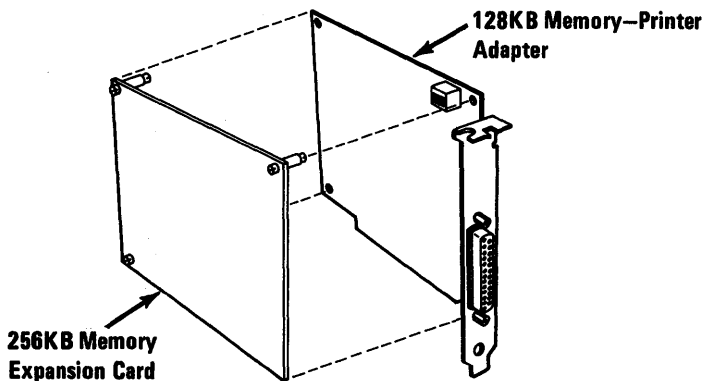
---

**NO**    Go to page 3-200-49

**YES**    

1. Remove the memory-printer adapter cards.
2. Separate the 256KB Memory Expansion Card from the 128KB Memory-Printer Adapter.
3. Reinstall the 128KB Memory-Printer then rerun the diagnostic (see page 3-200-55) to see if the 256KB Memory Expansion Card was the cause of the failure.

*Note:* It is **not** necessary to modify the switch settings for this temporary removal. Your memory will now be 384K during post.



### **DID THE DIAGNOSTIC COMPLETE SUCCESSFULLY?**

---

**YES** Replace the 256KB Memory Expansion Card. See Section 5, "Removal/Replacement and Adjustments."

**NO** If the first character is still 4, replace the 128KB Memory-Printer Adapter. See Section 5, "Removal/Replacement and Adjustments." If The error code is not a 4, go to page 3-200-1 and follow the PIC again.

Check the first character of your error code.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

?2

TESTING - XXXKB MEMORY

THIS TEST TAKES UP TO TWO MINUTES

PLEASE STAND BY

XX:XX:XX

ERROR - XXXKB MEMORY 201 S

FAILING ADDRESS - SPACE/MODULE XXXXX XX



PRESS ENTER TO CONTINUE

?\_


**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 5?**

---

**YES** Replace the 128KB Memory-Printer  
Adapter. See Section 5,  
"Removal/Replacement and Adjustments."

**NO**





The first character of your error code is 6, 7, 8 or 9.

1. Replace the 256KB Memory Expansion Card. See Section 5, "Removal/Replacement and Adjustments."
  2. Rerun the diagnostics (see page 3-200-55). then return to this page and answer the question below.
- 

**DID THE DIAGNOSTICS COMPLETE SUCCESSFULLY?**

---

**YES** Your system is now functioning correctly.

**NO** If you get the same failure, replace the 128KB Memory-Printer Adapter. See Section 5, "Removal/Replacement and Adjustments." If you get new error, go to page 3-200-1 and follow the PIC again.

If the first character of the error code is 4 or 5,  
the failure is on the 128KB Memory-Printer  
Adapter.

---

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS  
?2  
TESTING - XXXKB MEMORY  
THIS TEST TAKES UP TO TWO MINUTES  
PLEASE STAND BY  
XX:XX:XX  
ERROR - XXXKB MEMORY 201 S      ↓  
FAILING ADDRESS - SPACE/MODULE XXXXX XX  
  
PRESS ENTER TO CONTINUE  
?\_

---

**IS THE FIRST CHARACTER OF YOUR  
ERROR CODE A 4 or 5?**

---

**YES** Replace the 128KB Memory-Printer  
Adapter and rerun the diagnostics (see  
page 3-200-55).

**NO** 



1. Use the table below to find the first character of the error code and the corresponding switch settings .
2. Compare these switch settings with those of all the 64/256KB Memory Expansion Options in your system. The failing option is the one with the switch settings that match those in the table.

---

First Character of Error Code	<b>64/256KB Expansion Option Switch Settings</b>				
6, 7, 8, or 9	1 On	2 Off	3 Off	4 On	5-8 N/A

**DOES YOUR SYSTEM HAVE A 64/256KB  
MEMORY EXPANSION OPTION WITH  
SWITCH SETTINGS THAT MATCH THOSE  
SHOWN ABOVE?**

---

**NO** Compare your switch settings with the switch settings in the chart above. Make the necessary corrections, then go to page 3-200-1 and follow the PIC again.

**YES** 

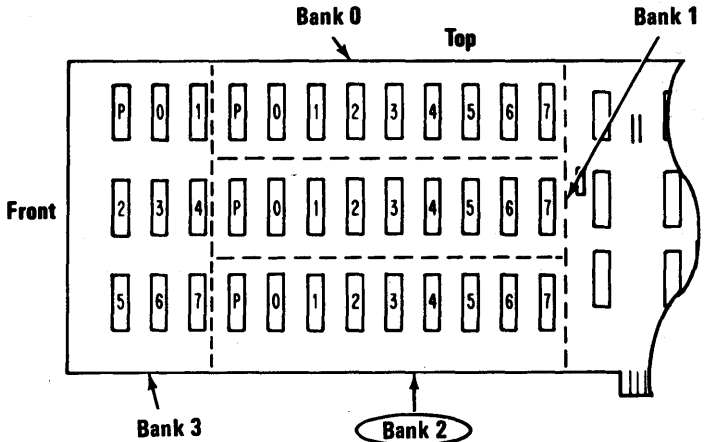
1. The 64/256KB Memory Expansion Option that matches the switch settings for your error code is failing. Use the first character of the parity error code and the chart below to determine the failing bank. For example, error code 8C00 would indicate that bank 2 is failing.
2. Replace all nine modules in the bank indicated by the first character of the error code.

**First Character of**

Error Code .....	4 or 8	5 or 9	6	7
Bank .....	Bank 0	Bank 1	Bank 2	Bank 3


**Sixth and Seventh**

Characters of Error Code .....	00	01	02	04	08	10	20	40	80
Bit .....	P	0	1	2	3	4	5	6	7



CONTINUE





3. Rerun the diagnostics (see page 3-200-55).

If you receive the same error code,\* replace another nine modules from a different bank and run the diagnostics again (see page 3-200-55). Repeat this process until either the problem\* is solved or all the modules on the failing adapter have been replaced.

If you receive the same error code\* after all four banks have been changed:

- a. Replace the 64/256KB Memory Expansion Option.
  - b. Remove all the 64K modules from the failing adapter board and install them on the new adapter. See Section 5, "Removal/Replacement and Adjustments."
  - c. Rerun the diagnostics (see page 3-200-55).
- 

---

\* *Note:* If you receive a new error code at any time during the above procedure go to page 3-200-1 and follow the PIC again.

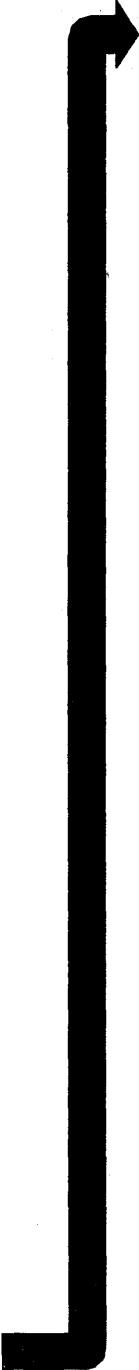
The following shows how to rerun the diagnostic for Memory and the results of a successful run.

1. With the Diagnostics diskette in drive A, and the load lever down, set the system unit On/Off (I/O) switch Off (O).
  2. Wait 5 seconds and set the system unit On/Off (I/O) to On (I).
  3. When the diagnostic menu appears, press 0 (RUN DIAGNOSTICS) then press Enter.
  4. When the Installed Devices menu appears press Y (IS THE LIST CORRECT?) then press Enter.
- 

---

**CONTINUE**



- 
1. When the **SYSTEM CHECKOUT** menu appears, press 0 (**RUN TESTS ONE TIME**) then Enter.
  2. When the next menu appears, press 2 then Enter to select the **MEMORY** tests.

If the diagnostic runs successfully, a “Memory 200” will appear very briefly followed by the screen shown below.

---

SYSTEM CHECKOUT

- 0 - RUN TESTS ONE TIME
- 1 - RUN TESTS MULTIPLE TIMES
- 2 - LOG UTILITIES
- 3 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED

---

Return to the page you came from and continue with the procedure there.

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

---

1. Check the entire system for loose or damaged connectors.
2. Return to page 3-5-1 and review "Start."
3. Select "UTILITIES" in the diagnostic menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the machine thoroughly and identify the failing symptom. When you have identified the symptom, go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.

---

If you have followed these procedures and still have an unsolved problem, you should request technical assistance.

# Notes:

# Keyboard/Timer 300

You have entered this PIC because you received a diagnostic 3XX error code or you have identified a Keyboard/Timer problem.

If you have a POST 3XX error, you should go to "Keyboard Check", on page 3-20-1.

---

XX.XX:XX  
ERROR -  
KEYBOARD/TIMER 3XX S


**DO YOU HAVE A 3XX DIAGNOSTIC ERROR?**

---

**YES** Go to "Keyboard Diagnostic Error Codes" on page 3-300-14.

**NO** 





If the Diagnostics diskette is already loaded, exit to the main menu (shown below) and begin on the next page. Otherwise follow the steps below and load the Diagnostics diskette.

1. Set the system unit On/Off switch to Off.
  2. Insert the diagnostic diskette into drive A and push the load lever down.
  3. If you have an Expansion Unit, set its Power switch to On.
  4. Set the Power switch on the system unit to On and the Diagnostic diagnostic menu should appear.
- 

The IBM 3270 Personal Computer  
DIAGNOSTICS  
Version X.XX (C) Copyright IBM Corp. XXXX

SELECT AN OPTION


- 0 - RUN DIAGNOSTIC ROUTINES
- 1 - FORMAT DISKETTE
- 2 - PREPARE SYSTEM FOR RELOCATION
- 3 - EXIT TO SYSTEM DIAGNOSTICS

ENTER ACTION DESIRED

?\_

---

**CONTINUE** 

- 
1. Press 0, then Enter to select RUN DIAGNOSTIC ROUTINES.
  2. Depending on the configuration of your system, questions about your attached devices will may appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?) then press Enter. (If the list is incorrect, follow the instructions on the screen to correct the list before answering yes.)
  4. Press 0, (RUN TESTS ONE TIME) then press Enter.
  5. Press 3, (KEYBOARD/TIMER) then press Enter.

---

TESTING - KEYBOARD/TIMER  
XX:XX:XX  
ERROR -  
KEYBOARD/TIMER 3XX S

---

**DID YOU GET A 3XX DIAGNOSTIC ERROR?**

---

**YES** Go to "Keyboard Diagnostic Error Codes" on page 3-300-14.

**NO** 

1. The following will appear on your screen.
2. Press each key slowly and verify that each block changes to a character.


**It is not important at this time that the character is the correct character.**



**DID EACH BLOCK CHANGE TO A CHARACTER?**

**NO** Replace the keyboard. See Section 5, "Removal/Replacement and Adjustments."

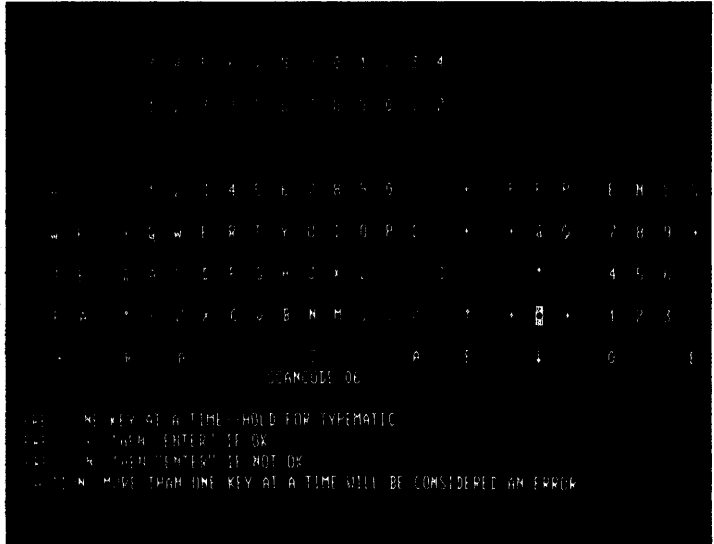
**YES**



Compare each character on your screen with the screen below, and verify that all characters are correct.

*Note:* The scan code may differ on your screen depending on which key was pressed last.

---




---

### DID EACH BLOCK CHANGE TO THE CORRECT CHARACTER?

---

**NO** This problem could be caused by a fault in the adapter for your display. Go run diagnostic for your display. If the "PC Character Sets" are displayed without errors, replace the Keyboard/Timer adapter. If there are errors in the PC character sets, replace the adapter for your display.

**YES** 



Press and hold each key, then release it. The corresponding character on the screen should blink. This is the typematic test. For test purposes, all keys have been made typematic.

---

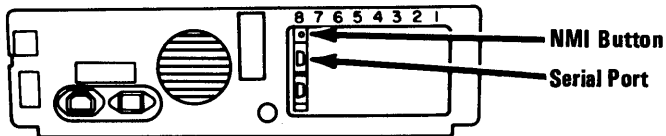
**DID THE TYPEMATIC TEST WORK  
CORRECTLY?**

---

**NO**    Replace the keyboard. See Section 5,  
          "Removal/Replacement and Adjustments."

**YES**    

1. Press Y, then Enter.
2. Look at the back of your system unit to determine if you have a serial port and NMI button.



**DOES YOUR SYSTEM UNIT HAVE A  
SERIAL PORT AND NMI BUTTON?**

---

**NO**    Go to page 3-300-16.

**YES**    



---


XX:XX:XX  
ERROR -  
KEYBOARD/TIMER 3XX S

**DID YOU GET A 3XX ERROR?**

---

**YES** Go to “Keyboard Diagnostic Error Codes”  
on page 3-300-14.

**NO** 



The following message should be displayed.

---

INSTALL THE SERIAL PORT WRAP PLUG

PRESS ENTER WHEN READY

?\_

**DID THE MESSAGE SHOWN ABOVE  
APPEAR ON YOUR SCREEN?**

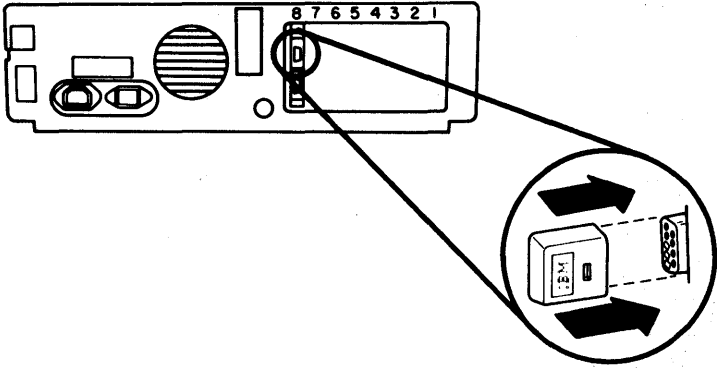
---

**NO**    Replace the Keyboard/Timer Adapter. See  
Section 5, "Removal/Replacement and  
Adjustments".


**YES**    



1. If there is any device attached to the Keyboard/Timer serial port, remove it.
2. Install the serial port wrap plug.



CONTINUE



Press Enter to run the serial port test.

---

REMOVE THE SERIAL PORT WRAP PLUG  
RECONNECT ANY PREVIOUSLY ATTACHED  
SERIAL PORT DEVICE

PRESS ENTER WHEN READY


?  
.....

**DID MESSAGE SHOWN ABOVE APPEAR  
ON YOUR SCREEN?**

---

**NO** Replace the Keyboard/Timer card. See  
Section 5, "Removal/Replacement and  
Adjustments."

**YES** 

- 
1. Remove the serial port wrap plug from the Keyboard/Timer adapter.
  2. If you removed a serial port device earlier in this procedure, reconnect it.
  3. Press Enter to continue testing.
- 


XX:XX:XX  
ERROR -  
KEYBOARD/TIMER 3XX S

**DID YOU RECEIVE A 3XX ERROR  
MESSAGE?**

---

**YES** Go to "Keyboard Diagnostic Error Codes"  
on page 3-300-14.

**NO** 

- 
1. The message shown below will be displayed on your screen.
  2. Press the Non-Maskable Interrupt (NMI) button on the back of the Keyboard/Timer adapter and check to see if an "OK" appears on your screen.
- 

PRESS THE NMI BUTTON ON THE REAR OF  
THE KEYBOARD/TIMER ADAPTER.

OK

DID "OK" APPEAR IN THE BOX (Y/N)?

—

**DID "OK" APPEAR IN THE BOX ON YOUR  
SCREEN?**

---

**NO** Replace the keyboard/timer adapter card.  
See Section 5, "Removal/Replacement and  
Adjustments."

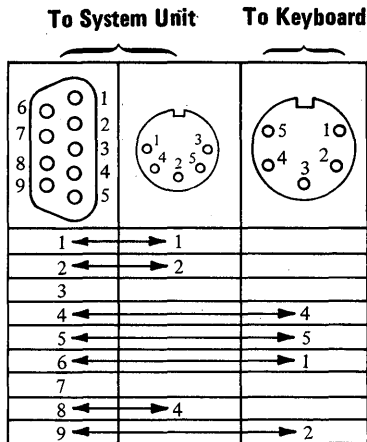
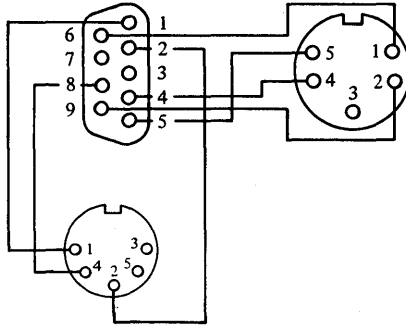
**YES** Go to page 3-300-16.

# Keyboard Diagnostic Error Codes

<b>Error Code</b>	<b>Corrective Action</b>
301	Replace Keyboard/Timer Adapter
304-311	Replace the Keyboard
312-316	Replace Keyboard/Timer Adapter
317-319	Replace Keyboard
320-321	Rerun the program and verify the operator actions. If the same error occurs replace the keyboard.
322	Go to "Continuity Check" on page 3-300-15.
323-326	Replace Keyboard/Timer Adapter
332-333	Replace Keyboard/Timer Adapter
334-343	Replace Keyboard/Timer Adapter
344-366	Replace the device attached to the serial port.

# Continuity Check

Check the continuity of the keyboard adapter cable.



## IS THE CONTINUITY OK?

**YES** Replace the system board. See Section 5, "Removal/Replacement and Adjustments."

**NO** Replace the keyboard adapter cable. See Section 5, "Removal/Replacement and Adjustments."

You have gone throughout the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start".
  3. Select "UTILITIES" in the diagnostic menu, and start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the machine thoroughly and identify the failing symptom, go to the page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

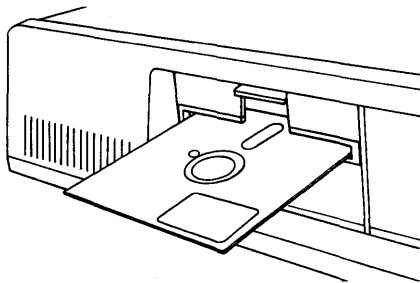
If you have followed these procedures and still have an unsolved problem, you should request technical assistance.

# 5-1/4 Inch Diskette Drive Assembly 600

You have entered this PIC because you have a 6XX error code or have identified a diskette drive problem. Check the diskette drive assembly for obstructions or broken parts and correct the problem. Check your diskette for damage.

*Note:* The following table shows meter readings that are acceptable for voltages described as "approximately X Vdc."

Requested Voltage	Reading	Minimum	Maximum
Approximately	0.0 Vdc	0.0 Vdc	0.8 Vdc
Approximately	0.2 Vdc	0.1 Vdc	0.3 Vdc
Approximately	0.5 Vdc	0.5 Vdc	1.0 Vdc
Approximately	5.0 Vdc	2.0 Vdc	5.5 Vdc
Approximately	12.0 Vdc	11.2 Vdc	12.6 Vdc



**IS YOUR DISKETTE FREE OF DAMAGE,  
FORMATTED, AND INSERTED  
CORRECTLY?**

---

**NO** Use another diskette or insert the diskette correctly. Repeat the test that failed and see if this corrected your 6XX error. If not, continue.

**YES** 

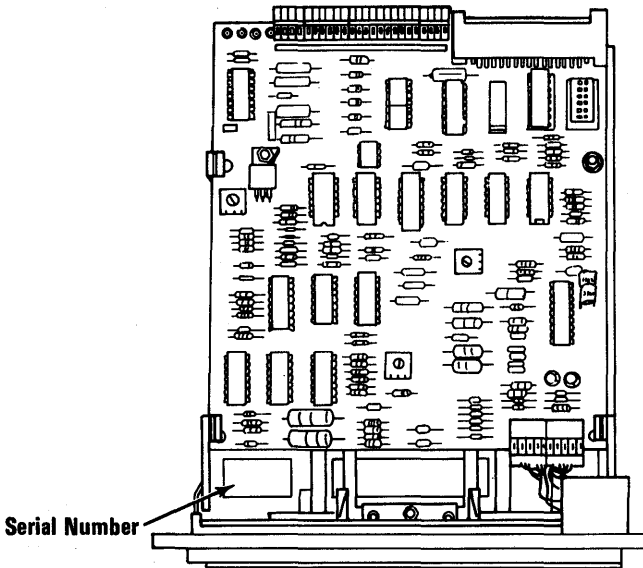


1. Refer to the figure below and find the serial number on the diskette-drive casting. Do not remove any parts; the number is visible from the top of the drive.

2. Determine if your diskette is a type 1 or type 2 drive.

Type 1 diskette drives have an A, B, or no character before the serial number. Type 2 drives have a D.

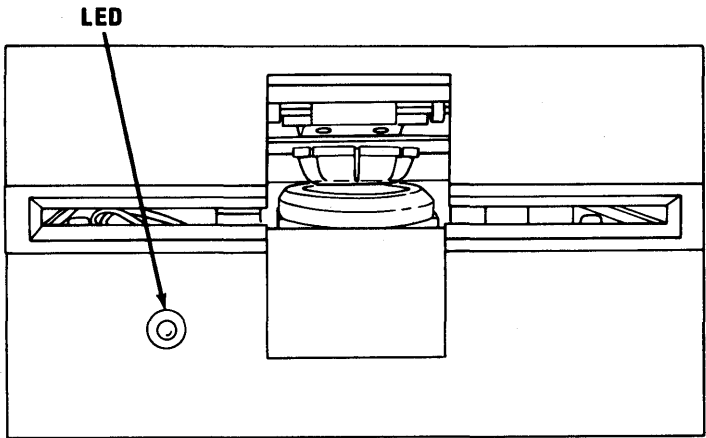
3. Make a note of the type of diskette drive(s) you have.



---

**CONTINUE**


1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Check that the diskette drive connectors are not damaged and that they are connected correctly. Replace damaged connectors.
3. Ensure the diskette assembly mounting screws are tight.
4. Insert your Diagnostics diskette in drive A.
5. Set the Power switch on the expansion unit (if attached) and system unit to On and observe the light-emitting diode (LED) on drive A.



**DID THE LED ON DRIVE A LIGHT BEFORE THE "BEEP" AT THE END OF THE POWER-ON SELF-TEST (POST)?**

**NO** Go to page 3-600-10.

**YES** 



The Diagnostic program should be loaded and the following should appear.

---

The IBM Personal Computer  
ADVANCED DIAGNOSTICS  
Version 2.XX (C) Copyright IBM Corp 1981, 1982

SELECT AN OPTION


0 - RUN DIAGNOSTIC ROUTINES  
1 - FORMAT DISKETTE  
2 - COPY DISKETTE  
3 - PREPARE SYSTEM FOR RELOCATION  
9 - EXIT TO SYSTEM DISKETTE  
ENTER THE ACTION DESIRED  
? -  
-

**IS THE ABOVE MENU ON YOUR SCREEN?**

---

**NO**    Go to page 3-600-15.

**YES**    



Test the write-protect feature as follows:

1. Press 1 (FORMAT DISKETTE) then Enter.
2. Select the drive to test (A or B).
3. Insert a write-protected scratch diskette in the selected drive, then press Enter.

The following message will appear if the write protect feature is working properly.

---


FORMAT NOT COMPLETED  
WRITE PROTECTED DISKETTE  
DRIVE B, TRACK 0, HEAD 0, SECTOR 0

**DID THE MESSAGE APPEAR?**

---

**NO**    Go to page 3-600-36.

**YES**    




Do the following:

1. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  2. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?) then press Enter. (If the list is incorrect, follow the instructions on the screen to correct the list before answering yes. If you cannot correct the list, you must still answer yes to continue.)
- 

---

CONTINUE 

- 
4. Press 1 (RUN TESTS MULTIPLE TIMES) then Enter.
  5. Press 6 (X DISKETTE DRIVE(S) AND ADAPTER) then Enter.
  6. Press 1 (ENTER NUMBER OF TIMES TO RUN TESTS) then Enter.
  7. Press Y (WAIT EACH TIME AN ERROR OCCURS?) then Enter.
  8. Insert a scratch diskette in all diskette drives then press Enter.
- 

```
TESTING - X DISKETTE DRIVE(S) AND ADAPTER
XX:XX:XX
611 TIME OUT
80210200090006
  0301020005
XX:XX:XX
ERROR -
X DISKETTE DRIVE(S) AND ADAPTER 601 S

PRESS ENTER TO CONTINUE
?_
```


---

**DID YOU RECEIVE A 6XX ERROR MESSAGE?**

---

**NO**    Go to page 3-600-33.

**YES**    



The fourth character in line 2 indicates which diskette drive is failing. If the character is 0, drive A is failing; if the character is a 1, drive B is failing.

---

XX:XX:XX

ERROR -  
DISKETTE DRIVE AND ADAPTER 6XX S

611 TIME OUT  
80200400090006  
0300040007

---


**IS THE FOURTH CHARACTER OF LINE 2 A ZERO?**

---

**NO** Set the Power switch on the system unit (and expansion unit, if attached) to Off. Swap the signal cable connectors for drives A and B. (The system now recognizes the original drive B as drive A.) Go to page 3-600-2

If you still have the same failure after swapping the connectors, go to page 3-600-34.

**YES** 



Repeat Steps 1 through 8 starting on page 3-600-6 with another formatted diskette. Then return to this page.

---

Error Code	Action
606.....	Go to page 3-600-32
607.....	Go to page 3-600-36
608.....	Go to page 3-600-32
611.....	Go to page 3-600-32
612.....	Go to page 3-600-31
613.....	Go to page 3-600-31
621.....	Go to page 3-600-31
622.....	Go to page 3-600-31
623.....	Go to page 3-600-31
624.....	Go to page 3-600-31
625.....	Go to page 3-600-31
626.....	Go to page 3-600-31

### DO YOU STILL HAVE AN ERROR?

---

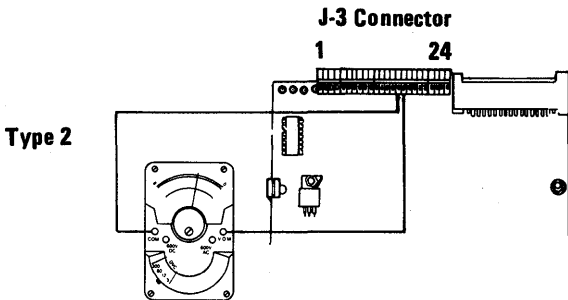
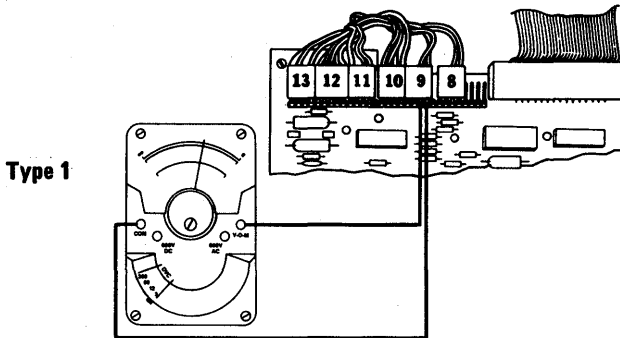
**NO** Replace the diskette you used for the first test.

**YES** Find your error code in the table and go to the page specified.



You may have a bad LED on your diskette drive. If the diagnostic programs perform correctly but the LED does not light, check for a minimum voltage of 1.5 Vdc on the diskette-drive logic board when the spindle is turning.

- For a *Type 1* diskette drive, check between pins P9-1 and P9-2.
- For a *Type 2* diskette drive, check between pins J3-15 and J3-16.

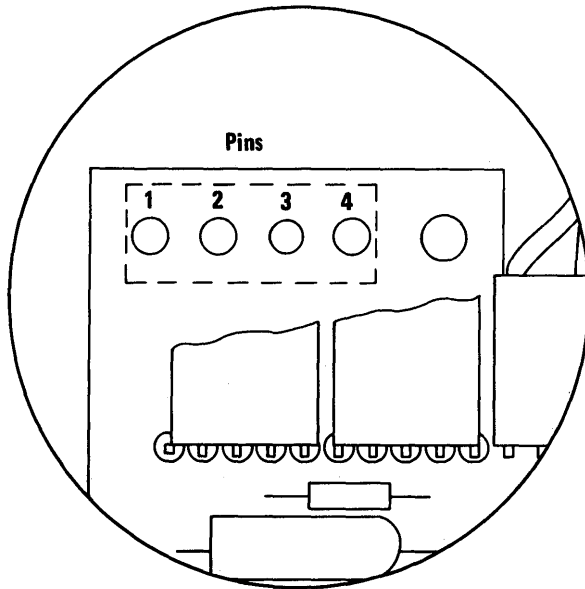


**DID THE VOLTAGE MEASURE AT LEAST 1.5 VDC?**



**YES** Replace the Diskette Drive (see Section 5, "Removal/Replacement and Adjustments").

**NO** 

Check the power connector on drive A for the voltages listed in the table below.



Diskette-Drive Power Connector

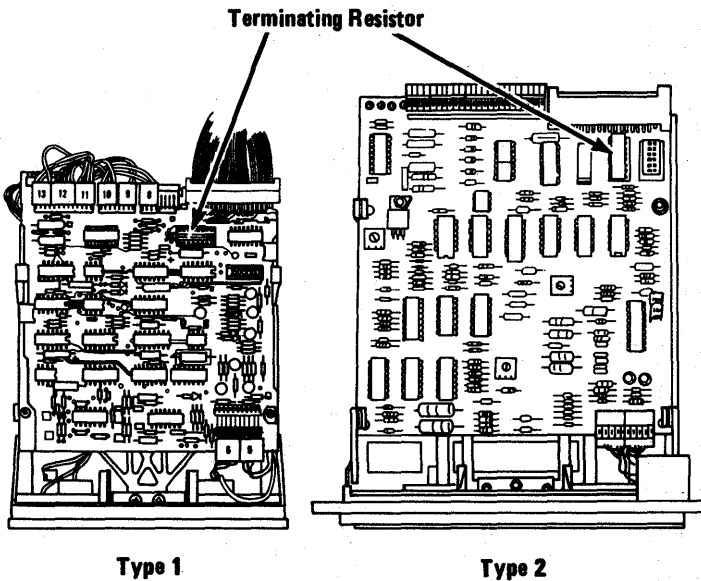
Min Vdc	Max Vdc	- Lead	+ Lead
+4.8	+5.2	2 	4
+11.5	+12.6	3 	1

**ARE THE VOLTAGES WITHIN THE LIMITS SHOWN IN THE TABLE?**

**NO** Go to "Undetermined Problems" on page 3-9999-1.

**YES** 

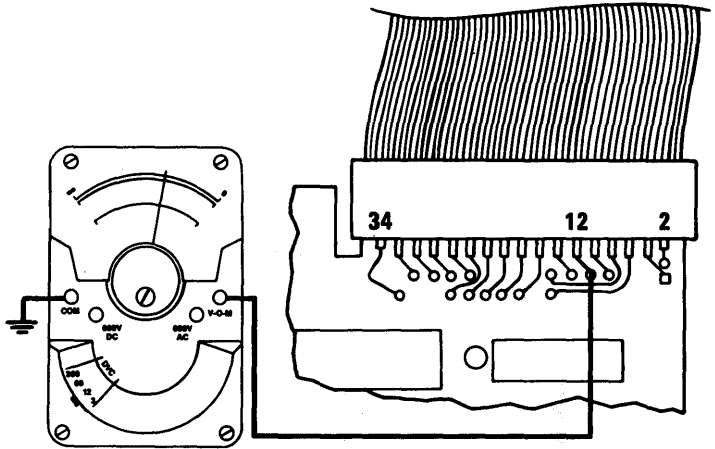
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
  2. Ensure the terminating resistor is correctly inserted. It should be in the logic board of drive A and not in the logic board of drive B (see Section 4, "Locations").
  3. Set the Power switch on the expansion unit (if attached) and the system unit to On.
- 



---

**CONTINUE**

4. Check the voltage at pin 12 on the signal cable connector for approximately 5.0 Vdc at the start of POST.
- 



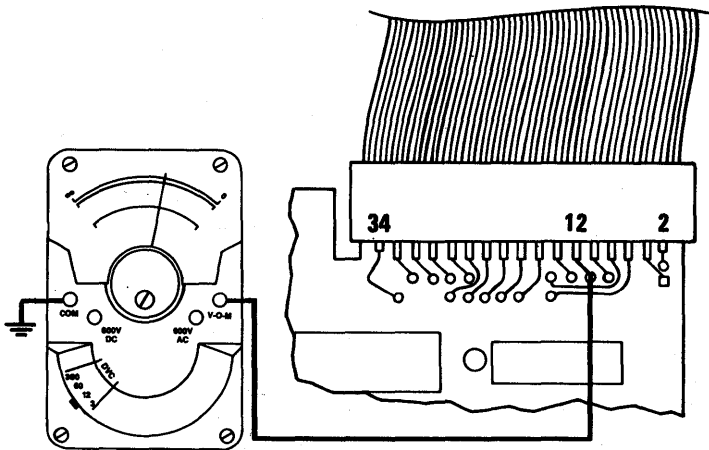
**WAS THE VOLTAGE APPROXIMATELY 5.0 Vdc AT THE START OF POST?**

---

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
3. Check that the voltage at pin 12 on the signal cable connector decreases from approximately 5.0 Vdc at the start of POST, to approximately 0 Vdc during POST.



**DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 Vdc DURING POST?**

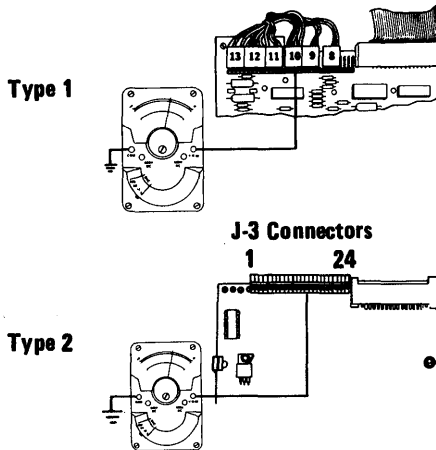
**NO** Go to page 3-600-34.

**YES** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

1. Remove your diskette.

**Warning:** Do not short the pins together when measuring voltages; damage to the boards may occur.

- For a *Type 1* diskette drive, check the voltage from P10-2 to ground while inserting a diskette in drive A. The voltage should decrease from approximately 0.5 Vdc to approximately 0 Vdc as you insert the diskette.
- For a *Type 2* diskette drive, check the voltage from J3-20 to ground increases from approximately 0 Vdc to approximately 5.0 Vdc as you insert the diskette.



**DID THE VOLTAGE CHANGE AS DESCRIBED ABOVE?**

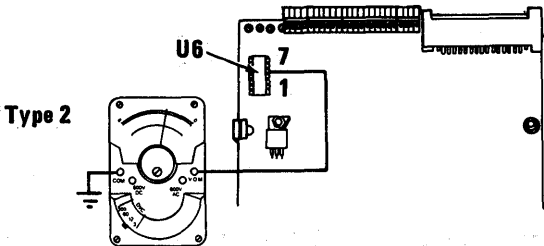
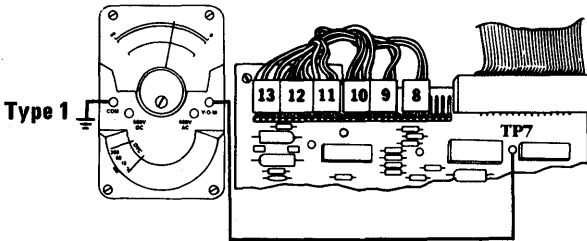
---

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

1. Remove your diskette.

- For a *Type 1* diskette drive, check the voltage from TP-7 to ground while inserting a diskette. The voltage should decrease from approximately 5.0 Vdc to approximately 0 Vdc as you insert the diskette.
- For a *Type 2* diskette drive, check that the voltage between U6 of pin 5 and ground decreases from approximately 5.0 Vdc to approximately 0 Vdc as you insert the diskette.

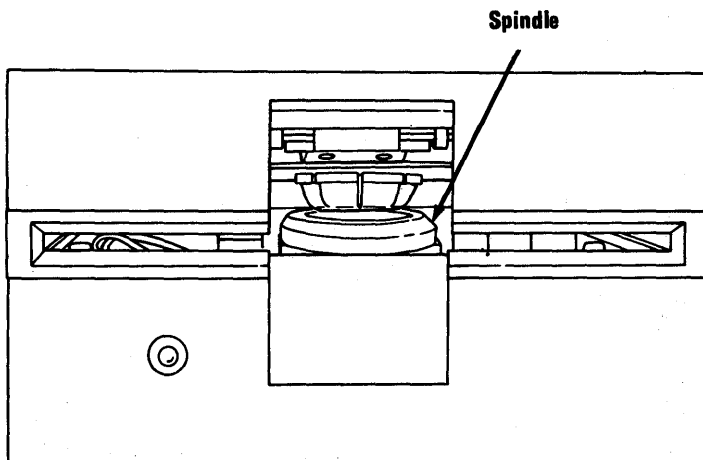


**DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 Vdc?**

**NO** Replace the diskette-drive. (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

1. Remove the diskette.
2. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
3. Set the Power switch on the expansion unit (if attached) and the system unit to On.
4. Observe the spindle during POST.



Front View-Diskette Drive

**DID THE SPINDLE ON DRIVE A BEGIN TO ROTATE BEFORE THE "BEEP" AT THE END OF POST?**

**NO** Go to page 3-600-28.

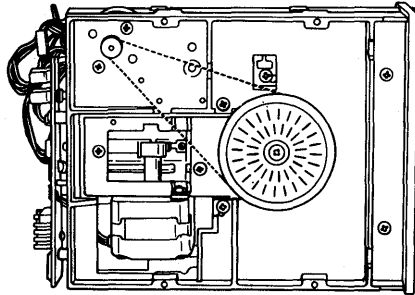
**YES** 



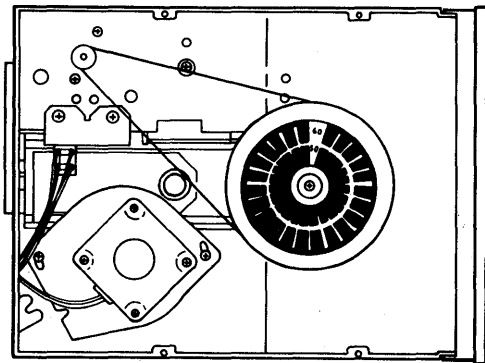
Use the Drive Motor Preliminary Speed Adjustment to ensure the diskette drive speed is correct (see Section 5, "Removal/Replacement and Adjustments").

*Note:* Fluorescent lighting is needed to see the strobe effect on this test.

Type 1



Type 2



**IS THE SPEED OF THE DISKETTE DRIVE CORRECT?**

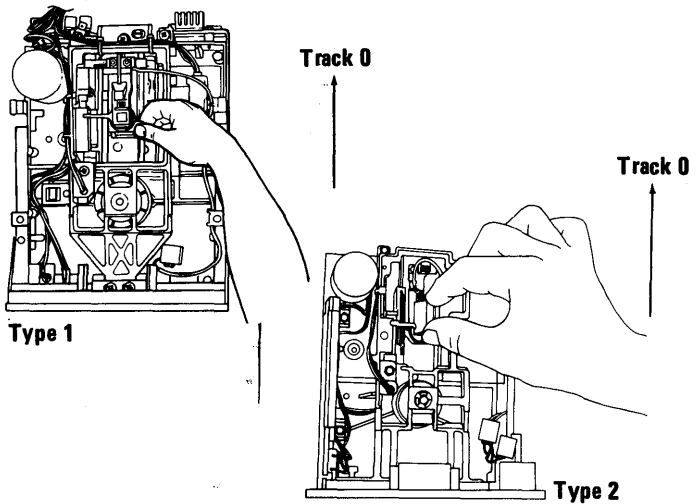
**NO** Adjust the speed of the diskette drive. If you are unable to adjust the speed, replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES**



1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove the diskette-drive logic board (see Section 5, "Removal/Replacement and Adjustments").
3. Move the read/write head assembly toward the rear of the diskette drive assembly until it reaches track 0.

*Note:* The head is moved under power by the stepper motor. When you move the head by hand, you will feel some resistance, but the head should not bind.



### **DID THE HEAD MOVE TO TRACK 0 WITHOUT BINDING?**

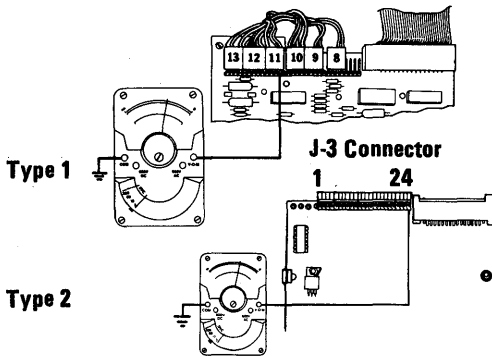
**NO** Replace the diskette drive assembly (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

1. With the head still at track 0, reinstall the diskette-drive logic board (see Section 5, "Removal/Replacement and Adjustments").

*Note:* The head may move away from track 0 during this test. If you do this test a second time, move the head back to track 0.

2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
  - For a *Type 1* diskette drive, check the voltage at P11-1. It should be approximately 0 Vdc before the LED lights at the end of
  - For a *Type 2* diskette drive, check that the voltage at pin 26 on the signal cable connector is approximately 5.0 Vdc at the start of POST.




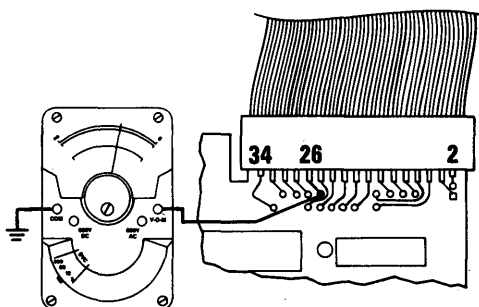
### IS THE VOLTAGE CORRECT?

---

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Remove the diskette-drive logic board (see Section 5, "Removal/Replacement and Adjustments").
  3. Move the read/write head assembly toward the rear of the diskette drive assembly until it reaches track 0.
  4. Reinstall the diskette-drive logic board (see Section 5, "Removal/Replacement and Adjustments").
  5. Set the Power switch on the expansion unit (if attached) and the system unit to On.
  6. Check that the voltage at pin 26 on the signal cable connector is approximately 5.0 Vdc at the start of POST then decreases to approximately 0 Vdc as the LED lights at the end of POST.
- 

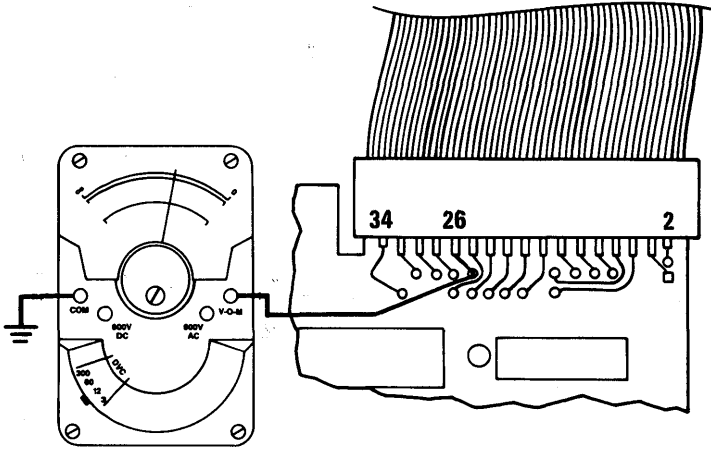


**WAS THE VOLTAGE APPROXIMATELY 5.0 Vdc AT THE START OF POST?**

---

**NO** Go to page 3-600-34.

**YES** 

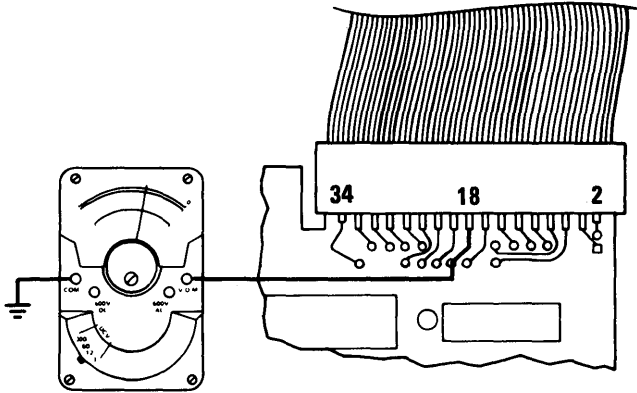


**DID THE VOLTAGE DECREASE TO APPROXIMATELY 0 Vdc WHEN THE LED LIT AT THE END OF POST?**

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
2. Ensure the terminating resistor is correctly inserted. It should be in the logic board of drive A and not in the logic board of drive B (see Section 4, "Locations.").
3. Set the Power switch on the expansion unit (if attached) and the system unit to On.
4. Check that the voltage at pin 18 on the signal cable connector is approximately 5.0 Vdc at the start of POST and decreases to approximately 0 Vdc before the "beep" at the end of POST.

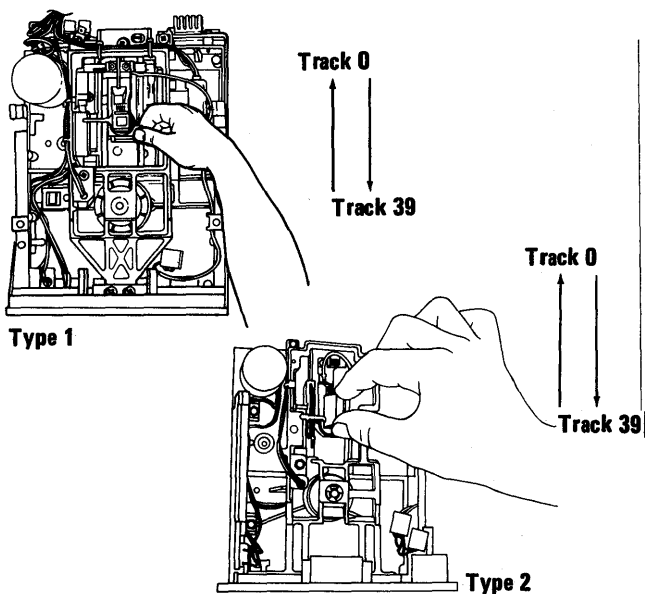


**DID THE VOLTAGE AT PIN 18 DECREASE TO APPROXIMATELY 0 Vdc?**

**NO** Go to page 3-600-34.

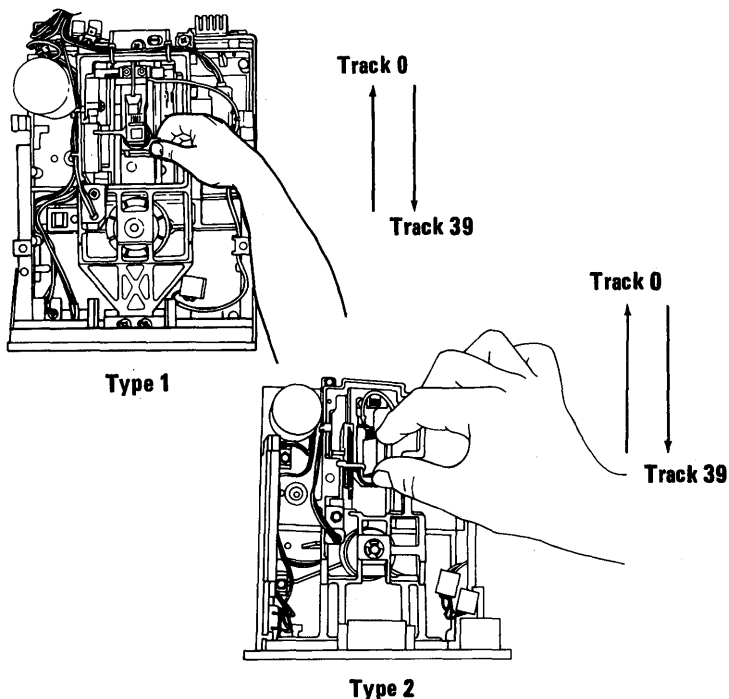
**YES** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Partially remove the diskette-drive logic board see Section 5, "Removal/Replacement and Adjustments" and the instructions below.
  - For a *Type 1* diskette drive, leave all connectors except P5 and P6 connected.
  - For a *Type 2* diskette drive, leave all connectors except HD0 and HD1 connected.
3. Lift the diskette-drive logic board just enough to see the head assembly.
4. Move the head assembly away from track 0.



CONTINUE

5. Set the Power switch on the expansion unit (if attached) and the system unit to On.
6. Observe the movement of the head assembly.




**DOES THE HEAD ASSEMBLY MOVE TO TRACK 0 AND THEN AWAY FROM IT BEFORE THE END OF POST?**

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES** 



- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Reinstall the diskette-drive logic board and connectors you disconnected earlier (see Section 5, "Removal/Replacement and Adjustments").
  3. Insert your Diagnostics diskette.
  4. Set the Power switch on the expansion unit (if attached) and the system unit to On.
- 

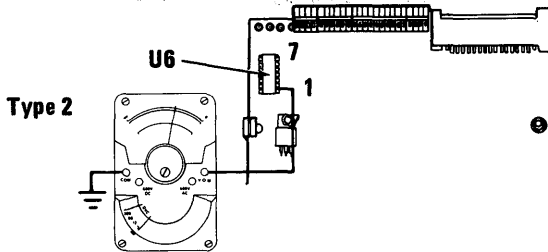
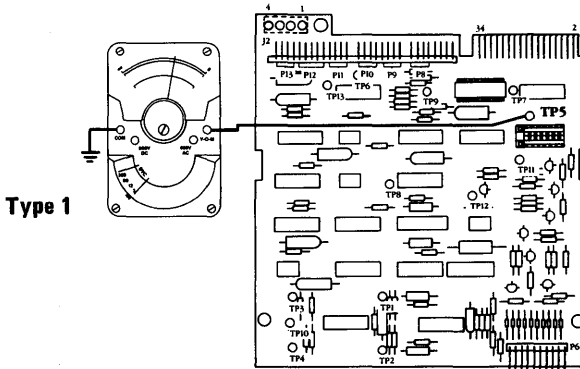
---

**CONTINUE**



Check for an increase in voltage (approximately 0.2 Vdc) at the respective points below:

- For a *Type 1* diskette drive, check point TP-5 of the diskette-drive logic board while the LED is on during POST.
- For a *Type 2* diskette drive, check point U6-1 of the diskette-drive logic board while the LED is on during POST.



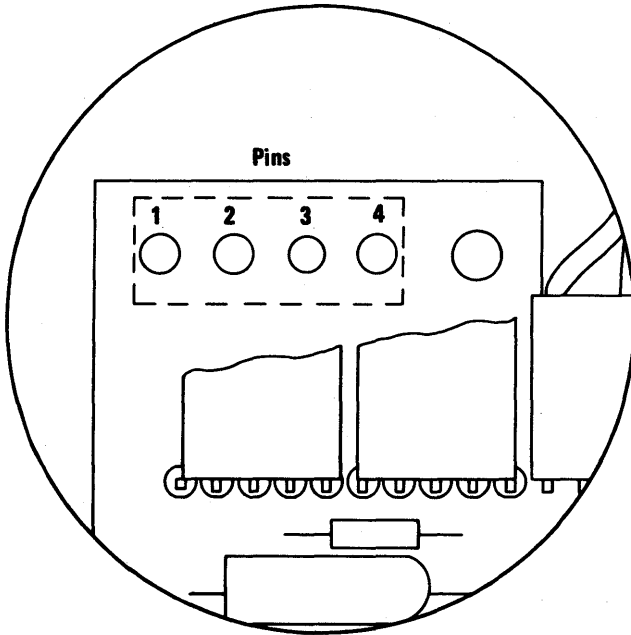
**DOES THE VOLTAGE INCREASE WHEN THE LED IS ON?**

**NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").



**YES** Go to page 3-600-34.

Check the diskette-drive power connector for the voltages listed in the table below.

---



### Diskette-Drive Power Connector

Min Vdc	Max Vdc	- Lead	+ Lead
+ 4.8	+5.2	2 	4
+ 11.5	+12.6	3 	1

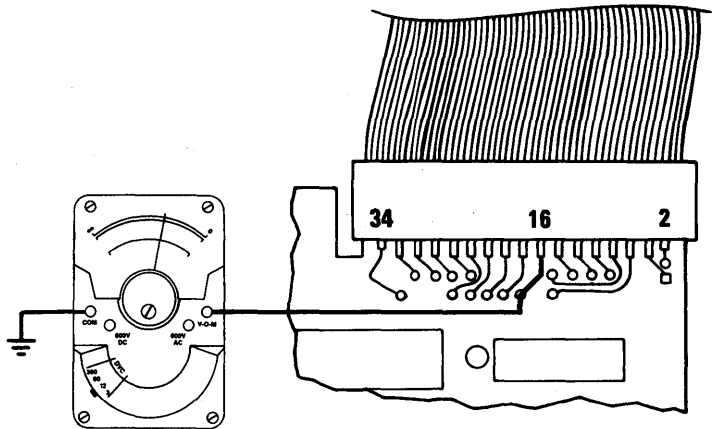
**ARE THE VOLTAGES WITHIN THE LIMITS SHOWN IN THE TABLE?**

---

**NO** Go to "Undetermined Problems" on page 3-9999-1.

**YES** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
3. Check that the voltage at pin 16 on the signal cable connector is approximately 5.0 Vdc at the start of POST and decreases to approximately 0 Vdc before the "beep" at the end of POST.



**DID THE VOLTAGE AT PIN 16 DECREASE TO APPROXIMATELY 0 Vdc?**

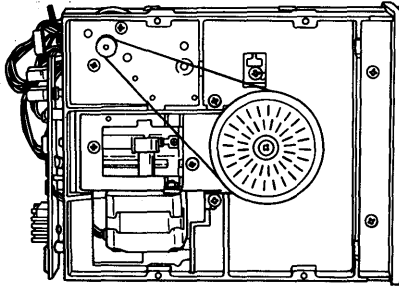
**NO** Go to page 3-600-34.

**YES** 

Check that the diskette drive belt is correctly installed on the pulleys and is in good condition.

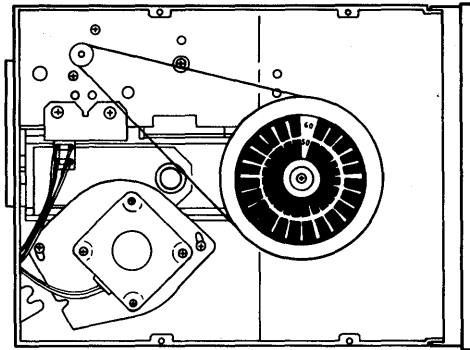
---

Type 1



Bottom View

Type 2



**IS THE DRIVE BELT INSTALLED ON THE PULLEYS CORRECTLY AND IN GOOD CONDITION?**

---

**NO** If the belt is installed incorrectly, correct it; if it is not in good condition, replace it (see Section 5, "Removal/Replacement and Adjustments").

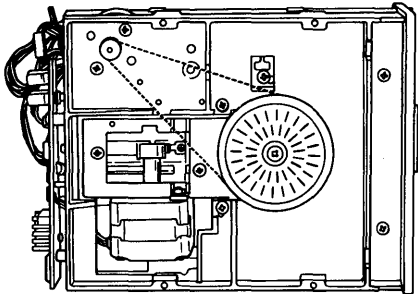
**YES** Replace the Diskette Drive (see Section 5, "Removal/Replacement and Adjustments").

1. Use the Drive Motor Preliminary Speed Adjustment to ensure the diskette drive speed is correct (see Section 5, "Removal/Replacement and Adjustments").

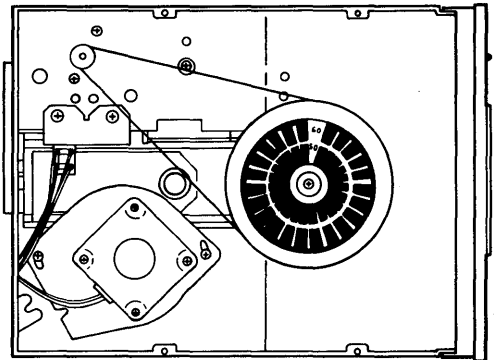
*Note:* Fluorescent lighting is needed on this test to see the strobe effect.

2. Go to page 3-600-6, and perform steps 1 through 8, to do the diagnostic tests on a formatted diskette. Then return to this page.

Type 1



Type 2

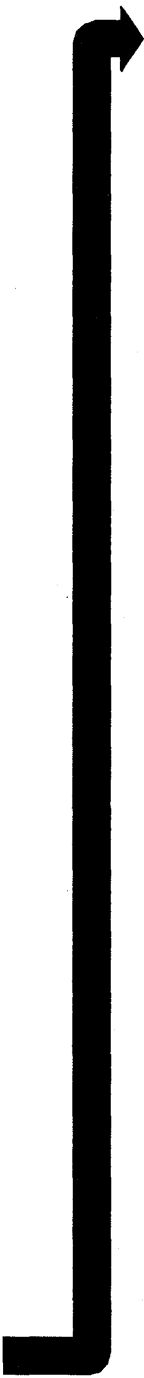


**DO YOU STILL HAVE AN ERROR CODE?**

**NO** Do the diagnostic tests to verify you have fixed the problem.

**YES**






Do not use the following table unless you were sent here by an earlier step in this PIC.

Follow the instructions for your error code.

---

### Diskette Drive Error Codes

<b>Error Code</b>	<b>Probable Cause</b>	<b>Corrective Action</b>
606 611 621 622 623 624 625 626	Your signal cable, Diskette Drive Adapter, or Diskette Drive has failed.	Go to page 3-600-34.
607	Write-Protect Error	Go to page 3-600-36.
608	There is a problem with your Diagnostics Diskette.	Use your backup copy of the Diagnostics diskette.
612 613	Your signal cable or Diskette Drive Adapter has failed.	Go to page 3-600-34.



Information about the diskette drives installed in your system appears on the screen. Your drives are single-sided or double-sided.

*Note:* Single-sided drives do not have a read/write head connected to P5 (see Section 4, "Locations").

---

TESTING - 1 DISKETTE DRIVE(S) AND ADAPTER  
DISKETTE A: IS DOUBLE SIDED  
1 DISKETTE DRIVE(S) AND ADAPTER      600S

---

**IS THE DISKETTE DRIVE INFORMATION CORRECT?**

---

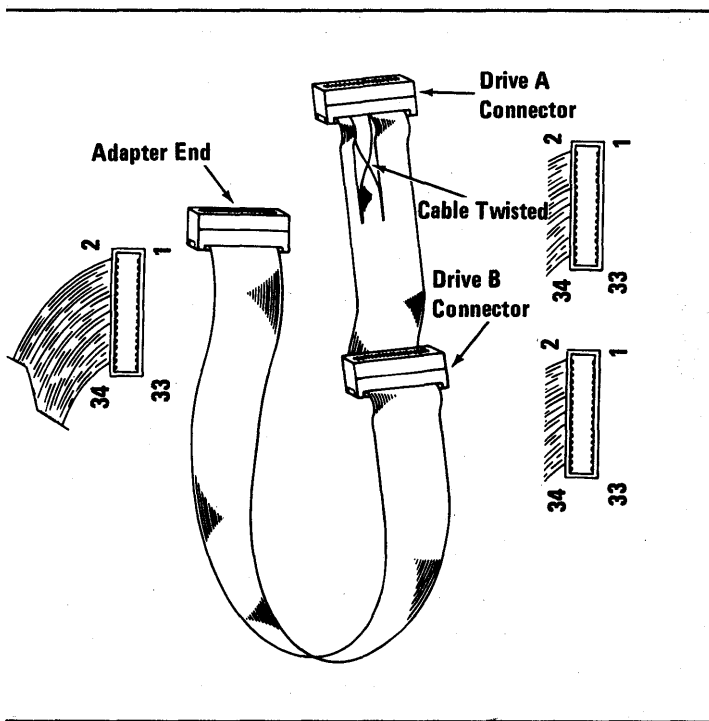
**NO**    Replace the diskette drive whose information is incorrect in the message (see Section 5, "Removal/Replacement and Adjustments").

**YES**    Go to page 3-600-39.



You may have a bad connection or a broken wire. Check the continuity of the diskette drive signal cable as follows:

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Disconnect the diskette drive signal cable from the Diskette Drive Adapter and diskette drive.
3. Carefully inspect the cable connectors for bent or broken contacts. Inspect the connectors on the adapter and on the diskette drive logic board for cracks or corrosion.
4. Set the meter on the Ohms (x1) scale.
5. Refer to the tables on the next page and check the continuity of the signal cable. The meter should indicate approximately 0 ohms.



*Note:* Check continuity from pin number to pin number, except the pins preceded by an asterisk.

---

Diskette Drive A Signal-Cable Connector		Diskette Drive B Signal-Cable Connector	
Even Pin Numbering Diskette	Adapter	Even Pin Numbering Diskette	Adapter
2	2	2	2
4	4	4	4
6	6	6	6
8	8	8	8
*10	16	10	10
*12	14	12	12
*14	12	14	14
*16	10	16	16
18	18	18	18
20	20	20	20
22	22	22	22
24	24	24	24
26	26	26	26
28	28	28	28
30	30	30	30
32	32	32	32
34	34	34	34
Odd Pin Numbering Diskette	Adapter	Odd Pin Numbering Diskette	Adapter
1	1	1	1
3	3	3	3
5	5	5	5
7	7	7	7
9	9	9	9
*11	15	11	11
13	13	13	13
*15	11	15	15
17	17	17	17
19	19	19	19
21	21	21	21
23	23	23	23
25	25	25	25
27	27	27	27
29	29	29	29
31	31	31	31
33	33	33	33

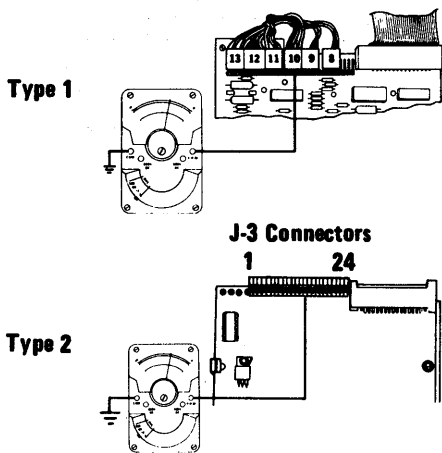
### IS THE CONTINUITY OF THE SIGNAL CABLE CORRECT?

---

**NO** Replace the signal cable (see Section 5, "Removal/Replacement and Adjustments").

**YES** Replace the Diskette Drive Adapter. If the problem still exists, replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

1. Remove your diskette.
2. Move a diskette in and out of the diskette drive to operate the Write Protect switch.
  - For a *Type 1* diskette drive, check that the voltage from P8-1 to ground increases to approximately 5.0 Vdc each time the switch operates.
  - For a *Type 2* diskette drive, check that the voltage from J3-14 to ground decreases from approximately 5.0 Vdc to approximately 0 Vdc each time the switch operates.



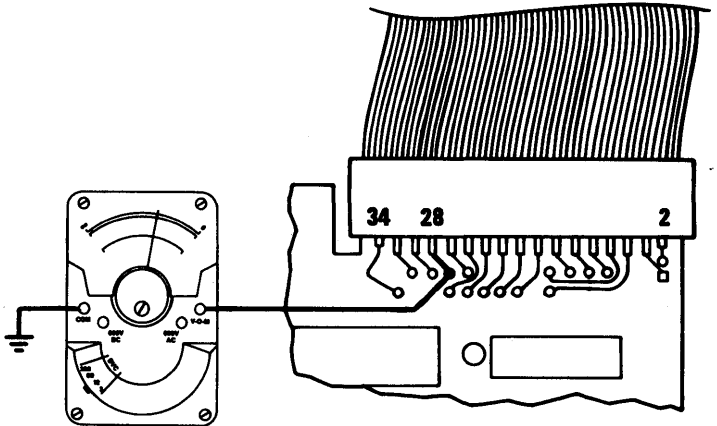
**DID THE VOLTAGE CHANGE AS DESCRIBED ABOVE EACH TIME THE SWITCH OPERATED?**

---

**NO**      Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").

**YES**      

1. Remove your diskette.
  2. Check that the voltage at J1-28 is approximately 5.0 Vdc.
- 




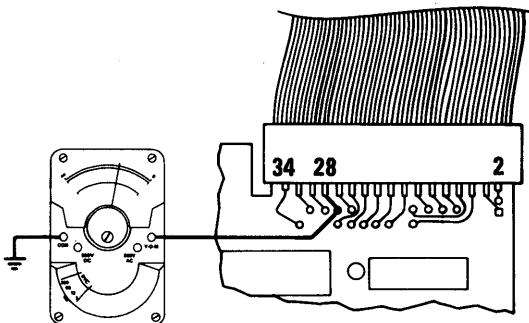
**IS THE VOLTAGE APPROXIMATELY 5.0 Vdc?**

---

**NO** Go to page 3-600-34.

**YES** 


- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off for 5 seconds.
  2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
  3. Move a diskette in and out of the diskette drive to operate the Write Protect switch. Measure the voltage at J1-28 when the LED is on. The voltage should be approximately 5.0 Vdc and decrease to approximately 0 Vdc each time the Write Protect switch operates. To test drive B, exchange the signal cable connectors and do the same steps.
- 



**DID THE VOLTAGE CHANGE FROM APPROXIMATELY 5.0 Vdc TO APPROXIMATELY 0 Vdc EACH TIME THE WRITE PROTECT SWITCH OPERATED WHILE THE LED WAS ON?**

---

- NO** Replace the diskette drive (see Section 5, "Removal/Replacement and Adjustments").
- YES** Replace the Diskette Drive Adapter (see Section 5, "Removal/Replacement and Adjustments").



You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select **LOG UTILITIES** in the System Checkout menu, start an error log, and select **RUN TESTS MULTIPLE TIMES**. This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

## Notes:

# Math Coprocessor

You have entered this PIC because you have a 7XX error code or have identified a Math Coprocessor problem. Follow the steps on this page to run the diagnostic routines.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Insert your Diagnostics diskette in drive A.
3. Set the Power switch on the expansion unit (if attached) and the system unit to On.

The menu below should be displayed.

---

```
The IBM 3270 Personal Computer
DIAGNOSTICS
Version 2.XX (C) Copyright IBM Corp XXXX XXXX

SELECT AN OPTION

0 - RUN DIAGNOSTIC ROUTINES
1 - FORMAT DISKETTE
2 - COPY DISKETTE
3 - PREPARE SYSTEM FOR RELOCATION
9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED


?_ -
-
```

---

**CONTINUE**







Follow the steps below to run the diagnostic routines.

1. Press 0 (RUN DIAGNOSTIC ROUTINES) then press Enter.  
(Skip Step 2 if you have only one display adapter installed.)
2. Press Y or N (IS THE LIST CORRECT (Y/N)?) then press Enter.

(If the list is not correct, follow the instructions on your screen and correct the list before answering yes.)

Press 0 (RUN TESTS ONE TIME) then press Enter.

Press 7(MATH COPROCESSOR) then press Enter.

The message on the screen below should appear for ten seconds or less.

---

TESTING MATH COPROCESSOR


---

**WAS THIS MESSAGE DISPLAYED FOR TEN SECONDS OR LESS?**

---

**NO** Replace the Math Coprocessor and 8088 processor. See Section 5, "Removal/Replacement and Adjustments"

**YES** 



You may receive an error message similar to the one below.

---


ERROR MATH COPROCESSOR 701 S  
SWITCH 1 - 2 INCORRECT  
  
PRESS ENTER TO CONTINUE

**DID YOU COMPLETE THE TEST WITHOUT THIS ERROR MESSAGE?**

---

**NO** Set all Power switches to Off. Correct the switch settings in your machine. See Section 6, "Switch Setting" Go to page 3-700-1 and begin the PIC again.

**YES** 



You may receive an error message similar to the one below.

---


ERROR MATH COPROCESSOR 701 S

**DID YOU COMPLETE THE TEST WITHOUT THIS ERROR MESSAGE?**

---

**NO**    Replace the Math Coprocessor and 8088 processor. See Section 5, "Removal/Replacement and Adjustments".

**YES**    



You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

---

1. Check the entire system for loose or damaged connectors.
2. Return to page 3-5-1 and review "Start".
3. Select "UTILITIES" in the diagnostic menu, start an error log, and select "RUN TESTS MULTIPLE TIMES". This will allow you to operate the machine thoroughly and identify the failing symptom. When you have identified the symptom, go to the page 3-5-1, "Start", or the appropriate PIC for the symptom you received.

---

If you have followed these procedures and still have an unsolved problem, you should request technical assistance.

# Notes:

# Printer Adapter 900


You have entered this PIC because your system has a 90X error code or you have identified a Printer Adapter problem. Follow the steps below and do the diagnostic tests.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Remove the Printer Cable from the Printer Adapter.
  3. Insert the Diagnostics diskette in drive A.
  4. Set the Power switch on the expansion unit (if attached) and system unit to On.
  5. When the System Checkout menu appears, press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
- 

---

**CONTINUE**



- 
1. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  2. Press Y or N (IS THE LIST CORRECT?) then Enter. If the list is incorrect, follow the instructions on the screen to correct the list before answering yes. If you can not correct the list, you still must answer yes before you can continue.
  3. Press 0 (RUN TESTS ONE TIME) then Enter.
  4. Press 9 (PRINTER ADAPTER) then Enter.

You may receive an error message similar to the one below.

---

```
X:XX:XX  
ERROR -  
PRINTER ADAPTER 432 S
```


```
PRESS ENTER TO CONTINUE _  
-
```

**DID THE TEST FINISH WITHOUT AN  
ERROR MESSAGE?**

---

**NO** Go to page 3-900-6.

**YES** 



If you did not receive an error message, you would have received a message similar to the one below.

*Note:* Do not press Enter at this time.

---

TESTING - PRINTER ADAPTER

INSTALL THE WRAP PLUG AND PRESS ENTER \_

-

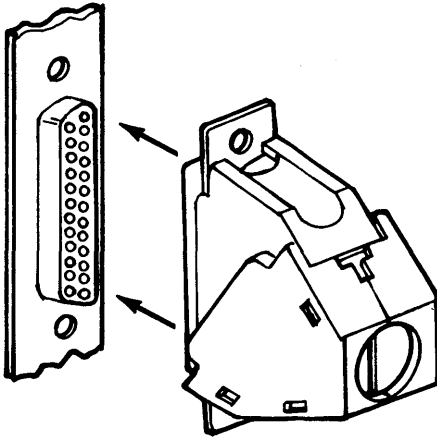
---

**CONTINUE** 



Install the Printer Adapter wrap plug, as shown below. If you do not install the wrap plug, you will receive an invalid error code.


---



**Printer  
Adapter Wrap Plug  
(IBM Part 8529228)**

---

**CONTINUE** 



Press Enter to begin the test. An error message similar to the one shown below may appear.

---

```
0:06:21
ERROR -
PRINTER ADAPTER 432 S

PRESS ENTER TO CONTINUE _
-
```

---

### **DID AN ERROR MESSAGE APPEAR?**

---

- NO** Remove the Printer Adapter wrap plug. You may want to run additional tests on the printer attached to this adapter (see PIC 3-1400-1, "Graphics Printer"). Go to page 3-900-9
- YES** Replace the Printer Adapter (see Section 5, "Removal/Replacement and Adjustments").

If your printer adapter is installed in an expansion unit, there could be a problem with the expansion unit.

---


**IS THE PRINTER ADAPTER INSTALLED IN AN EXPANSION UNIT?**

---

**NO**    Replace the Printer Adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**




- 
1. Set the Power Off on both the system unit and expansion unit.
  2. Remove the covers from both units.
  3. Remove the printer adapter from expansion unit.
  4. Remove the extender card. (This is the card in the system unit that communicates with the expansion unit.)
  5. Plug the printer adapter into the vacant slot.
  6. Go to 3-900-1 to rerun the PIC then return here and answer the question below.
- 

**DID THE DIAGNOSTIC COMPLETE  
WITHOUT ERRORS?**

---

**NO**     Replace printer adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**     



Check the continuity of the expansion unit  
signal cable.

---

**IS THE CONTINUITY GOOD?**

---

**NO**    Replace the expansion unit signal cable.

**YES**    Replace the expansion unit receiver card.

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "LOG UTILITIES" in the System Checkout menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

# Notes:

10/10/10  
10/10/10  
10/10/10

# Asynchronous Communications Adapter 1100

You have entered this PIC because your system has an 11XX error code or you have a problem with asynchronous communications.

Before starting the diagnostic tests, refer to Section 4, "Locations", and ensure the following conditions have been met:

- The primary Asynchronous Communications Adapter is set for "primary asynchronous adapter" operation.
- If a second Asynchronous Communications Adapter is installed, it must be set for "alternate asynchronous adapter" operation.

The asynchronous communications adapter can be set to either RS-232 mode or Current-Loop Mode, depending on the position of a module on the face of the adapter. When you run the diagnostic:


- For RS-232 mode, use wrap plug 8529228.
- For Current-Loop mode, use wrap plug 6423197.

---

CONTINUE





- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Insert the Diagnostics diskette in drive A.
  3. Set the Power switch on the expansion unit (if attached) and the system unit to On. If an error occurs, press the PF1 key.

The following appears on your screen.

---

```
The IBM Personal Computer
ADVANCED DIAGNOSTICS
Version 2.XX (C) Copyright IBM Corp 1981, 1983
```

```
SELECT AN OPTION
```

```
0 - RUN DIAGNOSTIC ROUTINES
1 - FORMAT DISKETTE
2 - COPY DISKETTE
3 - PREPARE SYSTEM FOR RELOCATION
9 - EXIT TO SYSTEM DISKETTE
```

```
ENTER THE ACTION DESIRED
```

```
? _
-
```

---

**CONTINUE** 




Do the following:

1. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  2. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  4. Press 0 (RUN TESTS ONE TIME) then Enter.
  5. Select 11 (ASYNC COMMUNICATIONS ADAPTER) then press Enter.
- 

---

**CONTINUE** 

- 
6. Press Y or N (IS AN IBM COMMUNICATIONS CABLE ATTACHED?) then press Enter.

The screen message now instructs you to install the wrap plug on either the Asynchronous Communications Adapter or the IBM Communications Adapter Cable.

---

TESTING - ASYNC COMMUNICATIONS ADAPTER

IS AN IBM COMMUNICATIONS ADAPTER CABLE  
ATTACHED TO THE ASYNC ADAPTER (Y/N)? y

INSTALL THE WRAP PLUG ON THE END  
OF THE CABLE AND PRESS ENTER? \_

-

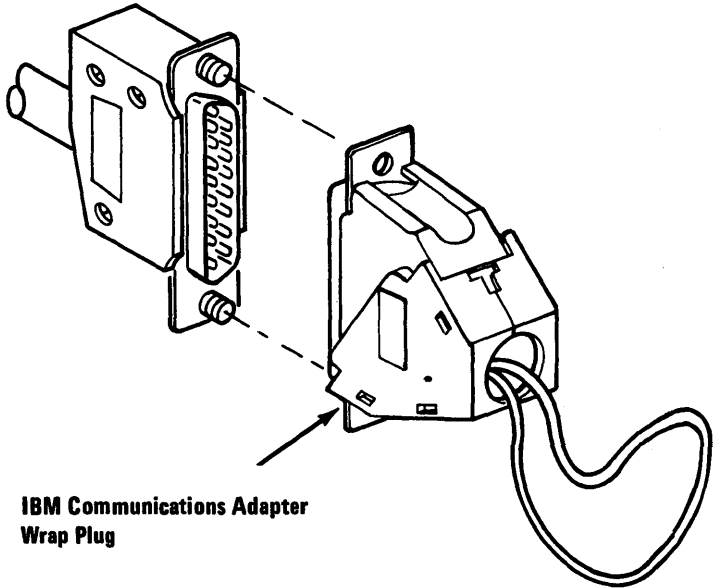
**IS AN IBM COMMUNICATIONS ADAPTER  
CABLE ATTACHED?**

---

**NO**    Go to page 3-1100-6.

**YES**    

1. Refer to the figure below and install the wrap plug on the modem end of the IBM Communications Adapter Cable.
  2. Press Enter to begin the test. The test may take up to 15 seconds.
- 



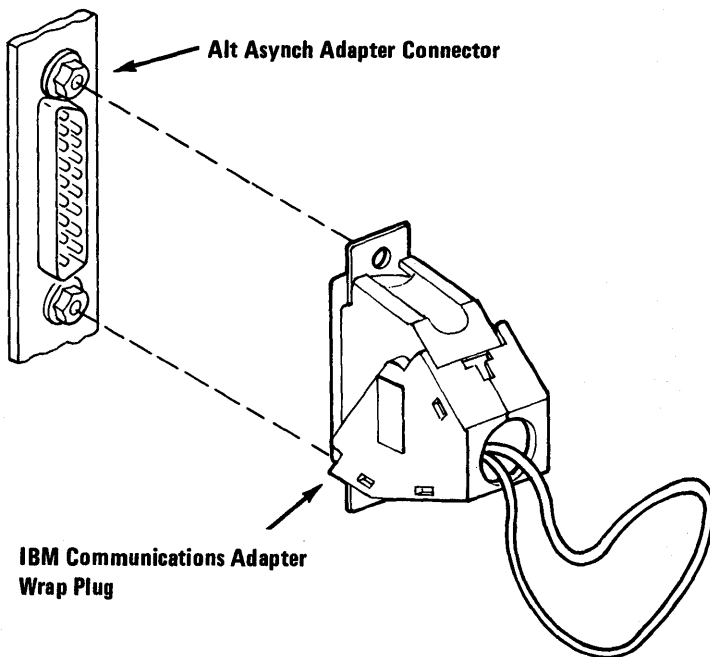
**DID YOU RECEIVE A MESSAGE  
INSTRUCTING YOU TO INSTALL THE  
WRAP PLUG ON THE ASYNC ADAPTER?**

---

**NO**    Go to page 3-1100-7

**YES**    

1. Disconnect the Communications Adapter Cable (if attached) from the Asynchronous Communications Adapter.
2. Refer to the figure below and install the wrap plug on the Asynchronous Communications Adapter.
3. Press Enter to begin the test. The test may take up to 15 seconds.




**DID THE TEST FINISH WITHOUT AN ERROR?**

---

**YES** Go to page 3-1100-10.

**NO** 



The test ended with an error.


---

**IS THE ASYNC ADAPTER INSTALLED IN  
THE EXPANSION UNIT?**

---

**NO**    Replace the cable or adapter as instructed  
by the screen message.

**YES**    


- 
1. Set the Power Off on both the system unit and expansion unit.
  2. Remove the covers from both units.
  3. Remove the asynchronous communications adapter from expansion unit.
  4. Remove the extender card. (This is the card in the system unit that communicates with the expansion unit.)
  5. Plug the asynchronous communications adapter into the vacant slot.
  6. Go to 3-1100-1 to rerun the PIC then return here and answer the question below.
- 

**DID THE DIAGNOSTIC COMPLETE  
WITHOUT ERRORS?**

---

**NO**    Replace the cable or adapter as instructed by the screen message.

**YES**    



Check the continuity of the expansion unit  
signal cable.

---

**IS THE CONTINUITY GOOD?**

---

**NO**    Replace the expansion unit signal cable.

**YES**    Replace the expansion unit receiver card.



You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "LOG UTILITIES" in the System Checkout menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

# Notes:



# IBM 5152 Graphics Printer 1400

You have entered this PIC because your system has a 14XX error code or you have identified a problem with your Matrix or Graphics Printer.

*Note:* If you have not already done so, run the Printer Adapter diagnostic before you continue with this procedure.

1. Set the system unit power switch to Off.
  2. Set the printer Power switch to Off.
  3. Verify that the forms and ribbon are properly inserted and not binding.
  4. Move the print head to the leftmost position.
  5. Set the printer Power switch to On.
- 

**ARE THE POWER, READY AND ONLINE LIGHTS ON?**

---

**NO**    Go to page 3-1400-12.

**YES**





Press the Online button.


---

**DO THE ONLINE AND READY LIGHTS GO OUT?**

---

**NO** Replace the printer. See Section 5, "Removal/Replacements and Adjustments".

**YES** 


- 
1. Press the Line Feed button and verify that the paper advances a line at a time.
  2. Press the Form Feed button and verify that the paper advances a form at a time.
- 

**DOES THE PAPER ADVANCE WHEN YOU  
PRESS EACH BUTTON?**

---

**NO** Replace the printer. See Section 5,  
"Removal/Replacements and  
Adjustments".

**YES** 


- 
1. Remove all forms.
  2. Press the Online button.
- 

**DOES THE ALARM SOUND AND THE NO PAPER LIGHT GO ON?**

---

**NO** Check the switch settings on the printer circuit board. If switch setting 1-6 is On, replace the printer. If it is Off, position it to On, then rerun this procedure.

**YES** 


- 
1. Set the printer Power switch to Off.
  2. Reinsert the forms.
  3. Set the printer Power switch to On.
  4. Insert the Diagnostics diskette in drive A and push the load lever down.
  5. Set the system unit Power switch to On.
  6. When the Diagnostic Menu appears, type 0 (RUN DIAGNOSTIC ROUTINES) then press Enter.
- 

---

**CONTINUE**







When the Installed Devices menu appears check to see that "14" is on the list.


---

**IS OPTION 14 ON THE INSTALLED DEVICES MENU?**

---

**NO**    Go to page 3-1400-11.

**YES**    

- 
1. Type Y, then press Enter.
  2. Type 0, then press Enter to select RUN TESTS ONE TIME.
  3. Type 14, then press Enter.
- 

**DID YOUR PRINTER PRINT THE TEST PATTERN?**

---

**NO** Go to page 3-1400-11.

**YES** 

Compare the printout with the appropriate sample on the following pages.

---

## IBM MATRIX PRINTER

!"#\$%&'()\*+,-./  
0123456789=:;<=>?  
@ABCDEFGHIJKLMNO  
PQRSTUVWXYZ[\]^\_  
'abcdefghijklmnop  
pqrstuvwxyz{|}~  
!"#\$%&'()\*+,-./  
0123456789:;<=>?  
@ABCDEFGHIJKLMNO  
PQRSTUVWXYZ[\]^\_  
'abcdefghijklmnop  
pqrstuvwxyz{|}~  
!"#\$%&'()\*+,-./  
" 7.1.7.7.7.7

---

CONTINUE 

If it applies to you, compare the printout with the sample below.

## IBM 5152 GRAPHICS PRINTER


### Character Set 1

```
!"#$%&'()*+,-./
0123456789:; <=>?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmnop
pqrstuvwxyz{ }~
!"#$%&'()*+,-./
0123456789:; <=>?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmnop
pqrstuvwxyz{ }~
!"#$%&'()*+,-./
áíóúññáâäåçèéêëì«»
ΣπσρσΣβΓσπσρσ@Ω
□ □ □ □
```

### Character Set 2

```
!"#$%&'()*+,-./
0123456789:; <=>?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmnop
pqrstuvwxyz{ }~
!"#$%&'()*+,-./
0123456789:; <=>?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmnop
pqrstuvwxyz{ }~
!"#$%&'()*+,-./
áíóúññáâäåçèéêëì«»
ΣπσρσΣβΓσπσρσ@Ω
□ □ □ □
▼♦♣♠ üéääáá
```

CONTINUE



Your printout should have matched one of the samples shown on the previous pages.

---

**DID YOUR PRINTOUT MATCH THE APPROPRIATE SAMPLE?**

---

**YES** If you are using a keyboard other than U.S.-English, and your printout does not match the desired character set, verify that the switch settings are correct for the desired character set. If the switch settings are correct, have your printer serviced.

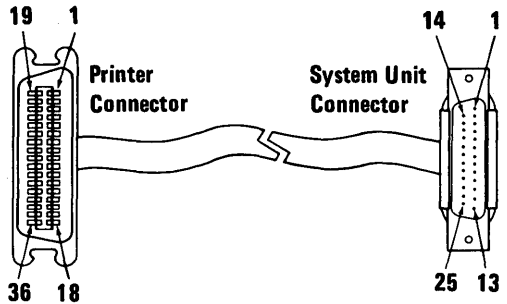
If you still have a problem, go to page 3-1400-19.

**NO** 

1. Set the printer, system unit and expansion unit Power switches to Off.
2. Remove the Printer cable from the back of the printer.
3. Remove the Printer cable from the printer adapter.
4. Check the printer cable. See Section 4, "Locations." Check all pins on the cable, pin to pin, for shorts or opens.

### Printer Signal Cable

Printer Connector Pin Number	System Unit Connector Pin Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
33	18
19	19
21	20
23	21
25	22
27	23
29	24
30	25



### WHERE THERE ANY SHORTS OR OPENS?

**YES** Replace the printer cable. See Section 5. "Removal/Replacements and Adjustments."

**NO** Replace the printer. See Section 5. "Removal/Replacements and Adjustments."


1. Set the printer Power switch to Off.
  2. Unplug the printer power cord.
  3. Check for an open fuse. See Section 4, "Locations."
- 

### **IS THE FUSE OPEN?**

---

**NO**    Replace the printer. See Section 5, "Removal/Replacement and Adjustments."

**YES**    

- 
1. Replace the fuse. See Section 5.  
"Removal/Replacements and Adjustments."
  2. Plug in the Printer power cord.
  3. Set the printer power switch to On.
  4. Leave the printer power On for one minute.
  5. Set the printer power switch Off.
  6. Unplug the printer power cord from the power outlet.
  7. Check for an open fuse.
- 

### **DID THE FUSE OPEN AGAIN**

---

**NO** The problem is resolved. Plug the printer power cord back into the power outlet.

**YES** Replace the printer.



# Printer Offline Diagnostic Test

The Offline Diagnostic Test verifies the proper operation of the printer and print quality.

1. Set the Power switch on the printer and system unit to Off.
2. Disconnect the Printer Cable from the printer and system unit.
3. Hold the line feed button down while switching the printer On. While the test runs, check that:
  - a. The ribbon is installed properly.
  - b. The forms and paper are inserted properly.
  - c. The forms or paper path has no obstructions.
  - d. The tractors are adjusted properly.

## CAUTION

**Switch the printer Off before making any adjustments.**

4. To stop the test before it is finished, set the printer power switch to Off.
- 

## DID YOUR PRINTER PRINT?

---

**NO**    Replace the printer. See Section 5, "Removal/Replacement and Adjustments."

**YES**    

Compare the printout with the appropriate sample on the following pages.

---

## IBM 80 CPS MATRIX PRINTER

```


        RSTUVWXYZ[\]^_`abcde
JPQRSTUWXYZ[\]^_`abcde
PQRSTUWXYZ[\]^_`abcdefghij,
RSTUWXYZ[\]^_`abcdefghijklmnop,
RSTUWXYZ[\]^_`abcdefghijklmnopqrstu..
STUWXYZ[\]^_`abcdefghijklmnopqrstuvwxy{;
TUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy{;
UVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy{;
VWXYZ[\]^_`abcdefghijklmnopqrstuvwxy{;
WXYZ[\]^_`abcdefghijklmnopqrstuvwxy{;
        noprstuvwxy{;
                tuvwxy{;
                        {;
                                {;

```

---

CONTINUE





Your printout should have matched one of the samples shown on the previous pages.

*Note:* If you are using a keyboard other than U.S. English, and your printout does not match the desired character set, verify that the switch settings are correct for the desired character set. If the switch settings are correct, have your printer serviced.

---

**DID YOUR PRINTOUT MATCH ONE OF THE  
DESIRED CHARACTER SET SAMPLES?**

---

**NO**    Replace the printer.

**YES**    Go to 3-1400-19.

1. Set the printer power Off.
2. Remove the printer cover see Section 4
3. Check the dip switch settings against the chart below to be sure the failure is not caused by an improper DIP switch setting.

*Note:* Graphics printer Switch No. 1-7 must be set for local requirements. This switch selects Table 1 or 2 and is factory set to Off for U.S. English speaking countries.

### Functions and Conditions of Dip Switch No. 1

#### Graphics Printer

Switch No.	Function	On	Off	Factory Set
1-1	Not Applicable	—	—	On
1-2	CR	Print Only	Print & Line Feed	On
1-3	Buffer Full	Print Only	Print & Line Feed	Off
1-4	Cancel Code	Invalid	Valid	Off
1-5	Not Applicable	—	—	On
1-6	Error Buzzer	Sound	Does Not Sound	On
1-7	Character Generator	Table 2	Table 1	Off
1-8	Select In Signal	Fixed Internally	Not Fixed Internally	On

#### Matrix Printer

Switch No.	Function	On	Off	Factory Set
1-1	Not Applicable	—	—	On
1-2	CR	Print Only	Print & Line Feed	On
1-3	Buffer Full	Print Only	Print & Line Feed	On
1-4	Cancel Code	Invalid	Valid	Off
1-5	Delete Code	Invalid	Valid	On
1-6	Error Buzzer	sound	Does Not Sound	On
1-7	Character Character	N.A.	Graphic Pattern Select	Off
1-8	Select In Signal	Fixed Internally	Not Fixed Internally	On

### Functions and Conditions of Dip Switch No. 2

#### Graphics Printer

2-1	Form Length	12"	11"	Off
2-2	Line Spacing	1/8"	1/6"	Off
2-3	Auto Feed XT Signal	Fixed Internally	Not Fixed Internally	Off
2-4	1-in Skip Over Perforation	Valid	Not Valid	Off

#### Matrix Printer

2-1	Not Applicable	—	—	On
2-2	Not Applicable	—	—	On
2-3	Auto Feed XT Signal	Fixed Internally	Not Fixed Internally	Off
2-4	Coding Table Select	N.A.	Standard	Off

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Run the "Printer Offline Diagnostic Test" on page 3-1400-14 and review the points below.
    - If you are using a keyboard other than U.S. English, and your printout does not match the desired character set, verify that the switch settings are correct for the desired character set. If the switch settings are correct, have your printer serviced.
    - Your printer also is controlled by program commands from the system unit. If you are still having a printer problem, or if a problem occurs only during a particular program, examine the program thoroughly for commands that might cause the printer to produce undesired results.
  3. Return to page 3-5-1 and review "Start."
  4. Select "LOG UTILITIES" in the System Checkout menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

# Notes:

# Fixed Disk Drive 1700

You have entered this PIC because your system has a 17XX error code, you have identified a problem with the fixed disk drive, or want to format the fixed disk drive.

**Warning:** Normal shipping and handling can result in permanent loss of all data and formatting on the fixed disk drive. We recommend that you copy all files to diskettes.

*Note:* The terminating resistor is a 14-pin logic block in a socket close to the rear of the printed circuit board with a "T-RES" label on it. Be sure the terminating resistor is positioned properly and in the correct fixed disk drive (see Section 5).

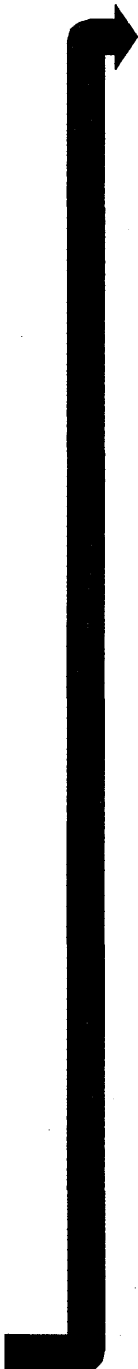
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Insert your Diagnostics diskette in drive A.
  3. Set the Power switch on the expansion unit (if attached) and the system unit to On. If an error occurs, press the PF1 key.
  4. When the menu appears, press 0 (**RUN DIAGNOSTIC ROUTINES**) then Enter.
- 

---

CONTINUE






- 
5. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  6. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  7. When the System Checkout menu appears, press 0 (RUN TESTS ONE TIME) then Enter.
  8. Select 17 (FIXED DISK DRIVE(S) & ADAPTER) then press Enter.
- 

---

**CONTINUE**





Fixed Disk Drive Adapter test will run. If the test ends without an error, the following will appear.

---

TESTING - X FIXED DISK DRIVE(S) & ADAPTER

0 - RUN FIXED DISK TEST  
1 - RUN MEASUREMENTS TEST  
2 - FORMAT FIXED DISK  
9 - EXIT FIXED DISK TESTS

ENTER THE ACTION DESIRED ? \_


-

**DID THE TEST FINISH WITHOUT AN ERROR?**

---

**NO**    Go to page 3-1700-21.

**YES**    



If your fixed disk has not been formatted yet, you should format it before you continue.

**Warning:** Formatting your fixed disk will erase all data on the fixed disk.


---

**DO YOU WANT TO FORMAT YOUR FIXED DISK?**

---


**YES** Go to page 3-1700-20.

**NO** 

- 
1. Press 0 (RUN FIXED DISK TEST) then Enter.
  2. When ENTER DRIVE ID (C/D) appears, press C (for drive C) then press Enter.
  3. When DO YOU WANT TO INCLUDE FIXED DISK WRITE TESTS ON DRIVE C? appears, press Y or N then Enter.
- 

---

**CONTINUE** 



The following appears.

---

PERFORMING SEEK TEST  
PERFORMING WRITE TEST  
PERFORMING TRACK ZERO TEST  
PERFORMING SURFACE SCAN  
PLEASE STAND BY

0 - RUN FIXED DISK TEST  
1 - RUN MEASUREMENTS TEST  
2 - FORMAT FIXED DISK  
9 - EXIT FIXED DISK TESTS

ENTER THE ACTION DESIRED? \_

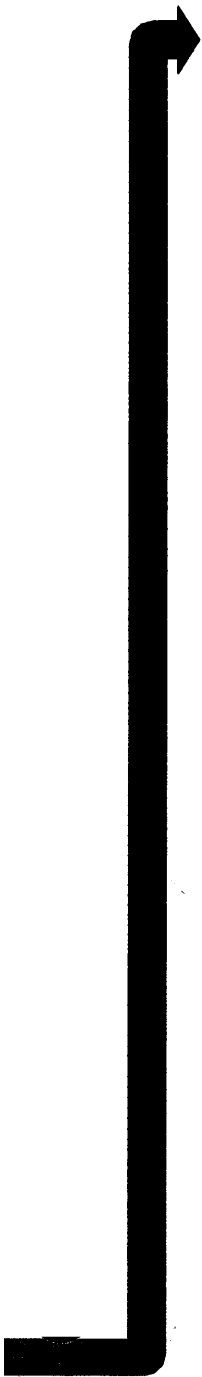
-

**DID THE ABOVE APPEAR WITHOUT AN  
ERROR CODE?**

---

**NO**    Go to page 3-1700-9.

**YES**    




If your system has only one fixed disk drive, go to page 3-1700-26.

1. Press 0 (RUN FIXED DISK TEST) then Enter.
  2. When ENTER DRIVE ID (C/D) appears, press D (for drive D) then press Enter.
  3. When DO YOU WANT TO INCLUDE FIXED DISK WRITE TESTS ON DRIVE D? appears, press Y or N then Enter.
- 

---

**CONTINUE**





The following appears.

---

PERFORMING SEEK TEST  
PERFORMING WRITE TEST  
PERFORMING TRACK ZERO TEST  
PERFORMING SURFACE SCAN  
PLEASE STAND BY

0 - RUN FIXED DISK TEST  
1 - RUN MEASUREMENTS TEST  
2 - FORMAT FIXED DISK  
9 - EXIT FIXED DISK TESTS

ENTER THE ACTION DESIRED? \_

-

**DID THE ABOVE APPEAR WITHOUT AN  
ERROR CODE?**

---

**NO** Go to page 3-1700-13.

**YES** Go to page 3-1700-26.

If your system has only one fixed disk drive, go to page 3-1700-13.


1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Refer to Section 5, "Removal/Replacement and Adjustments," and disconnect the data connector (J3) and the control connector (J1) from fixed disk drive D (see Section 4, "Locations").
  3. Set the Power switch on the expansion unit (if attached) and system unit to On. If an error occurs, press the F1 key.
  4. When the menu appears, press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  5. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
- 

---

CONTINUE





- 
6. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  7. Press 0 (RUN TESTS ONE TIME) then press Enter.
  8. Select 17 (FIXED DISK DRIVE(S) & ADAPTER) then press Enter.

The following appears.

---

TESTING - X FIXED DISK DRIVE(S) & ADAPTER

- 0 - RUN FIXED DISK TEST
- 1 - RUN MEASUREMENTS TEST
- 2 - FORMAT FIXED DISK
- 9 - EXIT FIXED DISK


ENTER THE ACTION DESIRED? \_

-

---


**CONTINUE**



- 
1. Press 0 (RUN FIXED DISK TEST) then Enter.
  2. When ENTER DRIVE ID (C/D) appears, press C (for drive C) then press Enter.
  3. When DO YOU WANT TO INCLUDE FIXED DISK WRITE TESTS ON DRIVE C? appears, press Y or N then Enter.
- 

---

**CONTINUE** 



The following appears.

---

PERFORMING SEEK TEST  
PERFORMING WRITE TEST  
PERFORMING TRACK ZERO TEST  
PERFORMING SURFACE SCAN  
PLEASE STAND BY

0 - RUN FIXED DISK TEST  
1 - RUN MEASUREMENTS TEST  
2 - FORMAT FIXED DISK  
9 - EXIT FIXED DISK TESTS

ENTER THE ACTION DESIRED? \_

-

**DID THE ABOVE APPEAR WITHOUT AN  
ERROR CODE?**

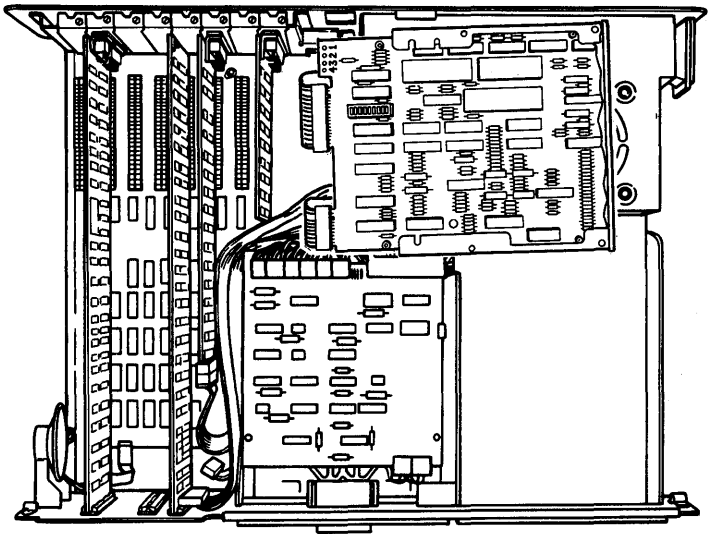
---

**YES** Replace drive D. See Section 5,  
"Removal/Replacement and Adjustments"

If the problem persists after replacing  
drive D, see page 3-1700-17.


**NO** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove the failing fixed disk drive from either the system unit or the expansion unit (see Section 5, "Removal/Replacement and Adjustments").
3. Place the failing fixed disk drive on the power-supply cover so that the logic board faces up and the face plate faces the right side of the unit, as shown below.
4. Connect all cables.



---

CONTINUE

- 
1. Insert your Diagnostics diskette in drive A.
  2. Set the Power switch on the expansion unit (if attached) and system unit to On. If an error occurs, press the PF1 key.
  3. When the menu appears, press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  4. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  5. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  6. When the System Checkout menu appears, press 0 (RUN TESTS ONE TIME) then Enter. The following appears.


---

1 - S SYSTEM BOARD  
18 - S EXPANSION OPTION  
2 - S 384KB MEMORY  
3 - S KEYBOARD/TIMER  
6 - S 1 DISKETTE DRIVE(S) AND ADAPTER  
9 - S PRINTER ADAPTER  
17 - E 2 FIXED DISK DRIVE(S) & ADAPTER  
28 - S DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER  
32 - S DISPLAY  
14 - S MATRIX PRINTER

ENTER THE NUMBER(S) OF OPTIONS TO TEST  
OR PRESS ENTER TO SELECT ALL OPTIONS

---

**CONTINUE** 

- 
1. Select 17 (FIXED DISK DRIVE(S) & ADAPTER) then press Enter.
  2. Press 1 (RUN MEASUREMENTS TEST) then Enter.
  3. When ENTER DRIVE ID (C/D)? appears, select the suspected failing drive, then press Enter.

*Note:* The next page has examples of the fixed-disk logic board and connectors. These may not be the same as those in your system; however, certain ones will be the same.

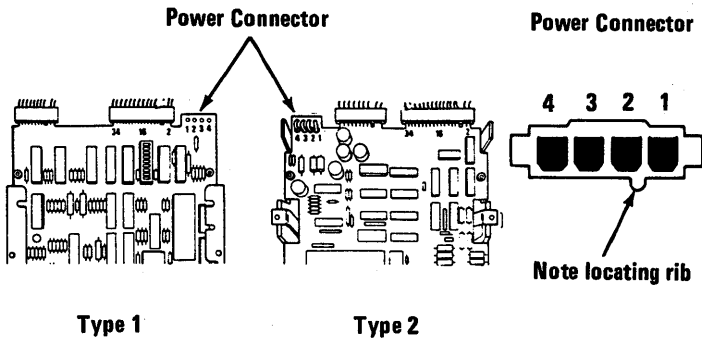
- J1, the control connector, has 34 pins.
  - J2, the data connector, has 22 pins.
  - The power connector has any one or more of the following:
    - Numbering on the plug
    - Numbering on the board
    - A ridge on the outside of the male plug that is toward pin 1
    - A square solder land on pin 1.
- 

---

CONTINUE



4. Measurement Test 1 is now running. Measure the voltages at the power-connector lands for the values shown in the table below. Do not press any keys on the keyboard until the PIC instructs you to do so.



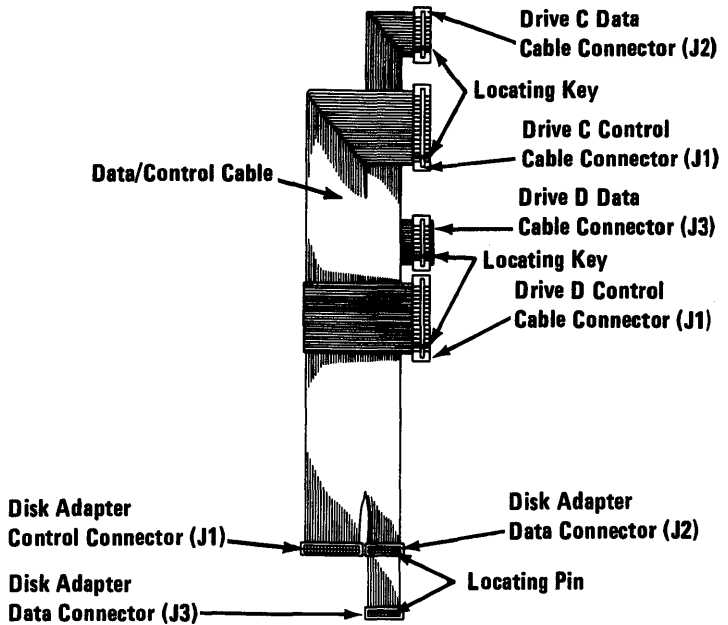
Test description	Fixed Disk	Response
Measurement Test 1	+ Lead Power 4 - Lead Power 2	+ 5.2 to 4.8 Vdc
	+ Lead Power 1 - Lead Power 3	+ 12.6 to 11.5 Vdc

### ARE THE VOLTAGES CORRECT?

**NO** Go to page 3-9999-1, "Undetermined Problems."

**YES** 

1. Set the Power switch for the system unit and expansion unit (if attached) to Off.
2. Unplug all work station power cord from the power outlets.
3. Remove the cover of the unit that contains the fixed disk (see Section 5).
4. Remove the fixed disk signal cable (see Section 5).
5. Check the continuity of the signal cable.



### IS THE CONTINUITY GOOD?

**NO** Replace the signal cable.

**YES** 





## To Format a Fixed Disk Drive


**Warning:** Formatting will destroy all data on the fixed disk drive. After formatting your fixed disk drive, the drive will have to be made ready to accept data. Refer to your disk operating system manual for the needed commands. The backup data may then be loaded onto the fixed disk drive.

You have entered this page because you have identified a failing fixed disk drive. Before replacing the drive, first try to format it, then do the diagnostic tests. Because formatting destroys all data on the drive, do it as the last step before replacing the drive. After you format the drive, you may reload the data from your backup diskette.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Install the fixed disk drives and connect any data and control connectors that were disconnected during testing.
3. Insert your Diagnostics diskette in drive A.
4. Set the Power switch on the expansion unit (if attached) and system unit to On.
5. After the diskette loads, press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
6. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.

---

CONTINUE 

- 
7. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  8. When the System Checkout menu appears, press 0 (RUN TEST ONE TIME) then Enter.
  9. Select 17 (FIXED DISK DRIVE(S) & ADAPTER) then press Enter.

The following appears.

---

```
TESTING - X FIXED DISK DRIVE(S) & ADAPTER
```


```
0 - RUN FIXED DISK TEST
1 - RUN MEASUREMENTS TEST
2 - FORMAT FIXED DISK
9 - EXIT FIXED DISK TESTS
```

```
ENTER THE ACTION DESIRED ? _
```

```
-
```

---

**CONTINUE** 

- 
1. Press 2 (FORMAT FIXED DISK) then Enter.
  2. When ENTER DRIVE ID C/D appears, press C or D (depending on which drive you want to format) then press Enter.
  3. When ARE YOU SURE YOU WANT TO CONTINUE appears, press Y then Enter.
  4. When formatting is complete, go to page 3-1700-1 and do the fixed disk diagnostic tests. Then return to this page and answer the question below.
- 

**DID THE ERROR REMAIN AFTER  
FORMATTING?**

---

- NO** The problem has been corrected and your fixed disk can be prepared to accept data.
- YES** Replace the fixed disk drive that failed (see Section 5, "Removal/Replacement and Adjustments").

If your fixed disk is installed in an expansion unit, the expansion unit could be the cause of your problem.

---


**IS THE FIXED DISK INSTALLED IN AN EXPANSION UNIT?**

---

**NO**    Replace the fixed disk drive adapter. See Section 5, "Removal/Replacement and Adjustments"

**YES**






The steps below describe how to move the fixed disk adapter to the system unit while leaving the fixed disk in the expansion unit.

1. Set all work station Power switches to Off.
  2. Remove the covers from both the system unit and expansion unit.
  3. Remove the fixed disk adapter from the expansion unit without removing the signal cable from the adapter card.
  4. If you have two fixed disks, remove the signal cable from the back of fixed disk D.
- 

---

CONTINUE 

- 
5. Move the two units so they are side by side.
  6. Relocate any adapter that is installed in slot one of the system unit to make room for the fixed disk adapter.
  7. Carefully install the fixed disk adapter with its cables intact into slot one of the system unit.


You should now have the fixed disk still installed in the expansion unit but its adapter installed in the system unit.

---

---

CONTINUE




- 
8. Set the Power switches for all work station devices to On.
  9. Rerun the fixed disk diagnostics, (see page 3-1700-1) then return to this page and answer the question below.
- 

**DID THE TEST FINISH WITHOUT AN ERROR?**

---

**NO**    Replace the fixed disk drive adapter. See Section 5, "Removal/Replacement and Adjustments"

**YES**    

- 
1. Set the Power switches for all work station devices to Off.
  2. Remove the expansion unit signal cable from both units.
  3. Check the signal cable continuity.
- 

### **IS THE CONTINUITY GOOD?**

---

**NO** Replace the signal cable.

**YES** Replace the receiver card in the expansion unit. See Section 5, "Removal/Replacement and Adjustments"



You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "LOG UTILITIES" in the System Checkout menu, start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

# Notes:



# Expansion Unit 1800


You have entered this PIC because your system was unable to complete POST, you have an 18XX error code, or you suspect the expansion unit is failing. Check that all cable connectors are seated correctly.

1. Set the Power switch on the system unit and expansion unit to Off.
  2. Insert your Diagnostics diskette in drive A.
  3. Set the Power switch on the expansion unit to On.
  4. Set the Power switch on the system unit to On.
  5. If you receive an 1801 error code, press PF1 to continue.
- 

---

CONTINUE



- 
6. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  7. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  8. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  9. Press 0 (RUN TESTS ONE TIME) then Enter.
  10. Select 18 (EXPANSION OPTION) then press Enter.

You may receive an error message similar to the one below.

---

```
TESTING - EXPANSION OPTION
X:XX:XX
ERROR -
EXPANSION OPTION  18XXS
Data - XXXX= XX / XX  SW = X
PRESS ENTER TO CONTINUE
? _
-
```


---

**DID YOU GET AN 18XX ERROR CODE  
SIMILAR TO THE ONE ABOVE?**

---

**NO**    Go to page 3-1800-19.

**YES**    



Find the error code in the list below.

---

Error code	Action
1810.....	Go to page 3-1800-4
1811.....	Go to page 3-1800-4
1812.....	Go to page 3-1800-4
1813.....	Go to page 3-1800-4 *
1814.....	Go to page 3-1800-4
1815.....	Go to page 3-1800-4
1816.....	Go to page 3-1800-4
1817.....	Go to page 3-1800-4
1818.....	Go to page 3-1800-4
1819.....	Go to page 3-1800-16
1820.....	Go to page 3-1800-6
1821.....	Go to page 3-1800-6

*\*Note:* Your assembly number for the extender card should be 6319935. If not, replace your extender card.

---


Go to the page specified for your error code.

1. Set the Power switch on the system unit and expansion unit to Off.
  2. Disconnect the expansion cable at the system unit.
  3. Make sure the Diagnostics diskette is inserted.
  4. Set the Power switch on the system unit to On.
  5. If an 1801 error code appears, press PF1 to continue.
- 

---

CONTINUE



- 
6. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  7. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  8. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list for the system unit before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  9. Press 0 (RUN TESTS ONE TIME) then Enter.
  10. Select 18 (EXPANSION OPTION) then press Enter.

---

```
TESTING - EXPANSION OPTION
X:XX:XX
ERROR -
EXPANSION OPTION 18XXS
Data - XXXX= XX / XX SW= X
PRESS ENTER TO CONTINUE
? _
-
```

---


### DID YOU GET AN 1820 ERROR CODE?

---

**NO** Go to page 3-1800-18.


**YES** 



- 
1. Set the Power switch on the system unit and expansion unit to Off.
  2. Connect the expansion cable at the system unit, if you removed it in an earlier step.
  3. Remove all option adapters from the expansion unit, except the receiver card.
  4. Make sure the Diagnostics diskette is inserted.
  5. Set the Power switch on the expansion unit to On.
  6. Set the Power switch on the system unit to On.
  7. When the 1801 error code appears, press PF1 to continue.
- 
- 

CONTINUE



- 
8. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  9. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  10. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  11. Press O (RUN TEST ONE TIME).
  12. Select 18 (EXPANSION OPTION) then press Enter.

---

```
TESTING - EXPANSION OPTION
X:XX:XX
ERROR -
EXPANSION OPTION  18XX S
Data - XXXX= XX / XX SW= X
PRESS ENTER TO CONTINUE
?  _ _
```

---

### DID YOU GET AN 18XX ERROR CODE?

---

**NO**    Go to page 3-1800-14.

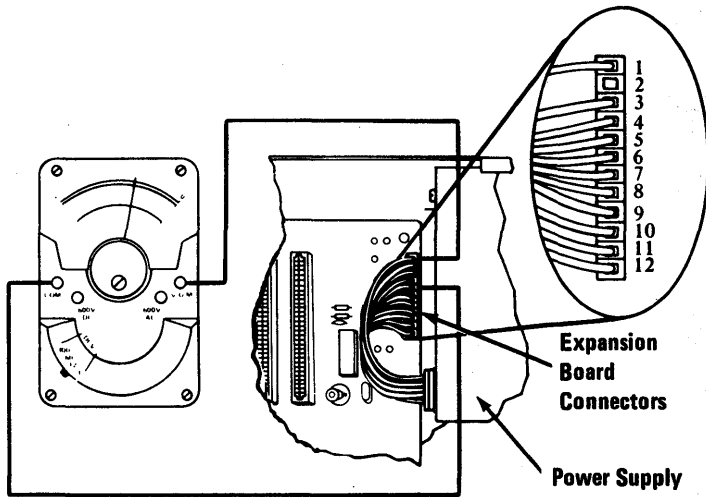
**YES**    

You may have a voltage problem.

1. Set your multimeter to the 12-Vdc scale.
2. Check the expansion board power connector for the voltages listed in the table.

---

Voltage Connectors			
Min Vdc	Max Vdc	-Lead	+ Lead
2.4	5.2	5	1
4.8	5.2	5	10

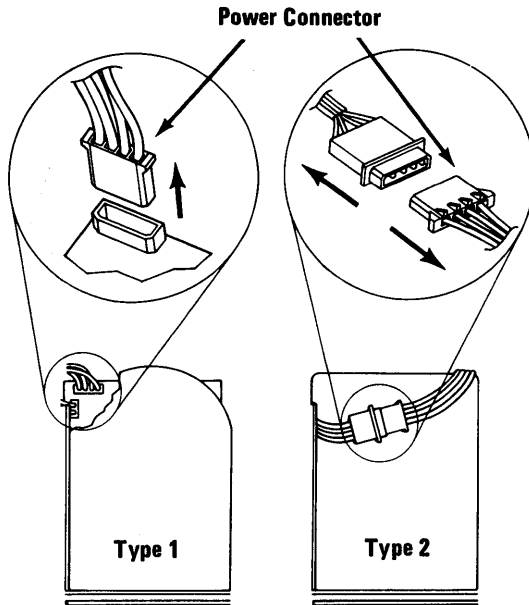


**ARE THE VOLTAGES WITHIN THE SPECIFIED RANGES?**

**YES** Go to page 3-1800-18.

**NO** 

1. Set the Power switches on the system unit and expansion unit to Off.
  2. Disconnect the power connector from the fixed disk drive on the right.
  3. Set the Power switch on the expansion unit to On.
  4. Set the Power switch on the system unit to On.
- 



---

### **DID THE SYMPTOM REMAIN?**

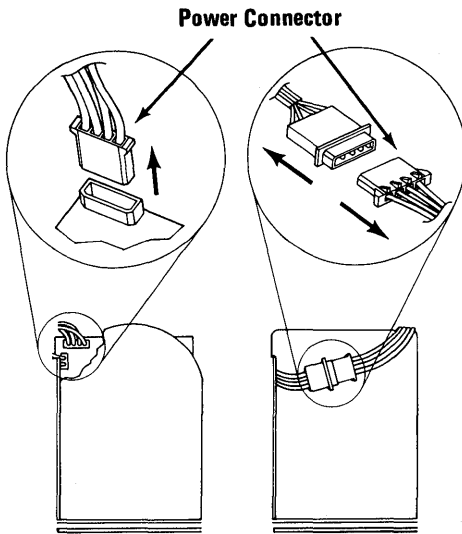
---

**NO**    Replace the fixed disk drive assembly on the right (see Section 5, "Removal/Replacement and Adjustments").

**YES**    

**Note:** If you have only one fixed disk drive, continue on the next page.

1. Set the Power switches on the system unit and expansion unit to Off.
2. Disconnect the power connector from the left fixed disk drive.
3. Set the Power switch on the expansion unit to On.
4. Set the Power switch on the system unit to On.



### **DID THE SYMPTOM REMAIN?**

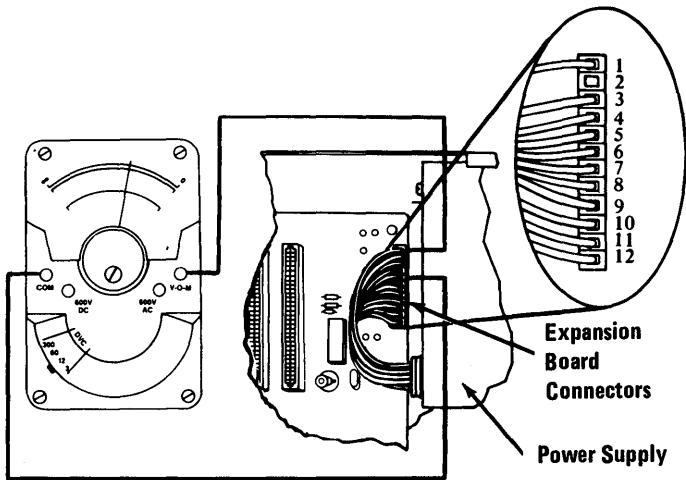
**NO** Replace the left fixed disk drive assembly (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

Check the rest of the power supply voltages to the expansion board.

1. Set your multimeter to the 12-Vdc scale.
2. Check the expansion board power connector for the voltages listed in the table.

Voltage Connectors			
Min Vdc	Max Vdc	-Lead	+ Lead
4.5	5.4	9	6
11.5	12.6	7	3
10.8	12.9	4	8



**ARE THE VOLTAGES WITHIN THE SPECIFIED VALUES?**

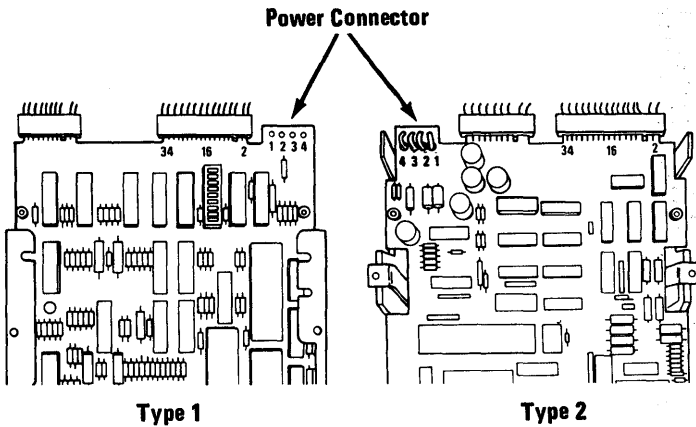
**NO** Replace the expansion unit power supply (see Section 5, "Removal/Replacement and Adjustments").

**YES**

Check the fixed disk drive voltages.

1. Connect the fixed disk drive power supply connectors.
2. Refer to the figure below for the proper voltage values. The voltages should be the same on both fixed disk drive connectors.

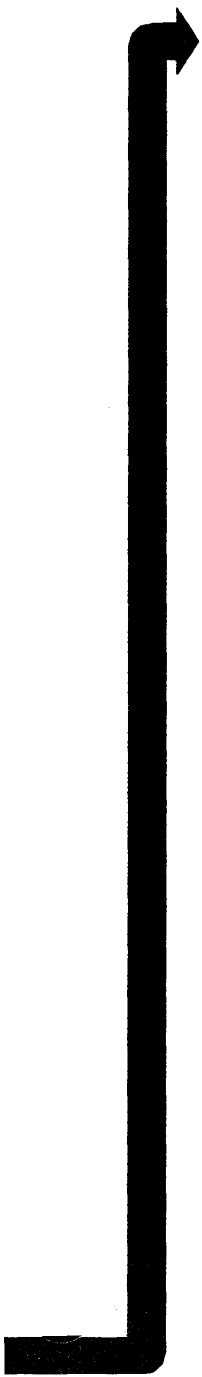
Fixed Disk Drive Power Connector			
Min Vdc	Max Vdc	-Lead	+ Lead
+ 4.8	+ 5.2	2	4
+ 11.5	+ 12.6	3	1



**ARE THE VOLTAGES WITHIN THE SPECIFIED VALUES?**

**NO** Replace the expansion unit power supply (see Section 5, "Removal/Replacement and Adjustments").

**YES** 

- 
1. Set the Power switch on the system unit and expansion unit to Off.
  2. Set your Multimeter to the Ohms (x1) scale.
  3. Remove all option adapters (including the receiver card) from the expansion slots in the expansion unit.
- 

---

**CONTINUE**

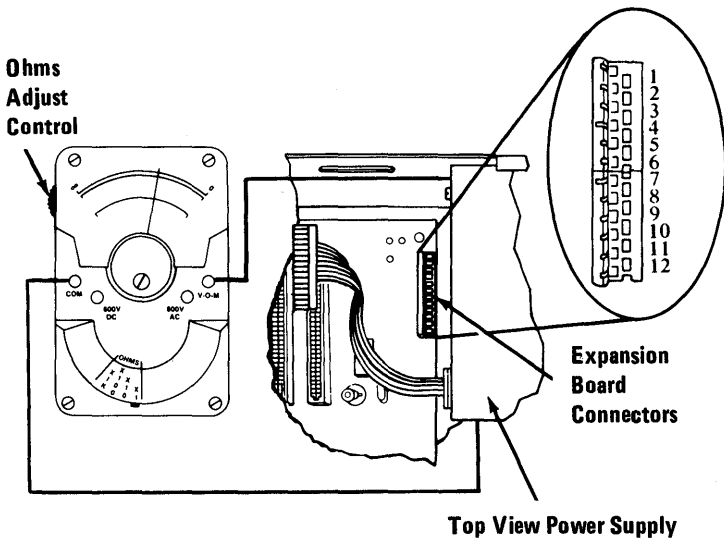




Disconnect the expansion board power connectors and take resistance measurements on the expansion board pins listed in the table.

---

-Lead	5	6	7	8	8	8
+ Lead	3	4	9	10	11	12
Minimum Resistance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms



**ARE ANY OF THE RESISTANCE MEASUREMENTS BELOW THE MINIMUM SHOWN IN THE TABLE?**

- 
- NO** Replace the expansion unit power supply (see Section 5, "Removal/Replacement and Adjustments").
- YES** Replace the expansion board (see Section 5, "Removal/Replacement and Adjustments").


One of the option adapters plugged into the expansion board may be failing.

1. Set the Power switch on the system unit and expansion unit to Off.
  2. Install one option adapter.
  3. Make sure the Diagnostics diskette is inserted.
  4. Set the Power switch on the expansion unit to On.
  5. Set the Power switch on the system unit to On.
  6. If an 1801 error code occurs, press PF1 to continue.
- 

---

CONTINUE



- 
7. Press 0 (RUN DIAGNOSTIC ROUTINES) then Enter.
  8. Depending on the configuration of your system, questions about attached devices may appear on your screen. Press Y or N as required, then press Enter.
  9. Press Y or N (IS THE LIST CORRECT?) then Enter. (If the list is not correct, follow the instructions on your screen and correct the list before answering yes. If you cannot correct the list, you still must answer yes before you can continue.)
  10. Press 0 (RUN TESTS ONE TIME) then Enter.
  11. Select 18 (EXPANSION OPTION) then press Enter.
- 

```
TESTING - EXPANSION OPTION
X:XX:XX
ERROR -
EXPANSION OPTION 18XX S
Data - XXXX= XX / XX SW= X
PRESS ENTER TO CONTINUE
? -
-
```

---

### DID YOU GET AN 18XX ERROR CODE?

---

- NO** Repeat the preceding steps until you find the failing option adapter.
- YES** Replace the option adapter you just installed in the expansion board (see Section 5, "Removal/Replacement and Adjustments").

Your screen will be similar to the figure below. Verify that the switch settings on the extender card correctly reflect the "Memory Segment." Use the "Extender Card Switch Settings" chart in Section 6.

---

```
TESTING - EXPANSION OPTION
X:XX:XX
ERROR -
EXPANSION OPTION 1819 S
Data - XXXX= XX / XX SW= X
PRESS ENTER TO CONTINUE
? --
```

---

**ARE THE EXTENDER CARD SWITCHES  
SET TO CORRECTLY REFLECT THE  
"MEMORY SEGMENT"?**

---

- NO** Set the extender card switches to reflect the correct "Memory Segment." See Section 6.
- YES** Replace the extender card (see Section 5, "Removal/Replacement and Adjustments").

**Check the continuity of the expansion unit  
signal cable.**

---

**IS THE CABLE CHECK OK?**

---

**YES** Replace the receiver card in the expansion unit.

**NO** Replace the cable.

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select LOG UTILITIES in the System Checkout menu, start an error log, and select RUN TESTS MULTIPLE TIMES. This will allow you to operate the system thoroughly and identify the symptom. Then go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.



# Distributed Function Communications Adapter 2800

You have entered this PIC because you have an 28XX error code or have identified a problem with your controller.

If the Diagnostics diskette is already loaded, exit to the main menu (shown below) and begin on the next page. Otherwise follow the steps below and load the Diagnostics diskette.

1. Set the system unit On/Off switch to Off.
2. Insert the diagnostic diskette into drive A and push the load lever down.
3. If you have an Expansion Unit, set its Power switch to On.
4. Set the Power switch on the system unit to On and the diagnostic menu should appear.

---

```
The IBM 3270 Personal Computer
DIAGNOSTICS
Version X.XX (C) Copyright IBM Corp. XXXX

SELECT AN OPTION

0 - RUN DIAGNOSTIC ROUTINES
1 - FORMAT DISKETTE
2 - PREPARE SYSTEM FOR RELOCATION
3 - EXIT TO SYSTEM DIAGNOSTICS


ENTER ACTION DESIRED
? _
```

---

**CONTINUE**





- 
1. Press 0, then Enter to select RUN DIAGNOSTIC ROUTINES.
  2. Depending on the configuration of your system, questions about your attached devices will appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?) then press Enter. (If the list is incorrect, follow the instructions on the screen to correct the list before answering yes.)
  4. Press 0, (RUN TESTS ONE TIME) then press Enter.
  5. Select 28, (DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER) then press Enter.
- 

TESTING - DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER

XX:XX:XX

ERROR -

DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER 28XX S


---

**DID YOU GET A 28XX DIAGNOSTIC ERROR?**

---

**YES** Replace the Distributed Function Communications Adapter. See Section 5, "Removal Replacement and Adjustments."

**NO** 



**Check your screen for the following error message.**

---

TESTING - DISTRIBUTED FUNCTION COMMUNICATIONS ADAPTER

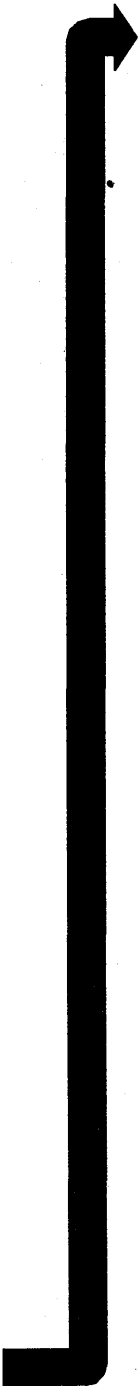
ERROR - NOT CONNECTED TO CONTROL UNIT  
REPEAT CONNECTION TEST (Y/N)?

**DID THE MESSAGE SHOWN ABOVE  
APPEAR ON YOUR SCREEN?**

---

**NO**    Go to page 3-2800-12

**YES**    



You should have a coaxial cable connected to your IBM 3270 Personal Computer from your control unit.

---

**IS A COAXIAL CABLE ATTACHED TO  
YOUR IBM 3270 PERSONAL COMPUTER?**

---

**NO** You cannot continue with this test unless you have a coaxial cable attached to your IBM 3270 Personal Computer. To end this test, press N, then Enter.

**YES** 



**CAUTION**

**Do not connect or disconnect the coaxial cable during an electrical storm.**


1. Disconnect and reconnect the coaxial cable to your system unit.
  2. Press "Y," then Enter.
- 

**DID "CONNECTED TO CONTROL UNIT"  
APPEAR ON YOUR SCREEN?**

---

**YES** Your problem is resolved; it was most likely a poor connection. To exit the test, press N, then Enter.

**NO** 



Check to see if there are other IBM 3270  
Personal Computers attached to your control  
unit.

---

**ARE OTHER IBM 3270 PERSONAL  
COMPUTERS ATTACHED TO THE SAME  
CONTROL UNIT AS YOURS?**

---

**NO** Go to "Coaxial Cable Resistance Check"  
on page 3-2800-10.

**YES** 



---

**ARE OTHER IBM 3270 PERSONAL  
COMPUTERS FUNCTIONING PROPERLY?**

---

**NO** Follow your local procedures to report a  
problem external to the IBM 3270  
Personal Computer.

**YES** 



**CAUTION**

**Do not connect or disconnect the coaxial cable during an electrical storm.**


1. Disconnect the coaxial cable from your system unit.
  2. Disconnect the coaxial cable from one of the properly functioning units and connect it to your system unit.
  3. Press "Y" then Enter to repeat the connection test.
- 

**DID "CONNECTED TO CONTROL UNIT"  
APPEAR ON THE SCREEN?**

---

**NO**    Reconnect both your system unit and the other personal computers to their original coaxial cables. Replace the Distributed Function Communications Adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**    

- 
1. Reconnect both your system and the other IBM 3270 Personal Computers to their original coaxial cables.
  2. Rerun the Distributed Function Communications Adapter diagnostic. (if it is still loaded, just press "Y" to rerun it.)
- 

**DID "CONNECTED TO CONTROL UNIT"  
APPEAR ON THE SCREEN?**

---

- NO** Follow your procedures to report a problem external to your IBM 3270 Personal Computer.
- YES** The problem is resolved. Press N, then enter. This will end the connection test.

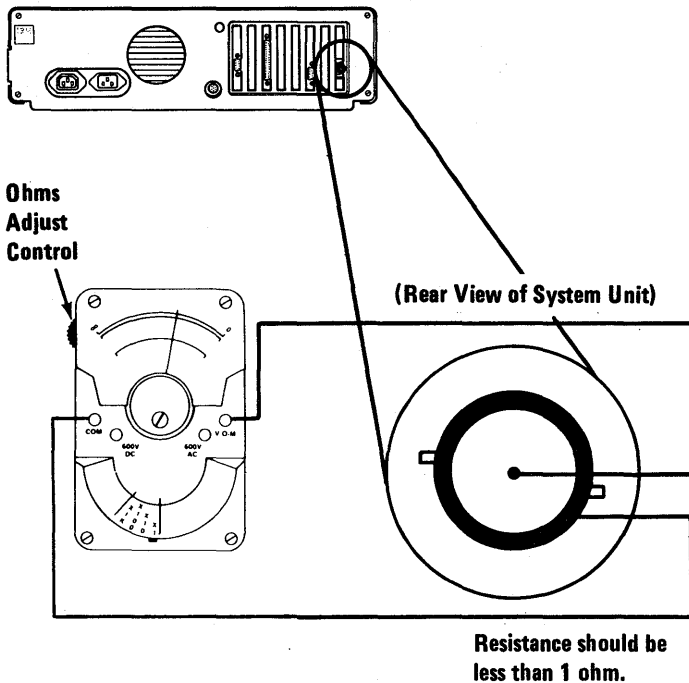


1. Set the Power switch on the system unit to Off.

### CAUTION

**Do not connect or disconnect the coaxial cable during an electrical storm.**

2. Disconnect the coaxial cable from the system unit.
3. Check the coaxial cable connector at the system unit for the appropriate resistance as shown in the diagram.



---

CONTINUE





---

**IS THE RESISTANCE CORRECT?**

---

- NO** Replace the Distributed Function Communications Adapter. See Section 5, "Removal/Replacement and Adjustments."
- YES** Follow your local procedures for reporting problems external to your 3270 Personal Computer. If you have followed these procedures and still have an unsolved problem You should replace the Distributed Functions Communications Adapter. See Section 5, "Removal/Replacement and Adjustments."

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "UTILITIES" in the diagnostic menu. Start an error log, and select "RUN TESTS MULTIPLE TIMES." This will allow you to operate the machine thoroughly and identify the failing symptom. When you have identified the symptom, go to page 3-5-1, "Start," or the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, you should request technical assistance.

# IBM Color Printer 2900

For detailed service information on the IBM 5182 Color Printer, refer to the *IBM Hardware Maintenance and Service for the Personal Computer Color Printer* part number 1502383.

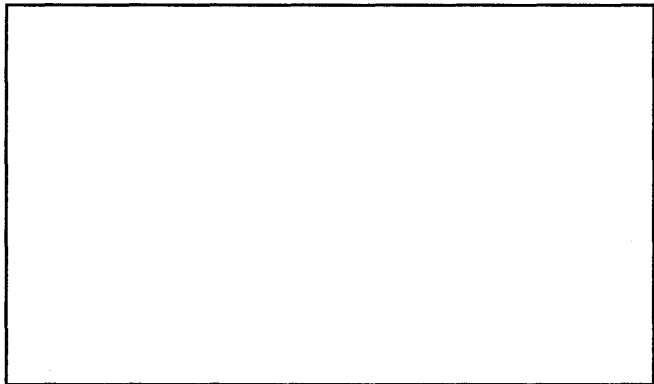
# Notes:

# Display Adapter 3200

You have entered this PIC because you have a 32XX Diagnostic error or have identified a display problem. If your display is blank, unreadable, or unstable, when POST is run or when the Diagnostics diskette is loaded, go to "Display Check" on page 3-25-1.

If the Diagnostics diskette is already loaded, exit to the main menu (shown below) and begin on the next page. Otherwise, follow the steps below to load the Diagnostics diskette.

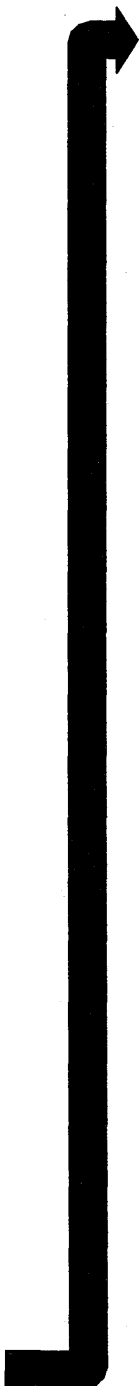
1. Set the system unit Power switch to Off (O).
2. Insert the diagnostic diskette into drive A and push the load lever down.
3. If you have an expansion unit, set its Power switch to On (I).
4. Set the Power switch on the system unit to On (I) and wait for the Diagnostics menu to appear.



---

**CONTINUE**



- 
1. Press 0, then Enter to select RUN DIAGNOSTIC ROUTINES.
  2. Depending on the configuration of your system, questions about your attached devices may appear on your screen. Press Y or N as required, then press Enter.
  3. Press Y or N (IS THE LIST CORRECT?), then press Enter. (If the list is incorrect, follow the instructions on the screen to correct the list before answering yes.)
  4. Press 0 (RUN TESTS ONE TIME), then press Enter.
  5. Press 3, then 2 (DISPLAY ADAPTER), then press Enter.

*Note:* Patterns will appear on the screen for approximately 60 seconds while the display diagnostics run.

---


XXXXXX  
ERROR -  
DISPLAY ADAPTER 32XX S

### **DID YOU GET A 32XX DIAGNOSTIC ERROR?**

---

**NO**    Go to page 3-3200-8.

**YES**    



This error can be caused by either the display adapter, the programmed symbols adapter, the all points addressable adapter, or a top card connector.

---

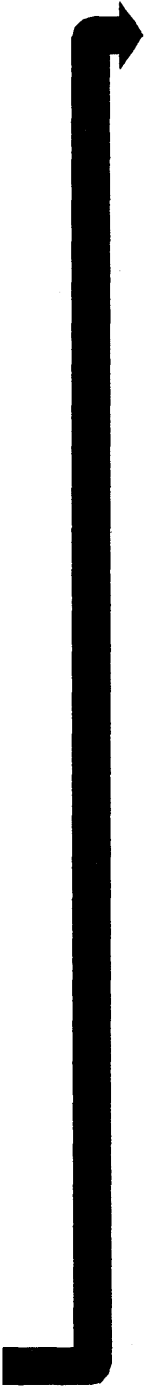
**DO YOU HAVE THE PROGRAMMED  
SYMBOLS ADAPTER INSTALLED?**

---

**NO**    Go to page 3-3200-5.

**YES**    





Remove the programmed symbols adapter. See Section 5, "Removal/ Replacement and Adjustments."


---

**IS THE PROBLEM STILL PRESENT?**

---

**NO**    Go to page 3-3200-7.

**YES**    



Reinstall the programmed symbols adapter.


---

**DO YOU HAVE THE ALL POINTS  
ADDRESSABLE ADAPTER INSTALLED?**

---

**NO**    Go to page 3-3200-8.

**YES**    



Remove the all points addressable adapter. See Section 5, "Removal/ Replacement and Adjustments."

---

**IS THE PROBLEM STILL PRESENT?**

---

**YES** Reinstall the all points addressable adapter and replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

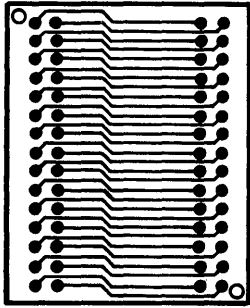
**NO** 

Check the continuity of the top card connector as shown below.

---



End View



Bottom View

---

### IS THE CONTINUITY CORRECT?

---

- NO** Replace the top card connector. See Section 5, "Removal/Replacement and Adjustments."
- YES** Replace the appropriate adapter (all points addressable or programmed symbols). See Section 5, "Removal/Replacement and Adjustments."

The procedure you follow depends on whether you have an IBM Monochrome Display or an IBM Color Display.

---

**DO YOU HAVE AN IBM MONOCHROME  
DISPLAY?**

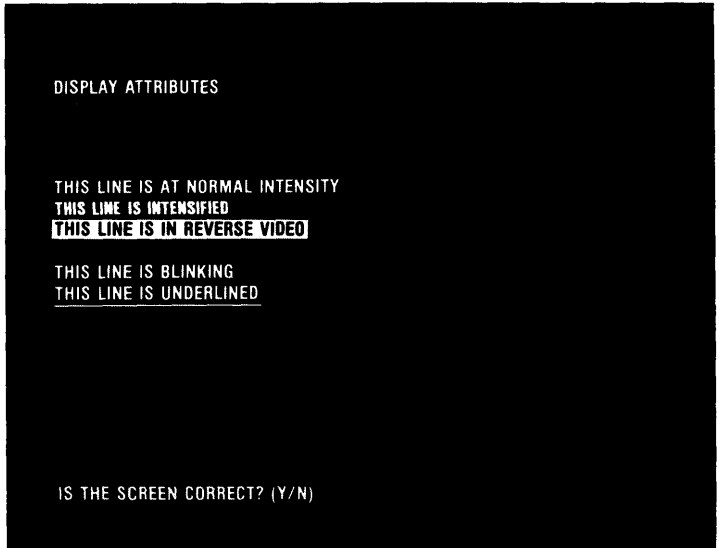
---

**NO** Go to "Color Display" on page 3-3200-32.

**YES** Go to the next page.

# Monochrome Display

---



## DID THE DISPLAY ATTRIBUTES SCREEN APPEAR?

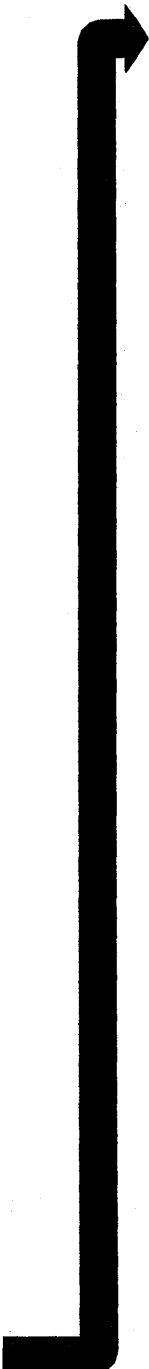
*Note:* Do not verify that the screen is correct at this time.

---

**NO**    Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES**





Adjust the brightness and contrast controls until the intensified line is brighter than the other lines.


---

**WERE YOU ABLE TO ADJUST THE INTENSIFIED LINE?**

---

**NO** Go to "Voltage Test" on page 3-25-18.

**YES** 



Each line should match its description; for example, "THIS LINE IS BLINKING" should blink.

---

**DO THE LINES MATCH THEIR DESCRIPTIONS?**

---

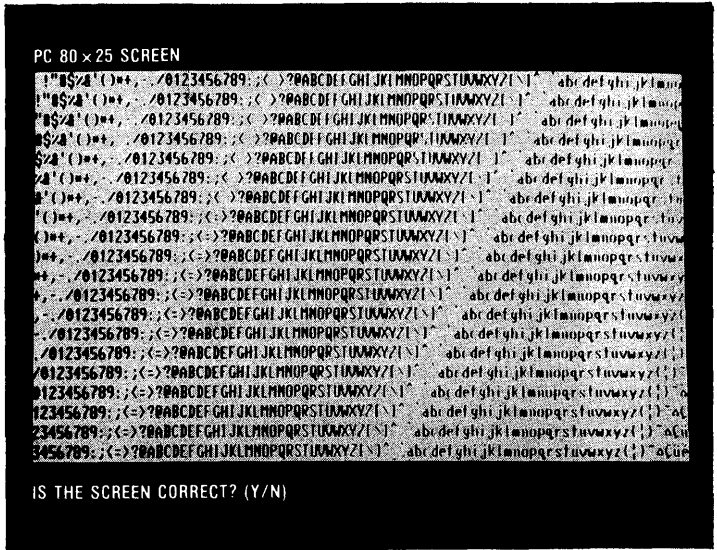
**NO** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES** 





Press Y, then Enter.




## DID THE ABOVE APPEAR ON YOUR SCREEN?

**NO** Press N, then Enter to end this test.  
Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES** 







See below.

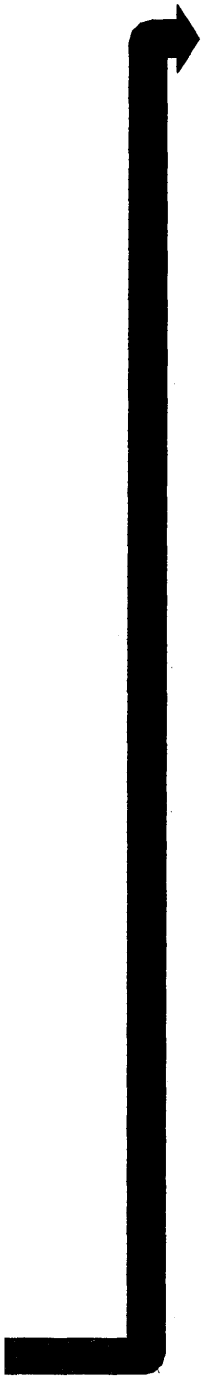
---

**WERE YOU DIRECTED TO THIS SECTION  
FROM THE KEYBOARD/TIMER ADAPTER  
TEST?**

---

**YES** Replace the keyboard.

**NO** 



Check the Installed Devices Chart on the 3270  
Personal Computer Components Record in the  
*Guide to Operations.*


---

**IS THE PROGRAMMED SYMBOLS  
ADAPTER INSTALLED IN YOUR  
MACHINE?**

---

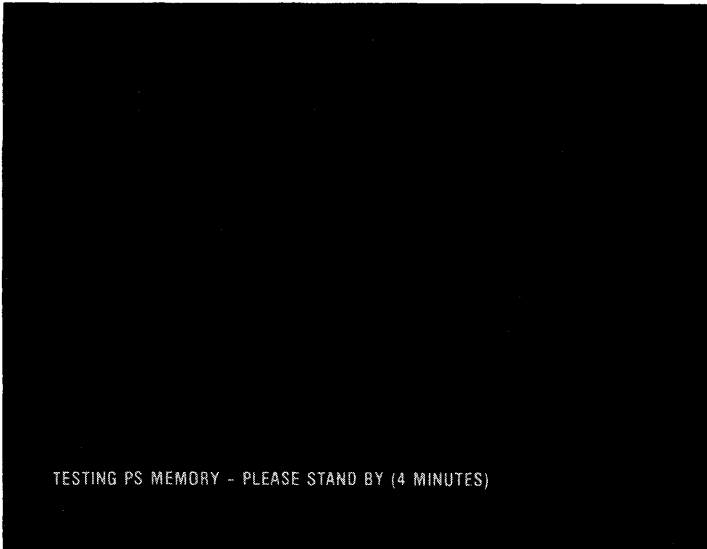
**NO**    Go to page 3-3200-24.

**YES**    



Your screen should look like the following screen.

---




**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

**NO** If you have an error message, go to page 3-3200-20. If there is no error message, reload the diagnostic and check to see if the programmed symbols adapter appears in the option menu.

**YES** 



Wait approximately four minutes for the  
programmed symbols memory test to complete.

---


**IS THERE A 32XX ERROR MESSAGE?**

---

**NO**    Go to page 3-3200-23.

**YES**    





Check the error code.

---

**WAS THE ERROR 3268?**

---

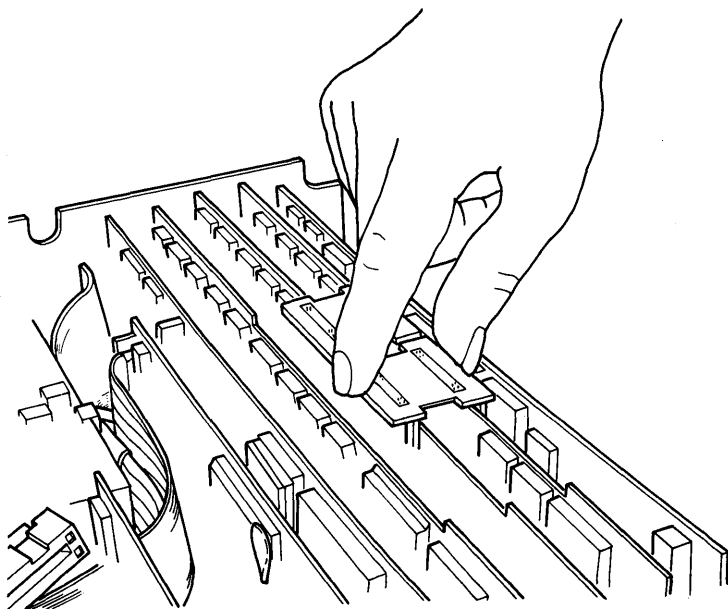
**NO** Replace the programmed symbols adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all font memory. Replace the adapter only if the error affects your applications.

**YES** 

Check the top card connectors for proper seating.

---



**Top Card  
Connectors**

**WERE THE TOP CARD CONNECTORS  
SEATED PROPERLY?**

---

**NO** Reseat the connectors and rerun the  
diagnostics (3-3200-1).

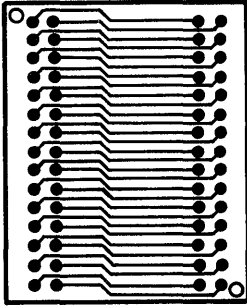
**YES** 

Check the continuity of the top card connectors.

---



End View



Bottom View

**WAS THE CONTINUITY OF THE TOP CARD CONNECTORS GOOD?**

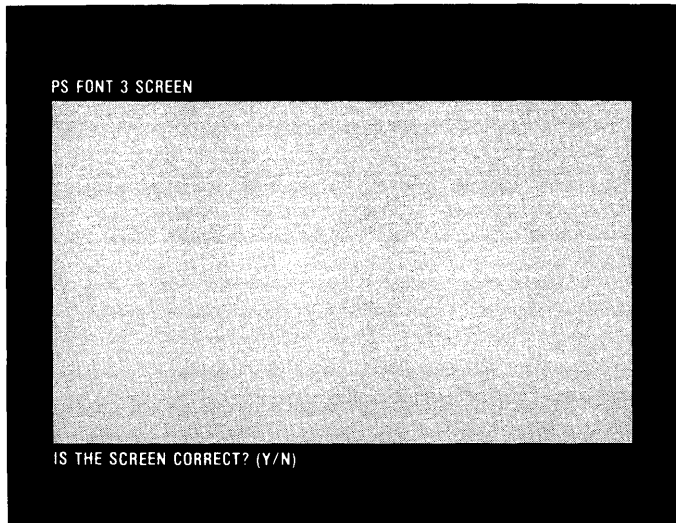
---

**NO** Replace the top card connector(s).

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."  
If the problem persists, replace the programmed symbols adapter.

Your screen should look like the following. Examine your screen and verify that the highlighted portion is solid green (there should be no holes in the highlighted area).

---



**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**


---

**NO**    Replace the programmed symbols adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all font memory. Replace the adapter only if the error affects your applications.

**YES**





Press Y, then Enter.

---

**IS THE ALL POINTS ADDRESSABLE  
ADAPTER INSTALLED IN YOUR  
MACHINE?**

---

**NO**    Go to page 3-3200-56.

**YES** 

The following should appear on your screen.

---



TESTING APA FEATURE  
(TEST WILL TAKE APPROX 3 MINS)


PRESS ENTER TO BEGIN TESTING

**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

**NO** If you have an error message, go to page 3-3200-27. If there is no error message, reload the diagnostics and check that the programmed symbols adapter appears in the option menu.

**YES** 


- 
1. Press Y, then Enter.
  2. Wait approximately three minutes for the all points addressable adapter tests to run. Your screen displays a stippled pattern while this test runs.
- 

**DID YOU RECEIVE A 32XX ERROR?**

---

**NO**    Go to page 3-3200-31.

**YES**    



Check the error code.

---

**WAS THE ERROR 3288?**

---

**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

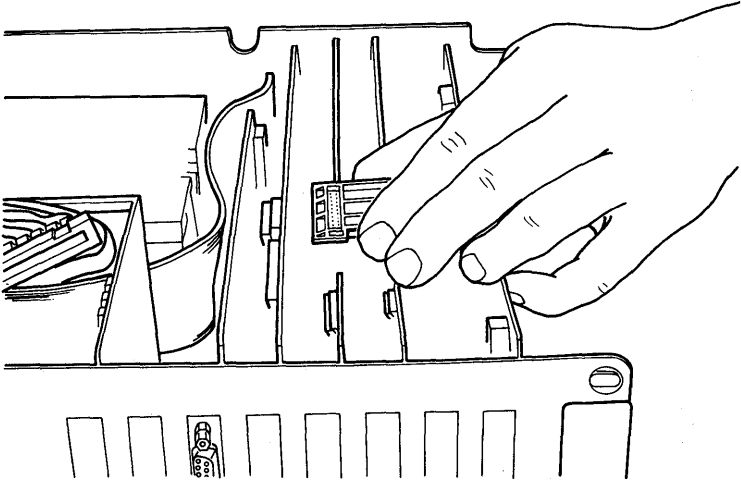
*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES** 



Check the top card connector for proper seating.

---



**WAS THE TOP CARD CONNECTOR  
SEATED PROPERLY?**

---

**NO** Reseat the connectors and rerun the  
diagnostics (3-3200-1).

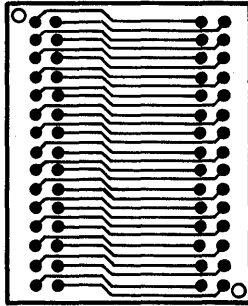
**YES** 

Check the continuity of the top card connector.

---



End View



Bottom View

---

**WAS THE CONTINUITY OF THE TOP CARD CONNECTOR GOOD?**

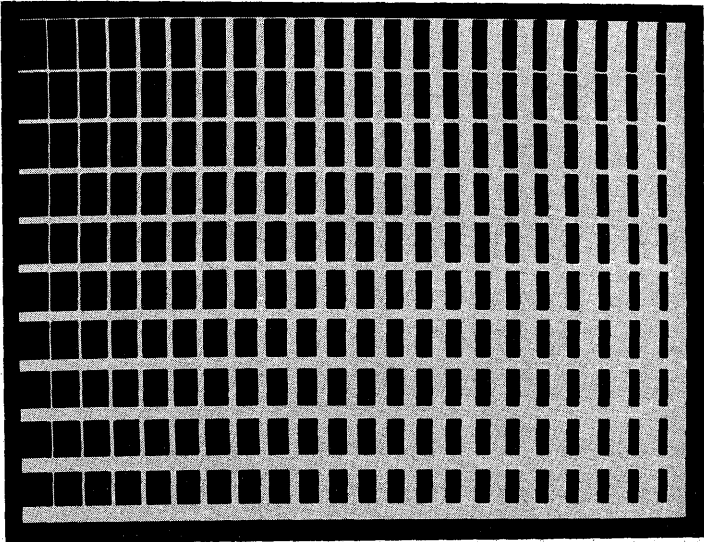
---

**NO** Replace the top card connector(s).

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."  
If the problem persists, replace the all points addressable adapter.

Your screen should look like the following. Examine your screen and verify that the highlighted portions are solid green and the non-highlighted portions are solid black.

---



**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

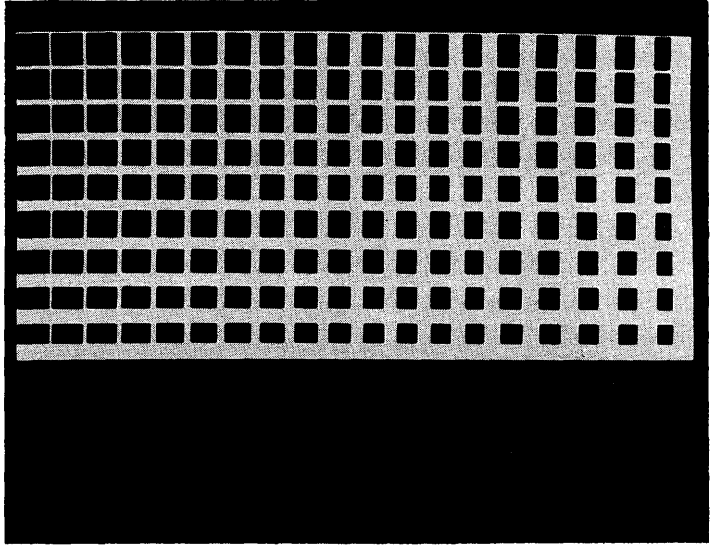
**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES**



1. Press Y, then Enter.
2. Your screen should look like the following. Examine your screen and verify that the highlighted portions are solid green and the non-highlighted portions are solid black.



---

**DOES YOUR SCREEN MATCH THE ONE ABOVE?**

---

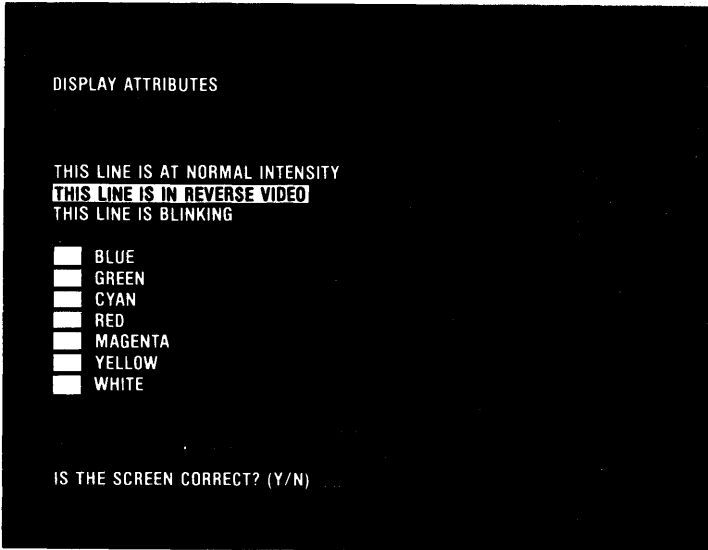
**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES** Press Y, then Enter, and go to page 3-3200-56.

# Color Display

---




## DID THE DISPLAY ATTRIBUTES SCREEN APPEAR?

*Note:* Do not verify that the screen is correct at this time.

---

**NO** Press N, then Enter to end this test.  
Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."

**YES** 



Adjust the brightness control and verify that the brightness of the screen changes.


---

**DID THE BRIGHTNESS CHANGE?**

---

**NO**    Replace the Color Display. See Section 5, "Removal/Replacement and Adjustments."

**YES**    



Each line should match its description; for example, "THIS LINE IS BLINKING" should blink.

---

**DO THE LINES MATCH THEIR DESCRIPTIONS?**

---

**NO**    Go to "Voltage Check" on page 3-25-18.

**YES**    

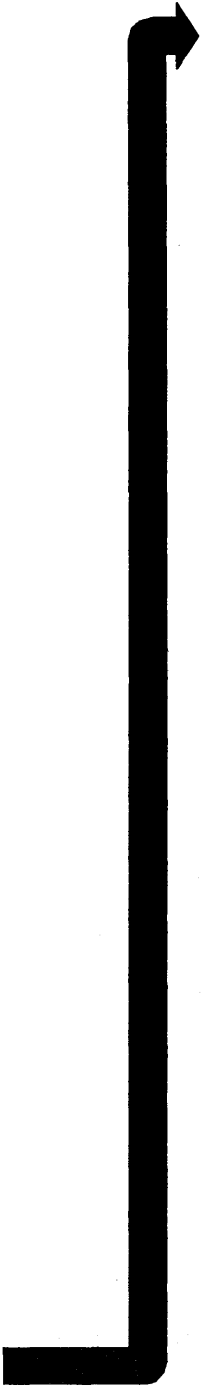












Press Y, then Enter.


---

**WERE YOU DIRECTED TO THIS SECTION  
FROM THE KEYBOARD/TIMER ADAPTER  
TEST?**

---

**YES** Replace the keyboard. See Section 5,  
"Removal/Replacement and Adjustments."

**NO** 

- 
1. Press Y, then Enter.
  2. Check the Installed Devices Chart on the 3270 Personal Computer Components Record in the *Guide to Operations*.
- 

**IS THE PROGRAMMED SYMBOLS  
ADAPTER INSTALLED IN YOUR  
MACHINE?**

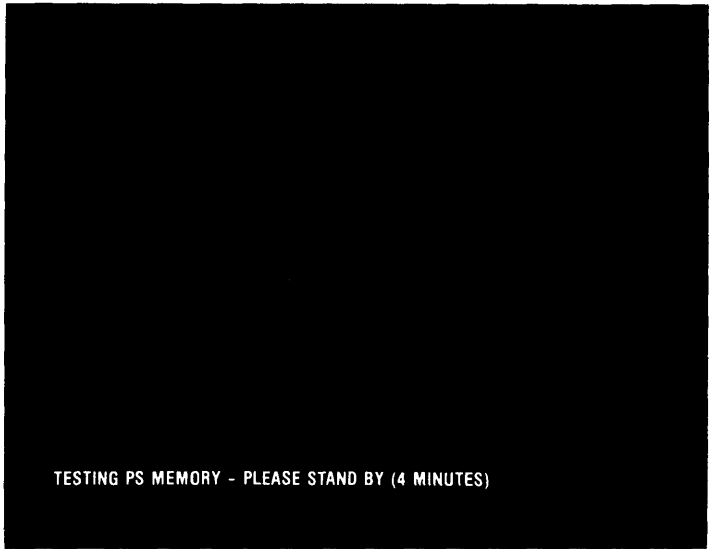
---

**NO**    Go to page 3-3200-48.

**YES**    

Your screen should look like the following.

---




**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

**NO** If you have an error message, go to page 3-3200-43. If there is no error message, reload the diagnostic and check that the programmed symbols adapter appears in the option menu.

**YES**





Wait approximately four minutes for the  
programmed symbols memory test to complete.


---

**IS THERE A 32XX ERROR MESSAGE?**

---

**NO** Go to page 3-3200-46.

**YES** 



Check the error code.

---

**WAS THE ERROR 3268?**

---

**NO**    Replace the programmed symbols adapter. See Section 5, "Removal/Replacement and Adjustments."

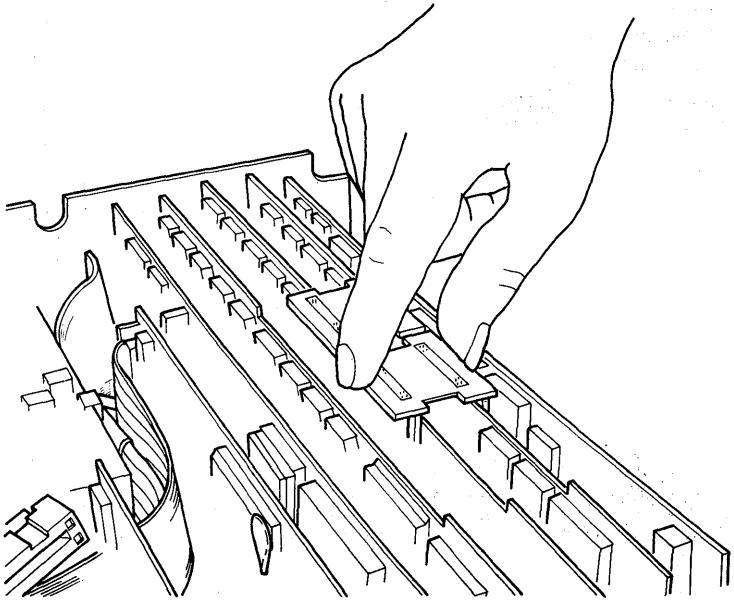
*Note:* The diagnostic detects errors in all font memory. Replace the adapter only if the error affects your applications.

**YES** 



Check the top card connectors for proper seating.

---



**WERE THE TOP CARD CONNECTORS  
SEATED PROPERLY?**

---

**NO** Reseat the connectors and rerun the diagnostics (3-3200-1).

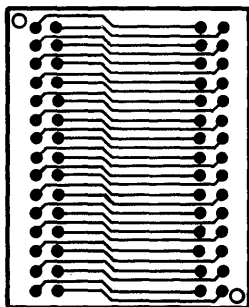
**YES** 

Check the continuity of the top card connectors.

---



End View



Bottom View

---

**WAS THE CONTINUITY OF THE TOP CARD CONNECTORS GOOD?**

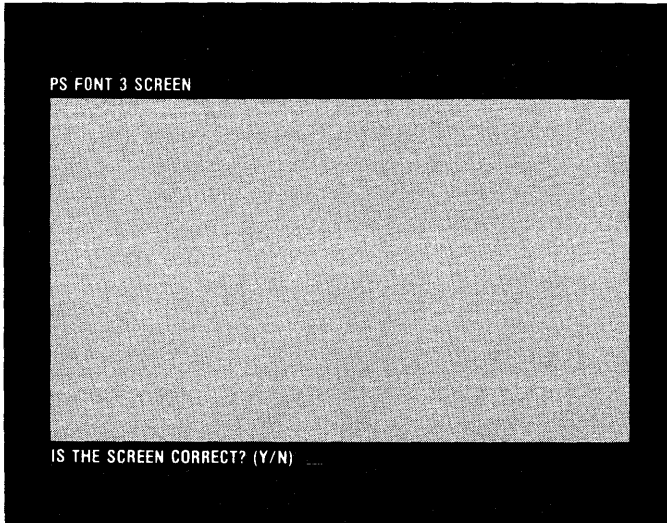
---

**NO** Replace the top card connector(s).

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments."  
If the problem persists, replace the programmed symbols adapter.

Your screen should look like the following. Examine your screen and verify that the highlighted portion is solid green (there should be no holes in the highlighted area).

---



**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**


---

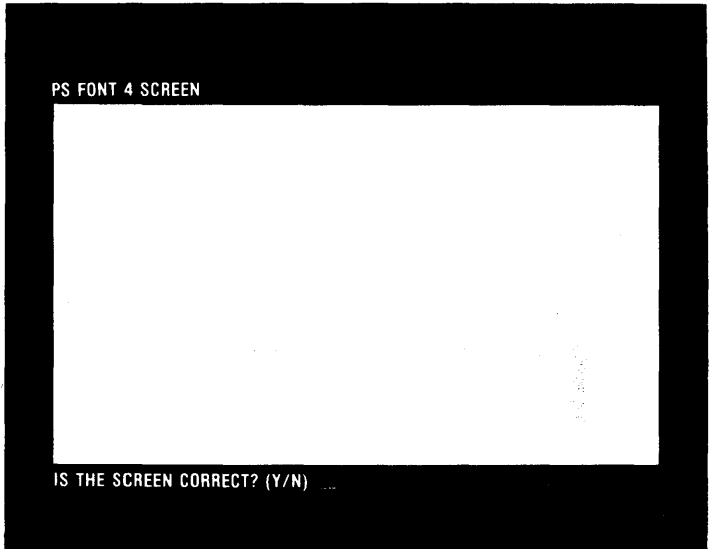
**NO**    Replace the programmed symbols adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all font memory. Replace the adapter only if the error affects your applications.

**YES**



- 
1. Press Y, then Enter.
  2. Your screen should look like the following. Examine your screen and verify that the highlighted portion is solid white (there should be no holes in the highlighted area).
- 




**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

**NO** Replace the programmed symbols adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all font memory. Replace the adapter only if the error affects your applications.

**YES** 



Press Y, then Enter.

---

**IS THE ALL POINTS ADDRESSABLE  
ADAPTER INSTALLED IN YOUR  
MACHINE?**

---

**NO** Go to page 3-3200-56.

**YES** 

The following should appear on your screen.

---

TESTING APA FEATURE  
(TEST WILL TAKE APPROX 3 MINS)


PRESS ENTER TO BEGIN TESTING

**DOES YOUR SCREEN MATCH THE SCREEN  
ABOVE?**

---

**NO** If you have an error message, go to page 3-3200-51. If there is no error message, reload the diagnostics and check that the programmed symbols adapter appears in the option menu.

**YES** 


- 
1. Press Y, then Enter.
  2. Wait approximately three minutes for the all points addressable adapter tests to run. Your screen displays a stippled pattern while this test runs.
- 

**DID YOU RECEIVE A 32XX ERROR?**

---

**NO** Go to page 3-3200-54.

**YES** 



Check the error code.

---

**WAS THE ERROR 3288?**

---

**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

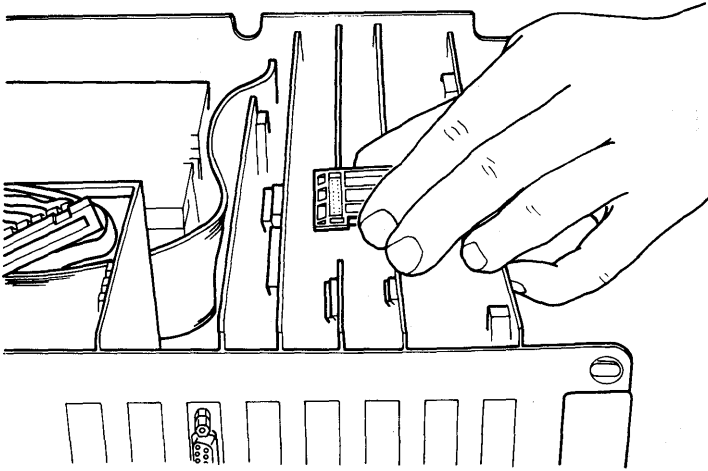
*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES** 



Check the top card connector for proper seating.

---



**WAS THE TOP CARD CONNECTOR  
SEATED PROPERLY?**

---

**NO** Reseat the connectors and rerun the diagnostics (3-3200-1).

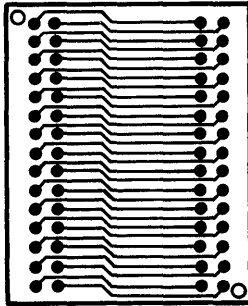
**YES** 

Check the continuity of the top card connector.

---



End View



Bottom View

**WAS THE CONTINUITY OF THE TOP CARD CONNECTOR GOOD?**

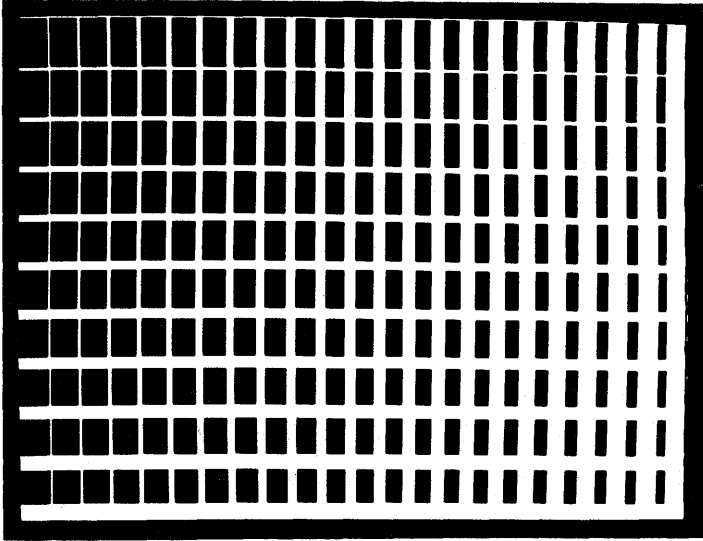
---

**NO** Replace the top card connector(s).

**YES** Replace the display adapter. See Section 5, "Removal/Replacement and Adjustments." If the problem persists, replace the all points addressable adapter.

Your screen should look like the following. Examine your screen and verify that the highlighted portions are solid white and the non-highlighted portions are solid black.

---



**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

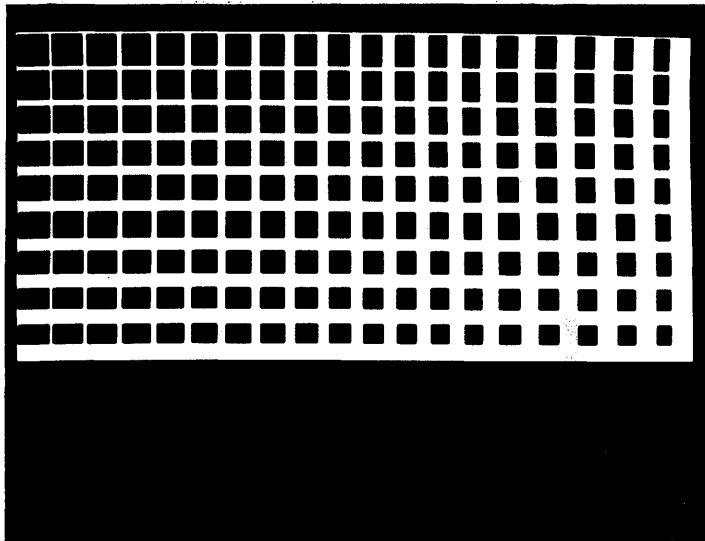
**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES**



1. Press Y, then Enter.
  2. Your screen should look like the following. Examine your screen and verify that the highlighted portions are solid green and the non-highlighted portions are solid black.
- 



---

**DOES YOUR SCREEN MATCH THE SCREEN ABOVE?**

---

**NO** Replace the all points addressable adapter. See Section 5, "Removal/Replacement and Adjustments."

*Note:* The diagnostic detects errors in all display memory. Replace the adapter only if the error affects your applications.

**YES** Press Y, then Enter, and go to the next page.

You have gone through the PICs without solving your problem. The following steps should help you find additional audio or visual symptoms.

1. Check the entire system for loose or damaged connectors.
  2. Return to page 3-5-1 and review "Start."
  3. Select "LOG UTILITIES" in the diagnostic menu. Start an error log and select "RUN TESTS MULTIPLE TIMES". This will allow you to operate the machine thoroughly to identify the failure symptom. When you have identified the symptom, go to "Start" on page 3-5-1, or to the appropriate PIC for the symptom you received.
- 

---

If you have followed these procedures and still have an unsolved problem, request technical assistance.

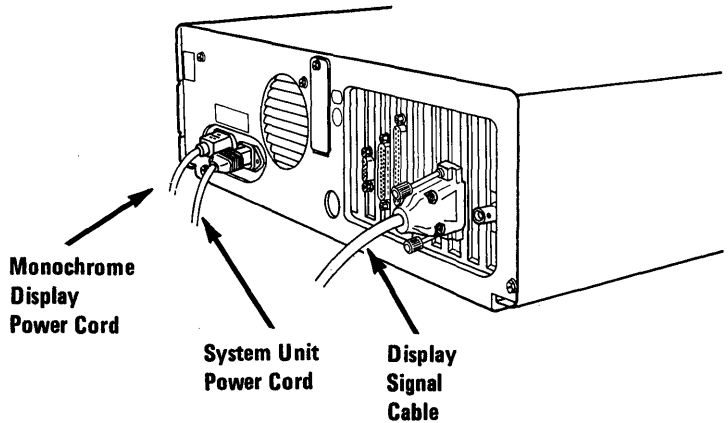
# Undetermined Problems

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the system unit power cord from the power outlet.
3. Remove the keyboard adapter cable from the system unit (0301 and 0302 errors may appear).

## CAUTION

**Do not connect or disconnect a coaxial cable during an electrical storm.**

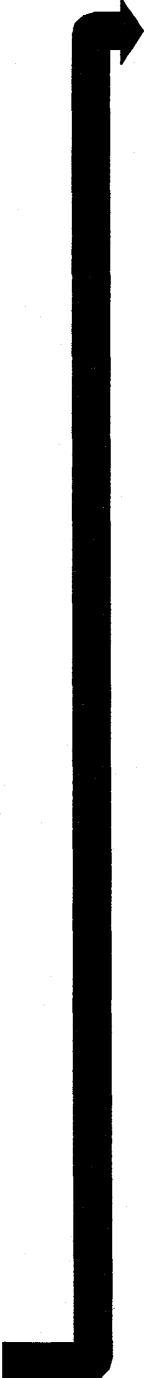
4. Remove any external devices except the display that are attached to the system unit.



---

**CONTINUE**




- 
1. Plug the system unit power cord into a properly grounded power outlet.
  2. Set the Power switch on the system unit (and expansion unit, if attached) to On.
- 

**DID THE FAILURE SYMPTOM REMAIN?**

---

**YES** Go to page 3-9999-4.

**NO** 



Beginning with the keyboard adapter cable, reconnect the external devices one at a time as described:

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Reconnect one device to the system unit.
  3. Set the Power switch(es) to On and see if the failure symptom has returned.
  4. Continue to reconnect one device at a time until the failure symptom returns.
- 

---

Replace the last device that you reconnected.



Remove the adapters one at a time, as described:

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove one adapter (in the following order).
  - Option adapters:
    - Personal Computer options
    - Printer
    - Fixed Disk
  - Distributed Function Communications Adapter (2801 error)
  - Diskette Adapter (601 error)
  - Display Adapter (one long and two short beeps)
  - Keyboard/Timer Adapter (no display, two beeps)

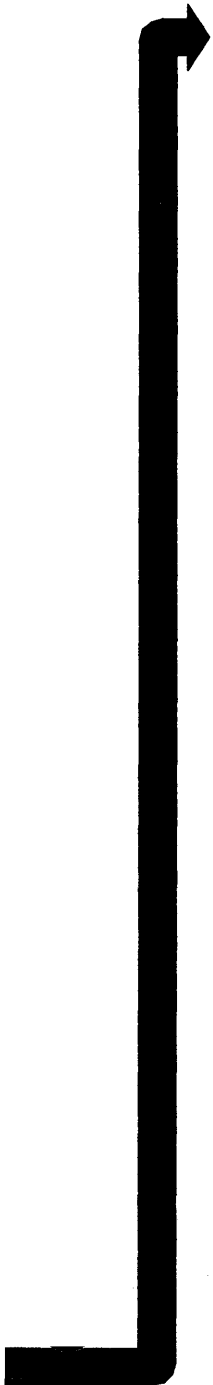
*Note:* The above error codes result from removing the adapters.

3. Set the Power switch(es) to On and see if the failure symptom remains.
  4. Continue to remove one adapter at a time until the failure symptom disappears or until you have removed all the adapters.
- 

---

CONTINUE





See below.


---

**DID THE FAILURE SYMPTOM REMAIN?**

---

**NO**    Replace the last adapter that you removed.  
See Section 5, "Removal/ Replacement and  
Adjustments."

**YES**    



You may have a failing coprocessor.


---

**IS AN IBM MATH COPROCESSOR  
INSTALLED IN THE SYSTEM UNIT?**

---

**NO**    Go to page 3-9999-8.

**YES**    

- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Remove the IBM Math Coprocessor from the system unit. See Section 5, "Removal/Replacement and Adjustments."
  3. Set the Power switch on the system unit (and expansion unit, if attached) to On.
- 

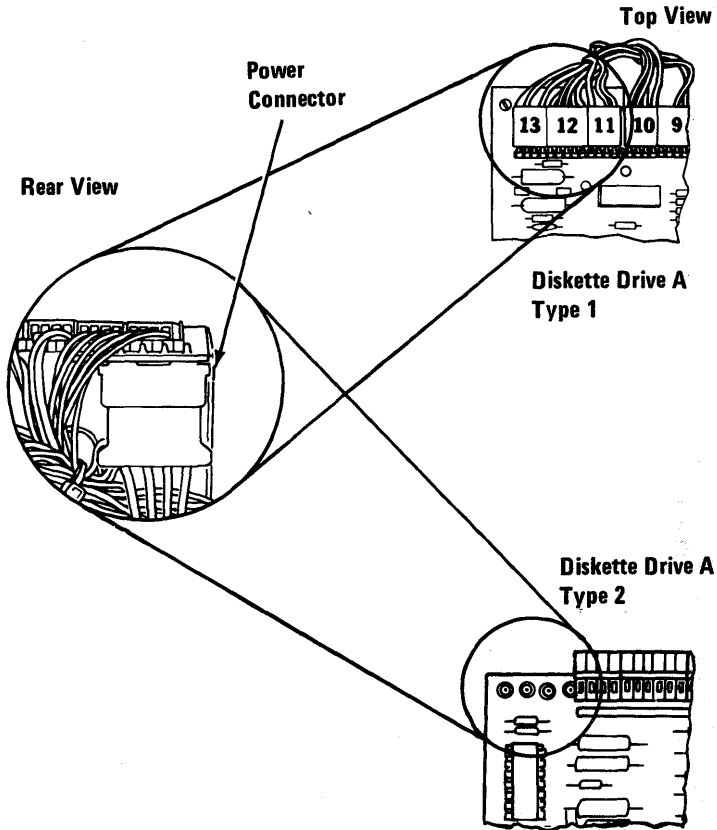
**DID THE FAILURE SYMPTOM REMAIN?**

---


**NO** Replace the IBM Math Coprocessor and the 8088 Processor. See Section 5, "Removal/Replacement and Adjustments."

**YES** 

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove the power connector from diskette drive A.



**CONTINUE**



Set the Power switch on the system unit (and expansion unit, if attached) to On.

---

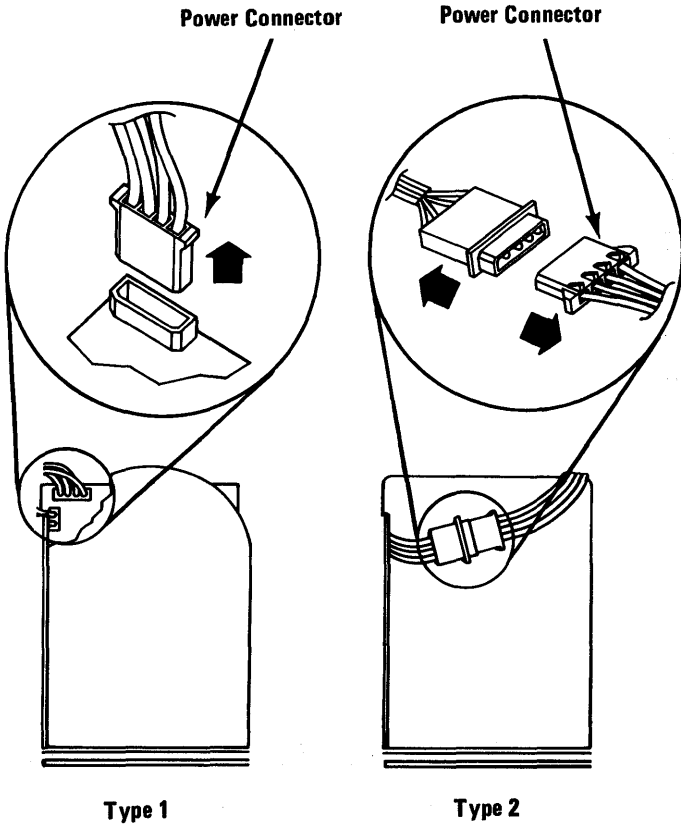
**DID THE FAILURE SYMPTOM REMAIN?**

---


**NO**    Replace the diskette drive. See Section 5, "Removal/Replacement and Adjustments."

**YES**    

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove the power connector from the right drive of the system unit. Leave the left drive disconnected.



CONTINUE



Set the Power switch on the system unit (and expansion unit, if attached) to On.

---

**DID THE FAILURE SYMPTOM REMAIN?**

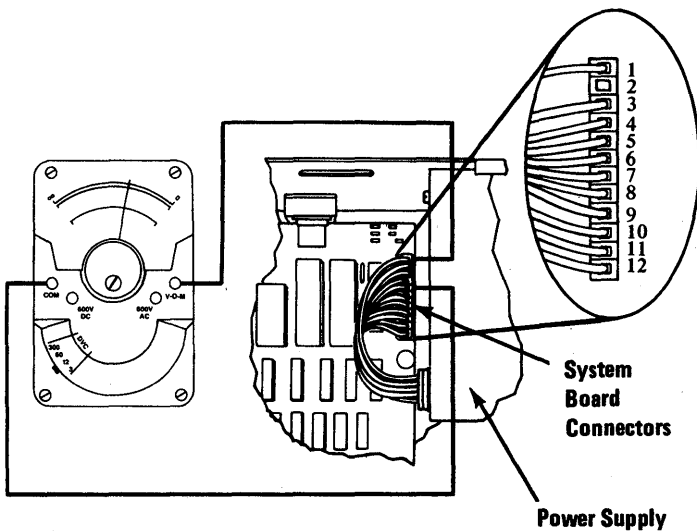
---

**NO** Replace the right drive assembly. See Section 5, "Removal/Replacement and Adjustments."

**YES** 



1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set your meter to the 12 Vdc scale.
3. Refer to the diagram below and locate the system board power connectors. Connect the common lead to pin 5 and connect the voltage lead to pin 1.
4. Set the Power switch on the system unit (and expansion unit, if attached) to On.
5. Check for a voltage reading of 2.4 to 5.2 Vdc.

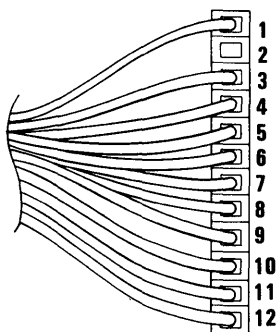


### IS THE VOLTAGE CORRECT?

**NO** Go to page 3-9999-21.

**YES** 

1. Check that your meter is set to the 12 Vdc scale.
2. Measure the voltage between the system board power connectors listed below.




Voltage Connectors			
Min Vdc	Max Vdc	-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

### ARE THE VOLTAGES CORRECT?

**NO** Replace the power supply. See Section 5, "Removal/Replacement and Adjustments."

**YES** 

- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Reconnect the diskette drive A power supply connector.
  3. Set the Power switch on the system unit (and expansion unit, if attached) to On.
- 

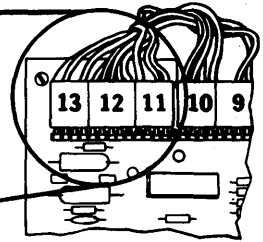
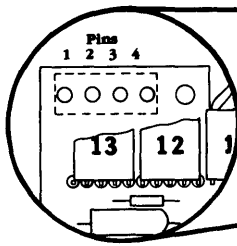
---

**CONTINUE**

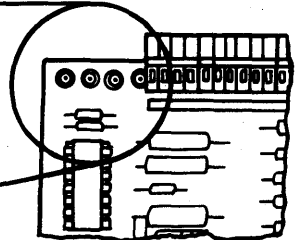
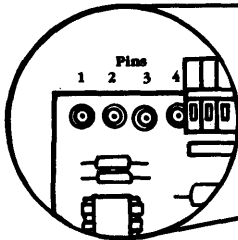


Check the voltage between the pins in the following chart.

Diskette Drive Power Connector			
Min Vdc	Max Vdc	- Lead	+ Lead
+ 4.8	+ 5.2	2	4
+ 11.5	+ 12.6	3	1



Type 1 Diskette Drive




Type 2 Diskette Drive

### ARE THE VOLTAGES CORRECT?

**NO** Replace the power supply. See Section 5, "Removal/Replacement and Adjustments"

**YES** 



See below.

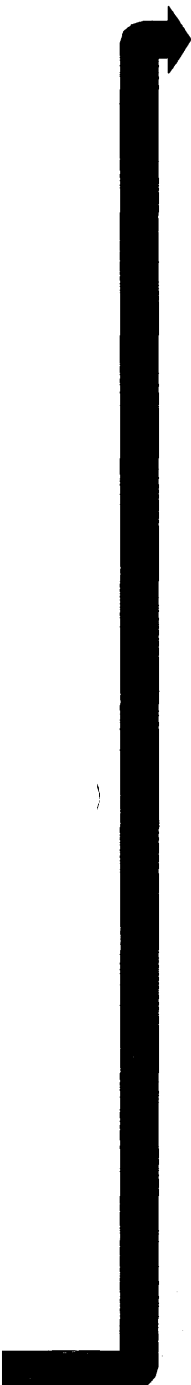
---

**IS A DRIVE INSTALLED IN THE RIGHT  
SIDE OF THE SYSTEM UNIT?**

---

**NO**    Go to page 3-9999-19.

**YES** 

- 
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Reconnect the right drive power supply connector.
  3. Set the Power switch on the system unit (and expansion unit, if attached) to On.
- 

**IS THE RIGHT DRIVE A DISKETTE DRIVE?**

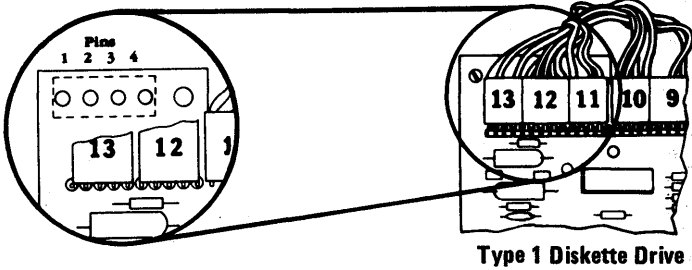
---

**NO** The right drive is a fixed disk drive. Go to page 3-1700-4.

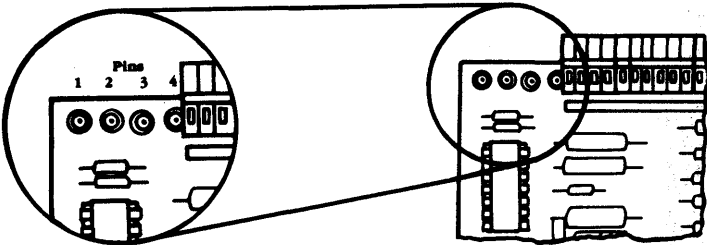
**YES** 

The right drive is a diskette drive. Check the voltage between the pins shown below.

Right Drive Power Connector			
Min Vdc	Max Vdc	-Lead	+ Lead
+ 4.8	+ 5.2	2	4
+ 11.5	+ 12.6	3	1



Type 1 Diskette Drive

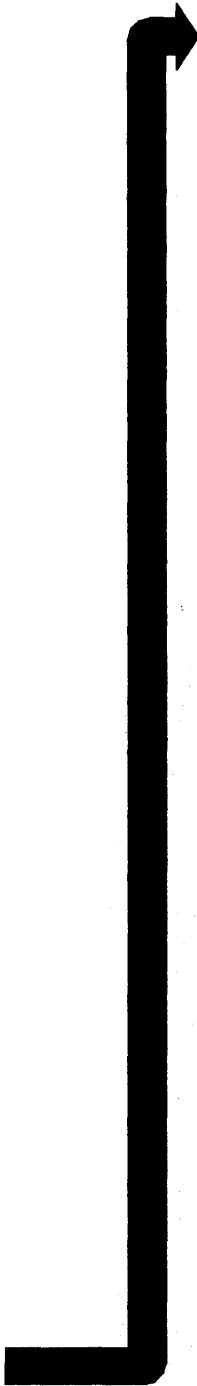


Type 2 Diskette Drive

**ARE THE VOLTAGES CORRECT?**

**NO** Replace the power supply. See Section 5, "Removal/Replacement and Adjustments."

**YES** 



Check the speaker circuit if you have no beep.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Set your meter to the Ohms (x1) scale.
  3. Remove the speaker connector from the system board.
- 

---

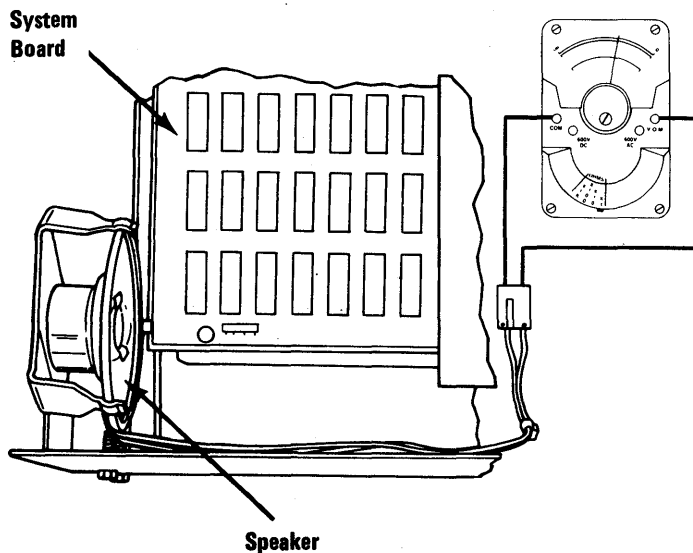
**CONTINUE**





Connect the meter leads to the speaker as shown.

---



---

### IS THE CONTINUITY GOOD?

---

**NO** Replace the speaker. See Section 5, "Removal/Replacement and Adjustments."

**YES** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments." If this does not solve your problem, then replace the system board.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Set your meter to the Ohms (x1) scale.
  3. Remove the system board power connectors from the system board.
  4. Remove all adapters from the system board.
- 

---

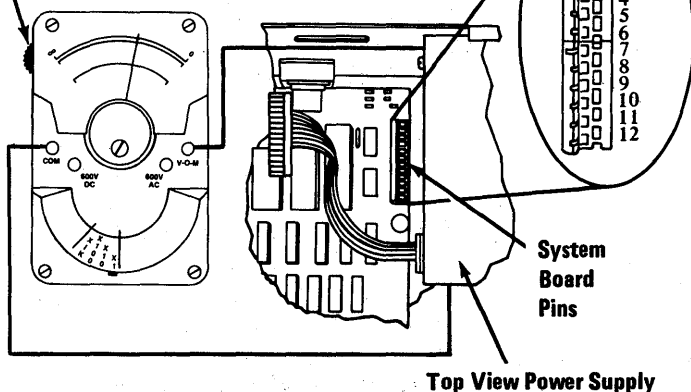
**CONTINUE**



Measure the resistance of the system board pins shown in the following chart.

Min Resistance	COM Lead	VOM Lead
17 Ohms	5	3
17 Ohms	6	4
17 Ohms	7	9
.8 Ohms	8	10
.8 Ohms	8	11
.8 Ohms	8	12

Ohms  
Adjust  
Control



**ARE ANY OF THE RESISTANCE MEASUREMENTS LESS THAN THEIR CORRECT MINIMUM VALUE?**

- NO** Replace your power supply. See Section 5, "Removal/Replacement and Adjustments."
- YES** Replace the keyboard/timer adapter. See Section 5, "Removal/Replacement and Adjustments." If this does not solve your problem, replace the system board.

## Section 4. Locations

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Safety Ground Locations 20	4-20-1
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IBM 5152 Graphics Printer	4-20-2
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System Board	4-100-2
System Unit Model 2	4-100-3
System Unit Model 4	4-100-4
System Unit Model 6	4-100-5
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64/256K Memory Expansion	
Option	4-200-1
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256KB Memory Expansion Card	4-200-2
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German Keyboard	4-300-3
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Diskette Drive Adapter	4-600-1
Type 1 Diskette Drive Assembly	4-600-2
Type 1 Printed Circuit Board	4-600-3
Type 2 Diskette Drive Assembly	4-600-4
Type 2 Printed Circuit Board	4-600-5
Printer Adapter 900	4-900-1
Printer Adapter	4-900-1
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Adapter 1100	4-1100-1
IBM 5152 Graphics Printer 1400	4-1400-1

Internal View . . . . .	4-1400-2
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Fixed Disk Adapter . . . . .	4-1700-2
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IBM 5151 Monochrome Display	4-3200-1
IBM 5272 Color Display . . . .	4-3200-1
Display Adapter . . . . .	4-3200-2
All Points Addressable Adapter	4-3200-2
Programmed Symbols Adapter	4-3200-3

# Option Parameters 10

The table below lists the options and adapters that are supported for the IBM 3270 Personal Computer and where they can be installed.

---

The following adapters **must be** installed in the System Unit:

- All-Points-Addressable Adapter
  - Display Adapter
  - Distributed Function Communications Adapter
  - Math Coprocessor
  - Programmed Symbols Adapter
  - 5-1/4 Diskette Drive Adapter
  - 64/256KB Memory Expansion Adapter
  - 128KB Memory-Printer Adapter
  - 256KB Memory Expansion Card
- 

The following can be installed in either the system unit or the expansion unit:

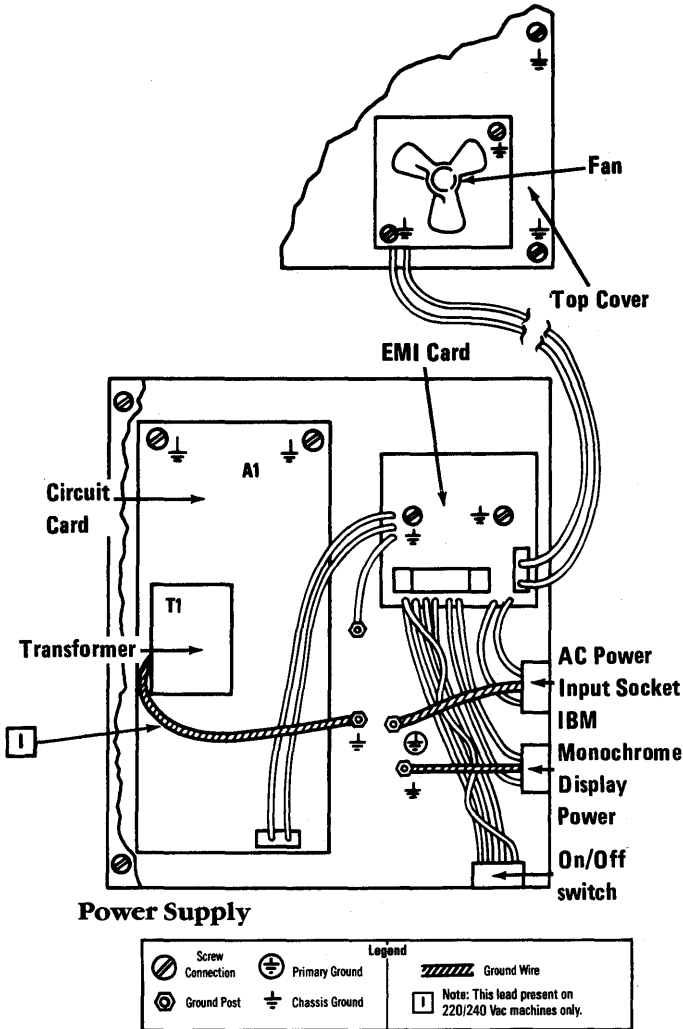
- Asynchronous Communications Adapter
- Fixed Disk Adapter
- Printer Adapter

## **Notes:**

# Safety Ground Locations 20

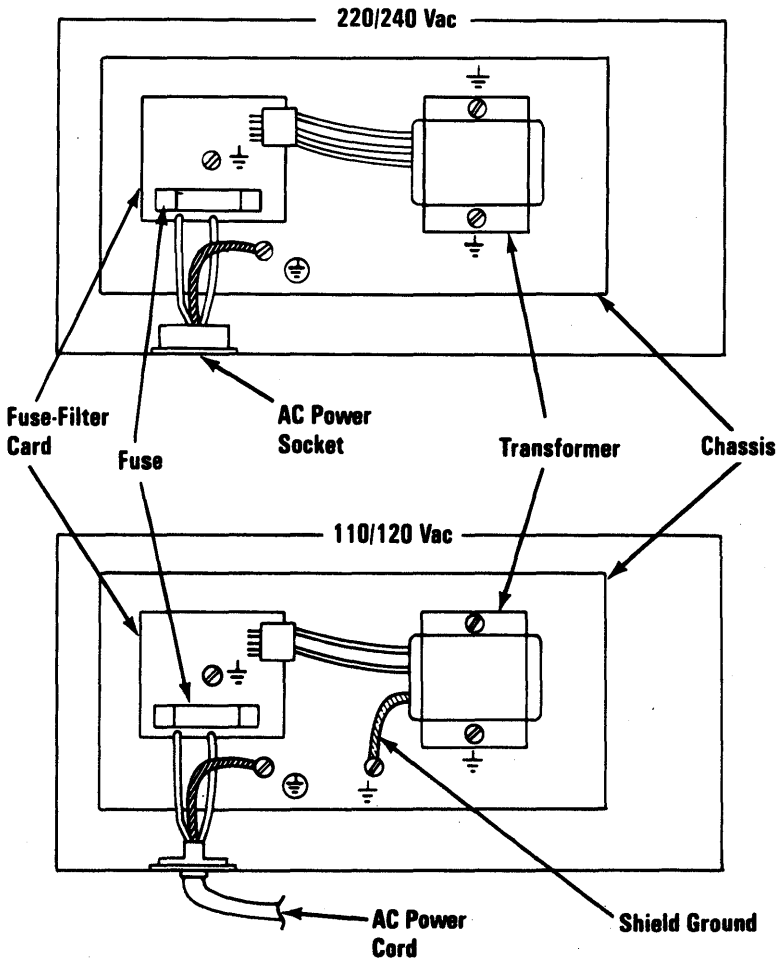
The following describes the safety ground locations the system unit, expansion unit and graphics printer.

## System Unit and Expansion Unit Power Supply

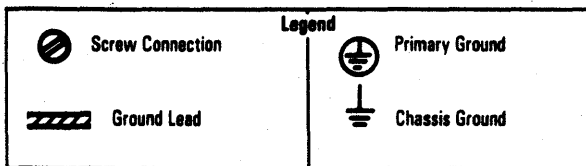




# IBM 5152 Graphics Printer

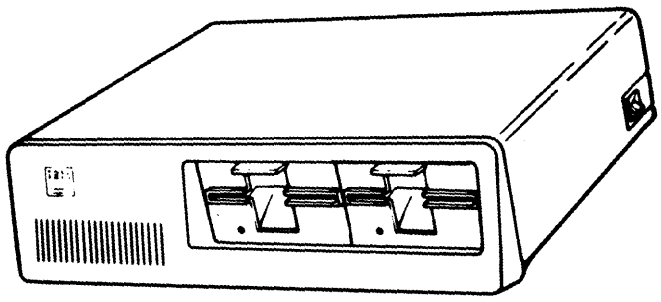


## IBM 80 CPS Printer

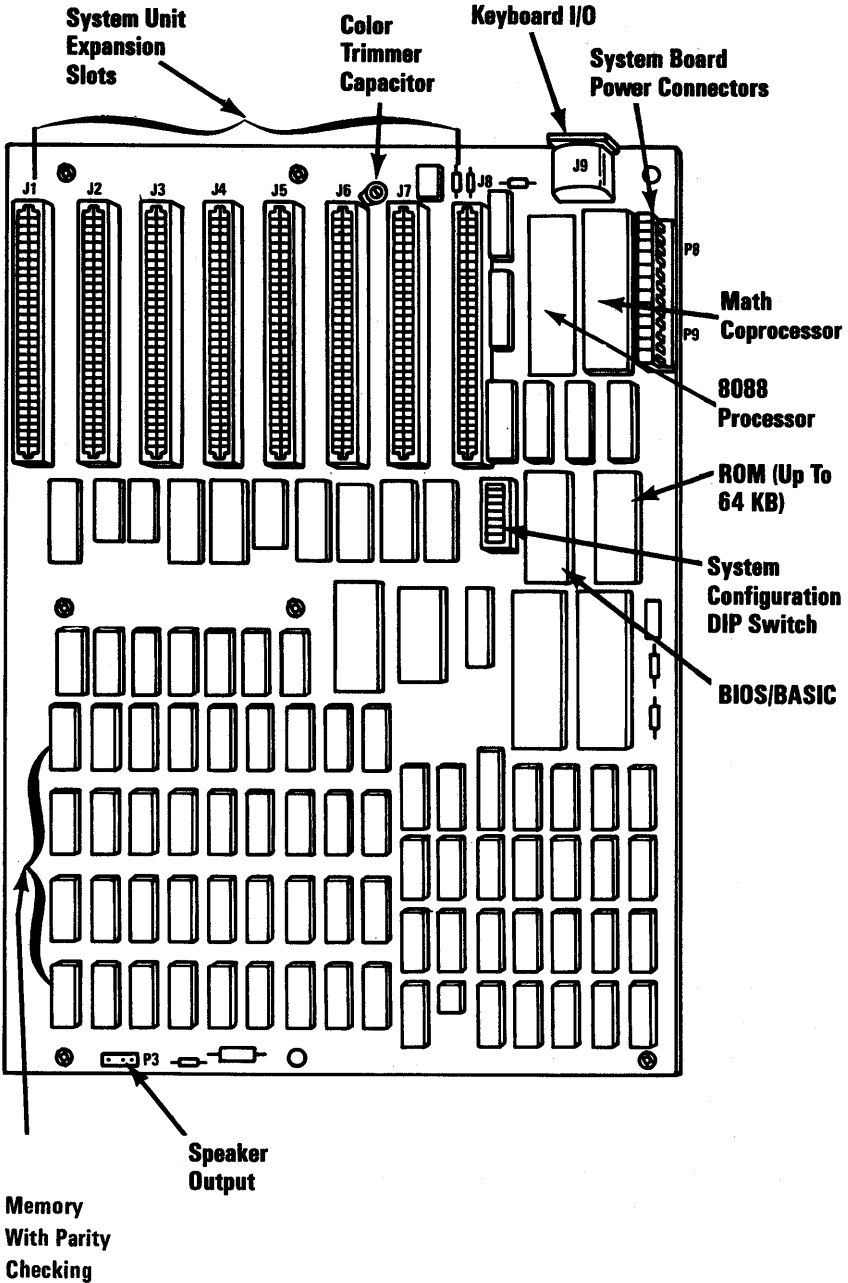


# System Unit 100

Section 100 illustrates the system board and the standard models of the IBM 3270 PC.

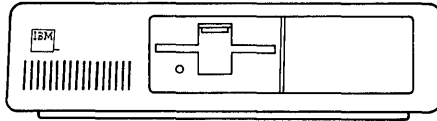


# System Board

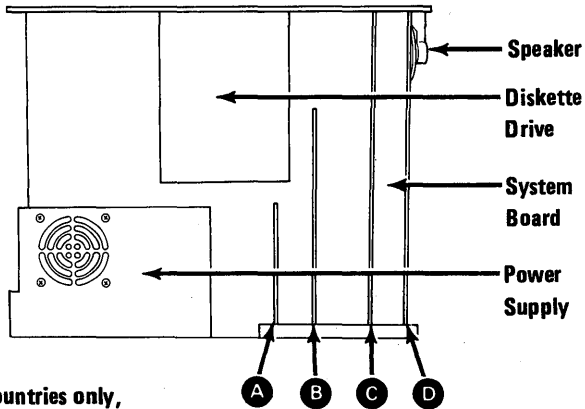


# System Unit Model 2

Front View

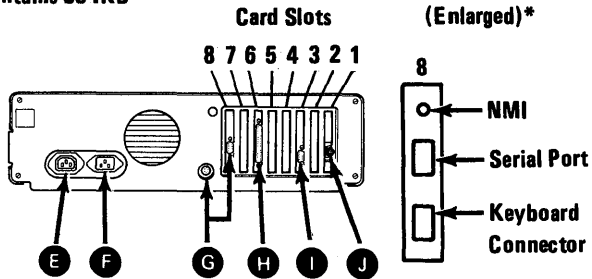


Top View  
(Internal)



Note: E/ME/A countries only,  
model 2 contains 384KB  
Memory.

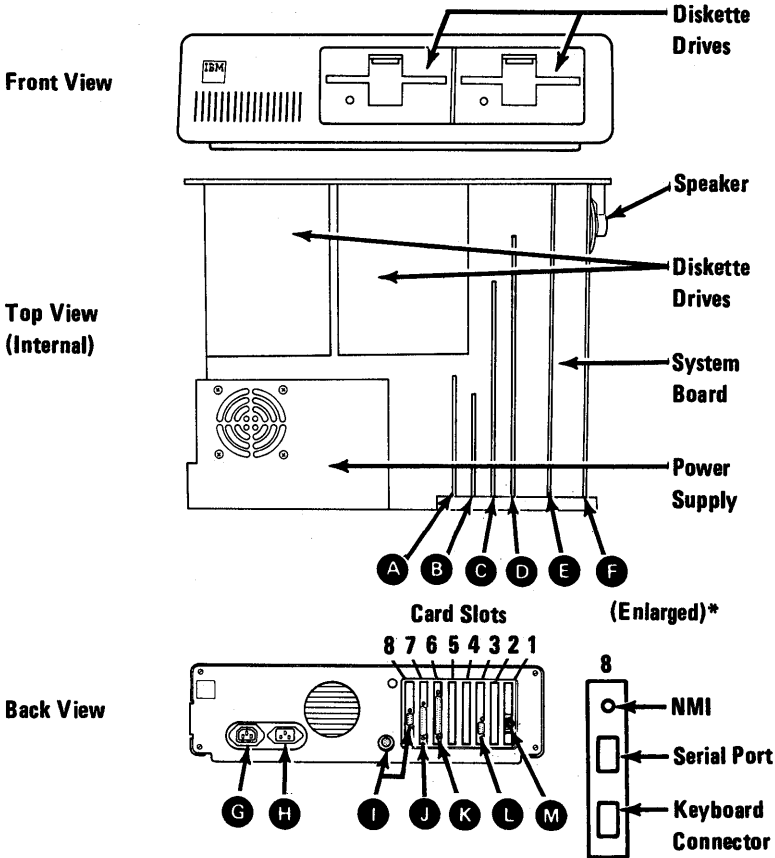
Rear View



- A** Keyboard/Timer Adapter
- B** 5 1/4" Diskette Drive Adapter
- C** Display Adapter
- D** Distributed Function Communications Adapter
- E** Power output for the IBM Monochrome Display
- F** Power input for the system unit
- G** Keyboard connectors
- H** External Diskette Drive Connector (not used)
- I** Display Connector
- J** Coaxial Cable Connector

\*May not be present on your unit.

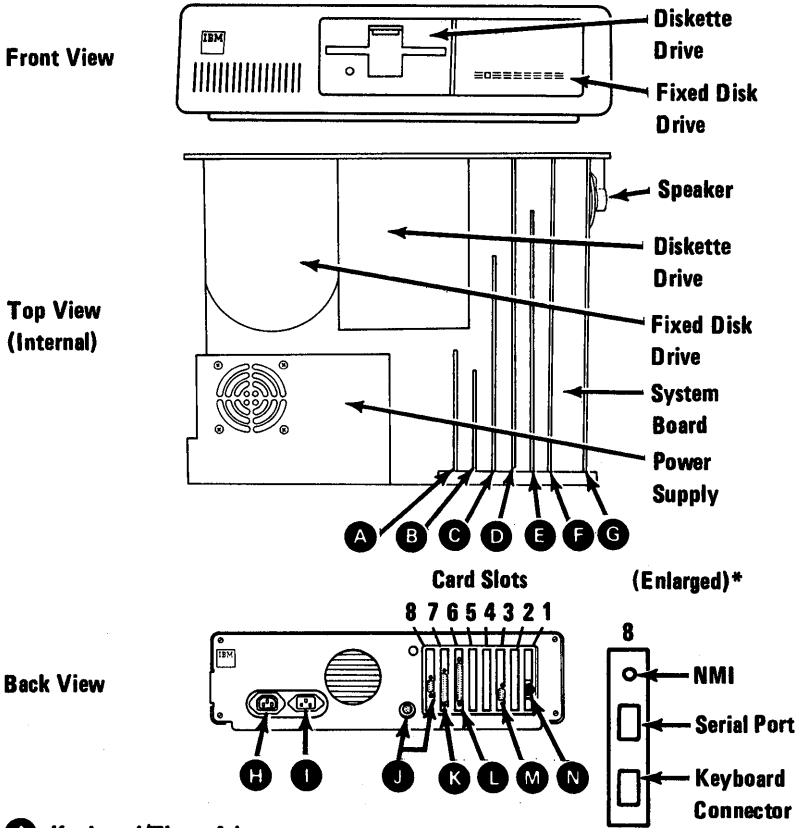
# System Unit Model 4



- A** Keyboard/Timer Adapter
- B** Printer Adapter or 128KB Memory-Printer Adapter
- C** 5 1/4" Diskette Drive Adapter
- D** 64/256KB Memory Expansion Adapter\*
- E** Display Adapter
- F** Distributed Function Communications Adapter
- G** Power output for the IBM Monochrome Display
- H** Power input for the system unit
- I** Keyboard Connectors
- J** Printer Connector
- K** External Diskette Drive Connector (not used)
- L** Display Connector
- M** Coaxial Cable Connector

\*May not be present on your unit.

# System Unit Model 6



- A** Keyboard/Timer Adapter
- B** Printer Adapter or 128KB Memory-Printer Adapter
- C** 5 1/4" Disk Drive Adapter
- D** Fixed Disk Adapter
- E** 64/256KB Memory Expansion Adapter\*
- F** Display Adapter
- G** Distributed Function Communications Adapter
- H** Power output for the IBM Monochrome Display
- I** Power input for the system unit
- J** Keyboard Connectors
- K** Printer Connector
- L** External Diskette Drive Connector (not used)
- M** Display Connector
- N** Coaxial Cable Connector

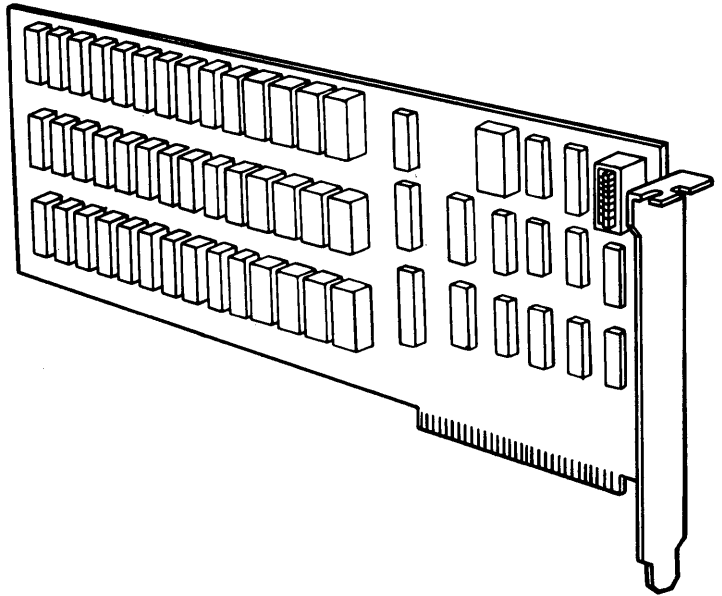
\*May not be present on your unit.

## **Notes:**

# Memory 200

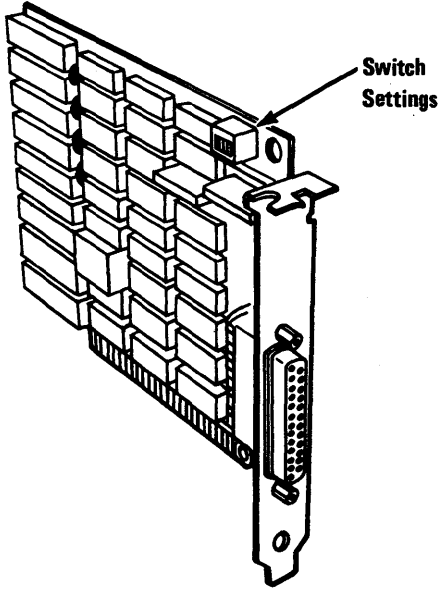
The memory expansion adapters used in the IBM 3270 Personal Computer are depicted below and on the following pages.

## 64/256K Memory Expansion Option

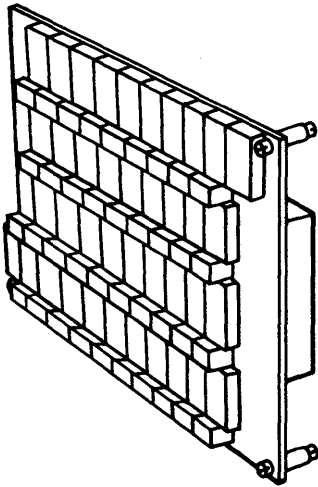




# 128KB Memory-Printer Adapter



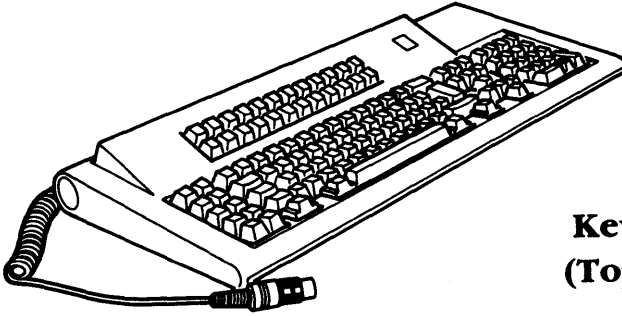
# 256KB Memory Expansion Card



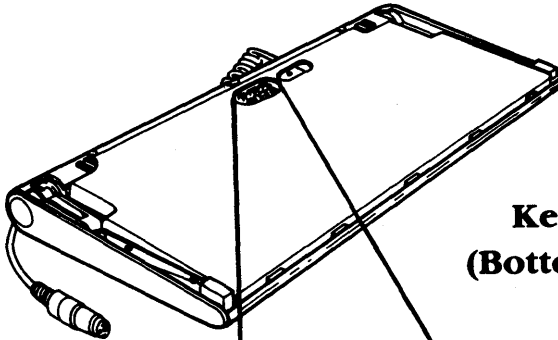
# Keyboard 300

This section contains location information for all the 3270 Personal Computer Keyboards and keyboard related items.

## Keyboard (Top and Bottom)

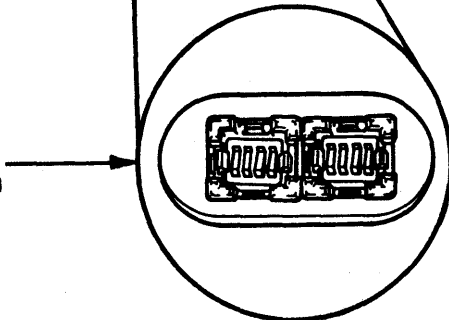


**Keyboard  
(Top View)**

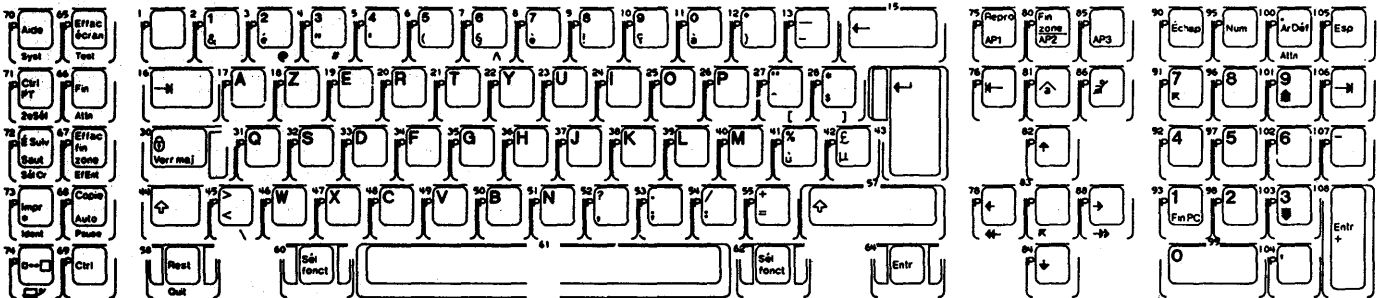
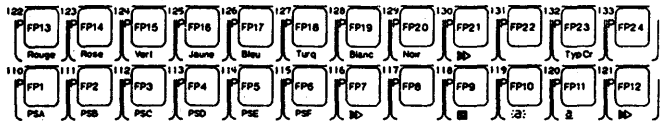


**Keyboard  
(Bottom View)**

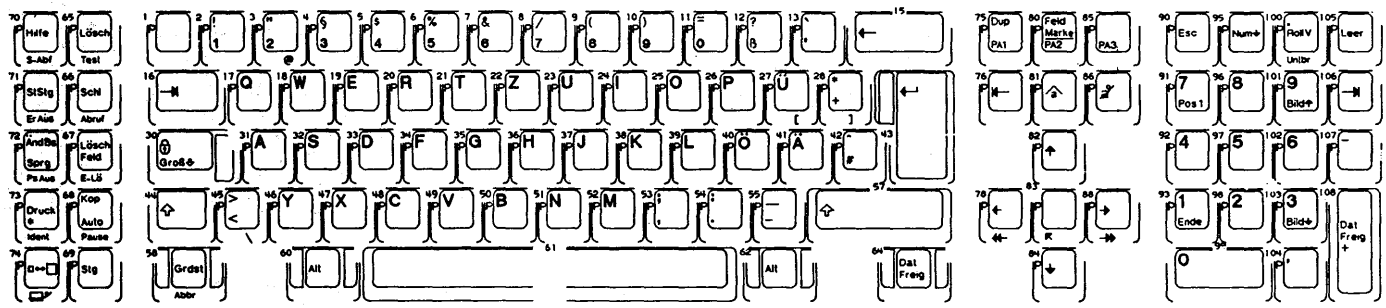
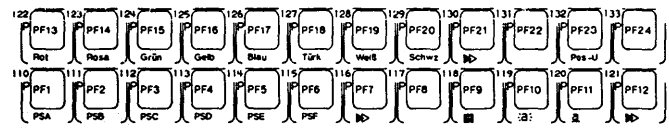
**These switches  
perform no function**



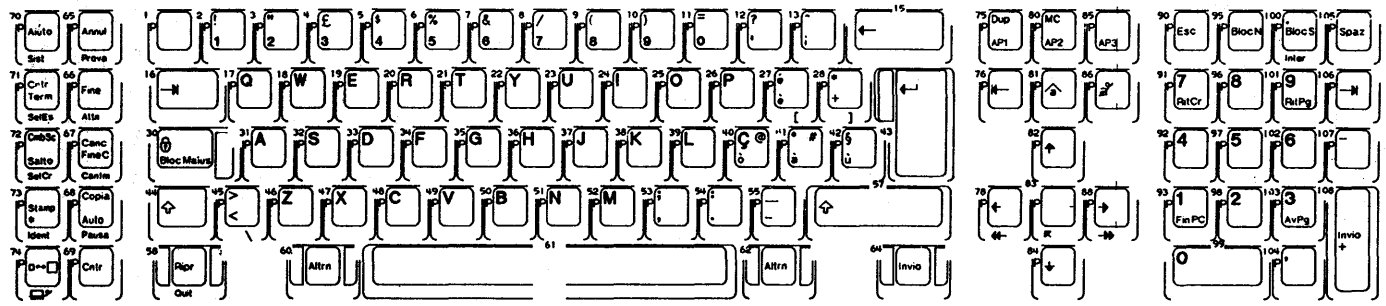
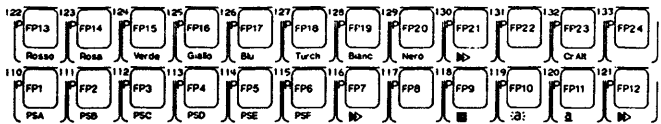
# French Keyboard



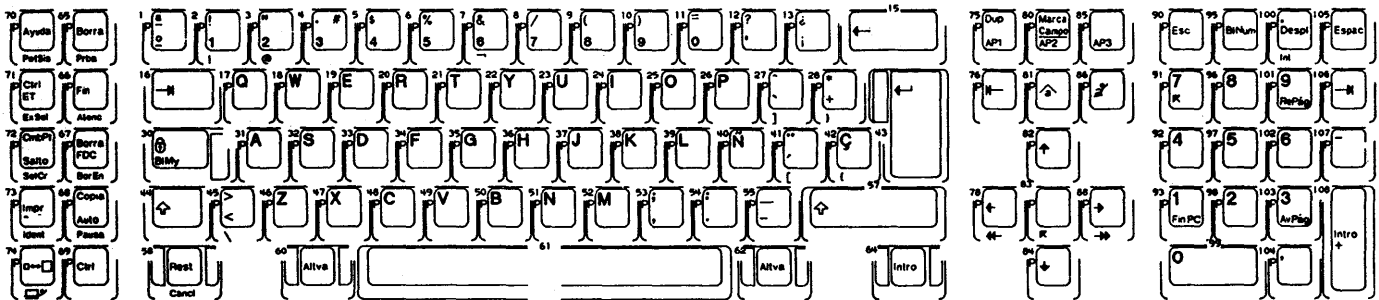
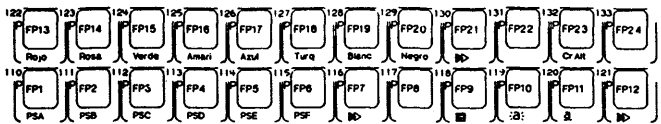
# German Keyboard



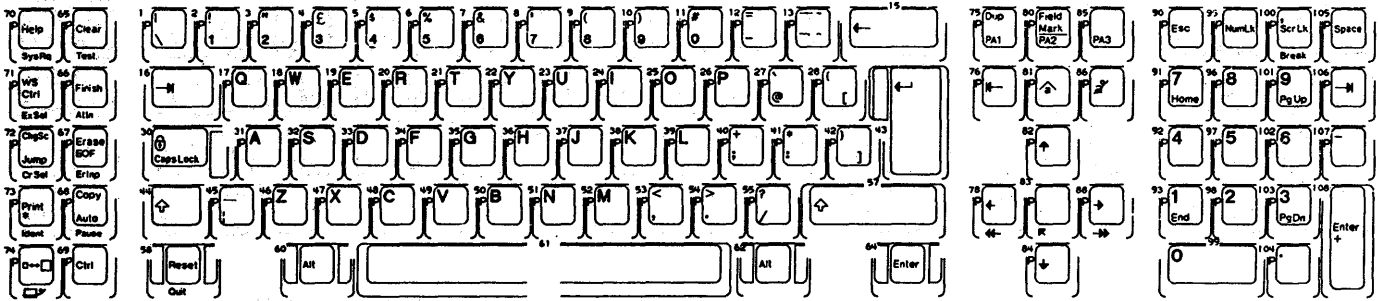
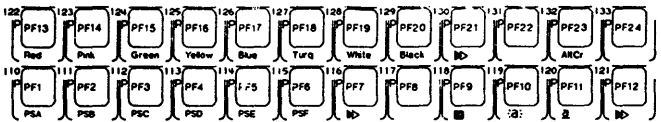
# Italian Keyboard



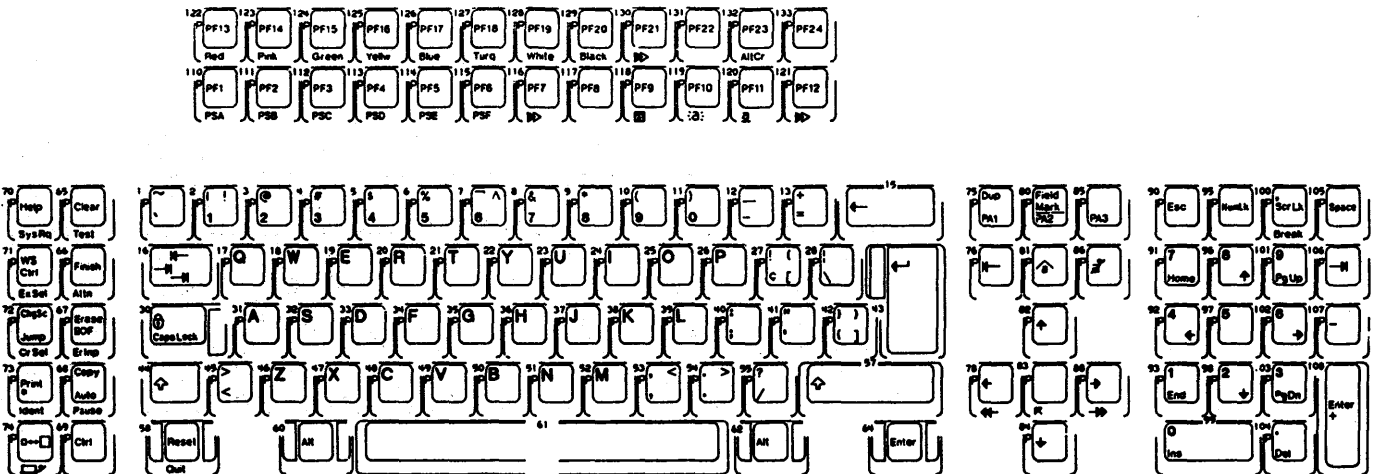
# Spanish Keyboard



# U.K. (English) Keyboard

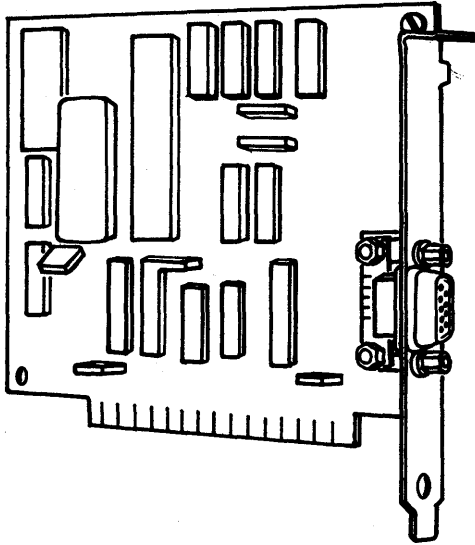


# U.S. (English) Keyboard

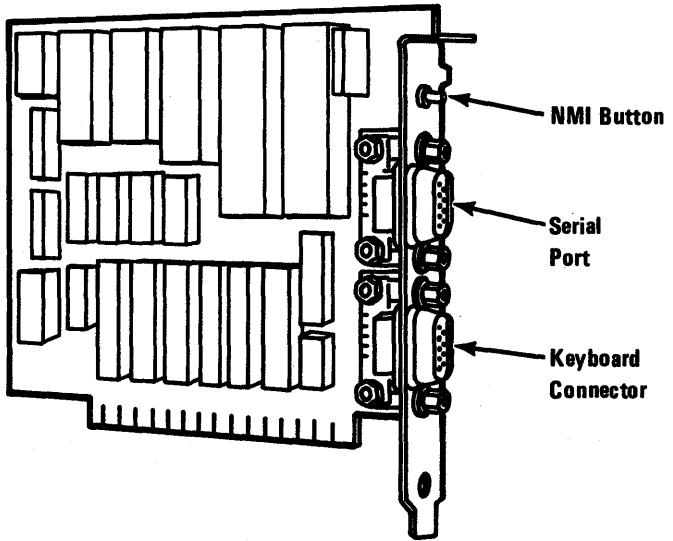




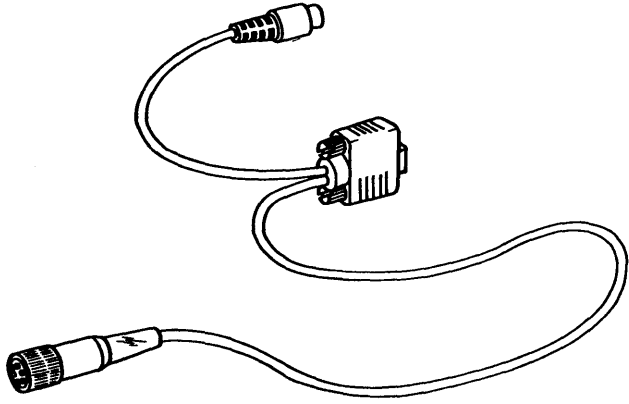
# Type 1 Keyboard/Timer



# Type 2 Keyboard/Timer



# Keyboard Adapter Cable

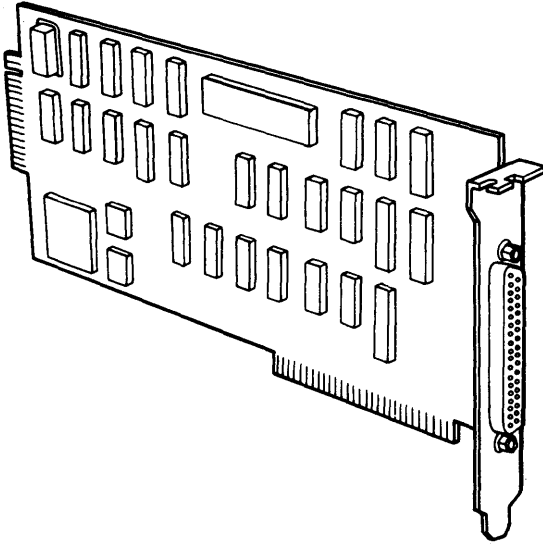


# Notes:

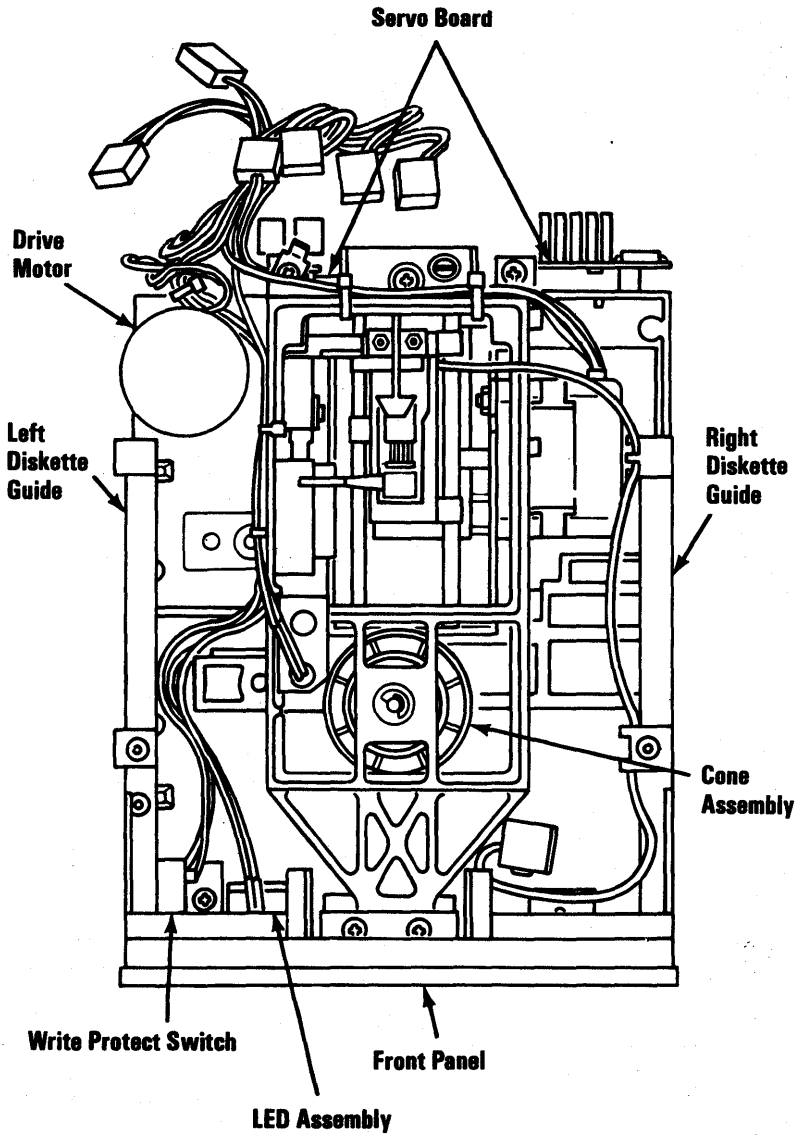
# Diskette Drive 600

Subsection 600 contains location information for diskette drives.

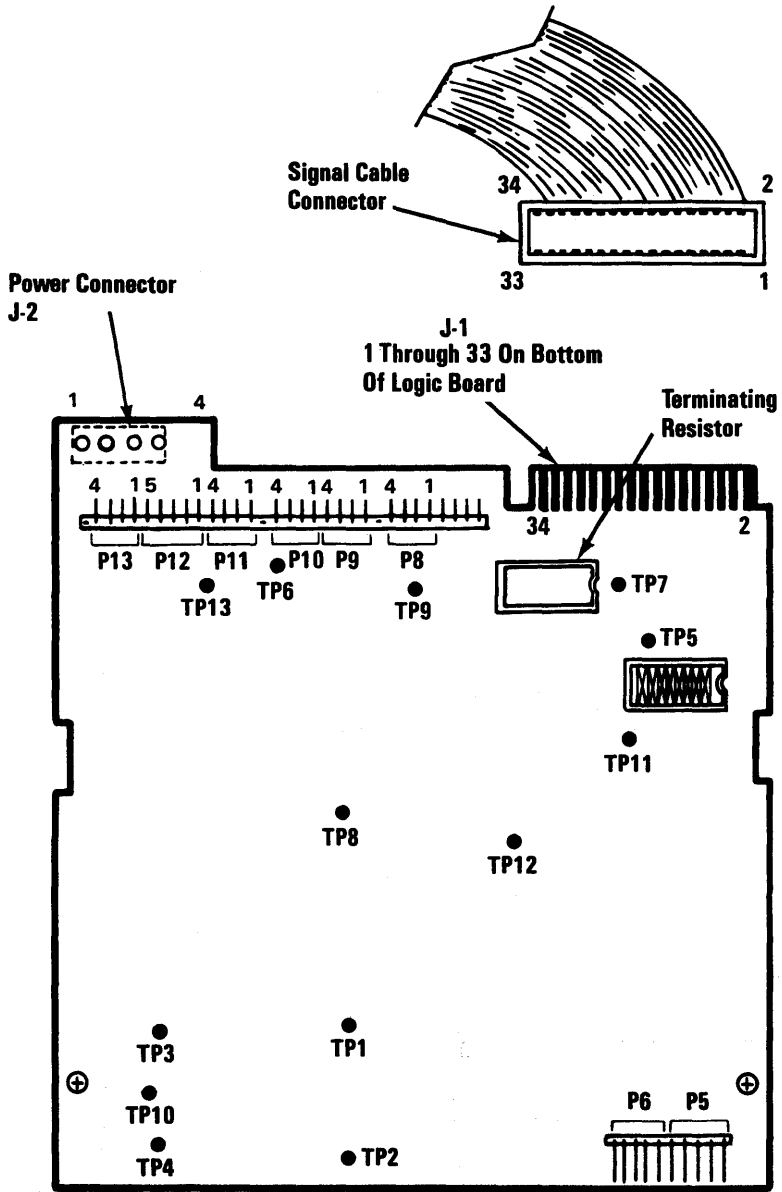
## Diskette Drive Adapter



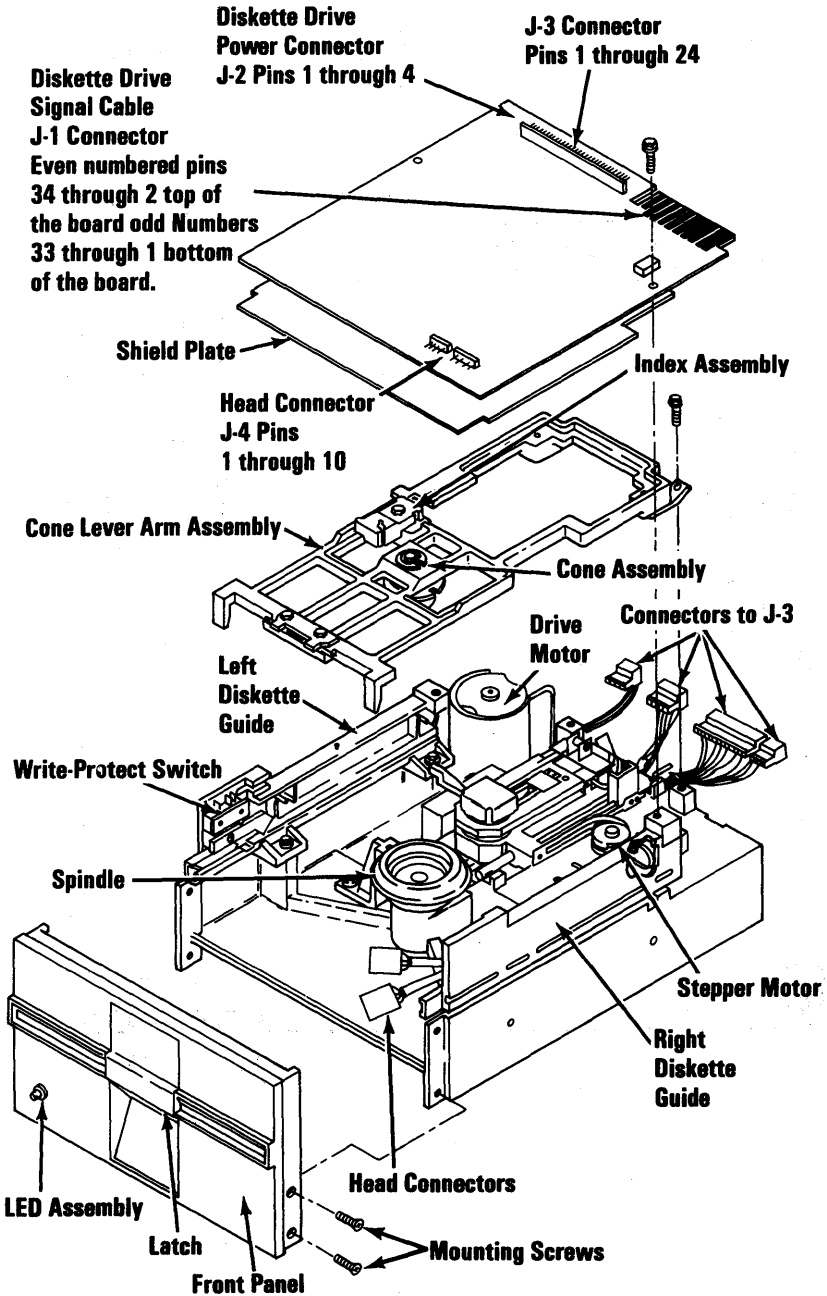
# Type 1 Diskette Drive Assembly



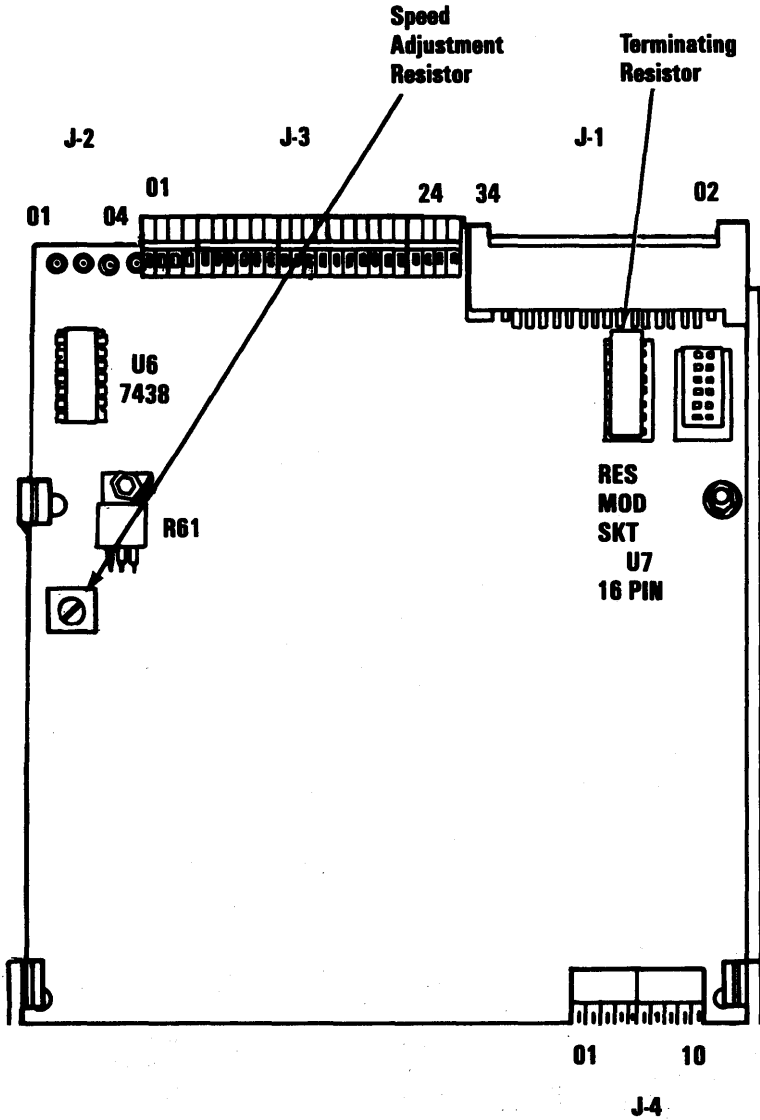
# Type 1 Printed Circuit Board



# Type 2 Diskette Drive Assembly



# Type 2 Printed Circuit Board



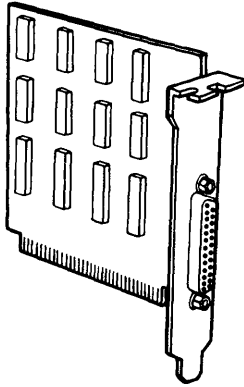


# Notes:

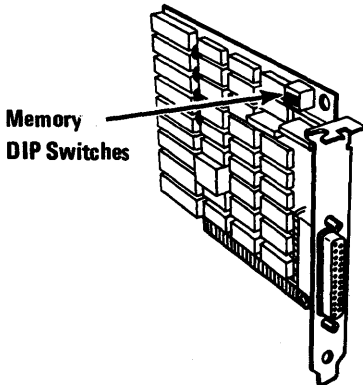
# Printer Adapter 900

Two possible printer adapters available for the 3270 Personal Computer are presented in the following.

## Printer Adapter



## 128KB Memory-Printer Adapter



Memory  
DIP Switches

# Notes:

# Asynchronous Communications Adapter 1100

**Module Position  
for "Primary Asynchronous  
Adapter"**

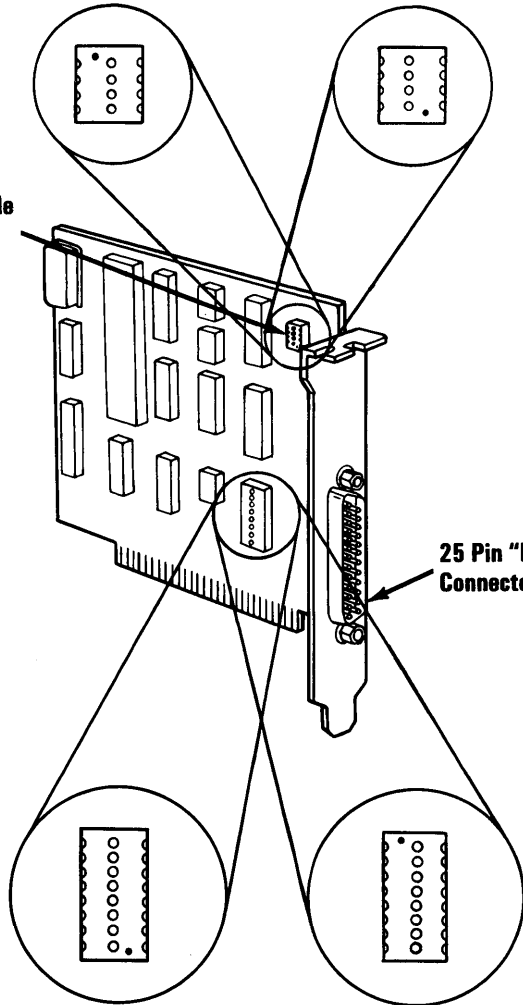
**Module Position  
for "Alternate Asynchronous  
Adapter"**

**Pluggable  
Module**

**25 Pin "D"  
Connector**

**Module Position for  
Current Loop Interface**

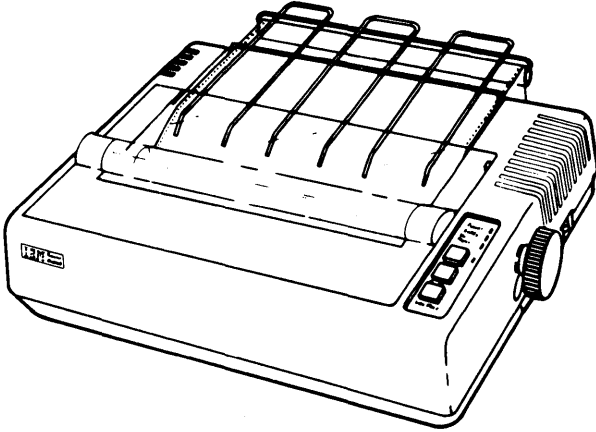
**Module Position for  
RS232-C Interface**



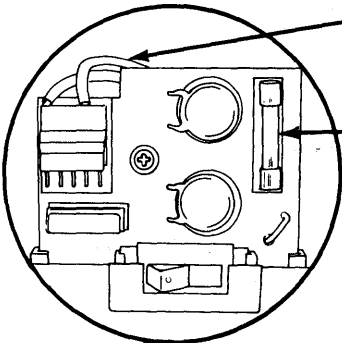
# Notes:

# IBM 5152 Graphics Printer 1400

This section contains the locations information for the IBM 5152 Graphics Printer shown below.



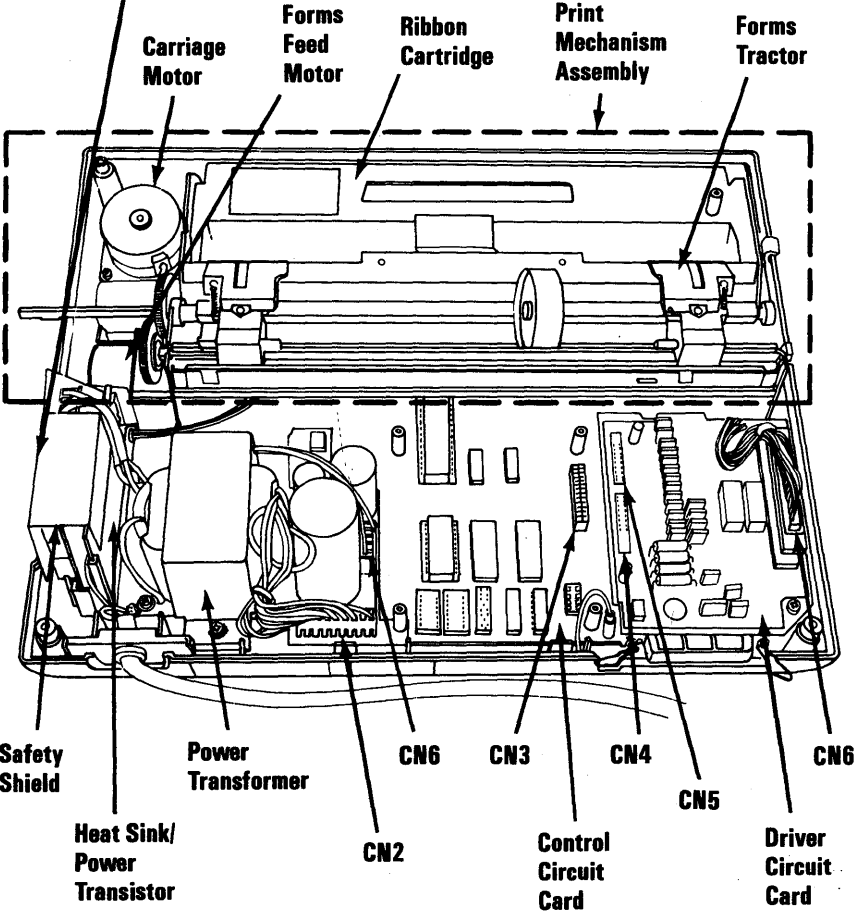
# Internal View



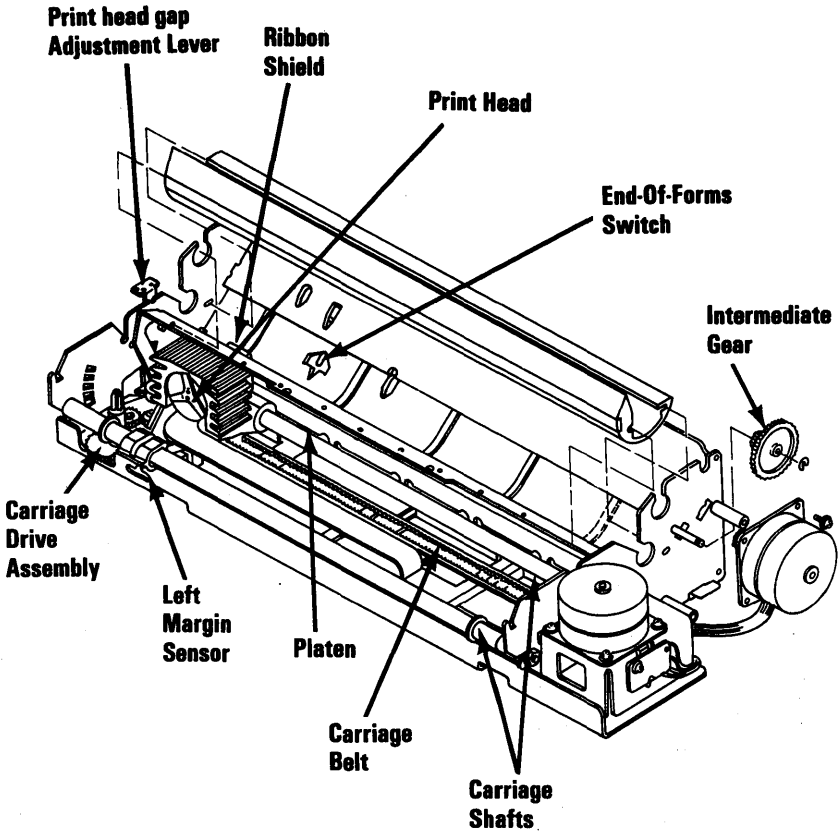
Power Transformer  
Primary Cable

Fuse

**Fuse-Filter Card  
(Right View)**

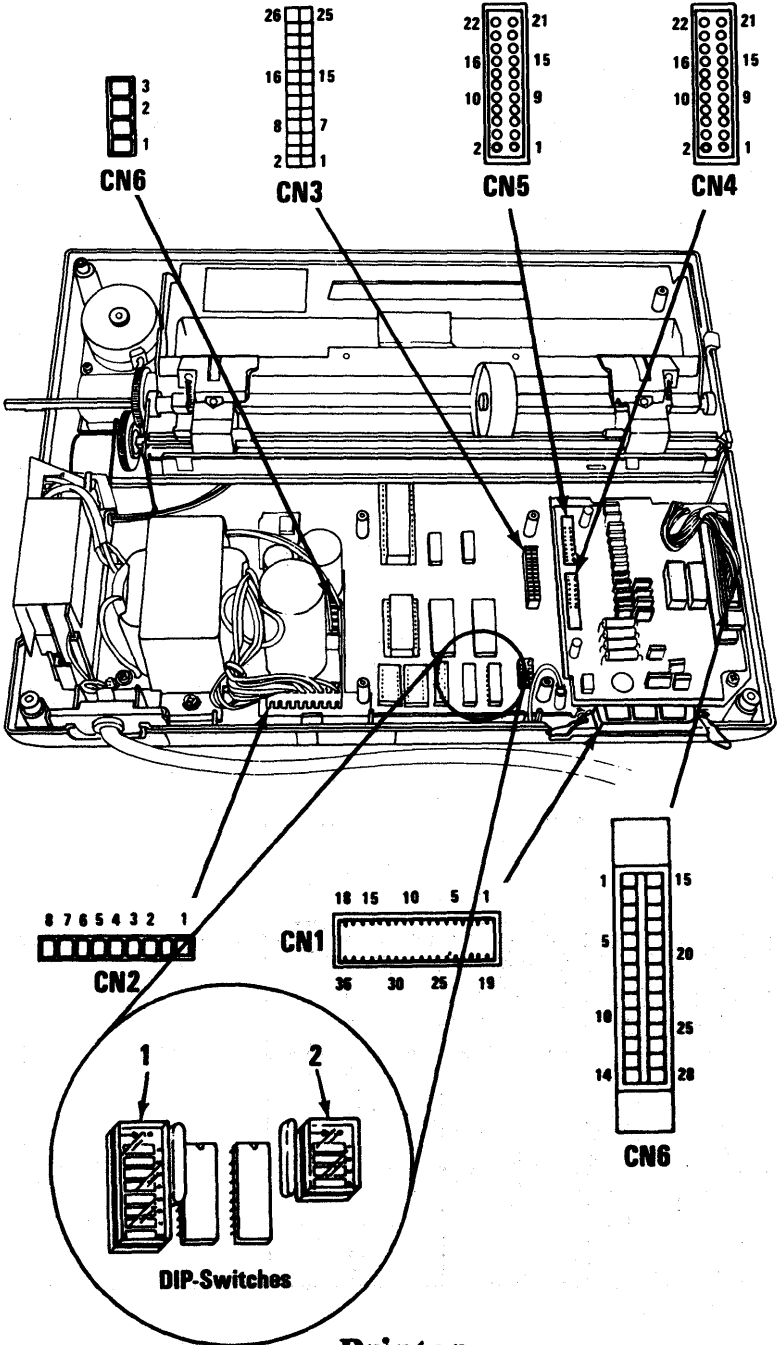


# Print Mechanism Assembly (Front View)



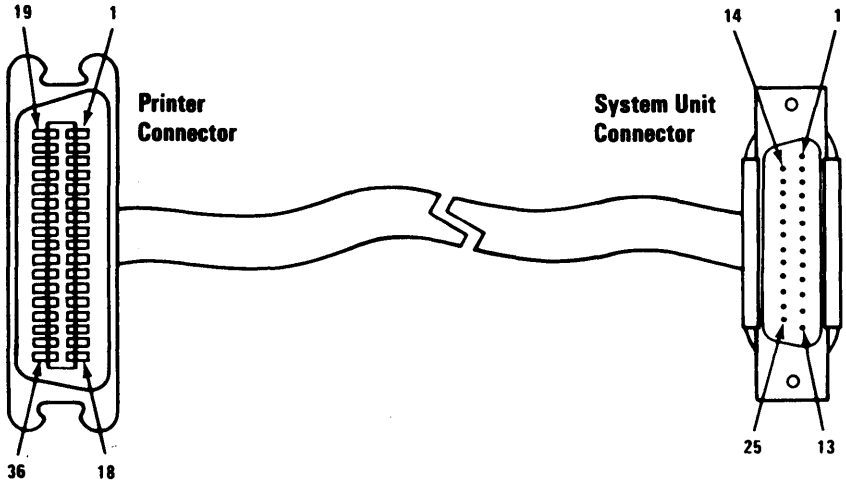


# Printer Connectors (CN#)



**Printer  
(Rear View)**

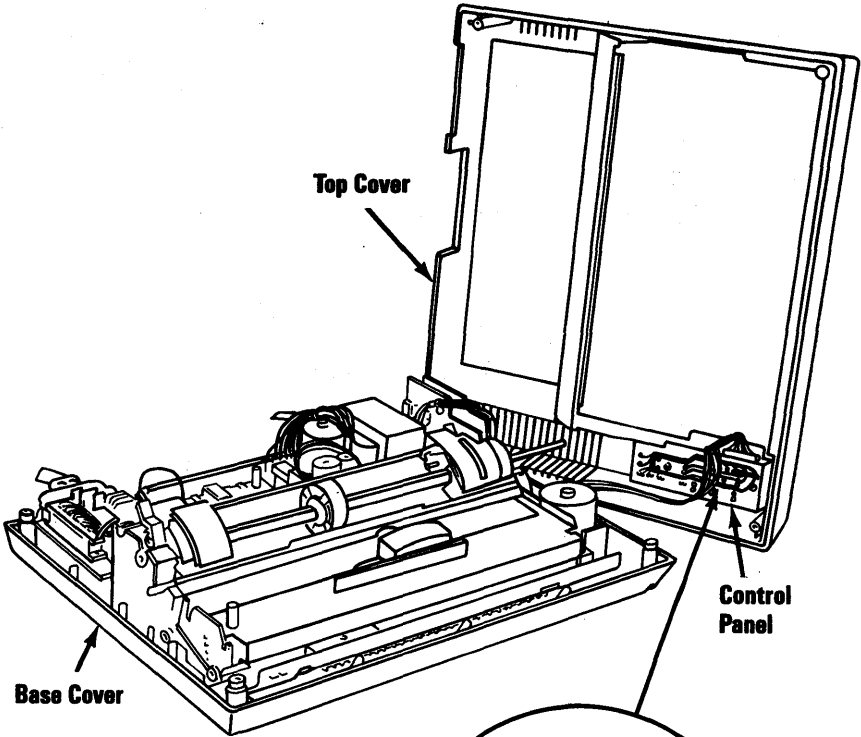
# Printer Signal Cable



## Printer Signal Cable

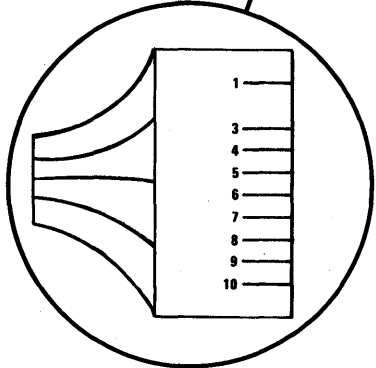
Printer Connector Pin Number	System Unit Connector Pin Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
33	18
19	19
21	20
23	21
25	22
27	23
29	24
30	25

# Printer (Top View)



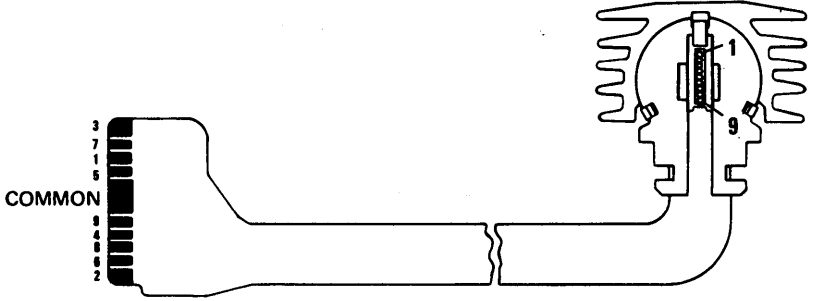
## Printer (Top View)

Pin	Name
1	Online Light
2	Key
3	No Paper Light
4	Ready Light
5	Online Switch
6	Forms Feed
7	Line Feed
8	Ground
9	+ 12 Vdc
10	Alarm



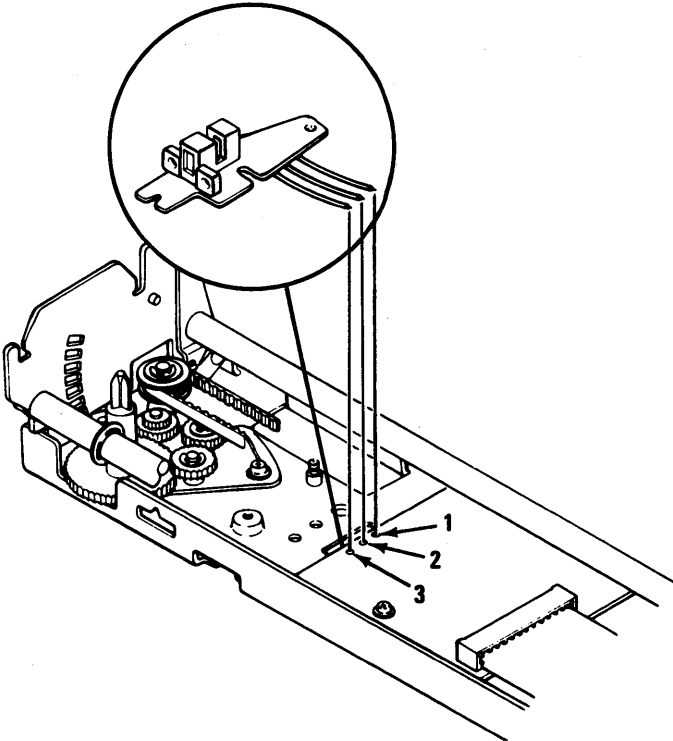
**Control Panel Connector**

# Print Head and Cable



**Print Head and Cable  
(Rear View)**

# Left Margin Sensor (Front View)

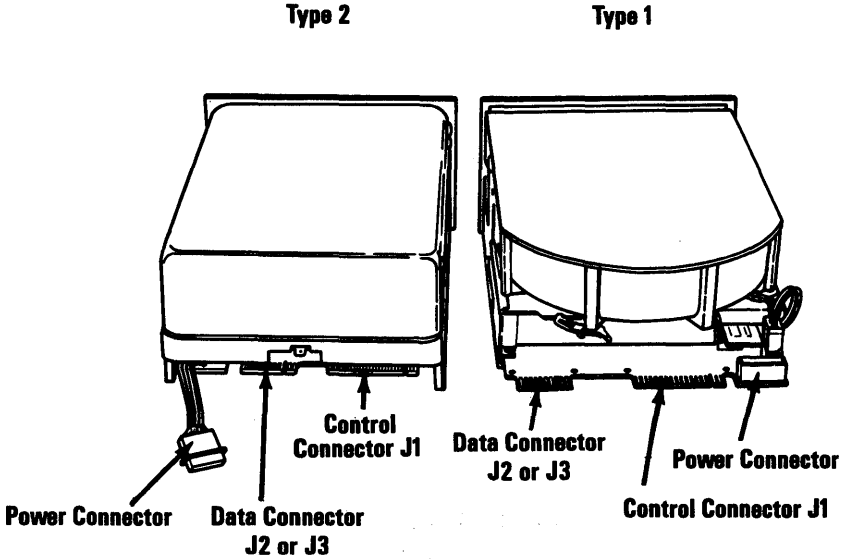


**Left Margin Sensor  
(Front View)**

# Fixed Disk 1700

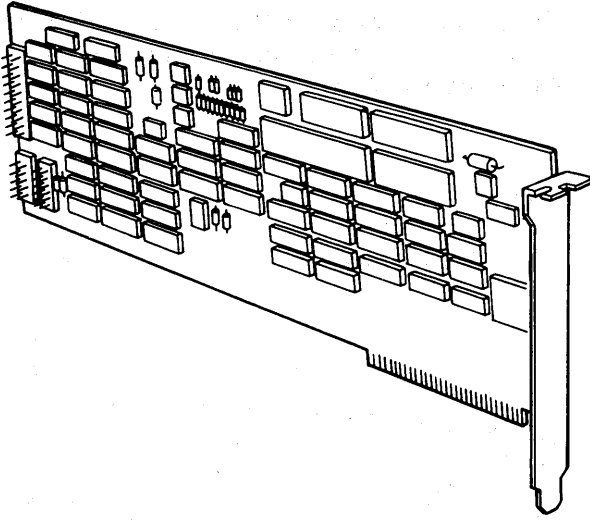
Both types of 10 Megabyte fixed disks are depicted below along with the fixed disk adapter card.

## Type 1 and 2 Fixed Disk Drives



**Note:** The top of type 1 drives may vary slightly in appearance.

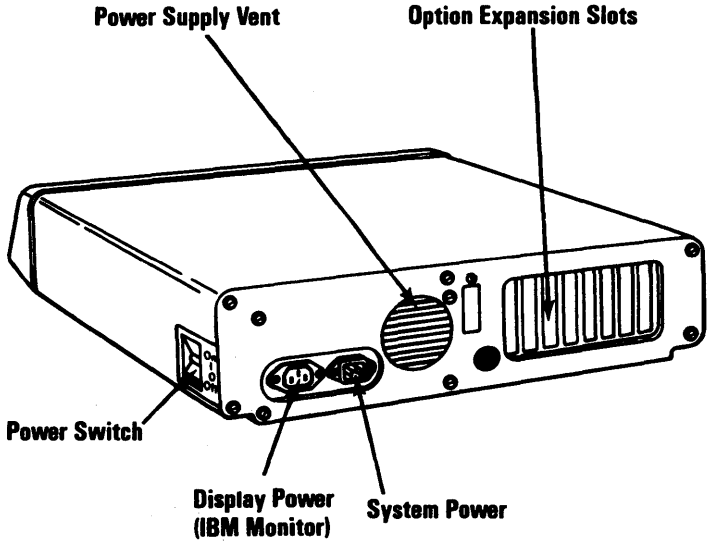
# Fixed Disk Adapter



# Expansion Unit 1800

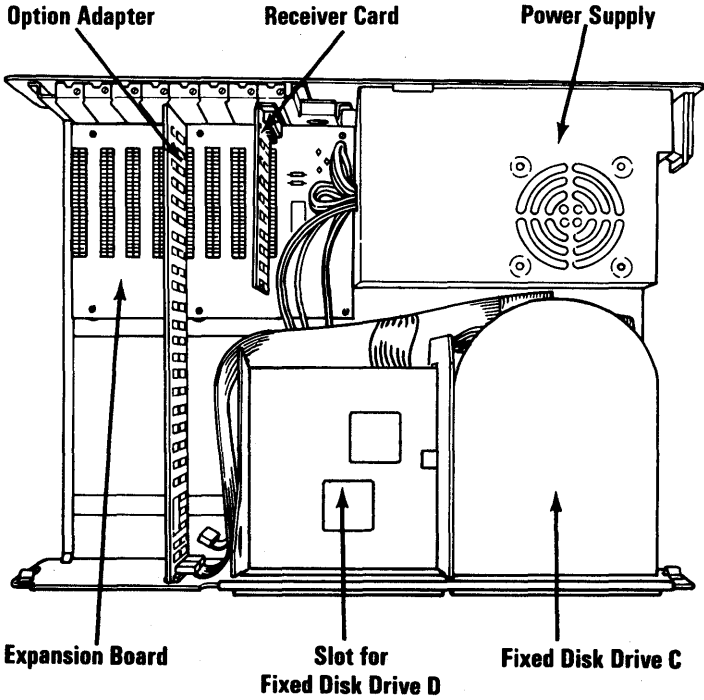
This section depicts the adapters for the expansion unit, the expansion unit and the expansion board.

## Rear View

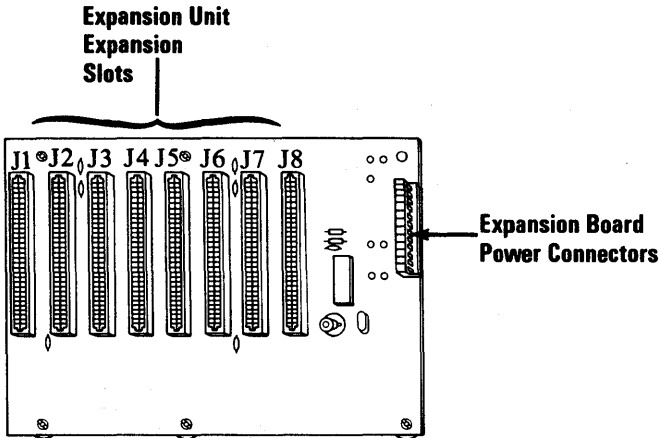




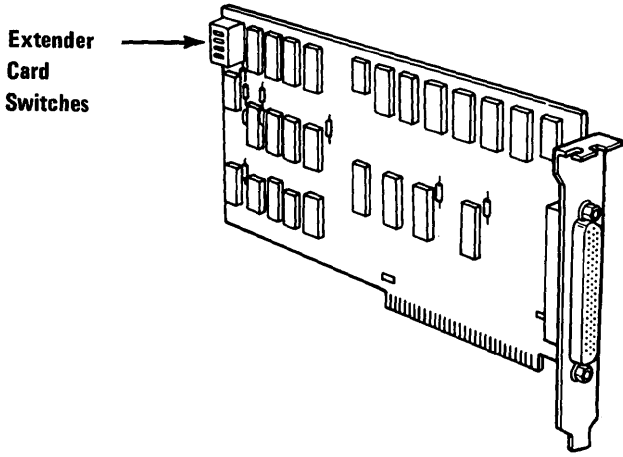
# Top View



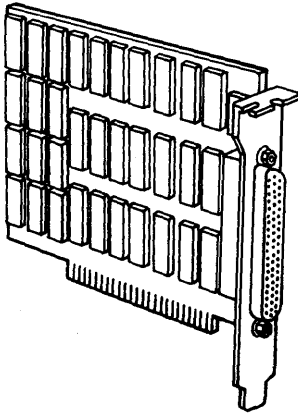
# Expansion Board



# Extender Card



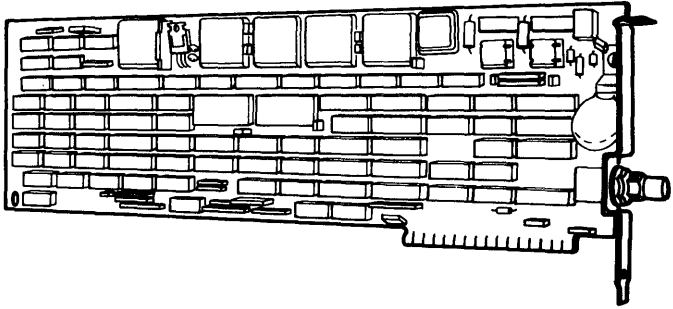
# Receiver Card



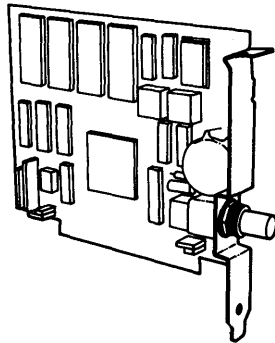
# Notes:

# Distributed Function Communications Adapter 2800

## Type 1



## Type 2

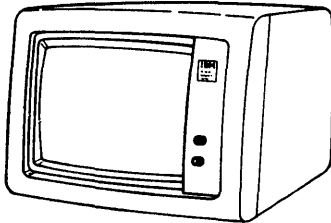


# Notes:

# Display 3200

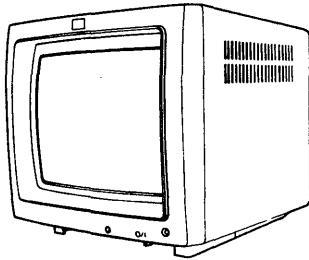
This subsection depicts the display adapter, all points addressable adapter, programmed symbols adapter, and displays.

## IBM 5151 Monochrome Display



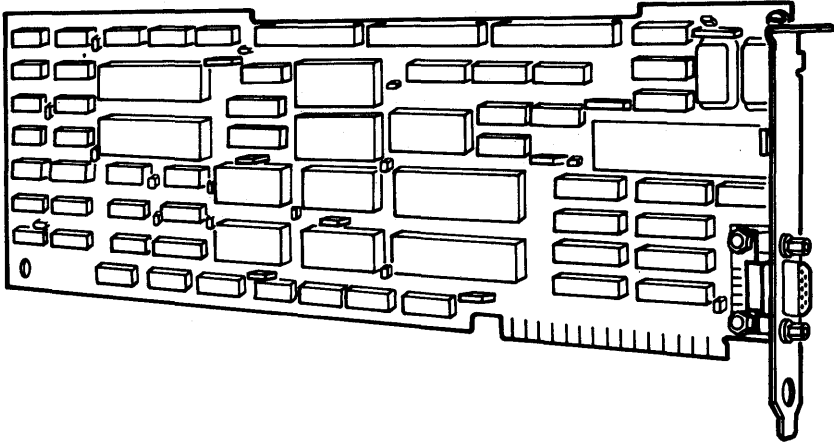
**IBM Monochrome Display**

## IBM 5272 Color Display

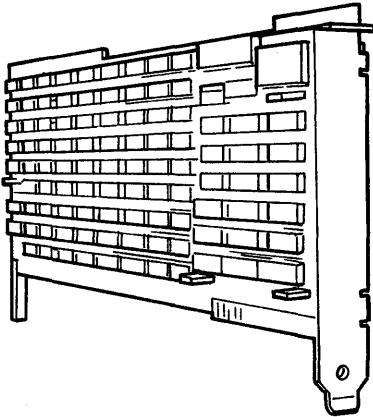


**IBM 3270 Color Display**

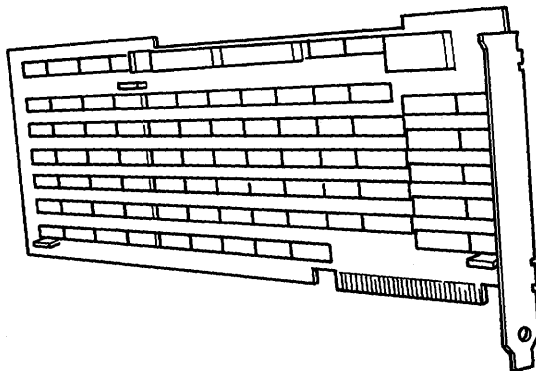
# Display Adapter



# All Points Addressable Adapter



# Programmed Symbols Adapter





**Notes:**

# Section 5. Removal/Replacement and Adjustments

Introduction 10	5-10-1
Option Adapters 20	5-20-1
General Adapter Removal	5-20-3
General Adapter Replacement	5-20-5
System Unit 100	5-100-1
Cover Removal	5-100-2
Cover Replacement	5-100-3
Power Supply Removal	5-100-4
Power Supply Replacement	5-100-8
Speaker Removal	5-100-9
System Board Removal	5-100-10
System Board Replacement	5-100-12
8088 Processor Removal	5-100-14
8088 Processor Replacement	5-100-16
Safety Protector Replacement	5-100-18
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Memory Module Removal (System Board)	5-200-2
Memory Module Replacement (System Board)	5-200-5
Memory Module Removal (64/256KB Expansion Option)	5-200-6
Memory Module Replacement (64/256KB Expansion Option)	5-200-8
Memory-Printer Adapter Removal	5-200-9
Printer-Memory Adapter Replacement	5-200-11
Keyboard 300	5-300-1
Keyboard Removal	5-300-2
Keyboard Replacement	5-300-3
Keyboard Adapter Cable Removal	5-300-4
Keyboard Adapter Cable Replacement	5-300-5
Diskette Drive 600	5-600-1

Diskette Drive Adapter Removal	5-600-2
Diskette Drive Adapter Replacement	5-600-3
Diskette Drive (Type 1) 601	5-601-1
Diskette Drive A Removal	5-601-2
Diskette Drive A Replacement	5-601-4
Diskette Drive B Removal	5-601-6
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Diskette-Drive Logic Board Removal	5-601-10
Diskette-Drive Logic Board Replacement	5-601-13
Drive Belt Removal	5-601-15
Drive Belt Replacement	5-601-16
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Drive Motor Speed Adjustment	5-601-21
Terminating Resistor (T-RES) Removal	5-601-27
Diskette Drive (Type 2) 602	5-602-1
Diskette Drive A Removal	5-602-2
Diskette Drive A Replacement	5-602-4
Diskette Drive B Removal	5-602-6
Diskette Drive B Replacement	5-602-8
Diskette Drive Logic Board Removal	5-602-10
Diskette Drive Logic Board Replacement	5-602-12
Drive Belt Removal	5-602-14
Drive Belt Replacement	5-602-15
Drive Motor Preliminary Speed Adjustment	5-602-16
Drive Motor Speed Adjustment	5-602-20
Terminating Resistor (T-RES) Removal	5-602-25
Math Coprocessor 700	5-700-1
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IBM 5152 Graphics Printer 1400	5-1400-1
Graphics Printer Removal	5-1400-2
Graphics Printer Replacement	5-1400-4
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Drive C Removal	5-1700-2
Drive C Replacement	5-1700-6
Drive D Removal	5-1700-10

Drive D Replacement . . . . .	5-1700-13
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Fixed Disk Drive Adapter Replacement . . . . .	5-1700-18
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Monochrome Display Replacement . . . . .	5-3200-3
IBM 5272 Color Display Removal . . . . .	5-3200-4
IBM 5272 Color Display Replacement . . . . .	5-3200-5
All Points Addressable Adapter Removal . . . . .	5-3200-7
All Points Addressable Adapter Replacement . . . . .	5-3200-10
Display Adapter Removal ..	5-3200-13
Display Adapter Replacement	5-3200-17
Programmed Symbols Adapter Removal . . . . .	5-3200-20
Programmed Symbols Adapter Replacement . . . . .	5-3200-23

# Notes:

# Introduction 10

To use this section, look at the table of contents on the previous page and find field replaceable unit (FRU) that you want to remove or replace, and then go to the appropriate page.

When a step is explained fully by another procedure, you can refer back to that procedure by using the page number in parenthesis. For example:

1. Set the Power switch to Off.
2. Remove the cover of the system unit (5-100-2).
3. Remove the screw holding the speaker.

In the example, Step 2 refers you to page 5-100-2 for complete instructions on removing the system unit cover.

# Notes:

# Option Adapters 20

To remove or replace an option adapter from either the system unit or expansion unit, go to the page listed for your adapter.

<b>Adapter</b>	<b>See Page</b>
128KB Memory-Printer Removal	5-600-2
128KB Memory-Printer Replacement	5-600-2
256KB Memory Expansion Card Removal	5-600-2
256KB Memory Expansion Card Replacement	5-600-2
Diskette Drive Adapter Removal	5-600-2
Diskette Drive Adapter Replacement	5-600-3
Fixed Disk Adapter Removal	5-1700-16
Fixed Disk Adapter Replacement	5-1700-18
All-Points Addressable Adapter Removal	5-3200-7
All-Points-Addressable Adapter Replacement	5-3200-10

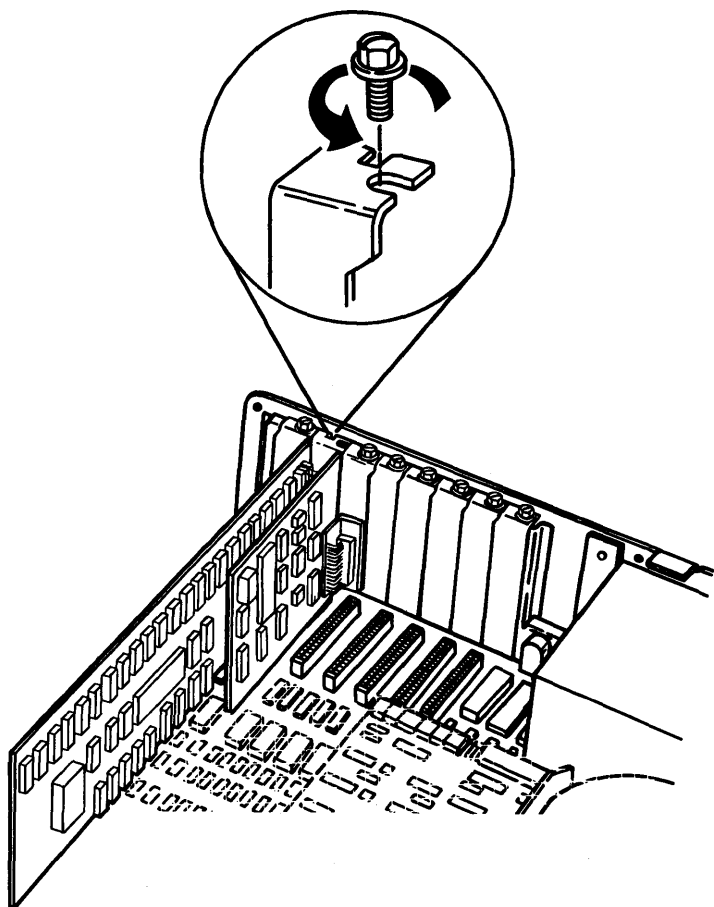


<b>Adapter</b>	<b>See Page</b>
Display Adapter Removal	5-3200-13
Display Adapter Replacement	5-3200-17
Programmed Symbols Adapter Removal	5-3200-20
Programmed Symbols Adapter Replacement	5-3200-10

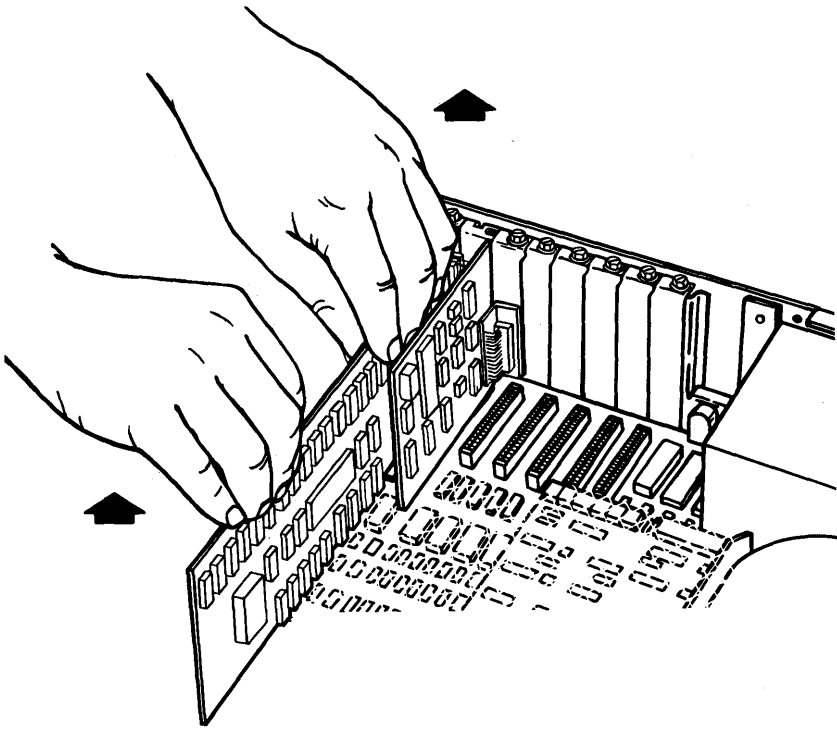
**For all other adapters not listed above, use “General Adapter Removal” on the next page and “General Adapter Replacement” on page 5-20-5.**

# General Adapter Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the power cords of the system unit (and expansion unit) from the outlet and disconnect all cables from the rear of the units.
3. Remove the cover of the system or expansion unit (5-100-2).
4. Remove the option adapter mounting screw.

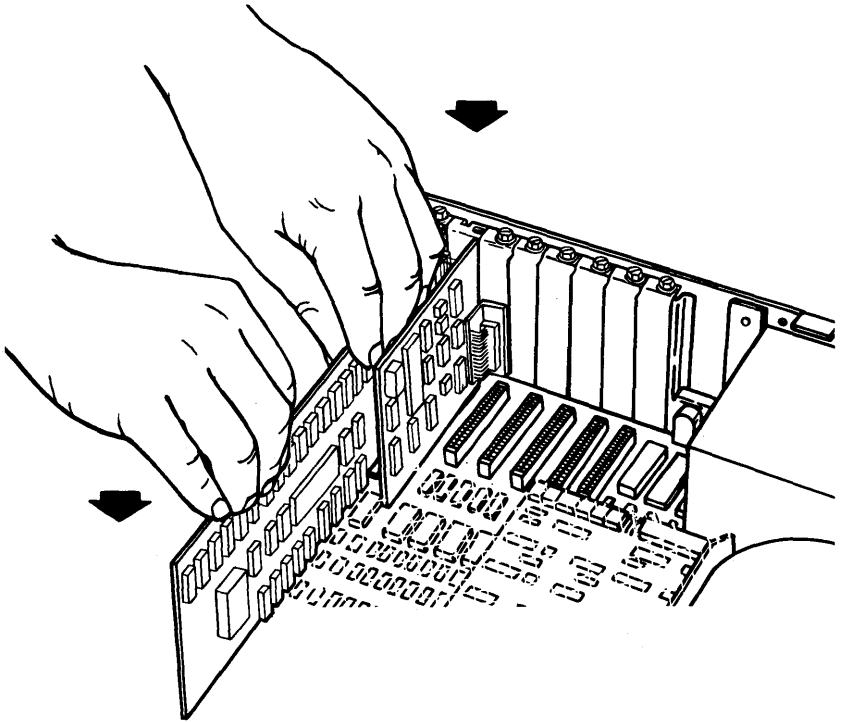


5. Grasp the option adapter by the top corners and lift straight up.



# General Adapter Replacement

1. Insert the option adapter into an expansion slot. Press down firmly on the adapter to seat the connector.



2. Install the option adapter mounting screw.
3. Install the cover of the system unit (or expansion unit) (5-100-3).

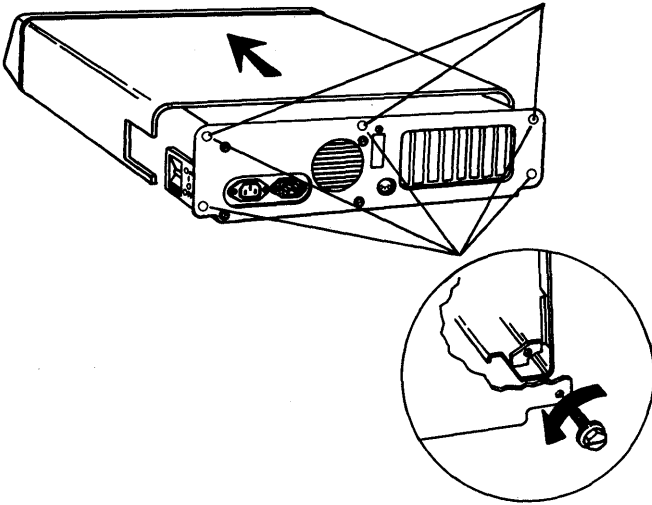
## **Notes:**

# System Unit 100

# Cover Removal

1. Set the system unit Power switch to Off, then unplug the power cord and disconnect all cables from the rear of the unit.
2. Move all external options away from the work surface.
3. Remove the cover mounting screws and slide the cover toward the front until it clears the unit.

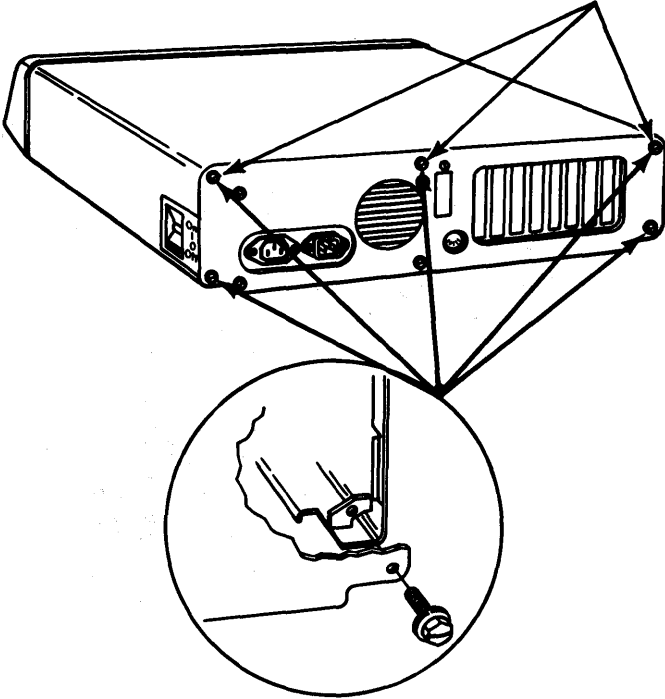
(These screws may not be present on your unit.)



# Cover Replacement

1. Slide the cover toward the rear of the unit.
2. Align the mounting screws with the threaded tabs and tighten.
3. Reconnect the cables to the system unit.

(These screws may not be present on your unit)

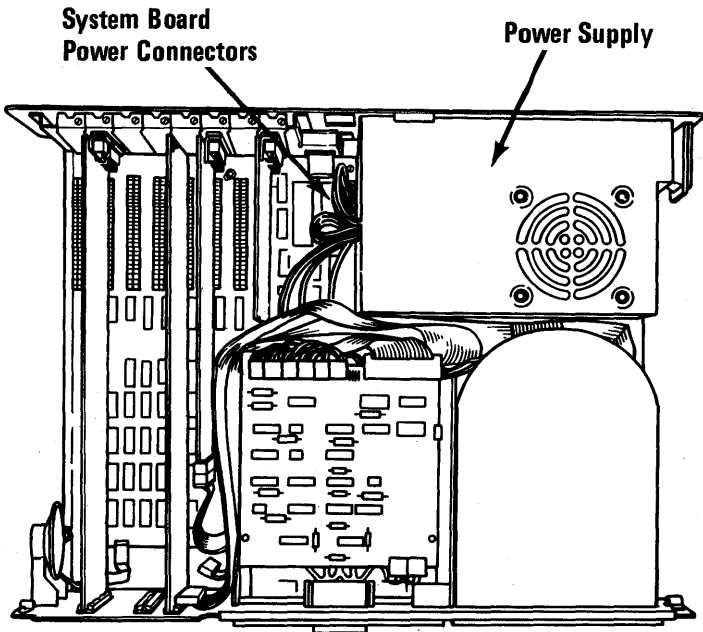




# Power Supply Removal

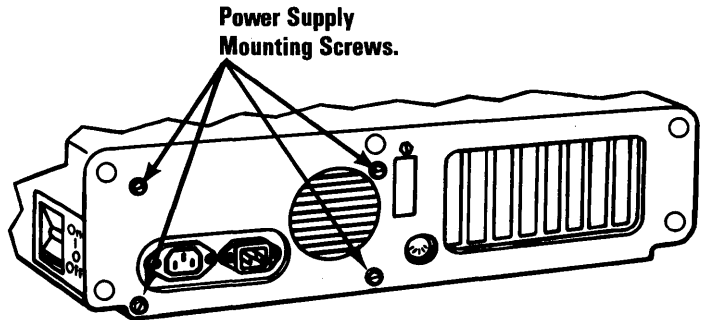
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the power cord of the system unit (and expansion unit) from the outlet, then unplug the cord from the rear of the system (expansion) unit.
3. Remove the cover of the system/expansion unit (5-100-2).
4. Disconnect the system board (expansion board) power connectors by grasping the connectors and pulling straight up.

**Warning:** Do not pull on the wires when disconnecting connectors.



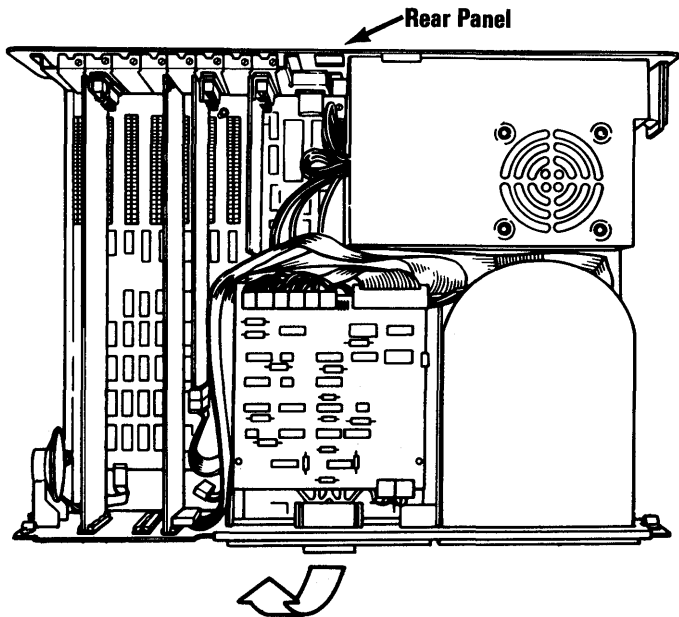
**System Unit  
(Top View)**

5. Disconnect the power connectors from the fixed disk drive and diskette drive (see Section 4, "Locations").
6. Remove the four power supply mounting screws.

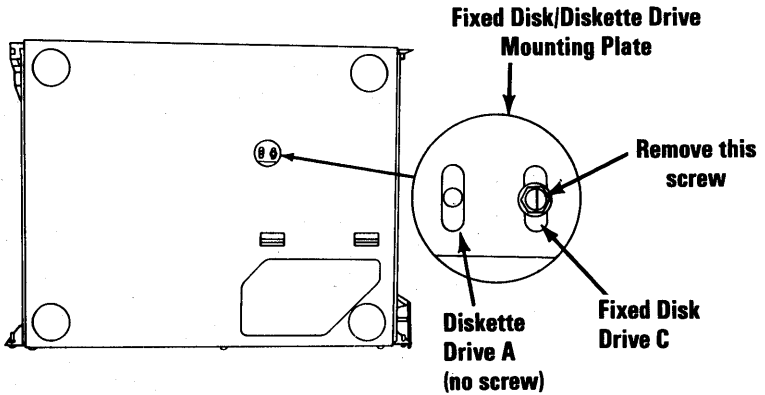


(Rear View)

7. Hold the system unit by the front panel and tilt up until the system unit rests on the rear panel.

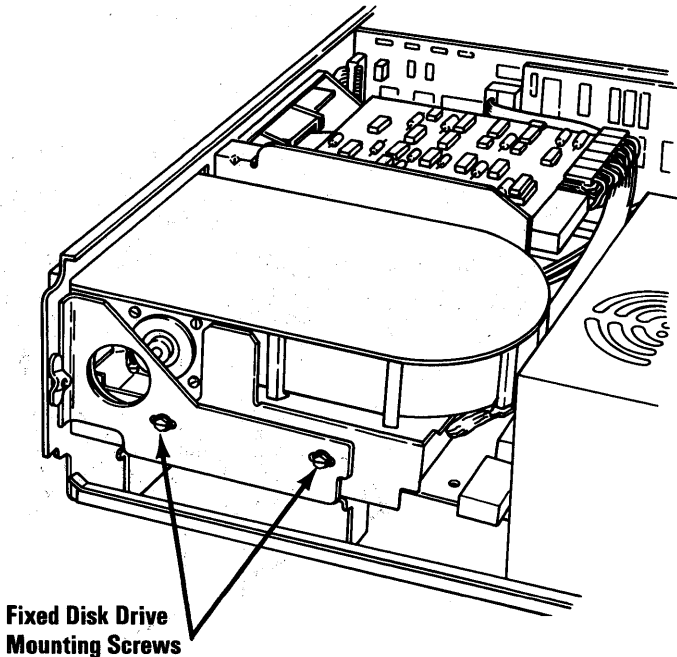


8. Remove the mounting plate screw for the fixed disk drive (turn counterclockwise) with a flat-blade screwdriver or 5-mm (3/16-in.) nutdriver.

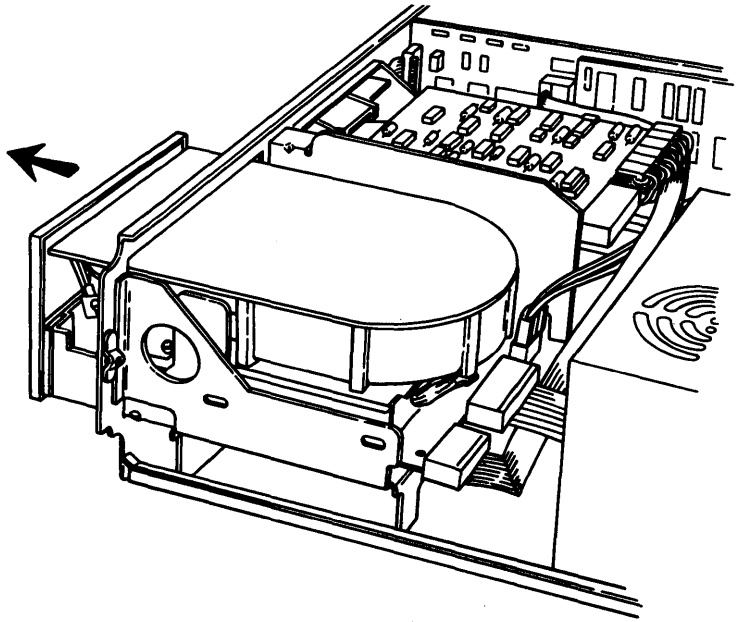


**(Bottom View)**

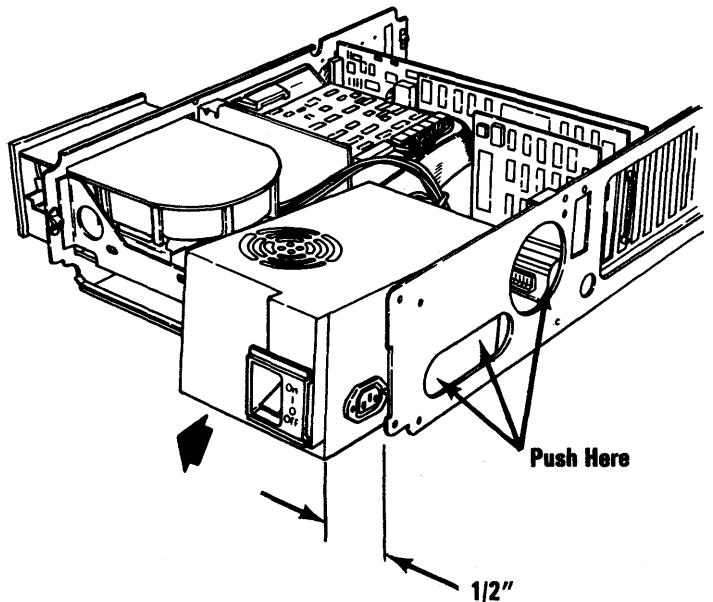
9. Remove the two mounting screws from the fixed disk drive.



10. Slide the fixed disk drive assembly to the front approximately 25 mm (about 1.0 in.).

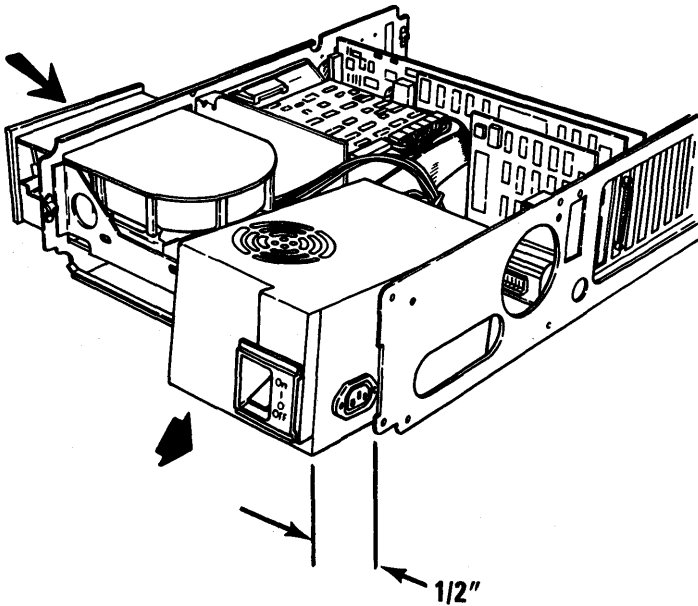


11. Push the power supply forward approximately 13 mm (about 0.5 in.), then lift and remove.



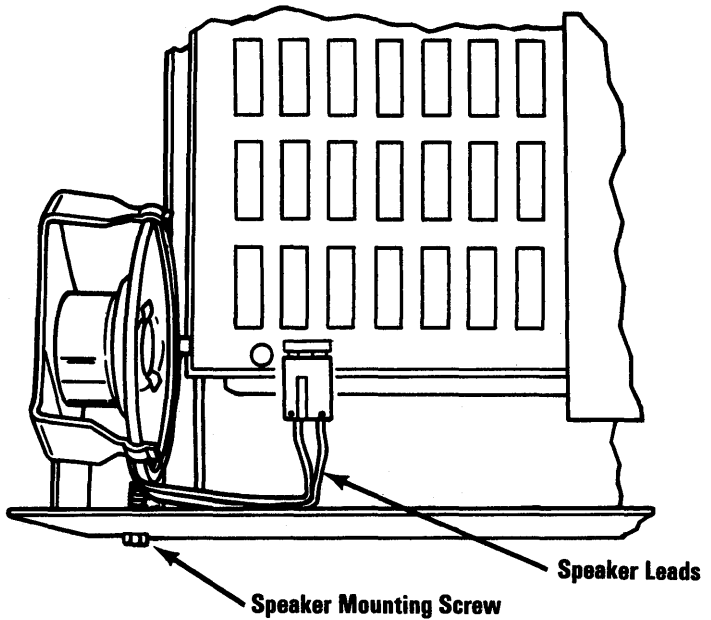
# Power Supply Replacement

1. Place the power supply approximately 13 mm (about 0.5 in.) from the rear of the system (or expansion unit) back plate, and slide the supply into position.
2. Align the screw holes in the power supply with the rear frame.
3. Install and tighten the four power supply mounting screws.
4. Connect the power connectors to the fixed disk drive and diskette drive.
5. Plug in the system board (or expansion board) power connectors.
6. Install the fixed disk drive (5-1700-6).
7. Install the unit cover (5-100-3).
8. Connect all cables to the unit.



# Speaker Removal

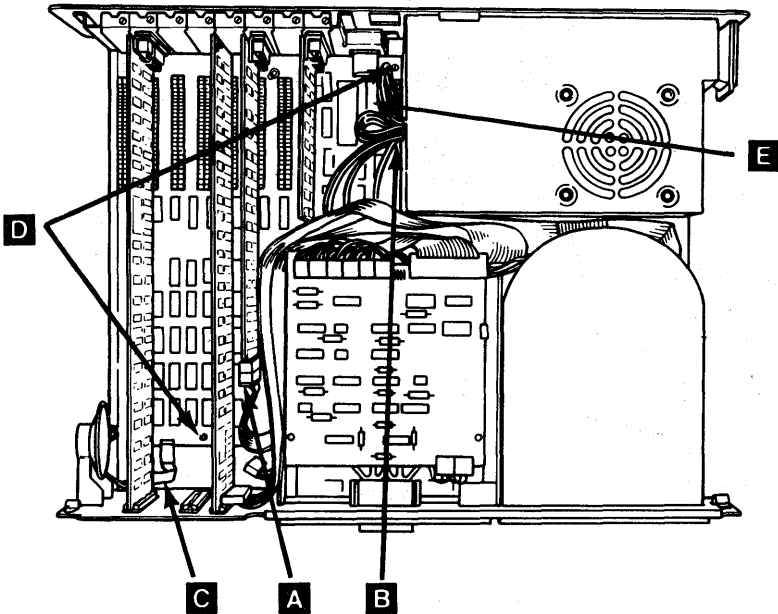
1. Set the system unit Power switch to Off.
2. Remove the system unit power cord from the outlet.
3. Remove the cover of the system unit (5-100-2).
4. Disconnect the speaker leads.
5. Remove the speaker mounting screw.
6. Remove the speaker.



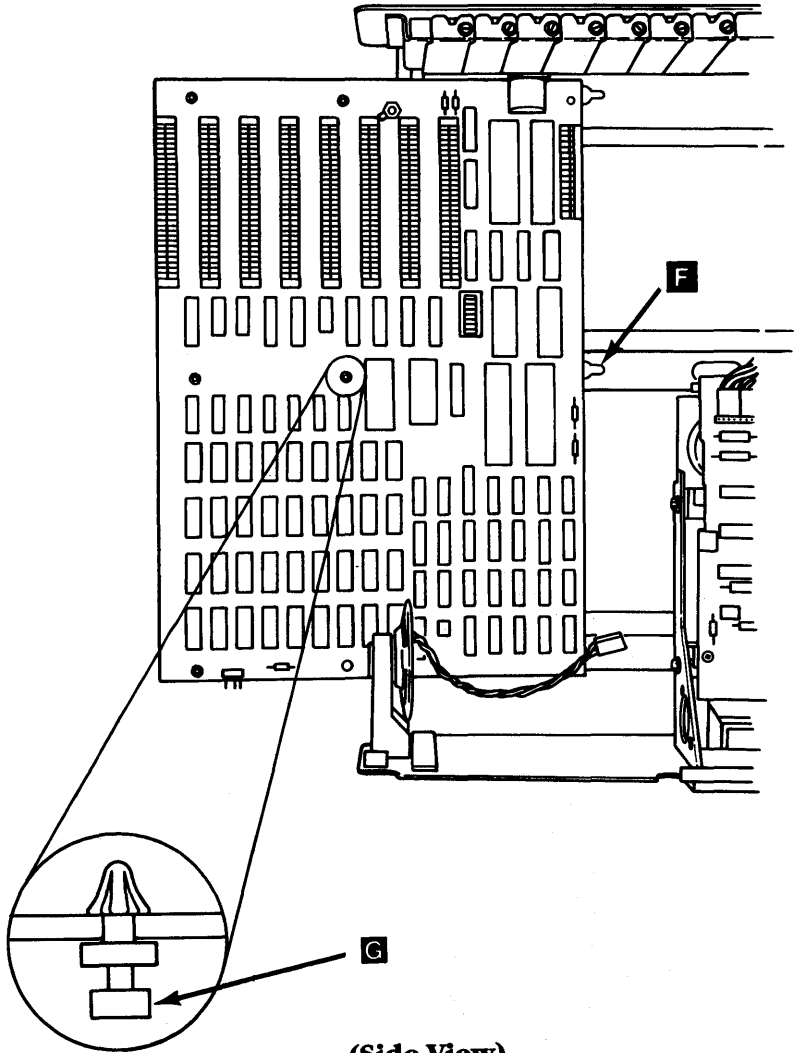
(Top View)

# System Board Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Remove all option adapters (5-20-3) (5-600-2) (5-1700-16).
7. Disconnect the diskette-drive signal cable **B** and the system board power connectors **A**.
8. Remove the Math Coprocessor **E**, if installed (5-700-2).
9. Remove the speaker connector **C**.
10. Remove the system board mounting screws **D**.



11. Slide the system board away from the power supply, approximately 13 mm (about 0.5 in.), until the standoffs **G** can be lifted from the mounting slots **F**.
12. Lift the system board up and out of the system unit.

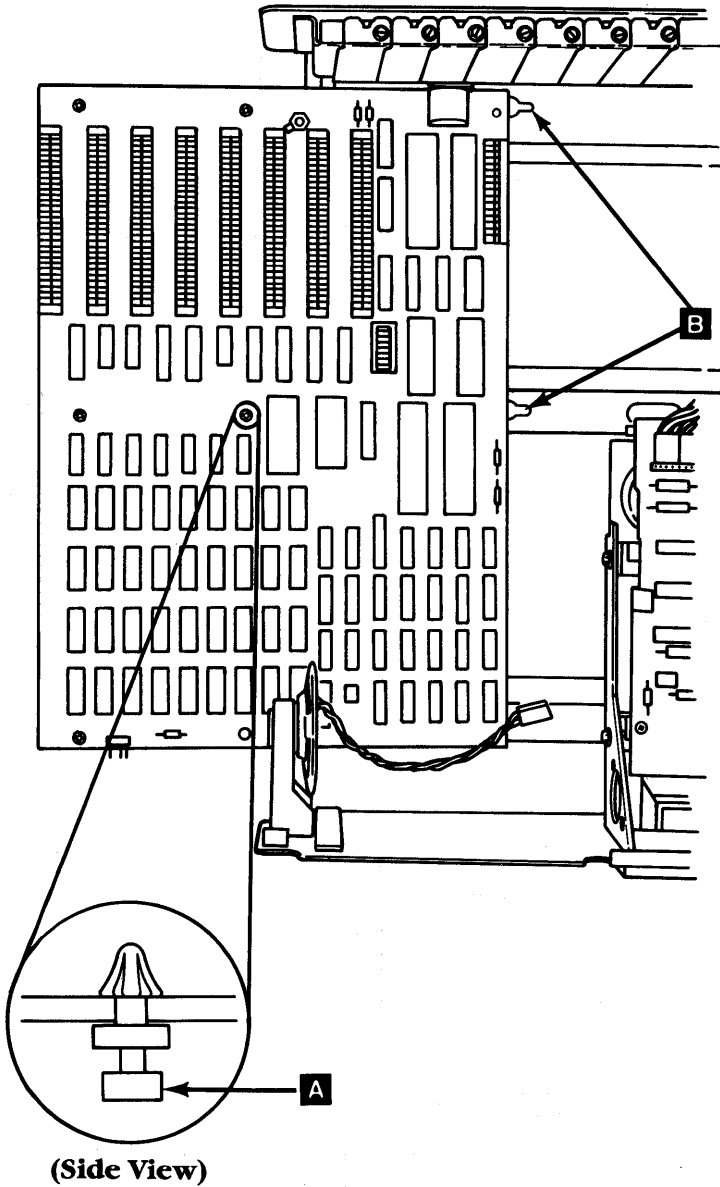


(Side View)

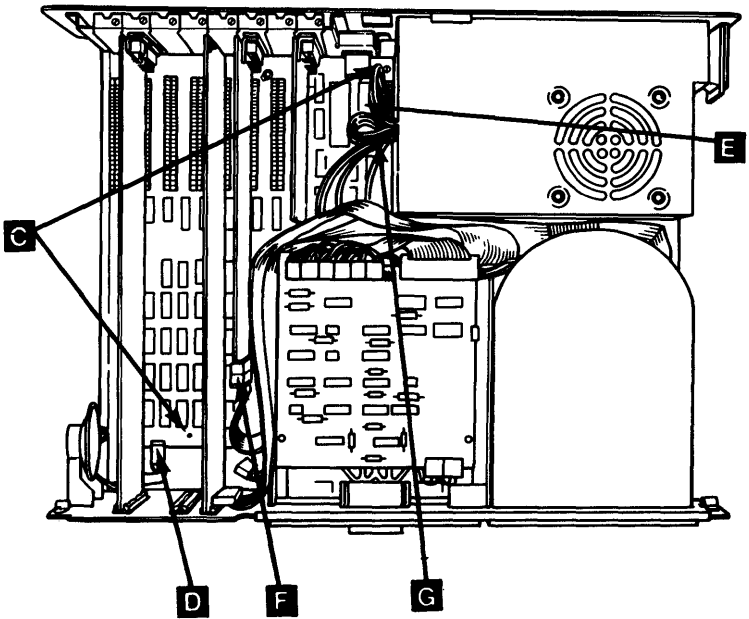


# System Board Replacement

1. Insert the system board standoffs **A** into the mounting slots **B**.



2. Slide the system board toward the power supply until the holes for the two mounting screws are aligned.
3. Install the two system board mounting screws **C**.
4. Install the speaker connector **D**.
5. Install the Math Coprocessor **E** (if removed) (5-700-5).
6. Install the option adapters (5-20-5).
7. Install the diskette-drive signal cable **F** and system board power connectors **G**.
8. Install the cover of the system unit (5-100-3).
9. Connect all cables to the rear of the system unit.

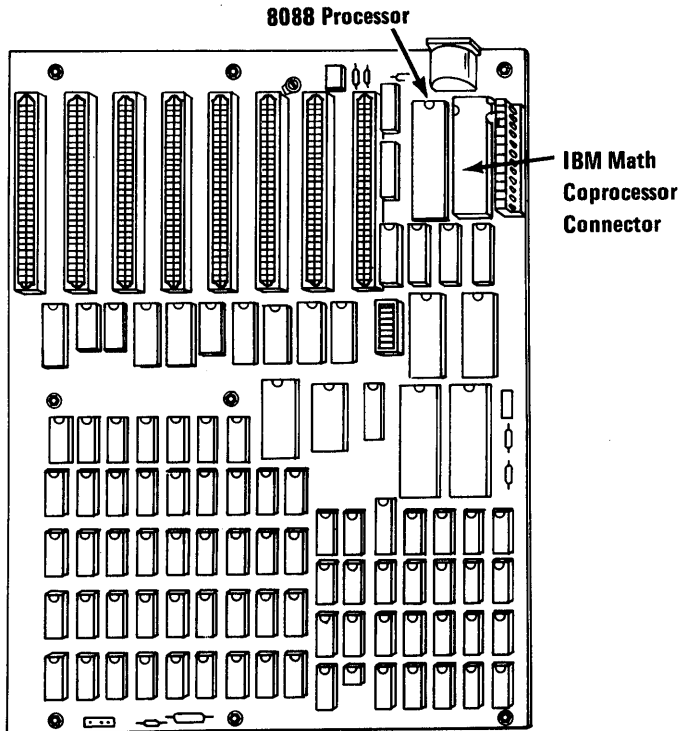


# 8088 Processor Removal

## Warning:

- The pins on the processor module are easily bent. Be careful not to bend them when removing the coprocessor.
  - The processor is sensitive to static. Maintain personal grounding by keeping one hand on the system unit frame while removing the coprocessor.
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Set the Power switches on all attached devices to Off
  3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
  4. Disconnect all cables from the rear of the system unit.
  5. Remove the cover of the system unit (5-100-2).

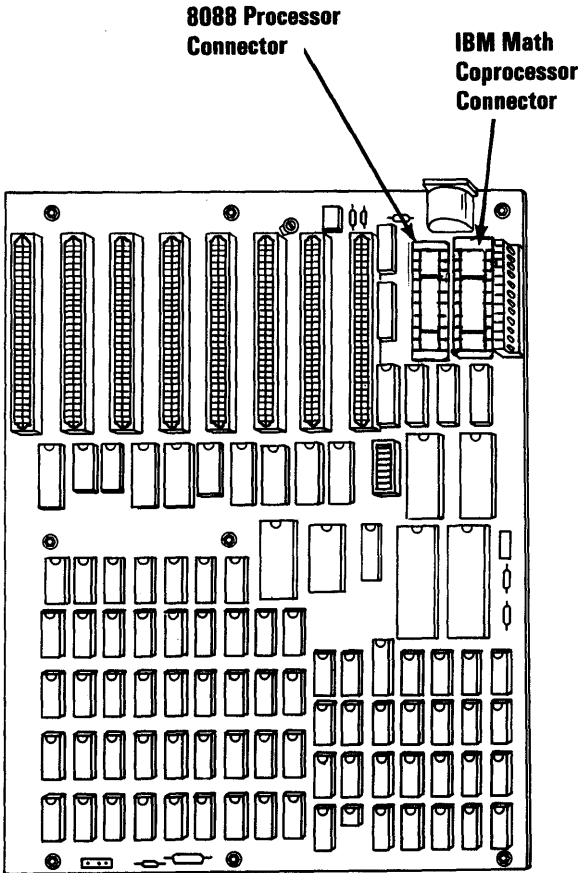
6. Remove any option adapters installed in slot 7 or 8 (5-20-3).
7. Look at the figure below and find the 8088 Processor on the system board.
8. Using a module puller, carefully remove the processor.



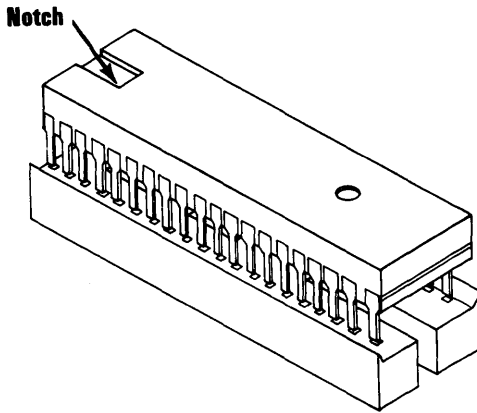
# 8088 Processor Replacement

## Warning:

- The pins on the processor are easily bent. Be careful not to bend them when replacing the processor.
  - The processor is sensitive to static. Maintain personal grounding by keeping one hand on the system unit frame while installing the processor.
1. Refer to the figure below then find the 8088 Processor connector on the system board.

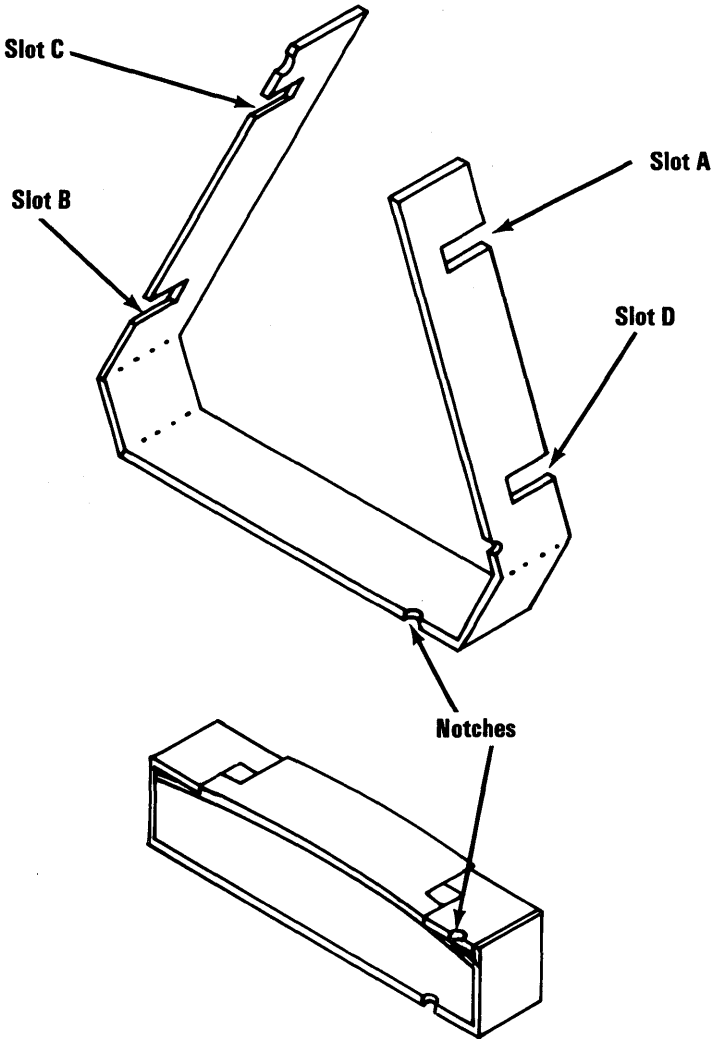


2. Carefully align the pins on the processor with the connector and firmly press the processor in place. Be sure the notch on the processor faces the rear of the system board.
3. Install any option adapters that you removed (5-20-5).
4. Install the cover of the system unit (5-100-3).
5. Connect all cables to the rear of the system unit.



# Safety Protector Replacement

1. Assemble the safety protector as shown in the figure below.
2. Insert slot A into slot B, then insert slot C into slot D.



# Memory 200

This section explains removal and replacement procedures for memory modules and memory option adapters.

To determine where the memory failure is, go to page 3-200-1 first. Then refer to the listing below to go to the appropriate pages for instructions on removing and replacing the failing memory component.

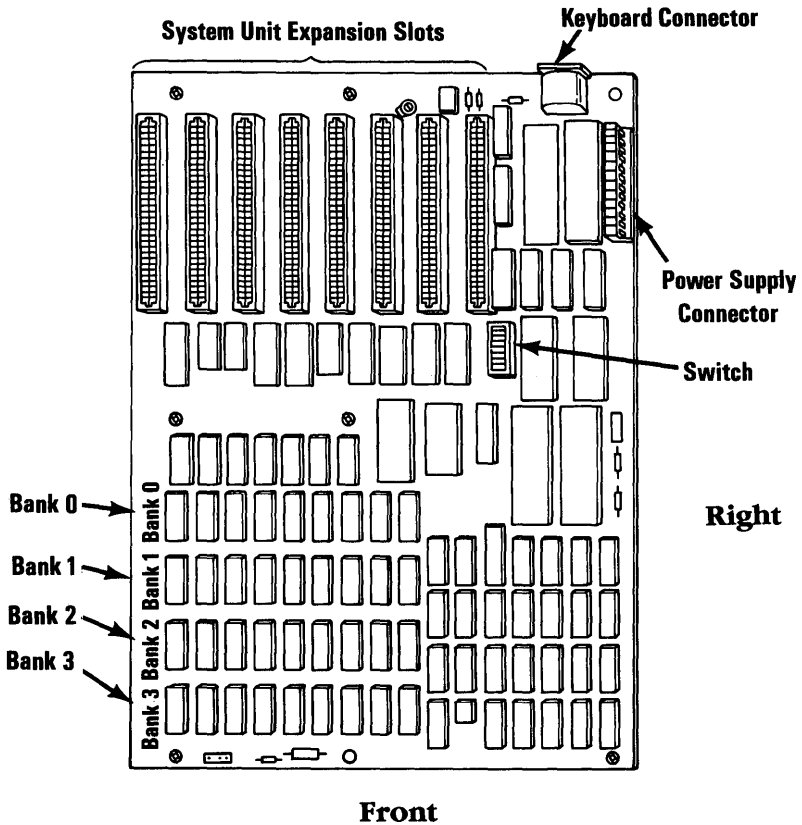
- If the failing module is on the system board, go to page 5-200-2 and follow the procedure there to remove the failing module(s).
- If the failing module is on the 64/256KB Memory Expansion Option, go to page 5-200-6 and follow the procedure there to replace the failing module(s).
- If the failure is on either the 128KB Memory-Printer Adapter or the 256KB Memory Expansion Card, go to page 5-200-9 for instructions on removing the faulty adapter.



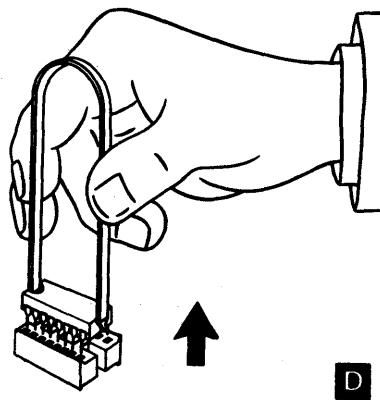
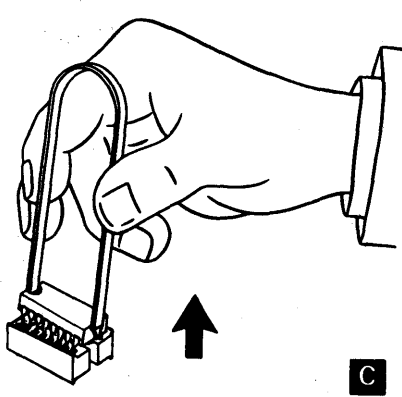
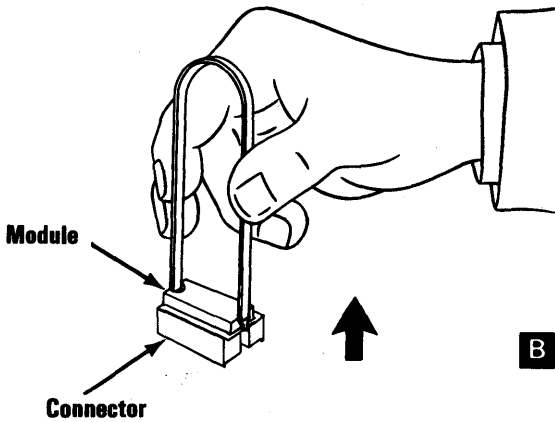
# Memory Module Removal (System Board)

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cord of the system unit (and expansion unit, if attached ) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit **(5-100-2)**.
6. Remove all option adapters from the system unit **(5-20-3)**. Make a note of the slot from which you remove each adapter.

7. Locate the module to be removed in bank 0, 1, 2, or 3. (If you are not sure of the module to remove, go to PIC 3-200-1, "Memory," and determine which module is failing.)

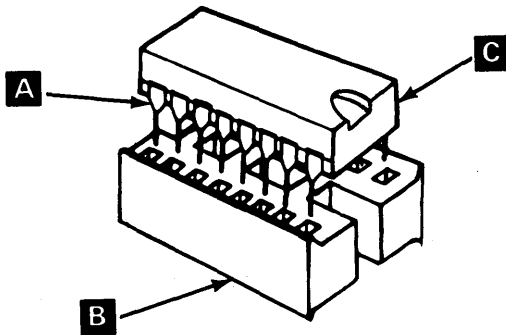


8. To separate the module from the connector, grasp the module as shown in **B** . Lift the module in a two-step rocking motion, **C** and **D** , to avoid bending the pins.



# Memory Module Replacement (System Board)

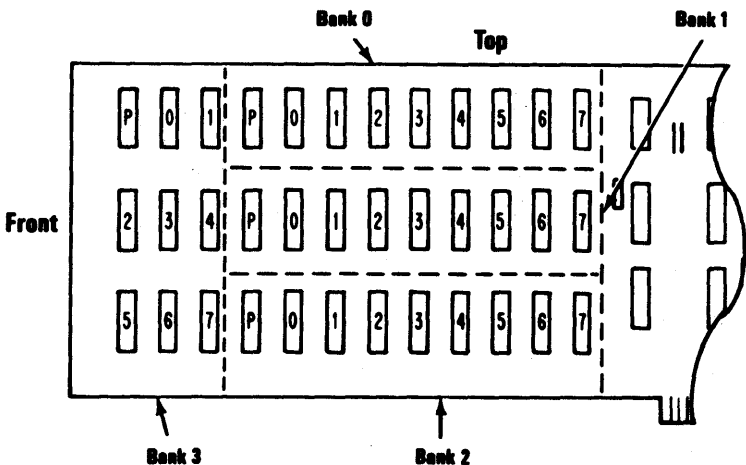
1. Align the module pins **A** with the connector **B** and firmly press the module into place. Notch **C** on the module should be aligned with the notch in the connector.
2. Install all option adapters (5-20-5). Use the notes you made in the removal procedure to install the option adapters in the correct slots.
3. Install the cover of the system unit (5-100-3).
4. Reconnect all cables.



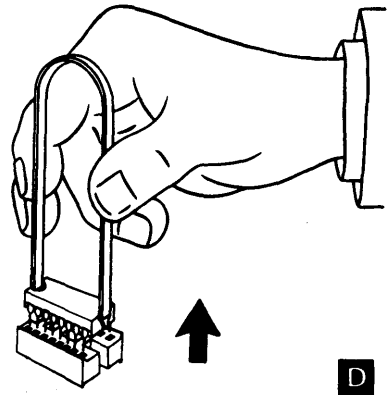
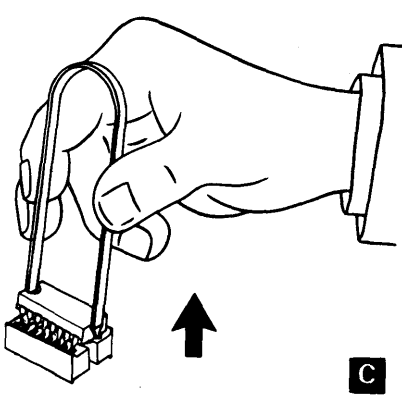
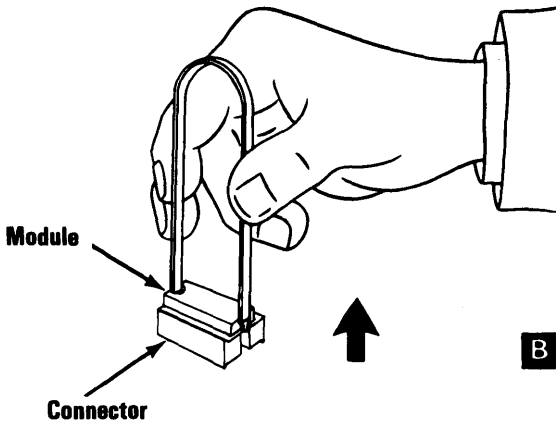
# Memory Module Removal (64/256KB Expansion Option)

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Remove the 64/256KB Memory Option Adapter (5-20-3).
7. Locate the module to be removed in bank 0, 1, 2, or 3. (If you are not sure of the module to remove, go to PIC 3-200-1, "Memory," and determine which module is failing.)

*Note:* If the module to be replaced is on the system board, see "Memory Module Removal" (5-200-2).

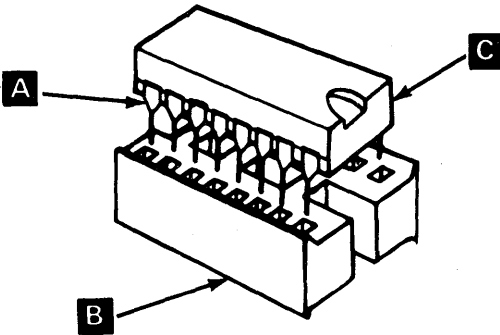


8. To separate the module from the connector, grasp the module as shown in **B**. Lift the module in a two-step rocking motion, **C** and **D**, to avoid bending the pins.



# Memory Module Replacement (64/256KB Expansion Option)

1. Align the module pins **A** with the connector **B** and firmly press the module into place. The notch **C** on the module should be aligned with the notch in the connector.
2. Reinstall the 64/256KB Memory Expansion Option (5-20-5) in the slot you removed it from.
3. Install the cover of the system unit (5-100-3).
4. Connect all cables.



# Memory-Printer Adapter Removal

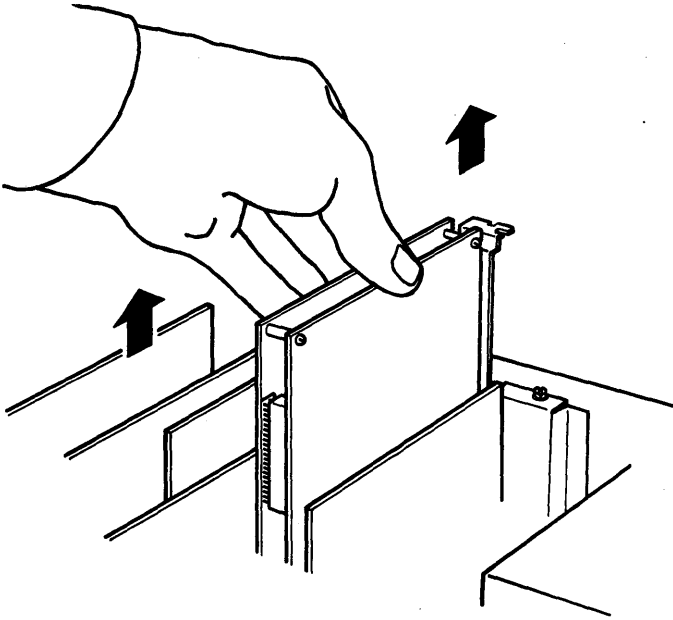
Follow this procedure to remove either the 128KB Memory-Printer or 256KB Expansion Adapter.

If you have any other memory or printer adapter, see "General Adapter Removal" on page 5-20-3.

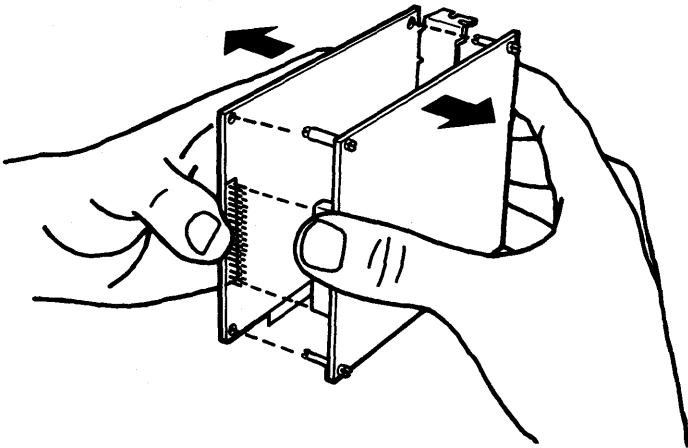
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Remove the cover of the system unit (5-100-2).
5. Locate 128KB Memory-Printer adapter with the attached 256KB Expansion Card.
6. If a printer cable is attached, remove it from the adapter.
7. Remove the option adapter mounting screw that holds the combination in place.



8. Hold the adapter(s) by the top and lift up for removal.



9. If you have both adapters, put one hand on either side of the adapter card combination and pull to separate them.

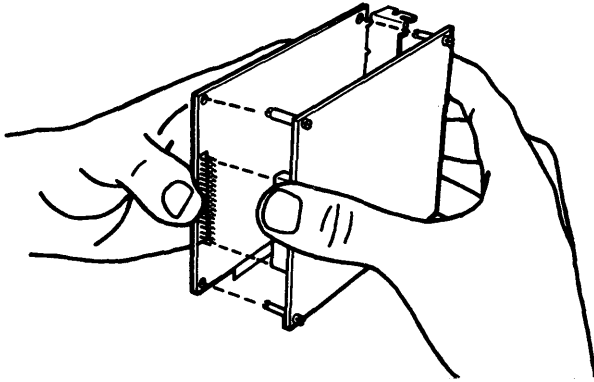


10. Replace the faulty adapter.

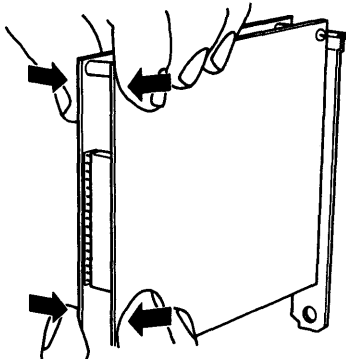
# Printer-Memory Adapter Replacement.

This procedure explains how to replace either 128KB Memory-Printer

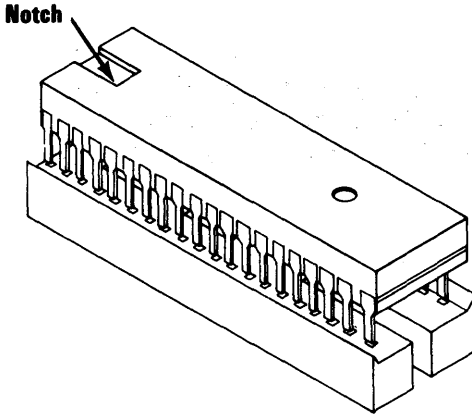
1. Refer to Section 6 and set the four DIP switches on the 128KB Memory-Printer Adapter for the total amount of memory installed.
2. If you have only the 128KB Memory-Printer Adapter, go to step 4.
3. If you have both adapters, hold the the expansion card so that the connector and spacers are aligned with corresponding connector and holes on the memory-printer adapter.



4. Press the two cards firmly together.



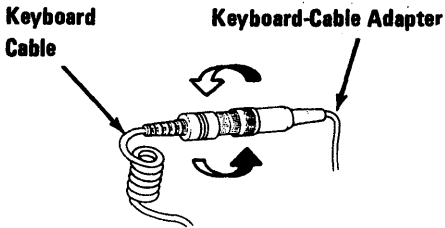
5. Hold the adapter(s) by the top and press it firmly into the vacant slot.
6. Install the cover of the system unit (5-100-3).
7. Connect all cables to the rear of the system unit.



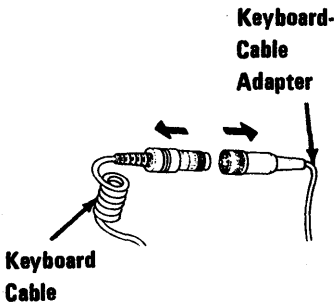
# Keyboard 300

# Keyboard Removal

1. Set the system unit Power switch to Off, and disconnect the keyboard cable from the rear of the system unit.
2. Place the keyboard with the bottom facing up and remove the two mounting screws.
3. Turn the metal sleeve of the keyboard cable counterclockwise until the cable is loose.

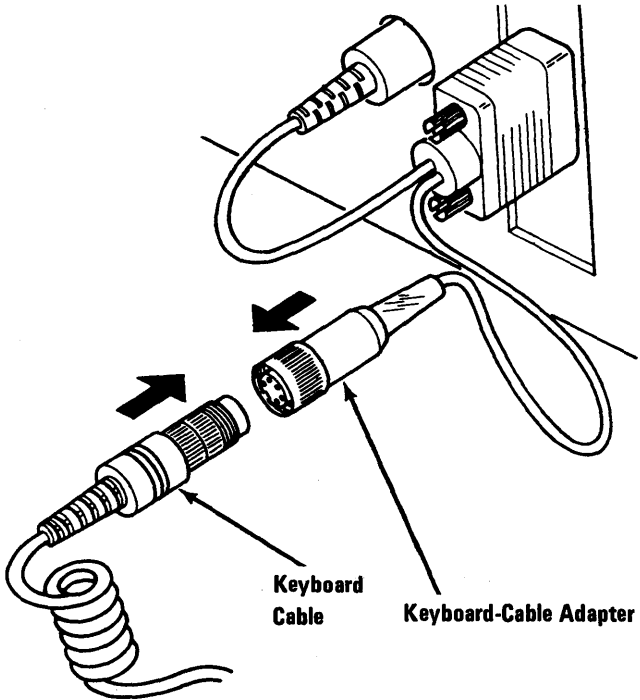


4. Disconnect the two cables.

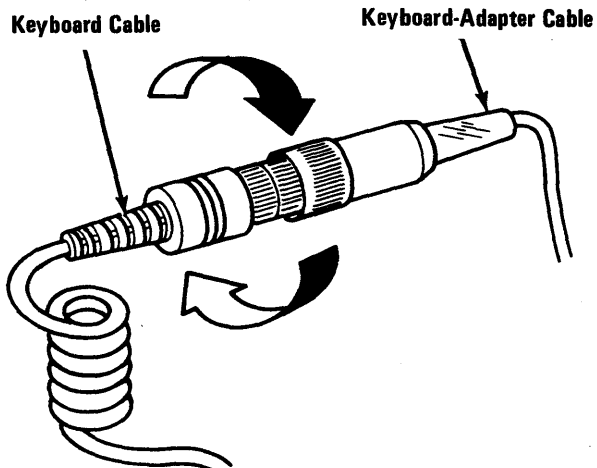


# Keyboard Replacement

1. Connect the cable from the keyboard to the keyboard adapter cable.

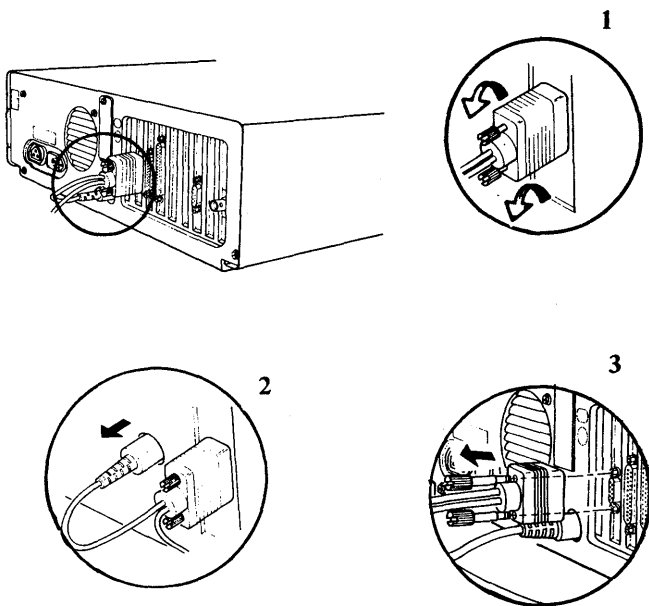


2. Secure the connection between the two cables.



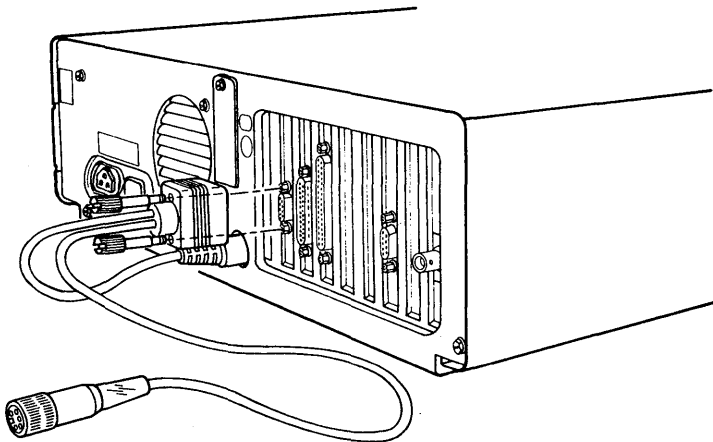
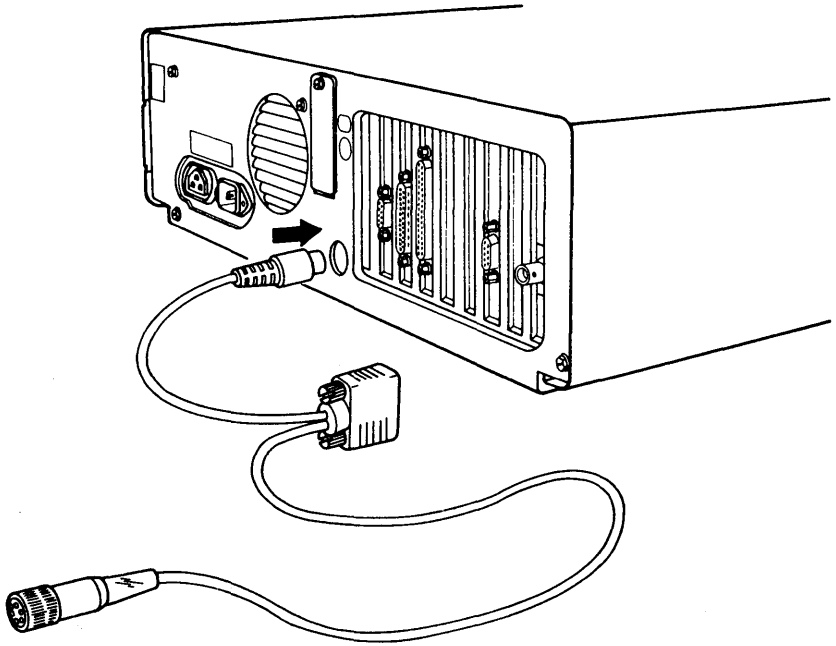
# Keyboard Adapter Cable Removal

1. Set the system unit Power switch to Off.
2. If attached, disconnect the keyboard (5-300-2).
3. Loosen the and remove the keyboard adapter cable from the back of the system unit.



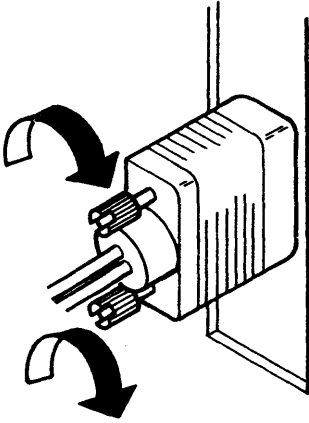
# Keyboard Adapter Cable Replacement

1. Connect the keyboard adapter cable to the system unit as shown below.





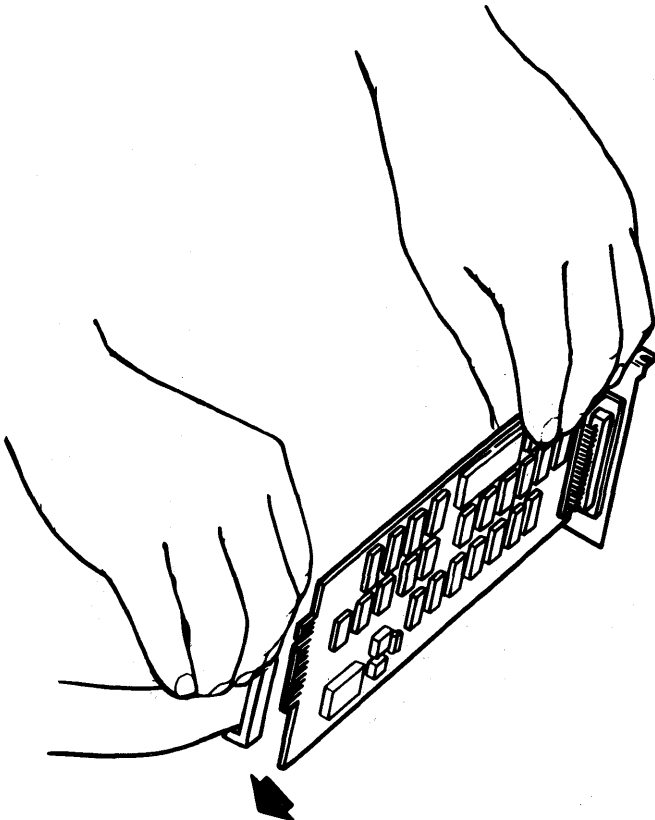
2. Secure the keyboard adapter in place as shown below.



# Diskette Drive 600

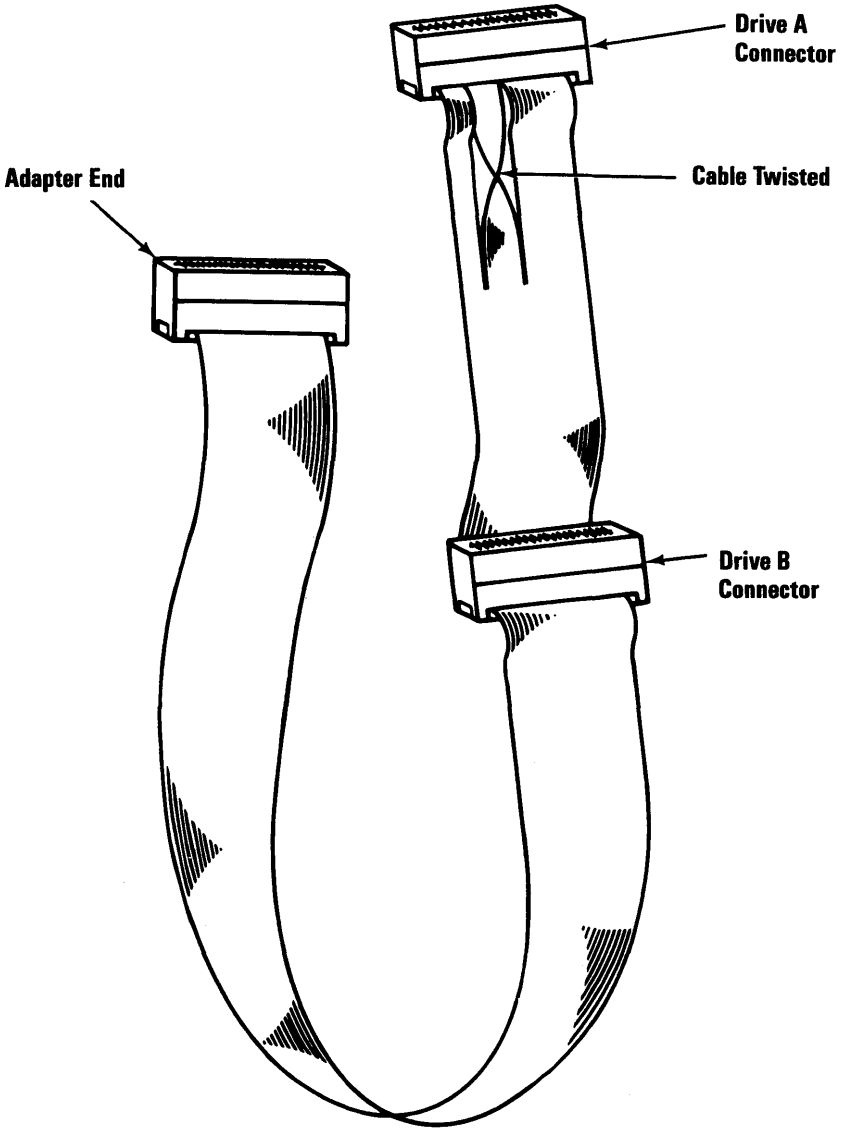
# Diskette Drive Adapter Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the power cords of the system unit (and expansion unit) from the outlet and disconnect all cables from the rear of the unit.
3. Remove the cover of the system unit (or expansion unit) (5-100-2).
4. Remove the Diskette Drive Adapter mounting screw.
5. Grasp the adapter by the top corners and lift straight up.
6. Disconnect the signal cable from the adapter.

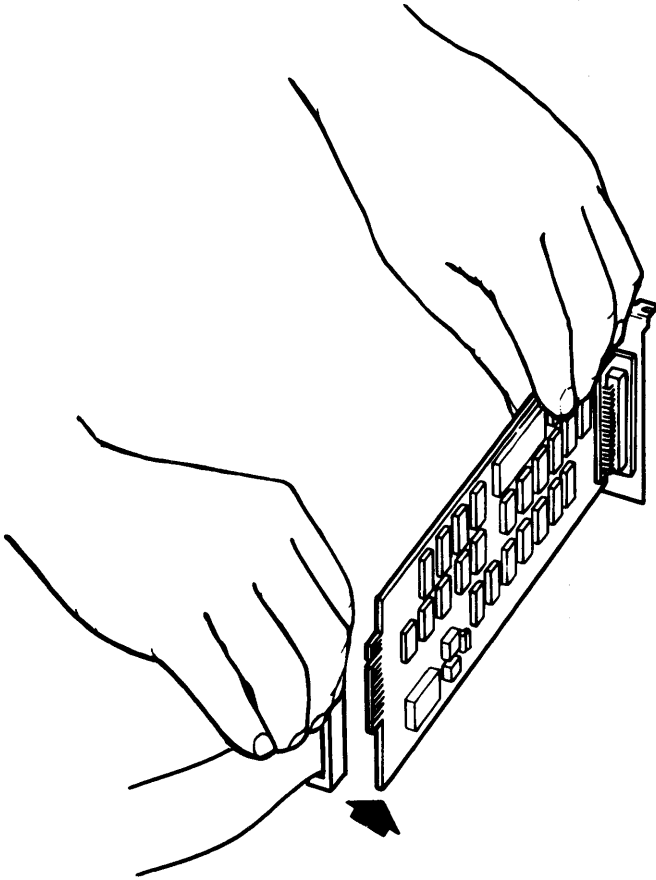


# Diskette Drive Adapter Replacement

1. Look at the following figure and become familiar with the signal cable before installing the connector.



2. Connect the adapter end of the signal cable to the Diskette Drive Adapter.

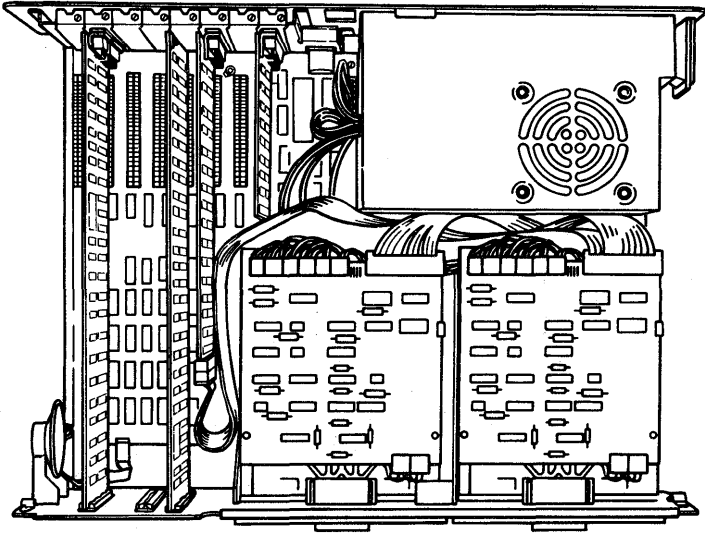


3. Insert the adapter into the option expansion slot. Press down firmly on the adapter to seat the connector.
4. Install the adapter mounting screw.
5. Install the cover of the system unit. (5-100-3).

# **Diskette Drive (Type 1 ) 601**

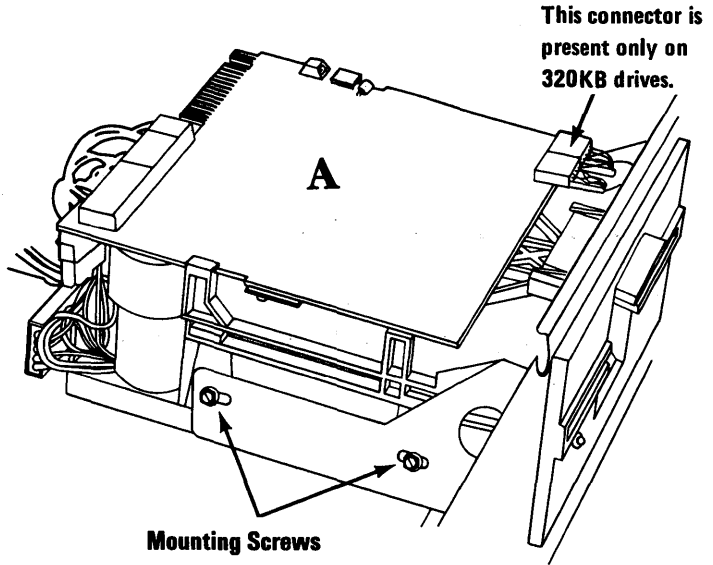
# Diskette Drive A Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Disconnect the signal cable from the diskette-drive logic board.

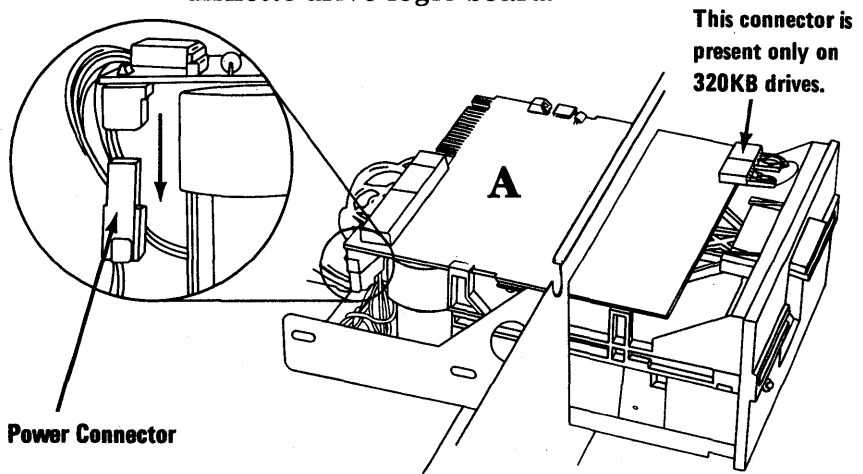


*Note:* You have to remove some of the option adapters to remove the diskette-drive mounting screws.

7. Remove the two mounting screws on the left side of diskette drive A.



8. Slide the diskette drive approximately 50 mm (about 2 inches) out of the system unit. Disconnect the power connector from the diskette-drive logic board.



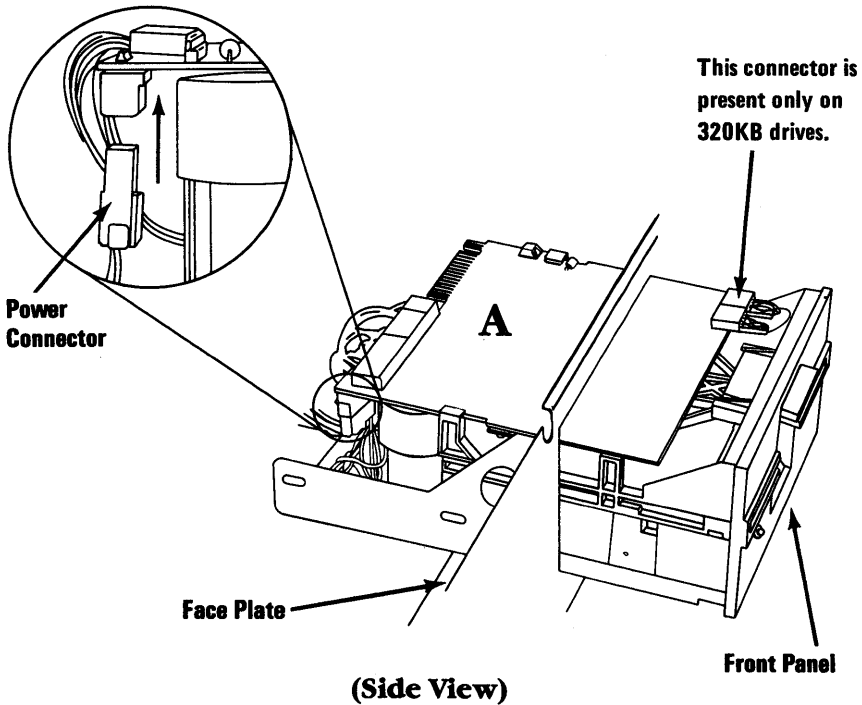
(Side View)

9. Remove the diskette drive from the system unit.



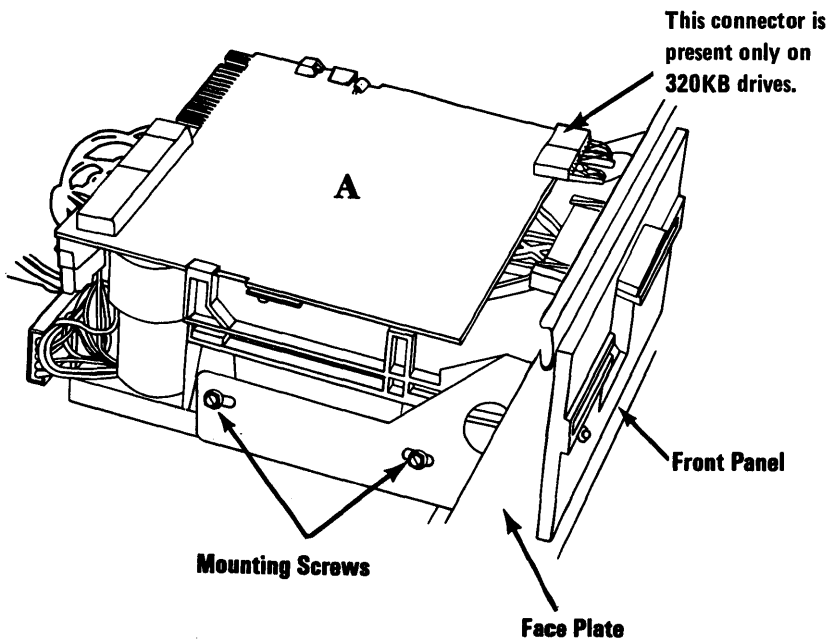
# Diskette Drive A Replacement

1. Slide the drive in until the front panel is approximately 50 mm (about 2 inches) from the frame. Connect the power cable to the diskette-drive logic board.



2. Slide drive A in until the face plate is even with the front panel.
3. Route the signal cable between the diskette drive and the power supply.
4. Connect the end of the signal cable to the diskette drive.

5. Install the two mounting screws. Adjust the diskette drive in or out for a clearance of 1.0 mm (0.040 in.) between the rear of the front panel and the face plate. Tighten the screws.

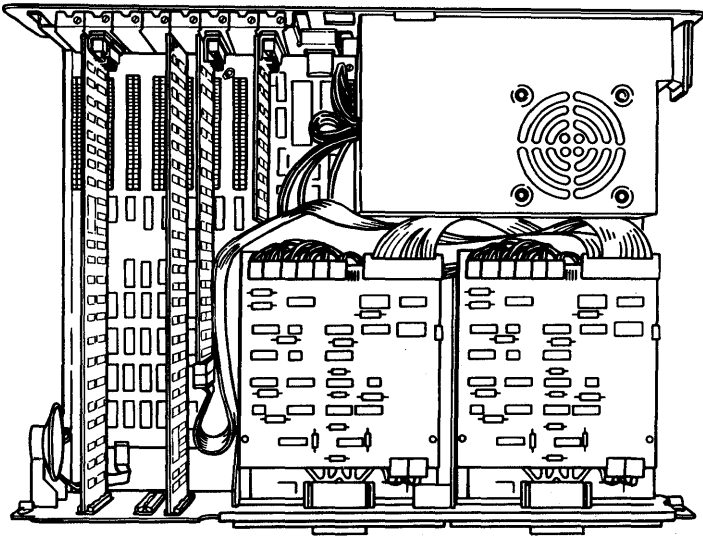


(Side View)

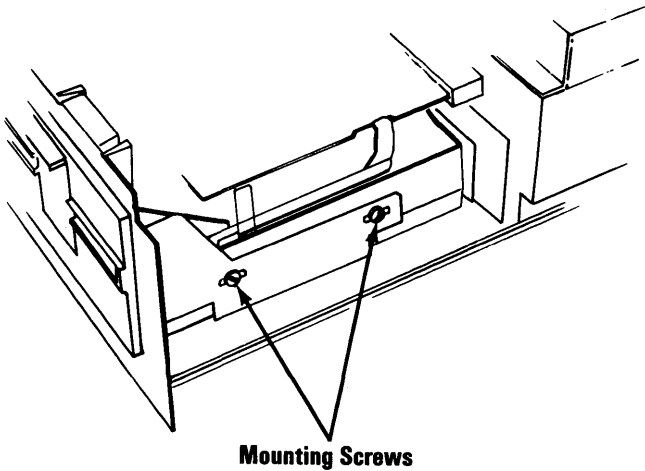
6. Install the option adapters you removed (5-20-5) (5-600-3).
7. Install the cover of the system unit (5-100-3).
8. Connect all cables.

# Diskette Drive B Removal

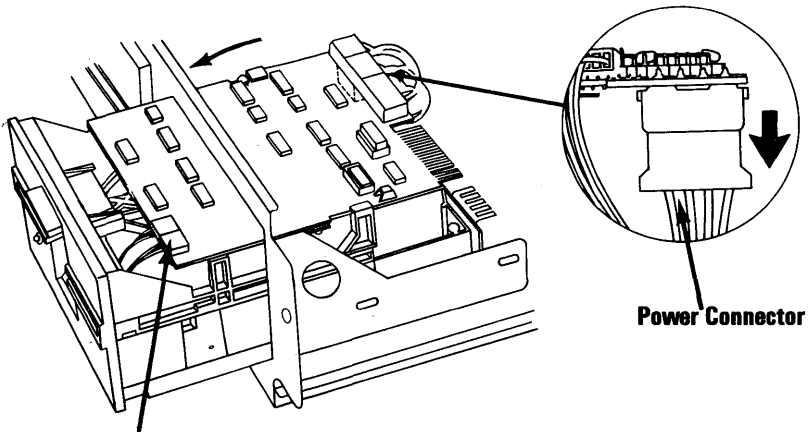
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all external devices to Off.
3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Disconnect the signal cable from the diskette-drive logic board.



7. Remove the two mounting screws on the right side of diskette drive B.



8. Slide the diskette drive approximately 50 mm (about 2 in.) out of the system unit  
Disconnect the power connector from the diskette-drive logic board.
9. Remove the diskette-drive signal cable.
10. Remove the diskette drive from the system unit.

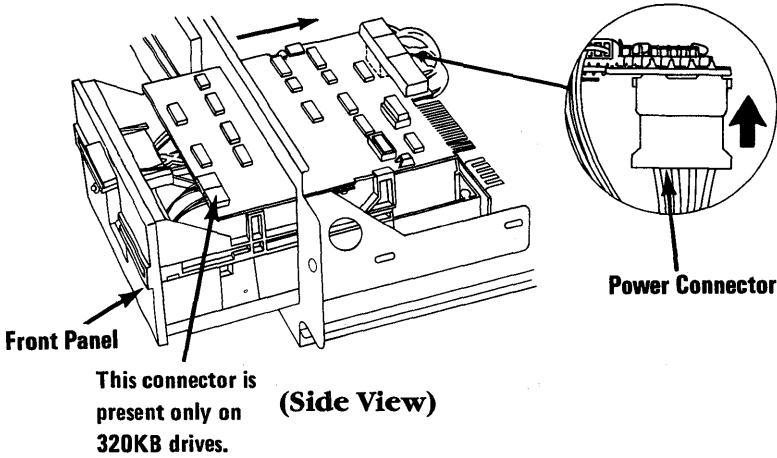


This connector is present only on 320KB drives.

(Side View)

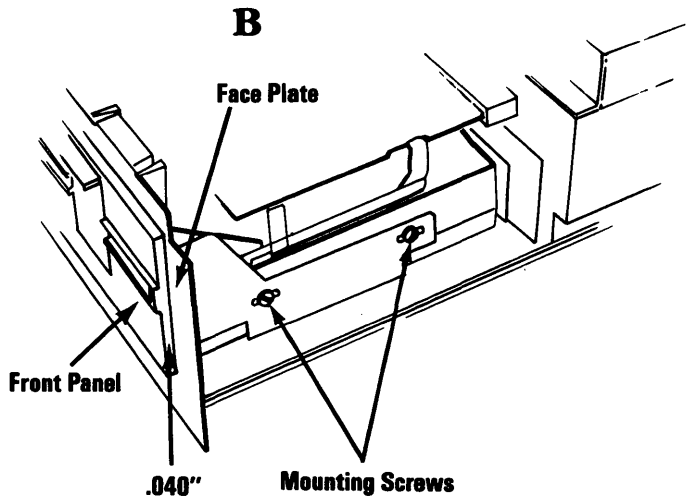
# Diskette Drive B Replacement

1. Slide the drive in until the front panel is approximately 50 mm (about 2 in.) from the frame. Connect the power cable to the diskette-drive logic board.



2. Slide diskette drive B in until the face plate is even with the front panel.
3. Route the signal cable between the diskette drive and the power supply.
4. Connect the end of the signal cable to the diskette drive.

5. Install the two mounting screws. Adjust the diskette drive in or out for a clearance of 1.0 mm (0.040 in.) between the rear of the front panel and the face plate. Tighten the screws.

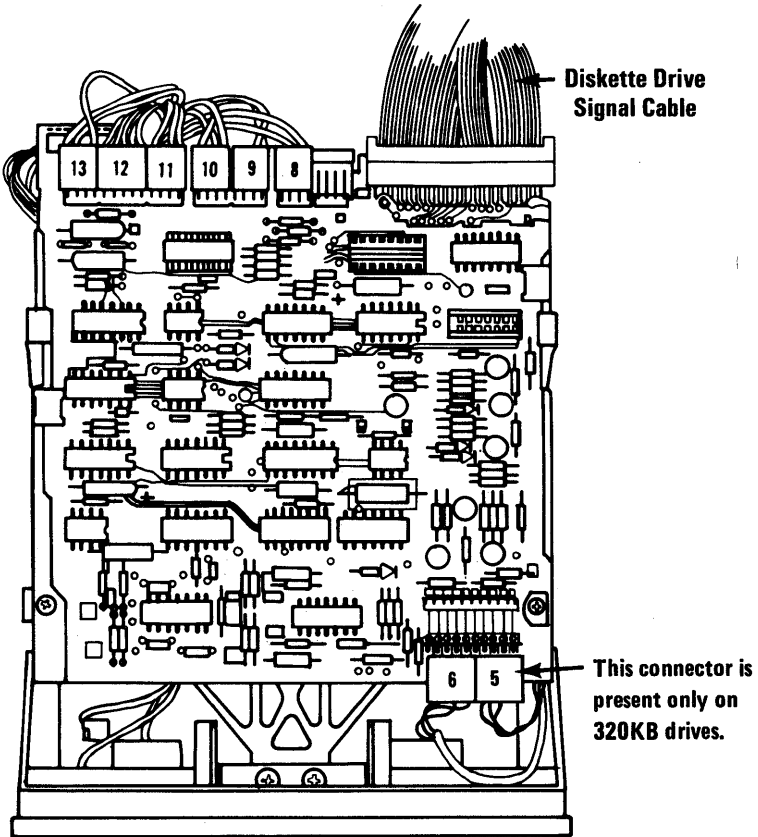


**(Side View)**

6. Remove the terminating resistor from drive B only (5-601-27).
7. Install the cover of the system unit (5-100-3).
8. Connect all cables.

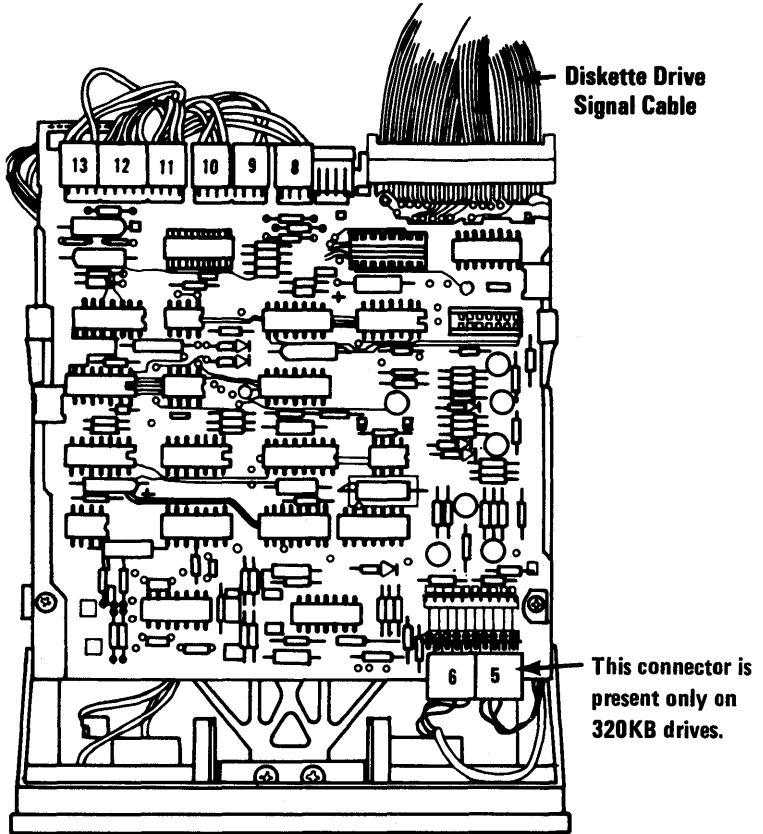
# Diskette-Drive Logic Board Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).



(Top View)

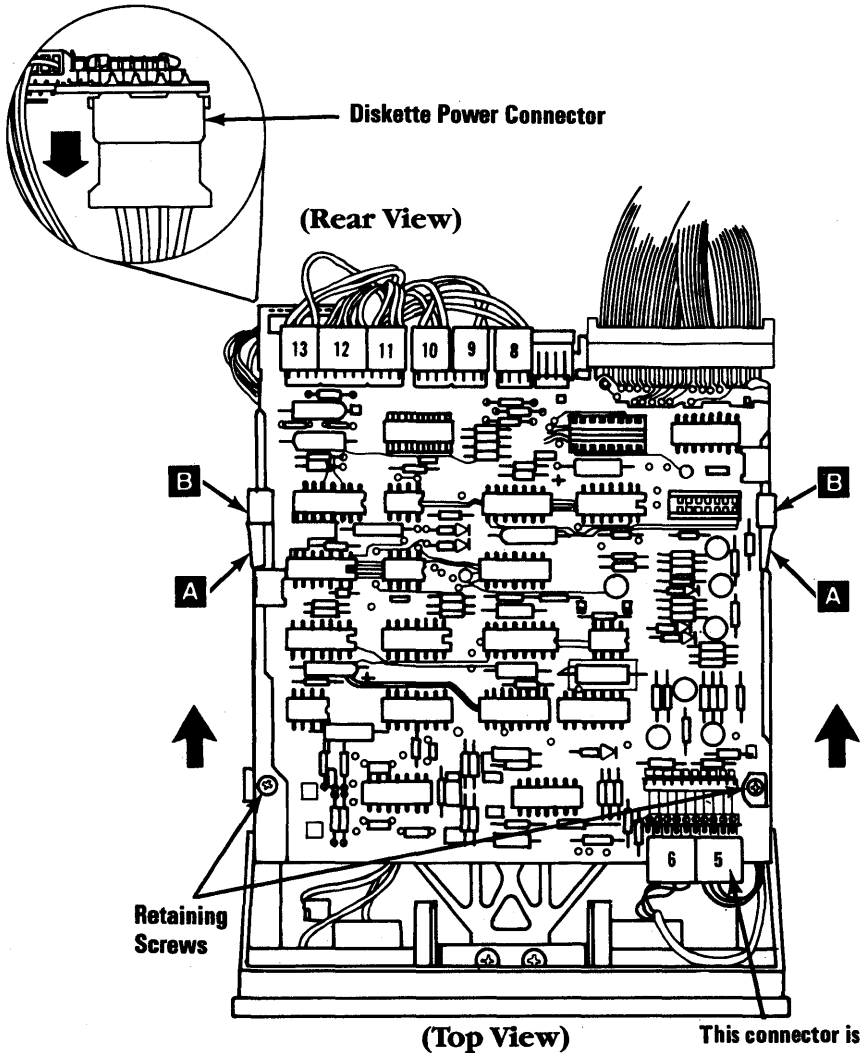
6. Disconnect connectors 8 through 13 from the left rear of the diskette-drive logic board.
7. Disconnect connectors 5 and 6 from the right front of the diskette-drive logic board.
8. Disconnect the diskette-drive signal cable from the diskette-drive logic board.



(Top View)



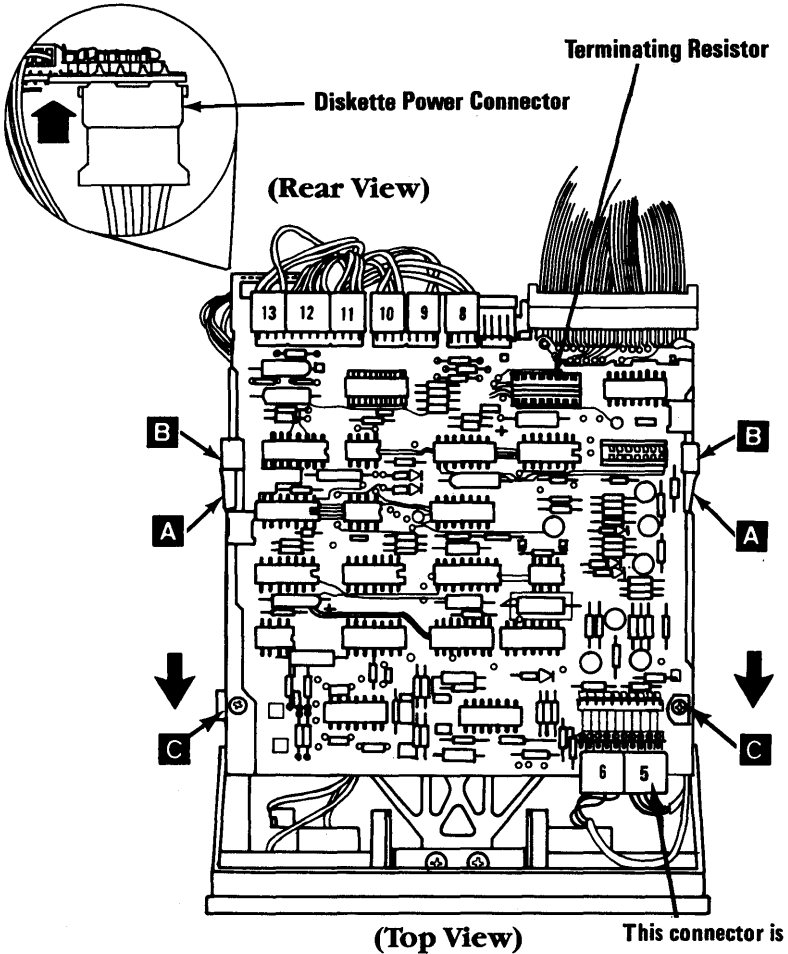
9. Remove the two retaining screws from the top of the diskette-drive logic board.
10. Slide the diskette-drive logic board to the rear until the notches **A** line up with the guide brackets **B**, then lift the diskette-drive logic board from the diskette drive assembly.
11. Disconnect the diskette-drive power connector from the left rear of the diskette-drive logic board.



This connector is present only on 320KB drives.

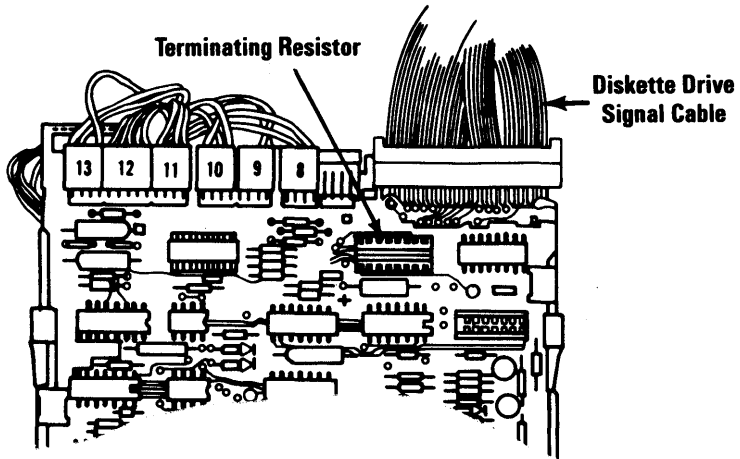
# Diskette-Drive Logic Board Replacement

1. Connect the diskette-drive power connector at the left rear of the diskette-drive logic board.
2. Align the notches **A** on the sides of the logic board with the guide brackets **B**, then lower the logic board onto the brackets.



This connector is present only on 320KB drives.

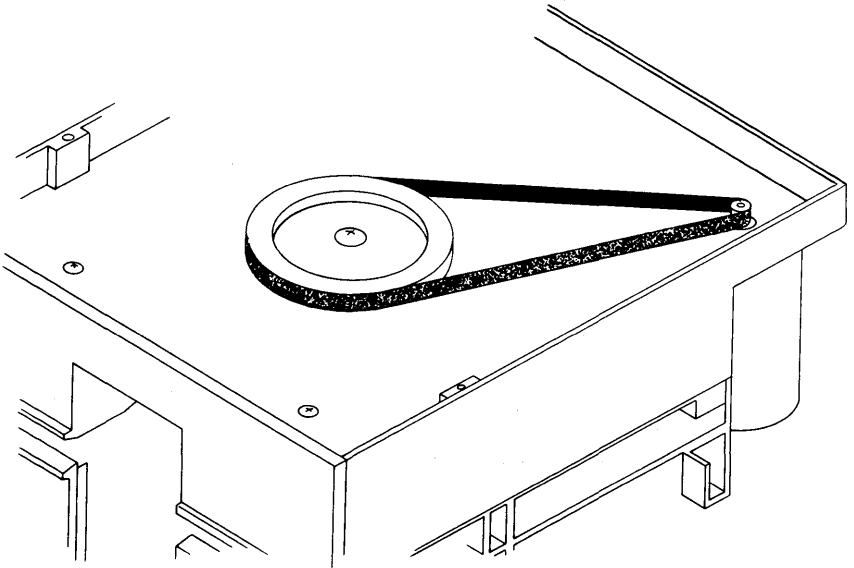
- Slide the logic board toward the front of the diskette drive until the holes in the logic board line up with the threaded holes **C** in the frame of the diskette drive.
- Install the logic board retaining screws.
- Connect connectors 8 through 13 at the left rear of the logic board.
- Connect connectors 5 and 6 at the right front of the logic board.
- Connect the diskette-drive signal cable to the right rear of the logic board.



- Remove the terminating resistor from drive B only (5-601-27).
- Install the cover of the system unit (5-100-3).
- Connect all cables.

# Drive Belt Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the Power switches on all attached devices to Off.
3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Remove the diskette drive (5-601-2) or (5-601-6).
7. Carefully place the diskette drive on a work surface, with the drive belt and pulleys facing up.
8. Lift the belt off the large pulley, then off the small pulley.



**(Bottom View)**

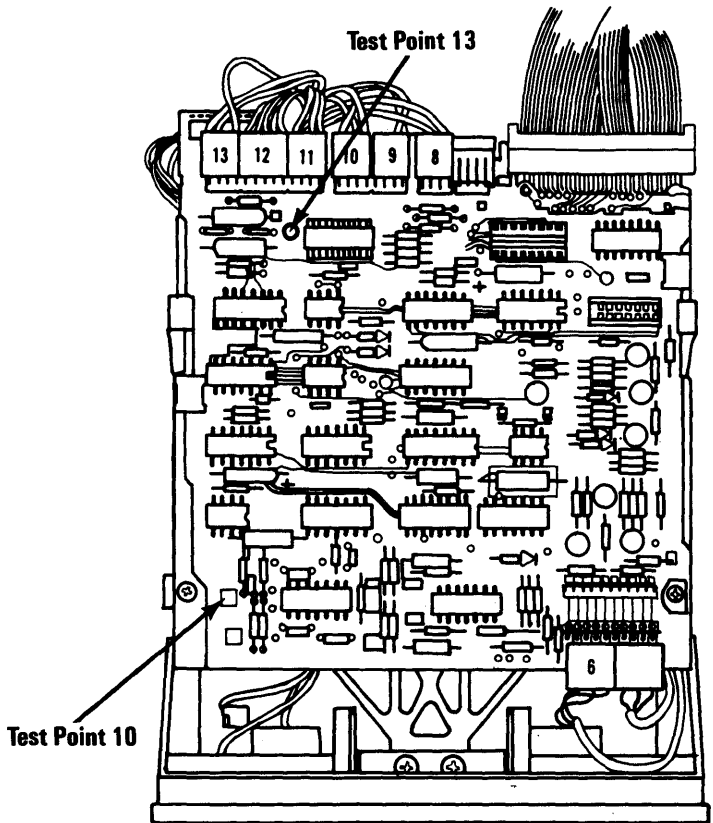
# Drive Belt Replacement

1. Place the drive belt around the small pulley (dark, shiny side facing the pulleys), then around the large pulley.
2. Install the diskette drive (5-601-4) or (5-601-8).
3. Install the cover of the system unit (5-100-3).
4. Connect all cables.

# Drive Motor Preliminary Speed Adjustment

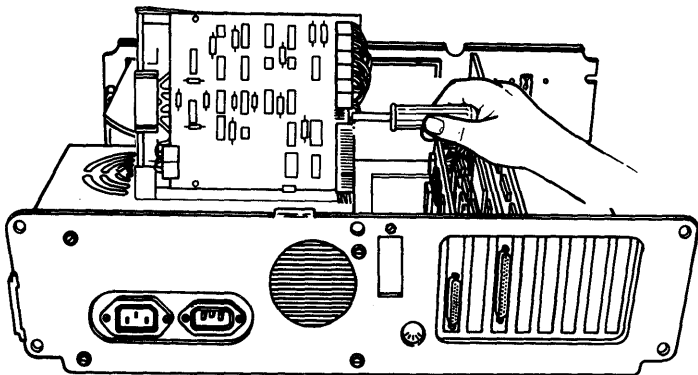
Use this procedure for diskette drive A or B, or both, when the Diagnostics program does not load or the Speed Test does not execute. You need fluorescent lighting for this adjustment.

1. Remove the diskette drive (5-601-2) or (5-601-6).



(Top View)

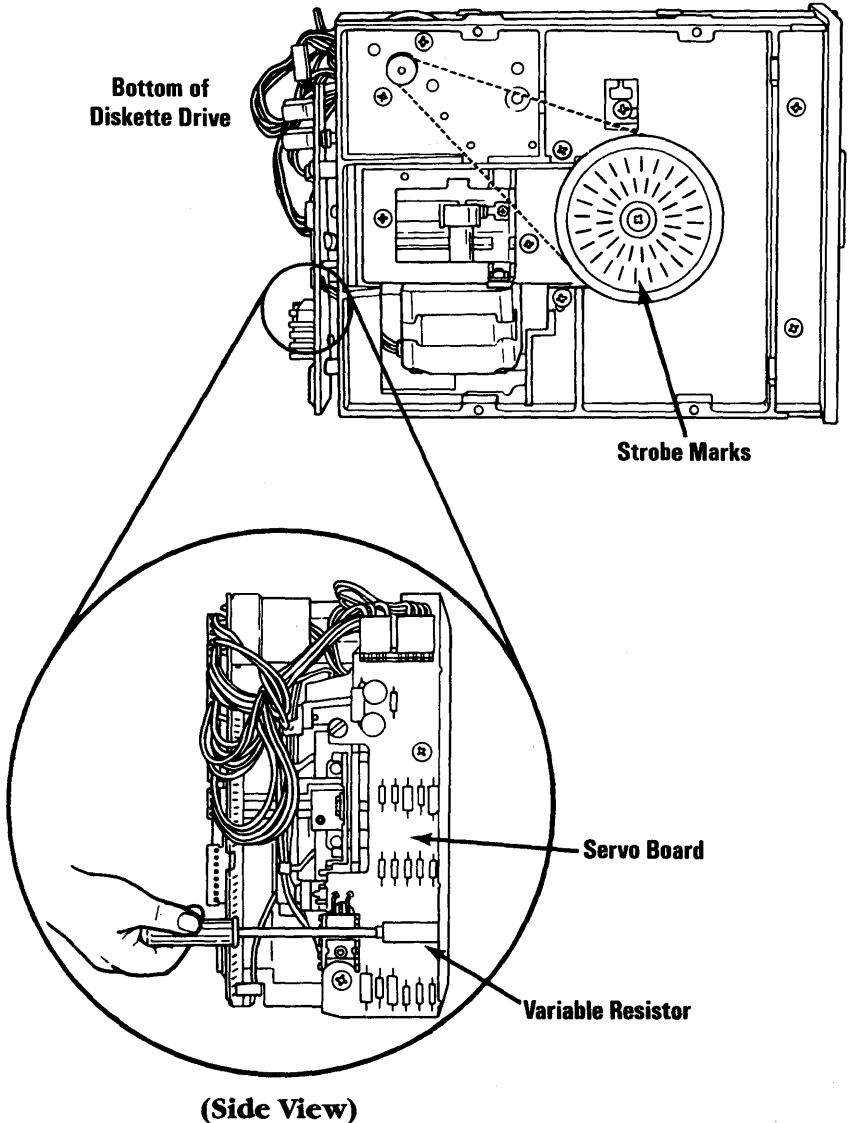
2. Insert a scratch diskette into the diskette drive.
3. Connect a jumper between test points 10 and 13 on the diskette-drive logic board.
4. Place the diskette drive (left side up) on the system-unit power supply as shown below.
5. Plug the power connector into the diskette-drive logic board; leave the signal cable disconnected.
6. Plug the system-unit power cord into the system unit, then into the outlet.
7. Set the system unit Power switch to On.



**(Rear View)**

- Using fluorescent lighting, observe the strobe marks on the outer ring of the drive pulley and adjust the variable resistor on the servo board until the applicable ring of strobe marks appear to stand still.

*Note:* The outer ring of the strobe is for 60 hertz, and the inner ring is for 50 hertz.





9. Set the system unit Power switch to Off.
10. Unplug the system unit power cord from the outlet.
11. Disconnect the power cord from the rear of the system unit.
12. Install the diskette drive **(5-601-4)** or **(5-601-8)**.
13. Turn to "Drive Motor Speed Adjustment" **(5-601-21)** and verify the speed is within specification. Adjust if necessary.
14. Install the cover of the system unit **(5-100-3)**.
15. Connect all cables.

# Drive Motor Speed Adjustment

1. Insert the Diagnostics diskette.
2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
3. Advance to menu 8 (see "Diagnostic Menu Reference" in Section 2).
4. Select option 4 (SPEED TEST) for the diskette drive you are testing. The diskette drive speed and adjustment specification appear on the screen.

*Note:* If you are unable to load the Diagnostics program, or if the Speed Test will not execute, go to the "Drive Motor Preliminary Speed Adjustment" (5-601-17).

SPEED IS 2000

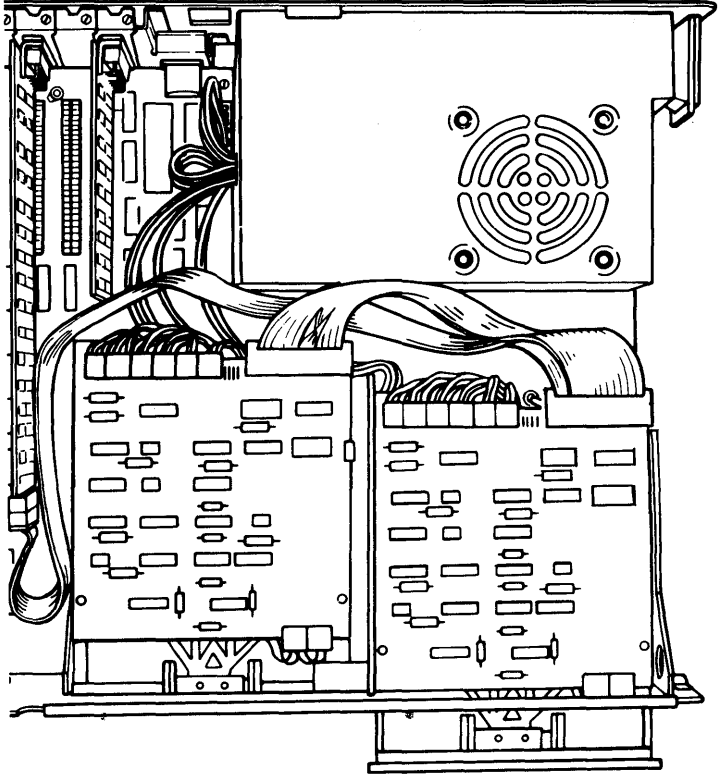
ADJUST FOR 1980 TO 2020  
PRESS ANY KEY TO EXIT

SPEED IS 1999

ADJUST FOR 1980 TO 2020

5. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
6. Set the Power switches on all attached devices to Off.
7. Unplug the power cord of the system unit (and expansion unit) from the outlet.
8. Disconnect all cables from the rear of the system unit.
9. Remove the cover of the system unit (5-100-2).
10. Remove the two mounting screws on the diskette drive that needs adjusting (5-601-2) or (5-601-6).

11. Slide the diskette drive out of the system unit approximately 50 mm (about 2 in.).
12. Connect all cables.
13. Insert the Diagnostics diskette.
14. Set the Power switch on the expansion unit (if attached) and the system unit to On.



15. Advance to Menu 8 (see "Diagnostic Menu Reference" in Section 2).
16. Select option 4 (SPEED TEST) for the diskette drive you are adjusting. The diskette drive speed and the adjustment specification appear on the screen.

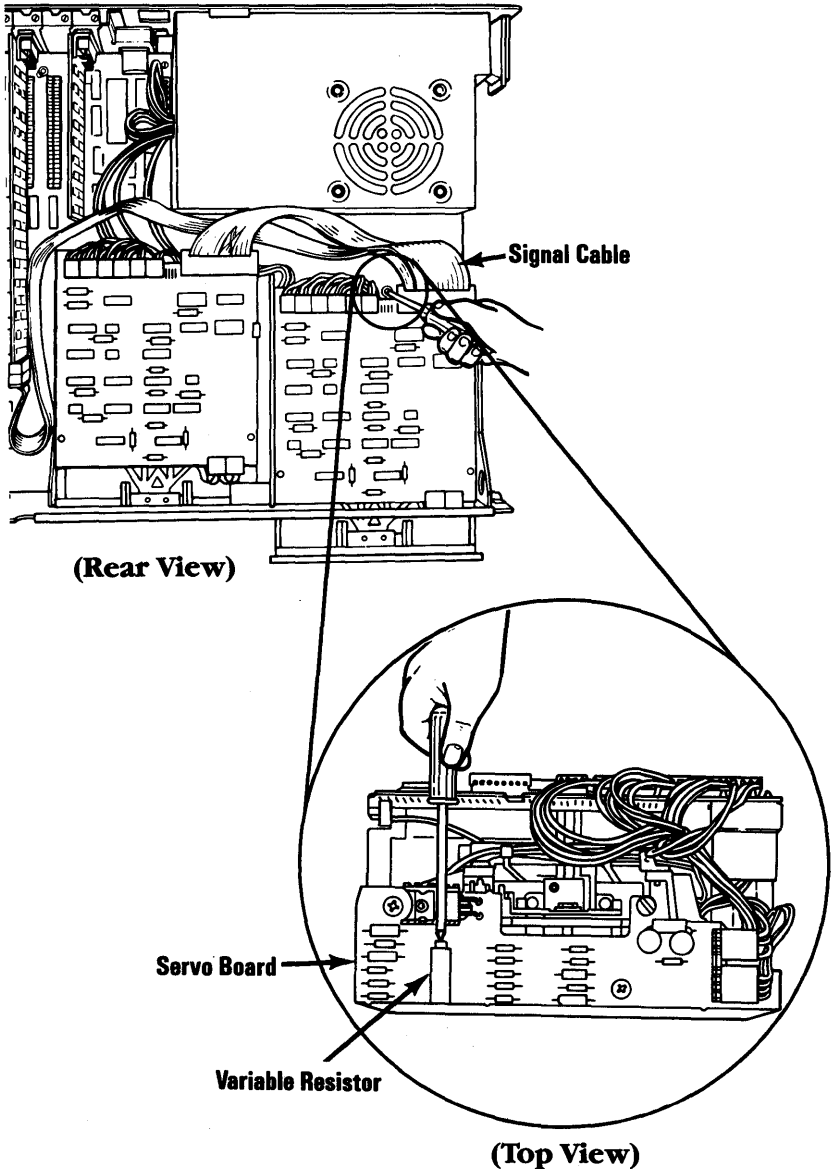
SPEED IS 2000

ADJUST FOR 1980 TO 2020  
PRESS ANY KEY TO EXIT

SPEED IS 1999

ADJUST FOR 1980 TO 2020

17. The adjustment for the diskette drive speed is a variable resistor on the servo board. To adjust the speed, carefully insert an insulated screwdriver down past the left end of the diskette-drive signal cable to the adjusting screw on top of the variable resistor.



18. Turn the screw until the speed shown on the screen is within the required specifications.

SPEED IS 2000

ADJUST FOR 1980 TO 2020  
PRESS ANY KEY TO EXIT

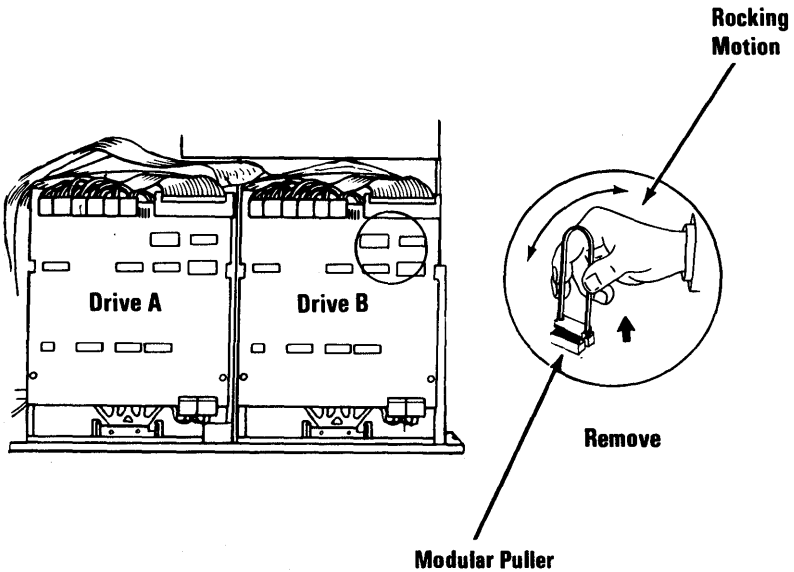
SPEED IS 1999

ADJUST FOR 1980 TO 2020

19. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
20. Set the Power switches on all attached devices to Off.
21. Unplug the power cord of the system unit (and expansion unit) from the outlet.
22. Disconnect all cables from the rear of the system unit.
23. Install the diskette drive (5-601-4) or (5-601-8).
24. Install the cover of the system unit (5-100-3).
25. Connect all cables.

# Terminating Resistor (T-RES) Removal

1. Locate the terminating resistor on the circuit board of the diskette drive. The terminating resistor is identified by a white adhesive label with **T-RES** in black letters.
2. Pull the terminating resistor from its connector on the circuit board.



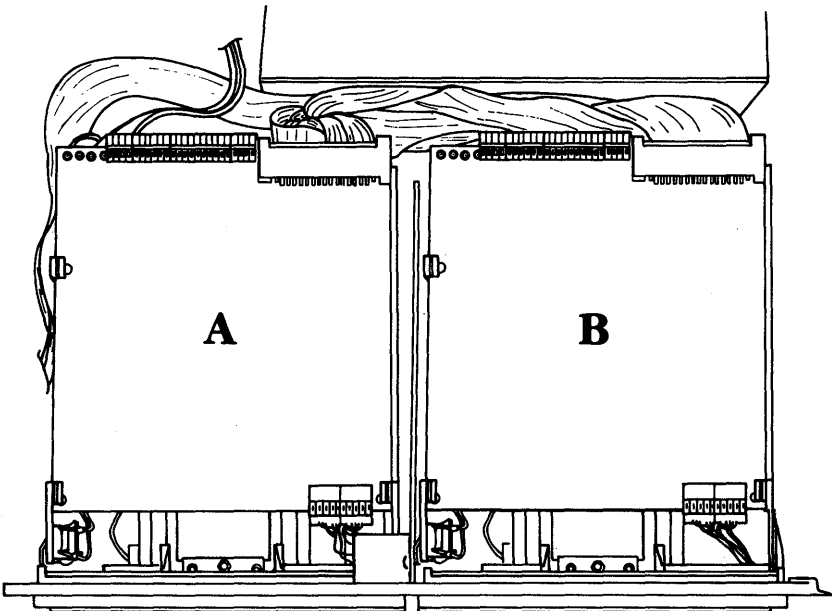


# Notes:

# **Diskette Drive (Type 2) 602**

# Diskette Drive A Removal

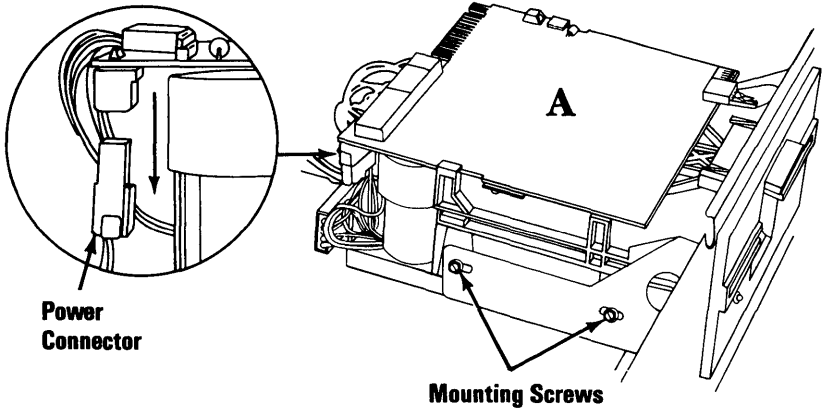
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set all external Power switches to off (printer, Display, and others).
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Disconnect the signal cable from the diskette-drive logic board.



7. Remove the two mounting screws on the left side of diskette drive A.

*Note:* Remove the option adapters, as necessary, for access to the screws (5-20-3).

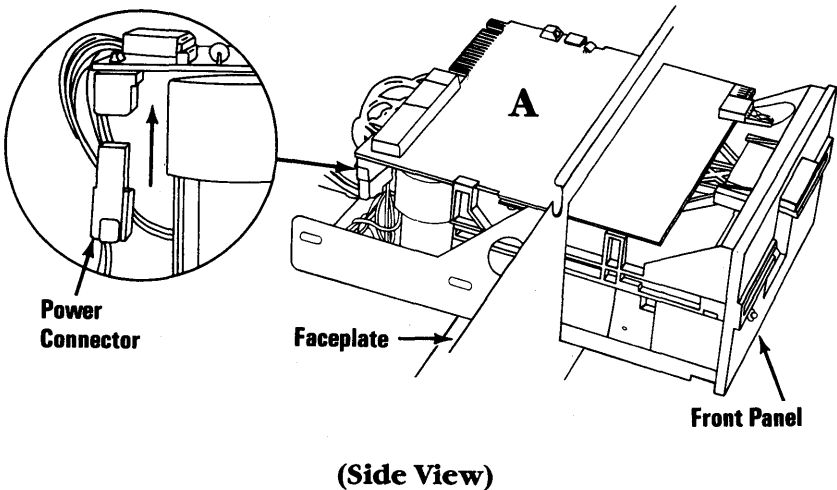
8. Slide the diskette drive approximately 50 mm (about 2 inches) out of the system unit. Remove the power connector from the diskette-drive logic board.



9. Remove the diskette drive from the system unit.

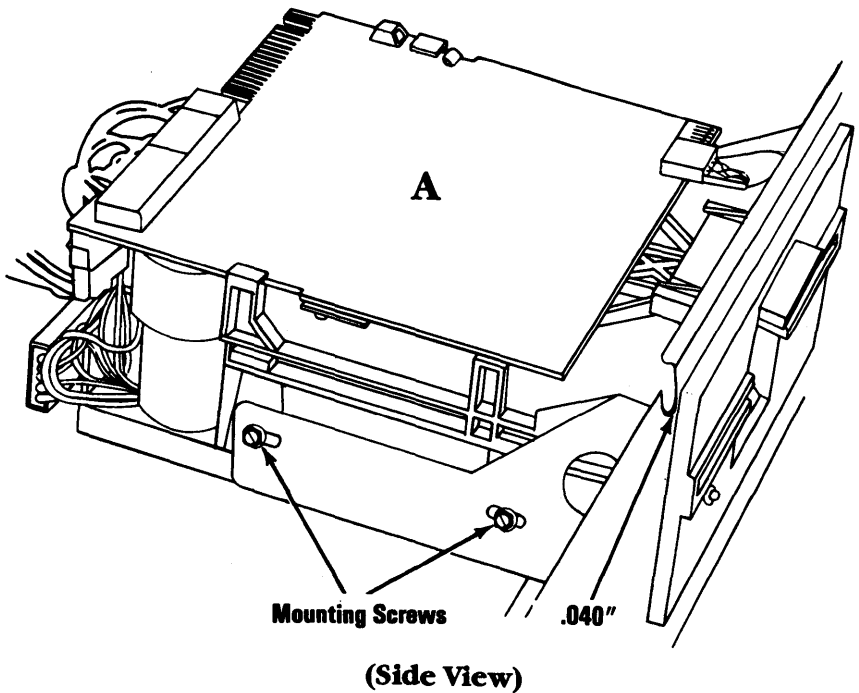
# Diskette Drive A Replacement

1. Slide diskette drive A in until the front panel is approximately 50 mm (about 2 inches) from the frame. Connect the power cable to the diskette-drive logic board.



2. Slide diskette drive A in until the face plate is even with the front panel.
3. Route the signal cable between the diskette drive and power supply.
4. Connect the end of the signal cable to the diskette drive.

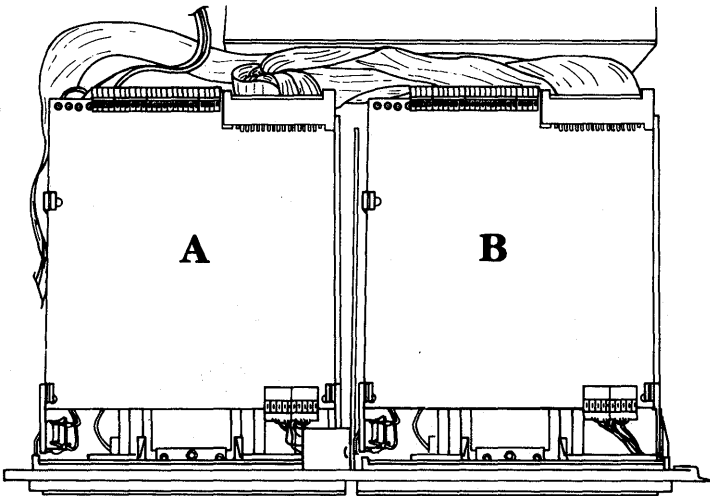
5. Install the two mounting screws. Move the diskette drive in or out for a clearance of 1.0 mm (0.040 inch.) between the rear of the front panel and the face plate; tighten the screws.



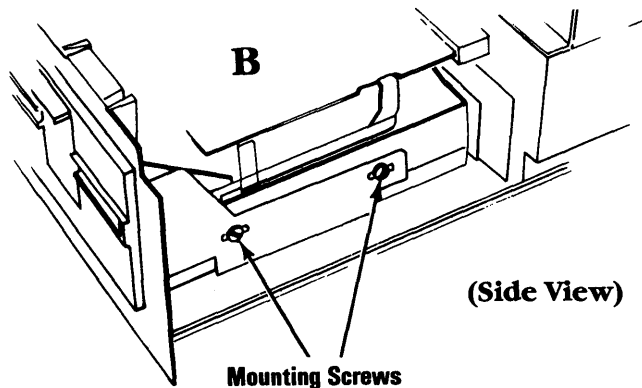
6. Install the option adapters you removed (5-20-5).
7. Install the cover of the system unit (5-100-3).
8. Connect all cables.

# Diskette Drive B Removal

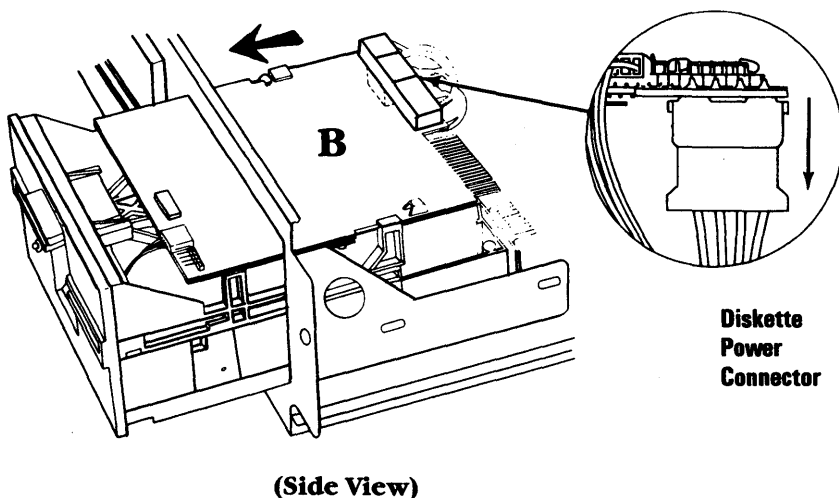
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set all external Power switches to off (printer, Display, and others).
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Disconnect the signal cable from the diskette-drive logic board.



7. Remove the two mounting screws on the right side of diskette drive B.



8. Slide the diskette drive approximately 50 mm (about 2 inches) out of the system unit.
9. Disconnect the power connector from the left rear corner of the diskette-drive logic board.

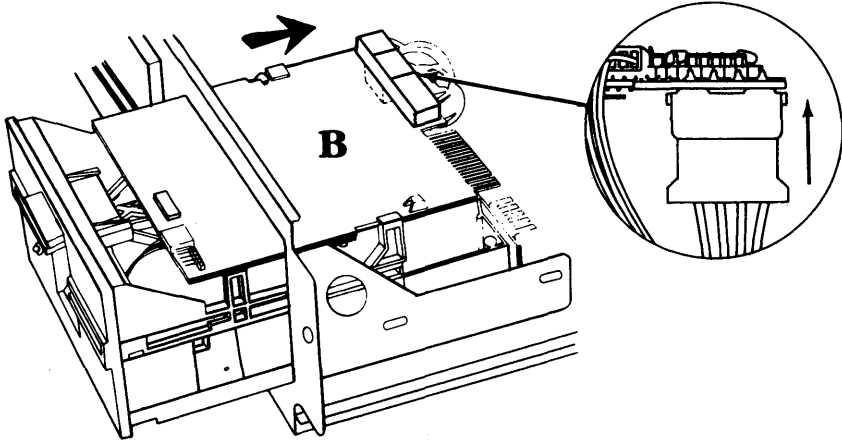


10. Remove the diskette drive from the system unit.



# Diskette Drive B Replacement

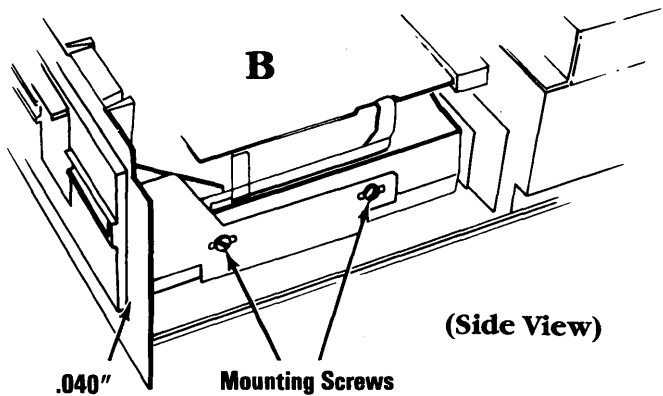
1. Slide diskette drive B in until the front panel is approximately 50 mm (about 2 inches) from the frame.
2. Connect the power cable to the diskette-drive logic board.



**(Side View)**

3. Slide diskette drive B in until the face plate is even with the front panel.
4. Route the signal cable between the diskette drive and power supply.
5. Connect the end of the signal cable to the diskette drive.

6. Install the two mounting screws. Move the diskette drive in or out for a clearance of 1.0 mm (0.040 inch.) between the rear of the front panel and the face plate; tighten the screws.



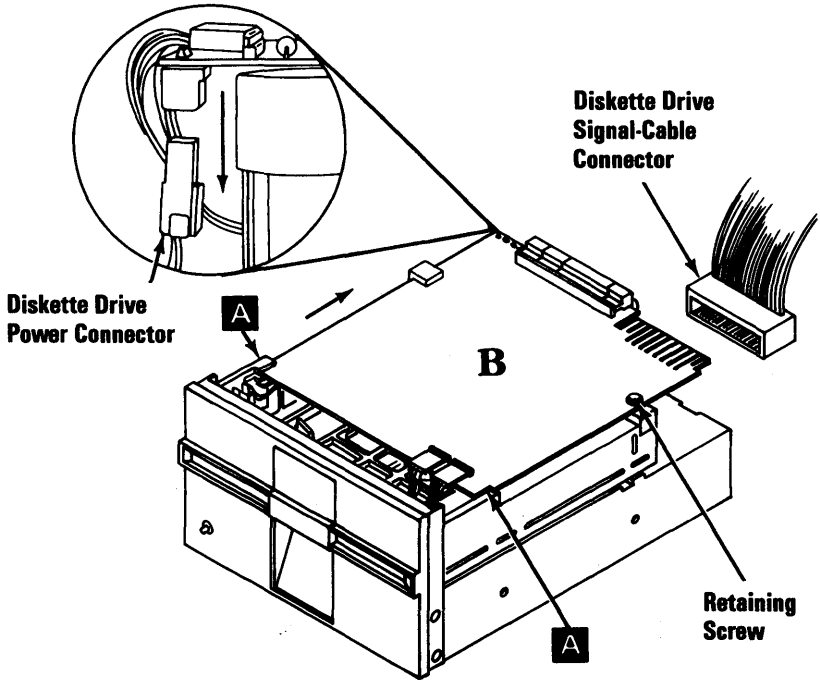
7. Remove the terminating resistor only on drive B (5-602-25).
8. Install the cover of the system unit (5-100-3).
9. Connect all cables.

# Diskette Drive Logic Board Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set all external Power switches to off (printer, Display, and others).
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Disconnect all connectors from the rear, and the head cables from the right front of the diskette-drive logic board.
7. Remove the retaining screw.
8. Slide the diskette-drive logic board toward the rear until it clears the front guide brackets **A** .
9. Lift the right side of the diskette-drive logic board up and out to clear the brackets.

10. Disconnect the diskette-drive power connector from the left rear corner of the diskette-drive logic board.

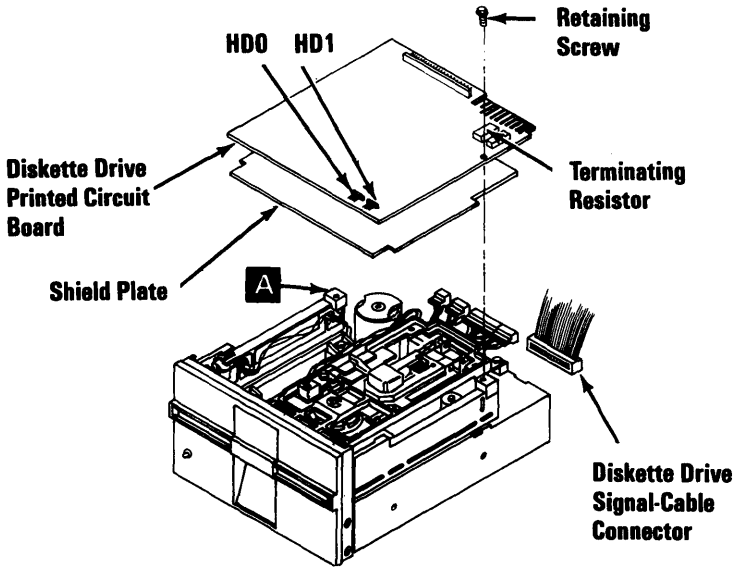
11. Remove the shield plate.



# Diskette Drive Logic Board Replacement

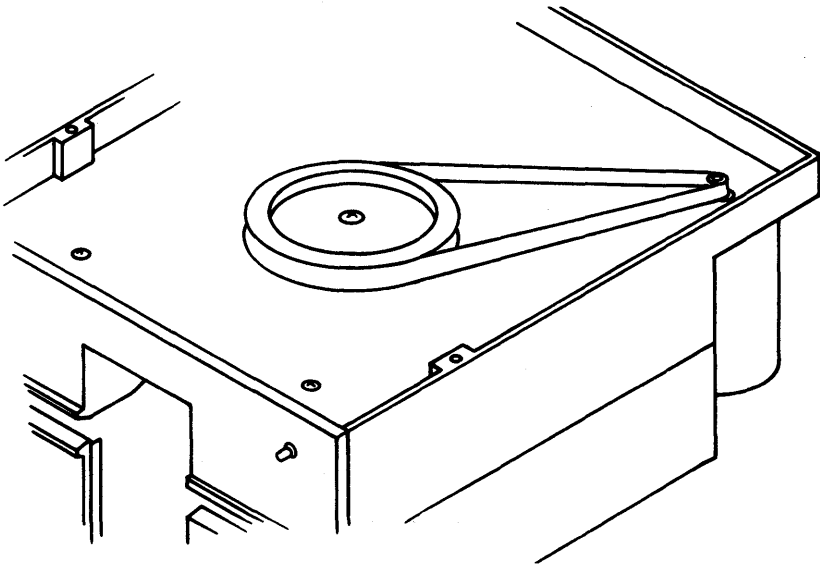
1. Install the shield plate with the metal side down.
2. Connect the diskette-drive power connector under the left rear corner of the diskette-drive logic board.
3. Guide the left side of the diskette-drive logic board into the left rear guide bracket **A**.
4. Slide the diskette-drive logic board into the front guide brackets; align the hole in the logic board with the threaded hole in the right diskette guide.
5. Insert the retaining screw.
6. Connect the connectors at the left rear of the diskette-drive logic board. The first connector on the left is a 4-pin connector for the drive motor, the second connector is a 6-pin connector, the third connector is a 10-pin connector, and the fourth connector is a 4-pin connector.
7. Connect the diskette-drive signal cable at the right rear of the diskette-drive logic board.
8. Connect the head connectors, HD1 outside and HD0 inside, to the right front of the diskette drive logic board.

9. Remove the terminating resistor only on drive B (5-602-25).
10. Install the cover of the system unit (5-100-3).
11. Connect all cables.



# Drive Belt Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set all external Power switches off (printer, Display, and others).
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Remove the diskette drive (5-602-2) or (5-602-6).
7. Carefully place the diskette drive on a work surface with the drive belt and pulleys facing up.
8. Lift the belt off the large pulley, then off the small pulley.



**(Bottom View)**

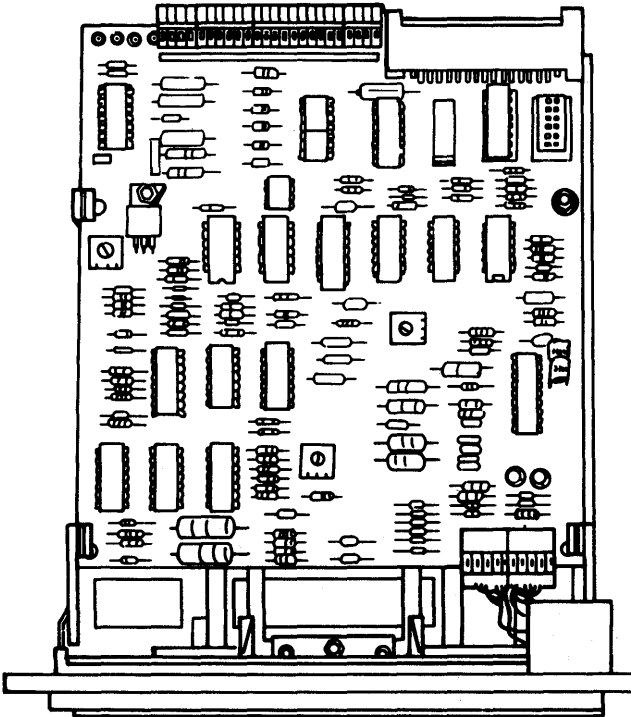
# Drive Belt Replacement

1. Place the drive belt around the small pulley (dark, shiny side facing pulleys), then place the belt around the large pulley.
2. Install the diskette drive (5-602-4) or (5-602-8).
3. Install the cover of the system unit (5-100-3).
4. Connect all cables.

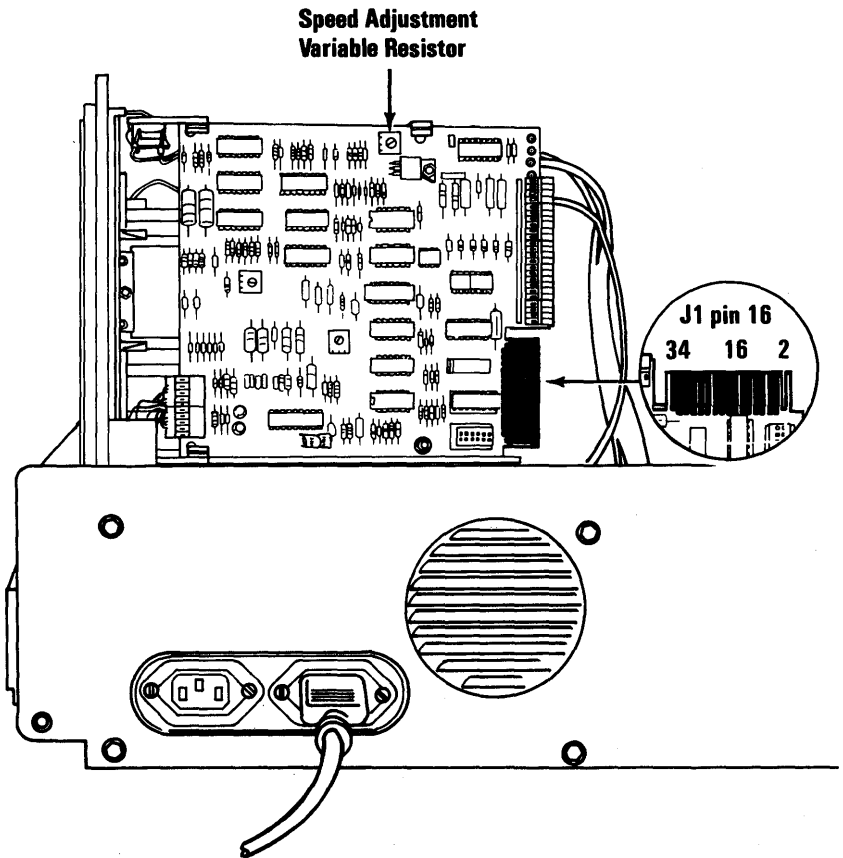


# Drive Motor Preliminary Speed Adjustment

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set all external Power switches off (printer, Display, and others).
3. Unplug the power cords of the system unit (and expansion unit) from the outlet.
4. Disconnect all cables from the rear of the system unit.
5. Remove the cover of the system unit (5-100-2).
6. Remove the diskette drive (5-602-2) or (5-602-6).



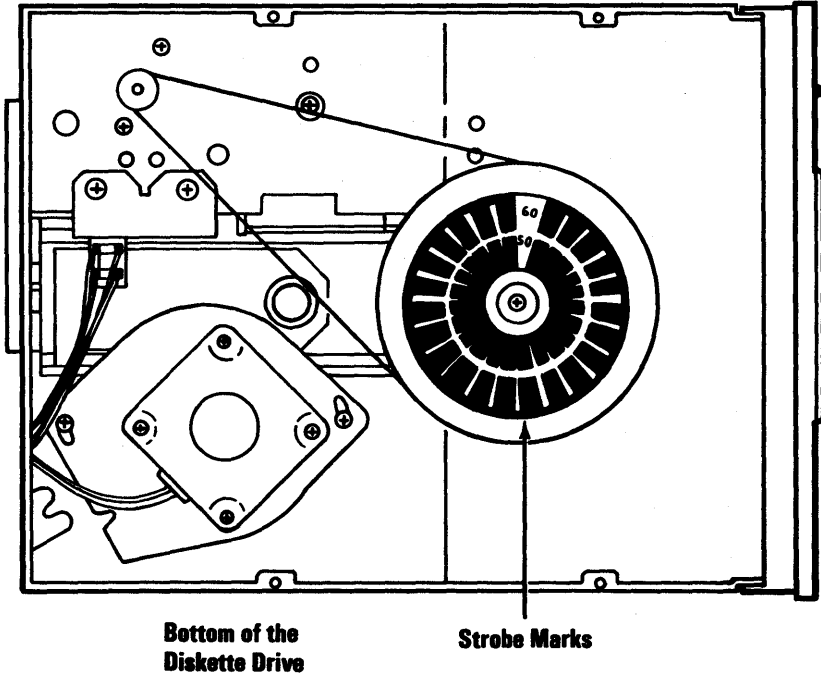
7. Insert a scratch diskette into the diskette drive.
8. Place the diskette drive (left side up) on the system unit power supply.
9. Connect a jumper between J-1 pin 16 on the diskette-drive logic board and ground.
10. Plug power connector P-3 into the diskette-drive logic board.
11. Plug the system unit power cord into the system unit, then into the outlet.
12. Set the system unit Power switch to On.



**(Rear View)**

13. Using fluorescent lighting, observe the strobe marks on the outer ring of the drive pulley. Adjust the variable resistor on the diskette-drive logic board until the applicable ring of strobe marks appear to stand still.

*Note:* The outer ring of strobe marks is for 60 hertz, and the inner ring is for 50 hertz.



14. Set the system unit Power switch to Off.
15. Disconnect the system unit power cord from the outlet.
16. Disconnect the system unit power cord from the rear of the system unit.
17. Install the diskette drive (5-602-4) or (5-602-8).
18. Use "Drive Motor Speed Adjustment" (5-602-20) to verify the speed is within specification. Adjust if necessary.
19. Install the cover of the system unit (5-100-3).
20. Connect all cables.

# Drive Motor Speed Adjustment

1. Insert the Diagnostics diskette.
2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
3. Advance to diagnostic menu 8 (refer to "Diagnostic Menu Reference," Section 2).
4. In menu 8, select option 4, SPEED TEST, for the diskette drive you are testing. The diskette drive speed and the adjustment specification appear on the screen.

*Note:* If you are unable to load the Diagnostics diskette, or if the Speed Test will not execute, refer to the "Drive Motor Preliminary Speed Adjustment" (5-602-16).

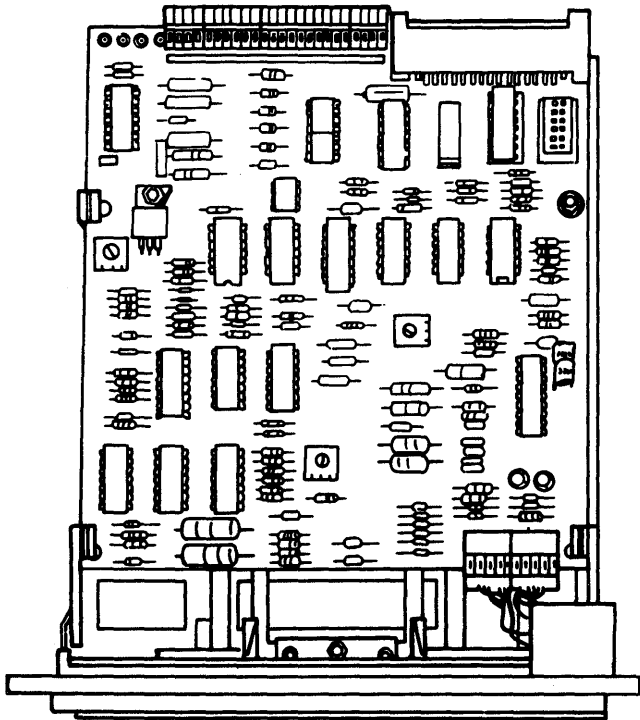
SPEED IS 2000

ADJUST FOR 1980 TO 2020  
PRESS ANY KEY TO EXIT

SPEED IS 1999

ADJUST FOR 1980 TO 2020

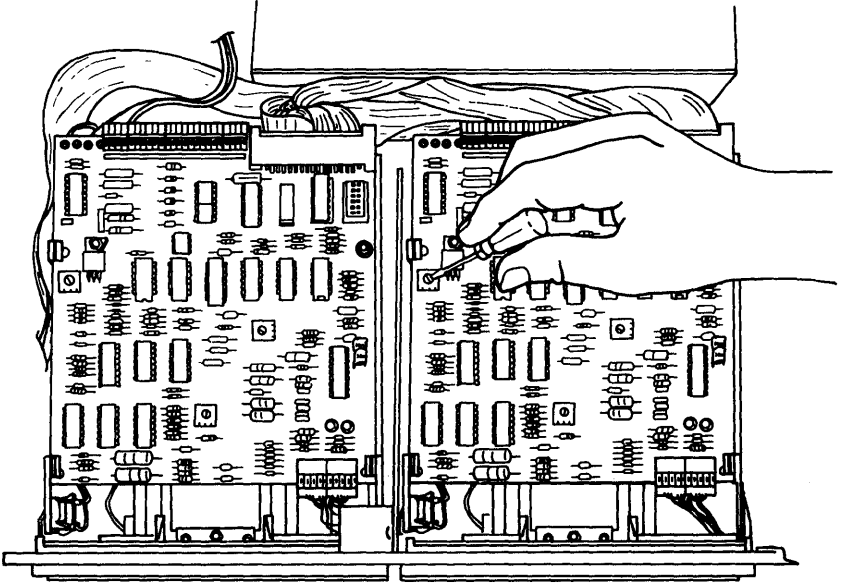
5. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
6. Set all external Power switches to off (printer, Display, and others).
7. Unplug the power cords of the system unit (and expansion unit) from the outlet.
8. Disconnect all cables from the rear of the system unit.
9. Remove the cover of the system unit (5-100-2).
10. Connect all cables.
11. Insert the Diagnostics diskette.
12. Set the Power switch on the expansion unit (if attached) and the system unit to On.



13. Advance to diagnostic menu 8 (refer to "Diagnostic Menu Reference," Section 2).
14. Select option 4, **SPEED TEST**, for the diskette drive you are adjusting. The diskette drive speed and the adjustment specification appear on the screen.

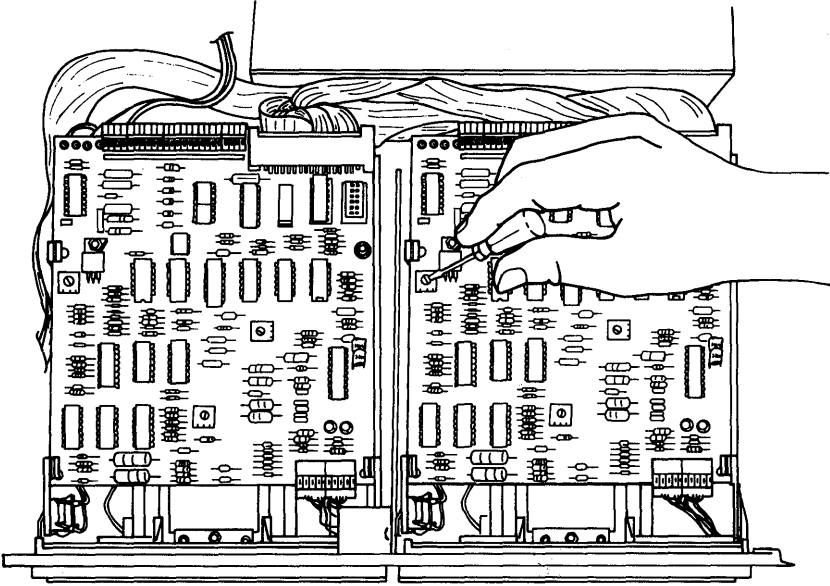
```
SPEED IS 2000  
  
ADJUST FOR 1980 TO 2020  
PRESS ANY KEY TO EXIT  
  
SPEED IS 1999  
  
ADJUST FOR 1980 TO 2020
```

15. The adjustment for the diskette drive speed is a variable resistor on the diskette-drive logic board. To adjust the speed, carefully insert an insulated screwdriver into the screw on the top of the variable resistor.





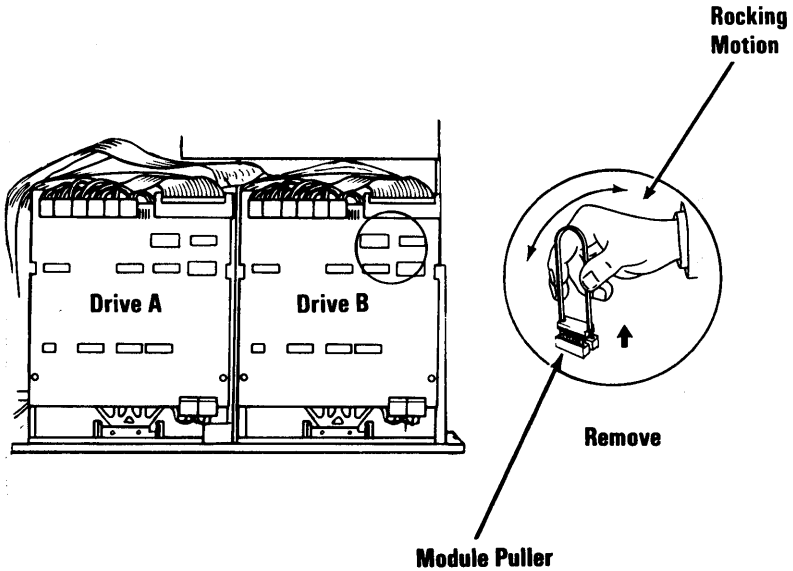
16. Turn the screw until the speed shown on the screen is within the required specifications.



17. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
18. Set all external Power switches to off (printer, Display, and others).
19. Unplug the power cords of the system unit (and expansion unit) from the outlet.
20. Disconnect all cables from the rear of the system unit.
21. Install the cover of the system unit (5-100-3).
22. Connect all cables.

# Terminating Resistor (T-RES) Removal

1. Locate the terminating resistor on the circuit board of the diskette drive. The terminating resistor is identified by a white adhesive label with T-RES in black letters.
2. Pull the terminating resistor from its connector on the circuit board.



# Notes:

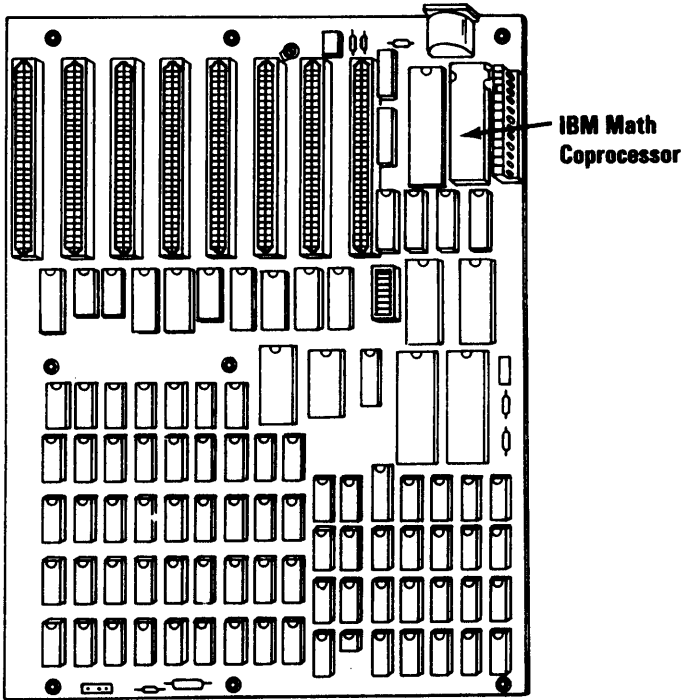
# **Math Coprocessor 700**

# Math Coprocessor Removal

## Warning:

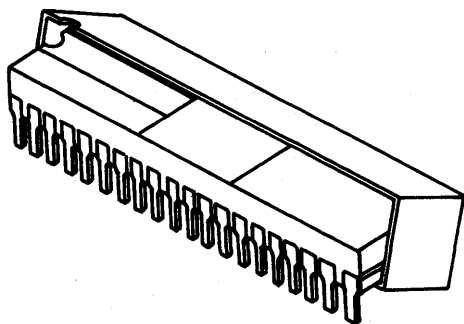
- The pins on the coprocessor are easily bent. Be careful not to bend them when removing the coprocessor.
  - The coprocessor is sensitive to static. Maintain personal grounding by keeping one hand on the system unit frame while removing the coprocessor.
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
  2. Set the Power switches on all attached devices to Off.
  3. Unplug the power cord of the system unit (and expansion unit) from the outlet.
  4. Disconnect all cables from the rear of the system unit.
  5. Remove the cover of the system unit (5-100-2).

6. Remove any option adapters installed in slot 7 or 8 (5-20-3).
7. Disconnect the power supply connectors from the system board and move them out of the way.
8. Look at the figure below and find the Math Coprocessor on the system board.



9. Using a module puller, carefully remove the coprocessor.

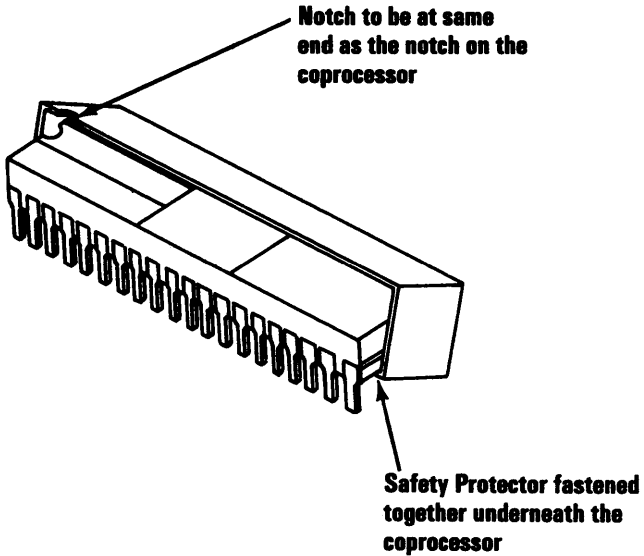
10. Remove the safety protector.



# Math Coprocessor Replacement

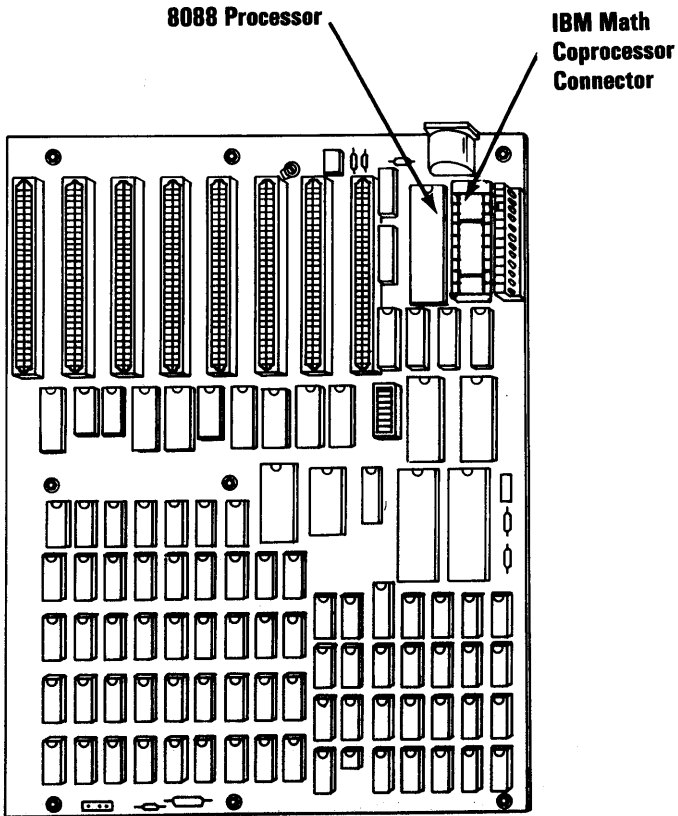
## Warning:

- The pins on the coprocessor are easily bent. Be careful not to bend them when replacing the coprocessor.
  - The coprocessor is sensitive to static. Maintain personal grounding, by keeping one hand on the system unit frame, while installing the coprocessor.
1. Install the safety protector (5-100-18). Make sure the notches in the safety protector are on the same end as the notch in the coprocessor. The safety protector overlaps on the bottom or pin side of the coprocessor.

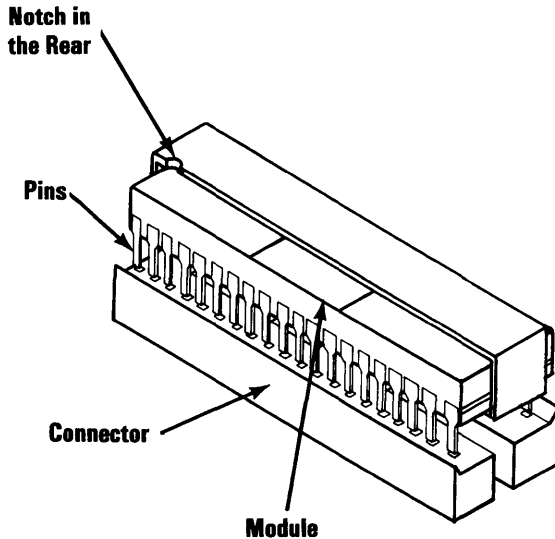




2. Refer to the figure below and find the Math Coprocessor connector on the system board.



3. Carefully align the pins on the coprocessor with the connector and firmly press the coprocessor in place. Be sure the notch on the end of the coprocessor faces the rear of the system board.
4. Ensure that Switch 2 on the system board is in the Off position.



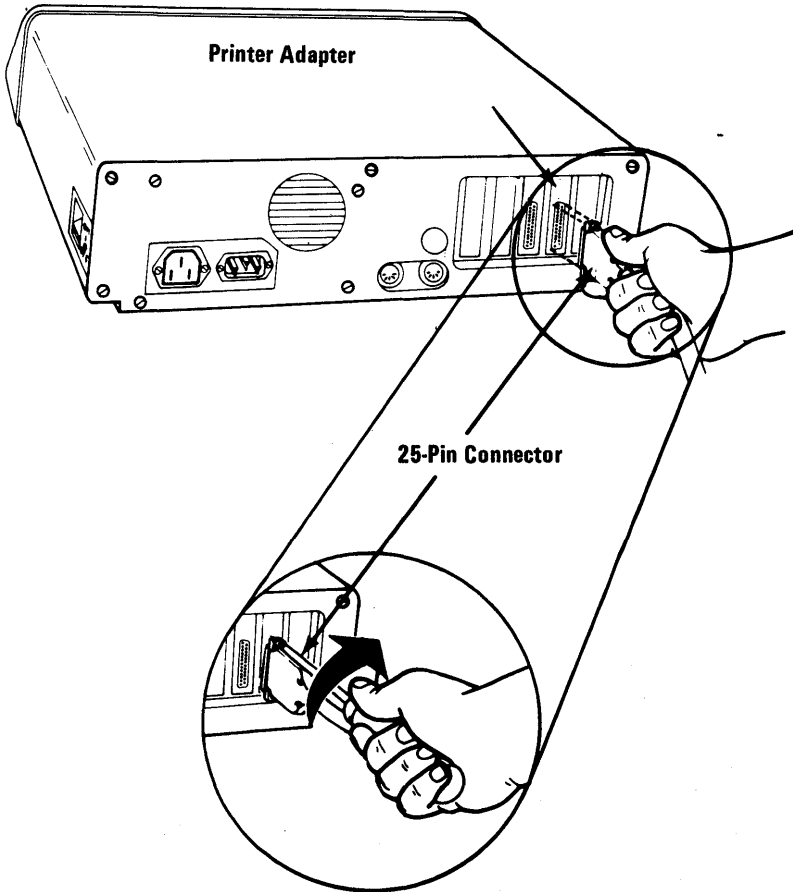
5. Reconnect the power supply connectors.
6. Install any option adapters that you removed (5-20-5).
7. Install the cover of the system unit (5-100-3).
8. Connect all cables to the rear of the system unit.

## **Notes:**

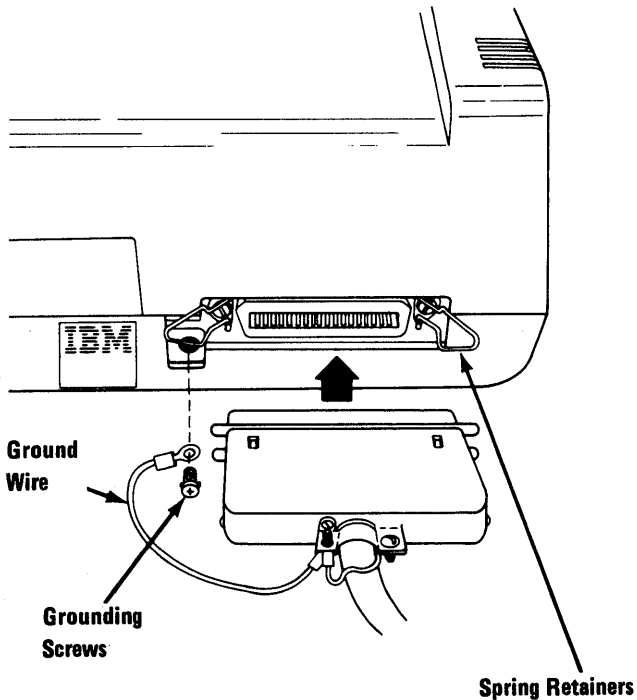
# **IBM 5152 Graphics Printer 1400**

# Graphics Printer Removal

1. Set all the On/Off (I/O) switches for your work station components to Off (O).
2. Unplug printer power cord from the power outlet.
3. Disconnect the printer cable from the system unit as shown below.



4. Loosen the grounding screw using a medium size Phillips screwdriver.
5. Push the printer cable spring retainers to either side and remove the cable from the printer.



6. Tape the printer cable to protect the connectors.
7. Place a piece of paper in the printer carriage to protect the print head during shipping.

# Graphics Printer Replacement

If this is a new printer, use the installation instructions that came with the printer **instead of these instructions.**

1. Connect the printer signal cable to the printer adapter on the system unit (or expansion unit).
2. Connect the printer cable to the back of the printer.
3. Use a medium sized Phillips screwdriver and connect the ground strap to the printer chassis.
4. Plug the printer power cord into the wall outlet.

# Fixed Disk 1700

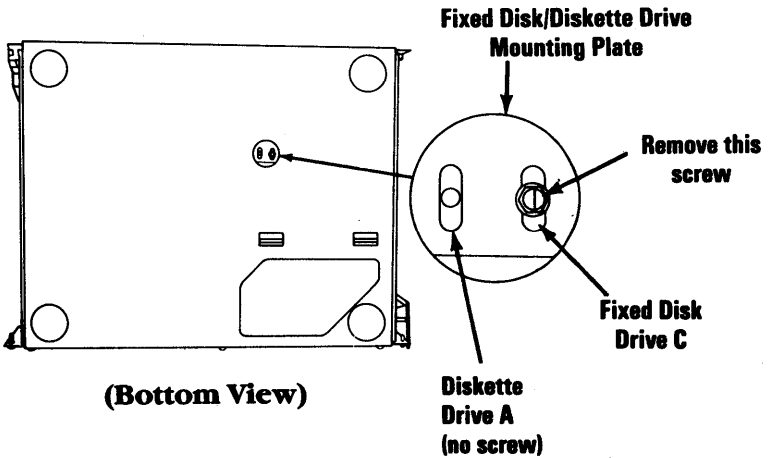


# Drive C Removal

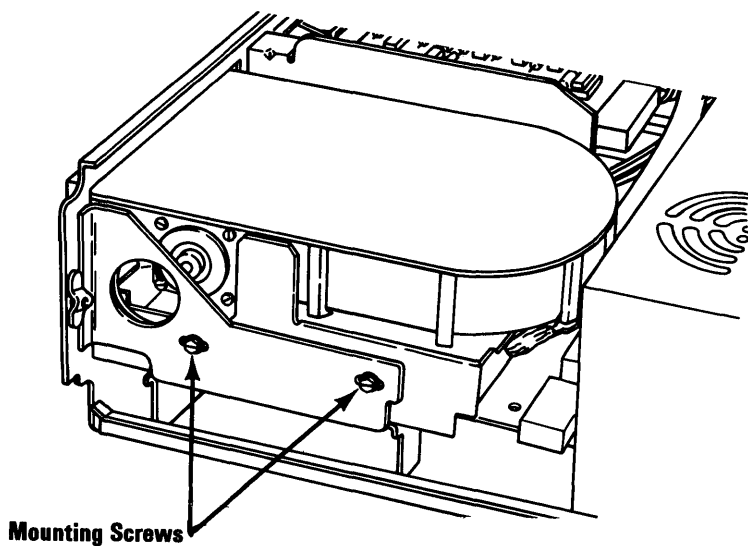
**Warning:** Normal shipping and handling can result in permanent loss of all data and formatting of the fixed disk drive. We recommend that you copy all files onto diskettes.

**Note:** Before removing the fixed disk drive, load the Diagnostic diskette and select "Prepare System for Relocation".

1. Set the system unit (and expansion unit) Power switch to Off, then unplug the expansion unit power cord and remove all cables from the rear of the unit.
2. Move the keyboard, display, and all external options away from the work surface.
3. Remove the cover of the system unit or expansion unit (5-100-1).
4. Tilt the unit up and remove the mounting plate screw for drive C.

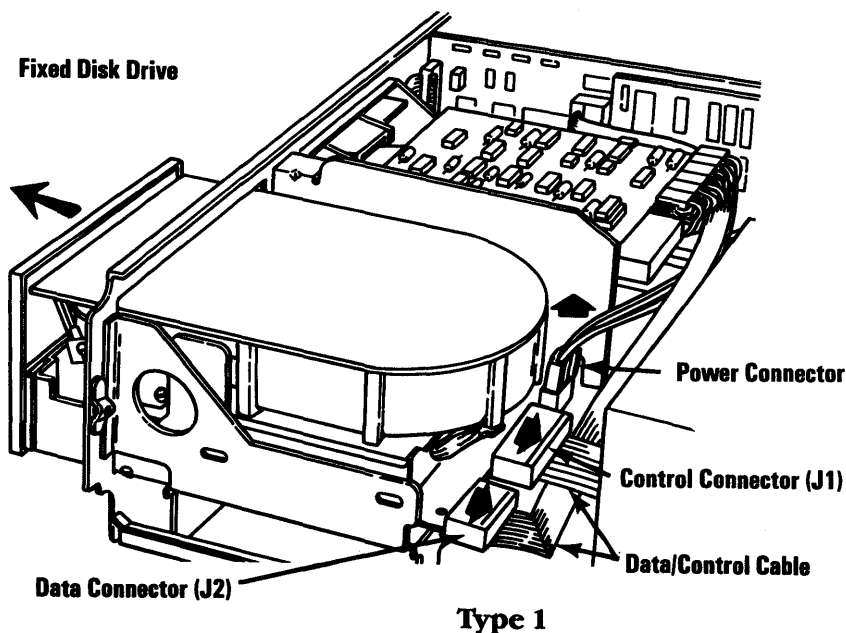


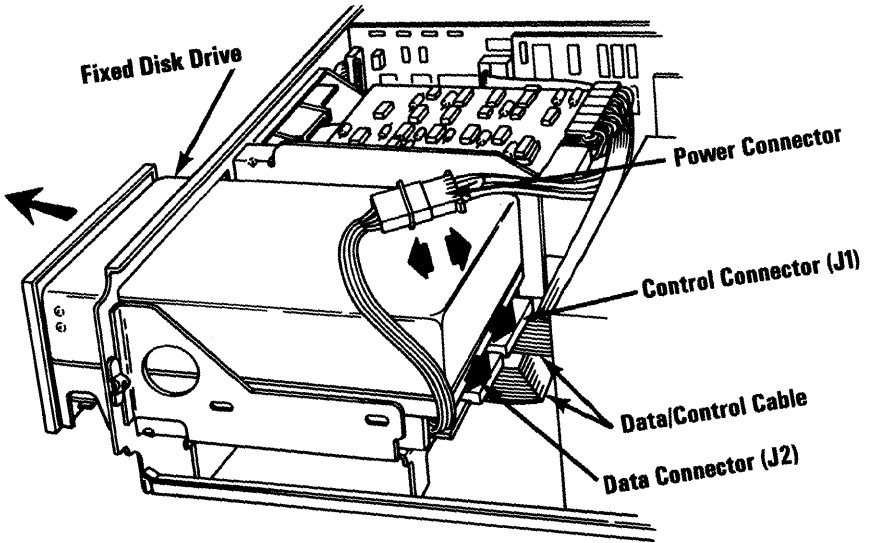
5. Remove the mounting screws on the left side of drive C.



*Note:* Shown below are examples of the fixed disk drive and connectors. These may not be the same as those in your system; however, certain items are the same.

- J1, the control connector, has 34 pins.
  - J2, the data connector, has 22 pins.
  - The Power connector has 4 pins and:
    - May be mounted on the logic board or,
    - May be on a pigtail.
6. Slide the drive out approximately 50 mm (about 2 in.) and disconnect the control connector (J1), data connector (J2), and the power connector.
  7. Remove the disk drive from the unit.





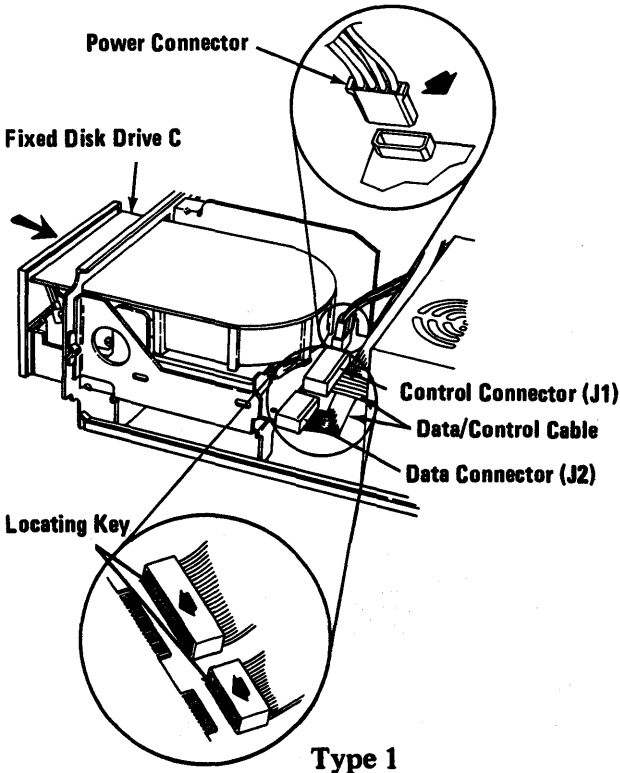
Type 2

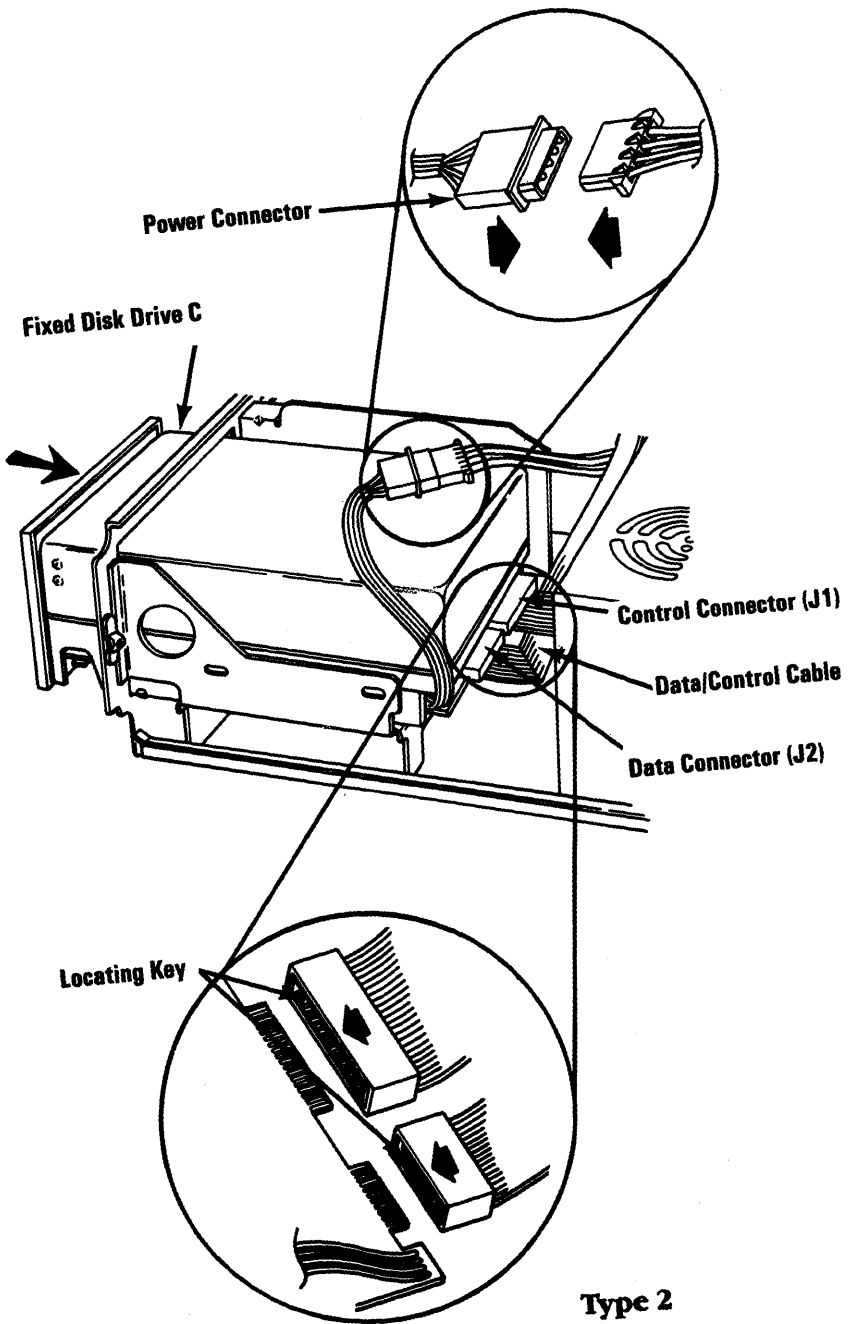
# Drive C Replacement

1. Slide the disk drive into slot C as shown.

*Note:* On the following pages are examples of the fixed disk drive and connectors. These may not be the same as those in your system; however, certain items are the same:

- J1, the control connector, has 34 pins.
  - J2, the data connector, has 22 pins.
  - The Power connector has 4 pins and:
    - May be mounted on the logic board or,
    - May be on a pigtail.
2. With the front of the drive extending out of the front panel approximately 50 mm (about 2 in.), connect the power connector, control connector (J1), and data connector (J2).

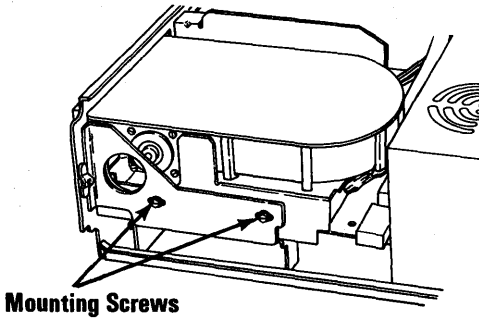




**Type 2**

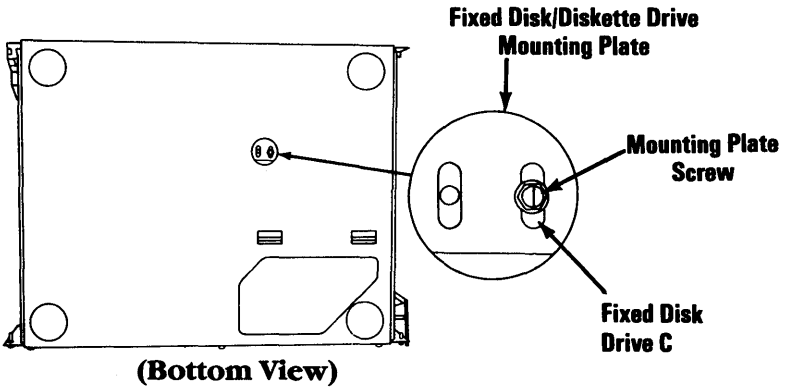
3. Slide the disk drive in until the clearance between the drive face plate and the front mounting panel is 1.0 mm (0.040 in.).
4. Install the two mounting screws.

**Warning:** Be sure to use the same two mounting screws (long screws) that you removed from the side of the drive, or damage to the drive will result.



5. Tilt the unit up and install the mounting plate screw for the fixed disk drive, as shown below.

**Warning:** Be sure to use the same screw (short screw) that you removed from the mounting plate, or damage will result.



6. Install all option adapters (5-20-5).
7. Install the cover of the expansion unit (5-100-3).
8. Connect all cables.
9. If this is a new fixed disk drive, refer to 3-1700 and format the drive.

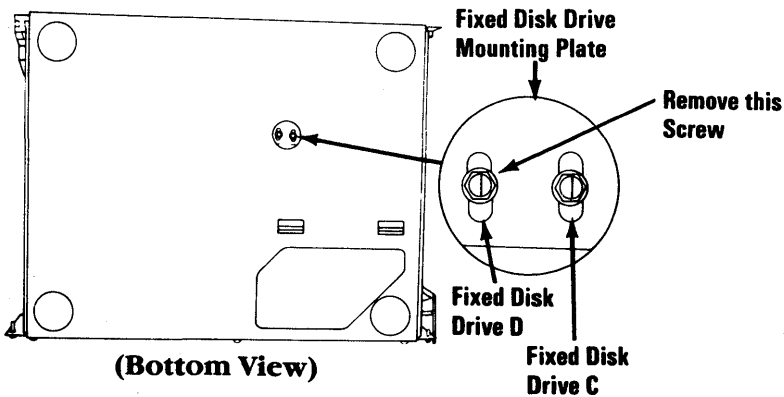


# Drive D Removal

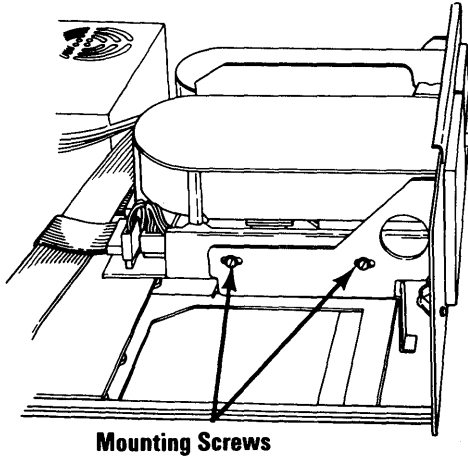
**Warning:** Normal shipping and handling can result in permanent loss of all data and formatting of the fixed disk drive. We recommend that you copy all files onto diskettes.

**Note:** Before removing the fixed disk drive, load the Diagnostic diskette and select 3 "Prepare System for Relocation".

1. Set the expansion unit Power switch to Off, then unplug the expansion unit power cord and remove all cables from the rear of the unit.
2. Move all external options away from the work surface.
3. Remove the cover of the expansion unit (5-100-2).
4. Tilt the unit up and remove the mounting plate screw for drive D.



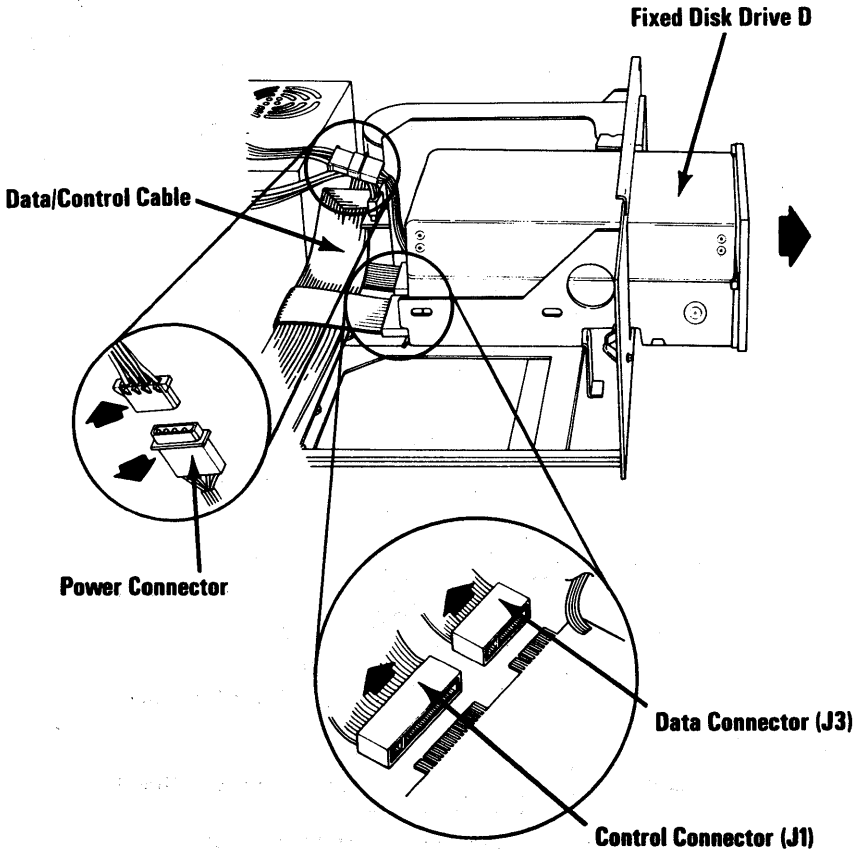
5. Remove all option adapters (5-20-3).
6. Remove the mounting screws on the left side of drive D.



*Note:* Shown below are examples of the fixed disk drive and connectors. These may not be the same as those in your system; however, certain items are the same.

- J1, the control connector, has 34 pins.
- J3, the data connector, has 22 pins.
- The Power connector has 4 pins and:
  - May be mounted on the logic board or,
  - May be on a pigtail.

7. Slide the drive out approximately 50 mm (about 2 in.) and disconnect the control connector (J1), data connector (J3), and the power connector.
8. Remove the disk drive from the unit.



**Type 2**

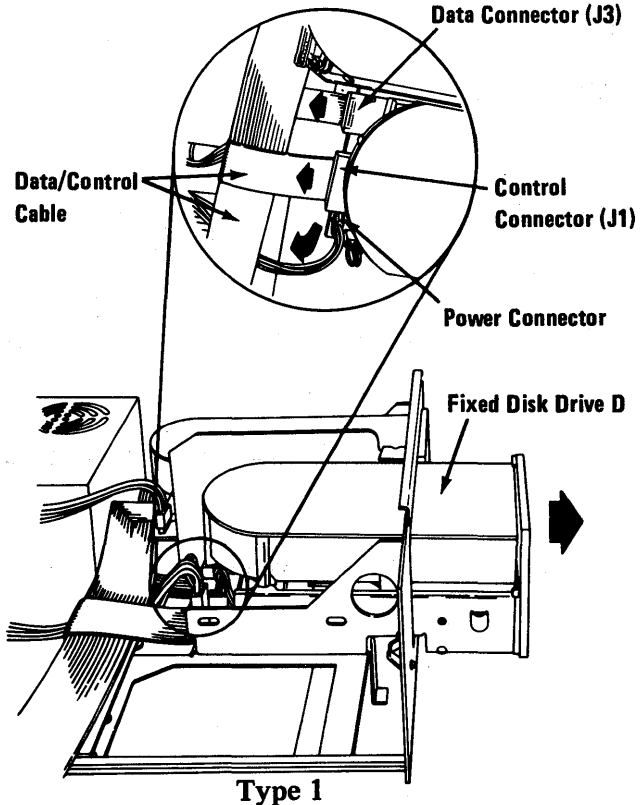
# Drive D Replacement

1. Slide the disk drive into slot D as shown.

*Note:* Shown below are examples of the fixed disk drive and connectors. These may not be the same as those in your system; however, certain items are the same.

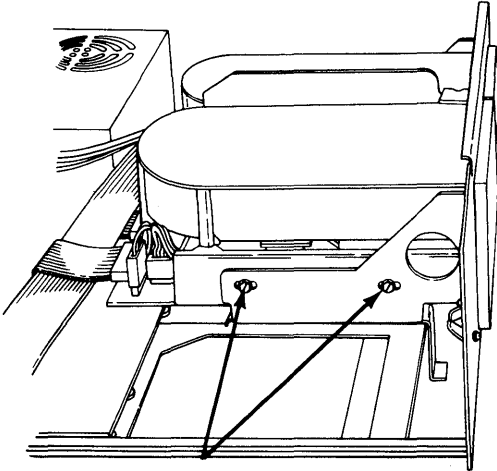
- J1, the control connector, has 34 pins.
- J3, the data connector, has 22 pins.
- The Power connector has 4 pins and:
  - May be mounted on the logic board or,
  - May be on a pigtail.

2. With the front of the drive extending from the front panel approximately 50 mm (about 2 in.), connect the power connector, control connector (J1), and data connector (J3).



3. Slide the disk drive in until the clearance between the drive face plate and the front mounting panel is 1.0 mm (0.040 in.).
4. Install the two mounting screws.

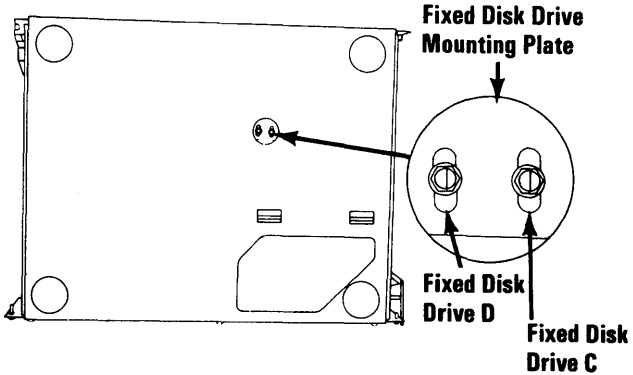
**Warning:** Be sure to use the same two mounting screws (long screws) that you removed from the side of the drive, or damage to the drive will result.



**Mounting Screws**

5. Tilt the unit up and install the mounting plate screw of the fixed disk drive, as shown below.

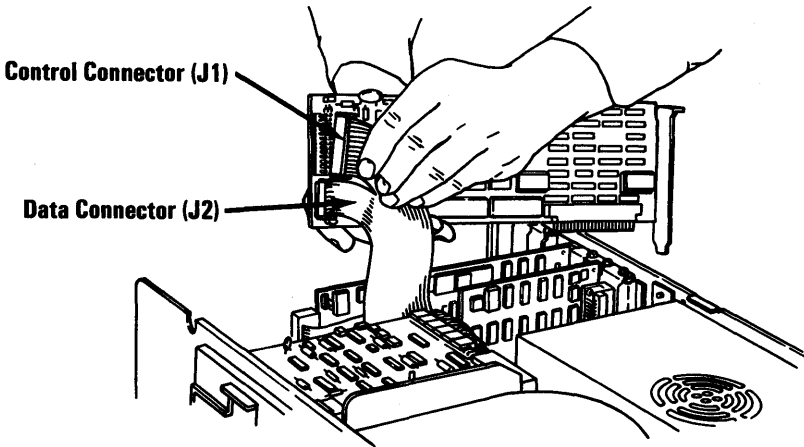
**Warning:** Be sure to use the same screw (short screw) that you removed from the mounting plate, or damage will result.



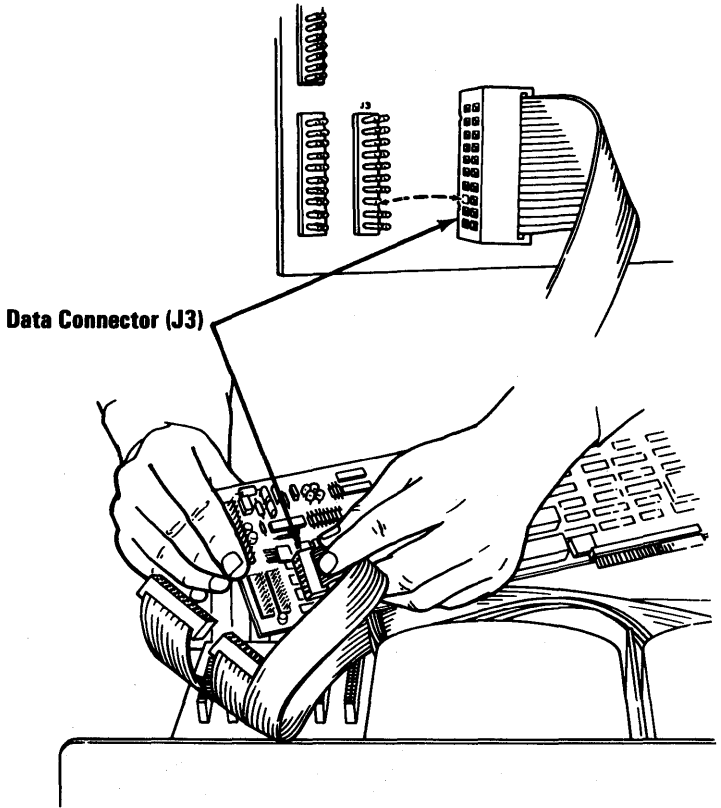
6. Install all option adapters (5-20-5).
7. Install the cover of the expansion unit (5-100-3).
8. Connect all cables.
9. If this is a new fixed disk drive, go to 3-1700 and format the drive.

# Fixed Disk Drive Adapter Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the power cords of the system unit (and expansion unit) from the outlet and disconnect all cables from the rear of the units.
3. Remove the cover of the system unit (or expansion unit) (5-100-2).
4. Remove the Fixed Disk Adapter mounting screw (5-20-3).
5. Grasp the adapter by the top corners and lift straight up.
6. Remove the data connector (J2) and the control connector (J1).



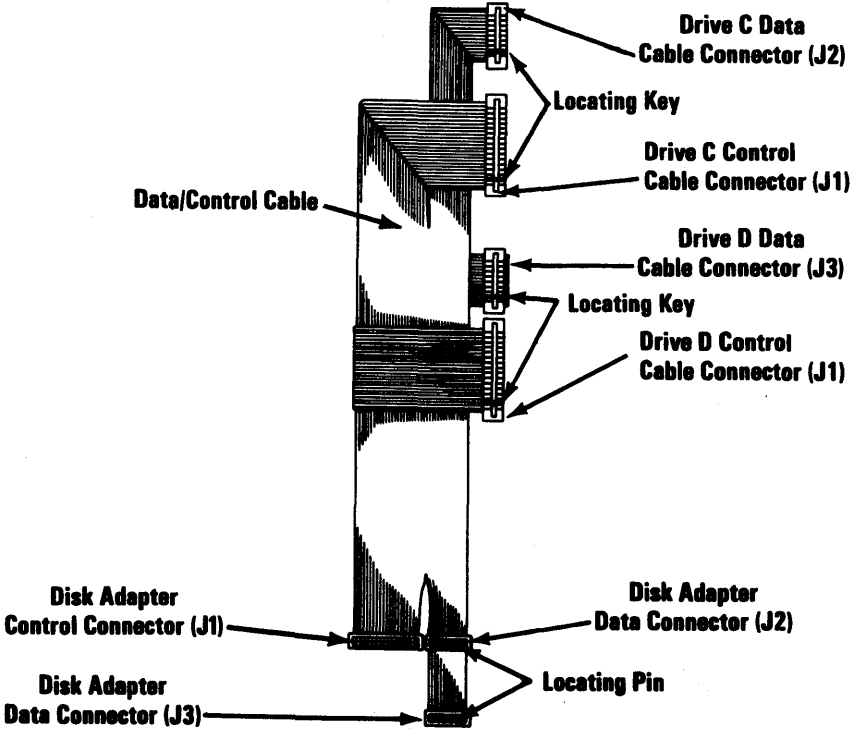
7. If two fixed disk drives are installed, remove data connector J3.



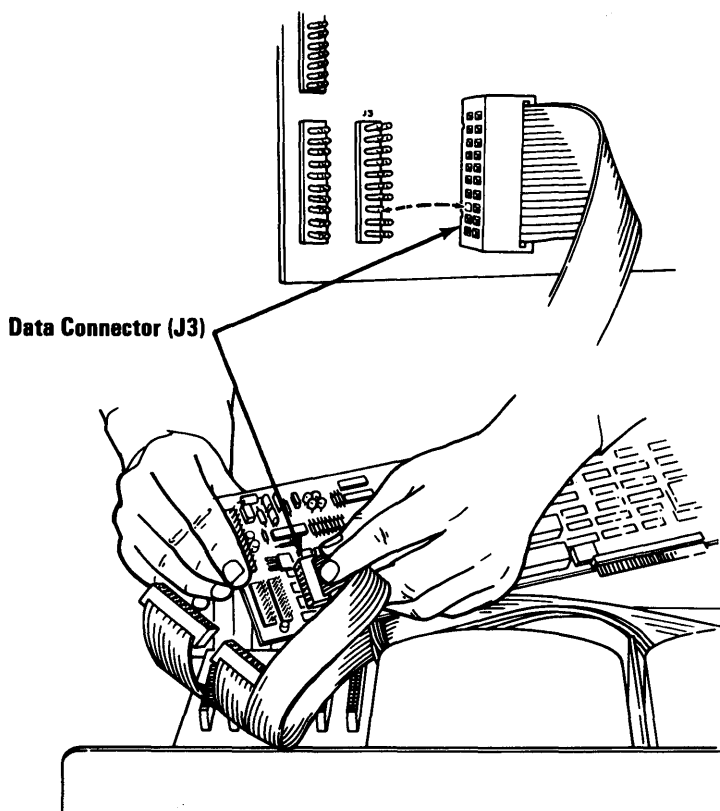


# Fixed Disk Drive Adapter Replacement

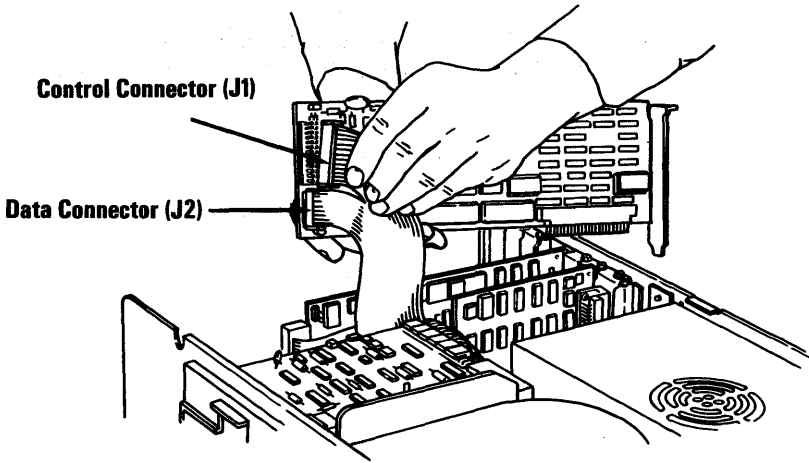
1. Look at the figure below and become familiar with the data/control cable before starting the replacement.



2. If two fixed disk drives are installed, connect data connector J3.



3. Connect the control connector (J1) and data connector (J2).



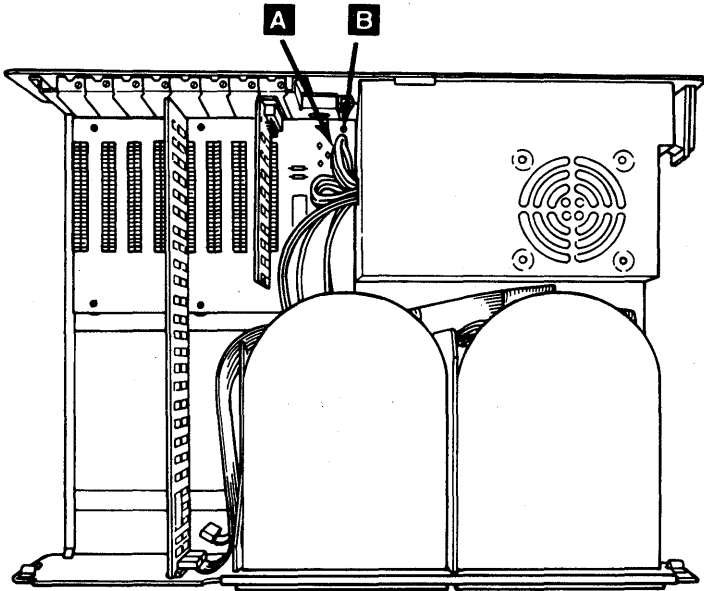
4. Insert the Fixed Disk Adapter into the option expansion slot. Press down firmly on the adapter to seat the connector.
5. Install the adapter mounting screw.
6. Install the cover of the system unit (or expansion unit) (5-100-3).

# Expansion Unit 1800

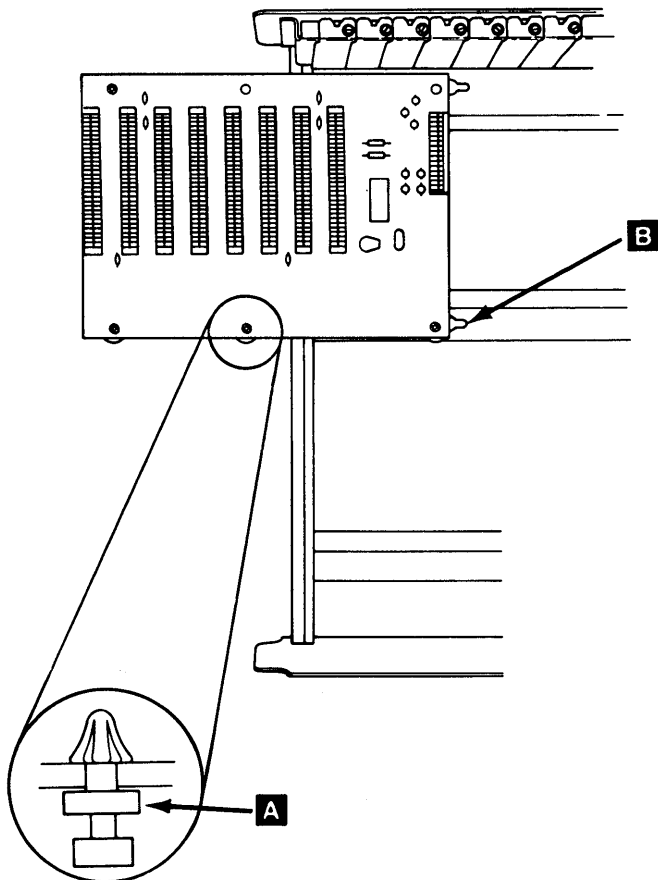
*Note:* For information on removing the expansion unit power supply, see page 5-100-4.

# Expansion Board Removal

1. Set the system unit and expansion unit Power switches to Off, unplug the expansion unit power cord, and disconnect all cables from the rear of the expansion unit.
2. Remove the cover of the expansion unit (5-100-2).
3. Remove all option adapters, including the receiver card (5-20-3).
4. Remove the expansion board power connectors  
**A** .
5. Remove the expansion board mounting screw  
**B** .



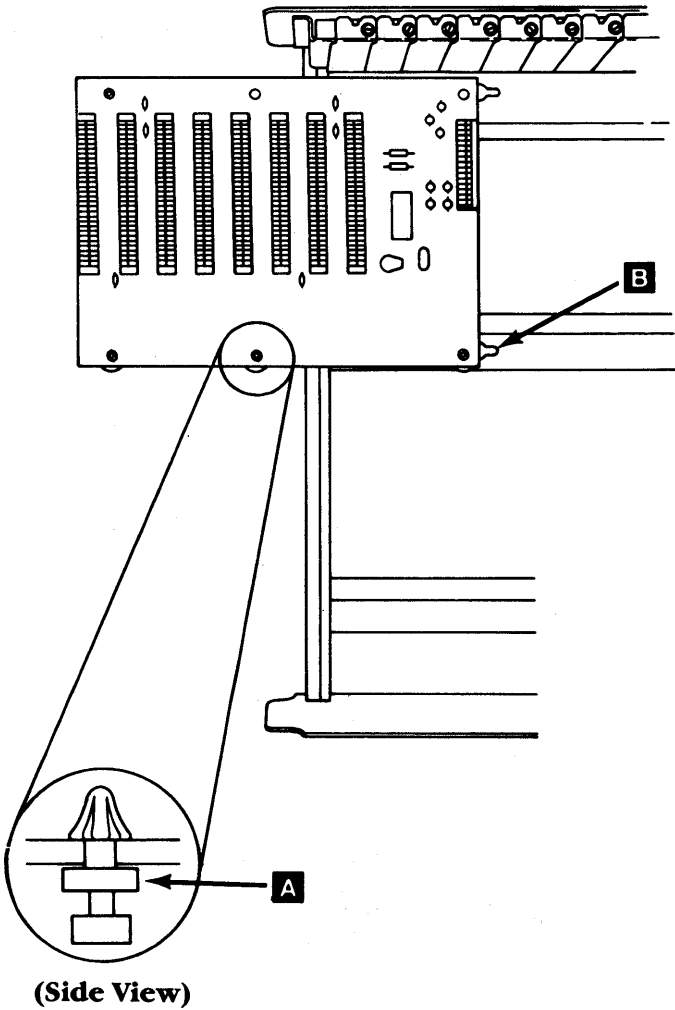
6. Slide the expansion board away from the power supply approximately 13 mm (about 0.5 in.) until the standoffs **C** can be lifted from the mounting slots **D**.
7. Lift the expansion board up and out of the system unit.



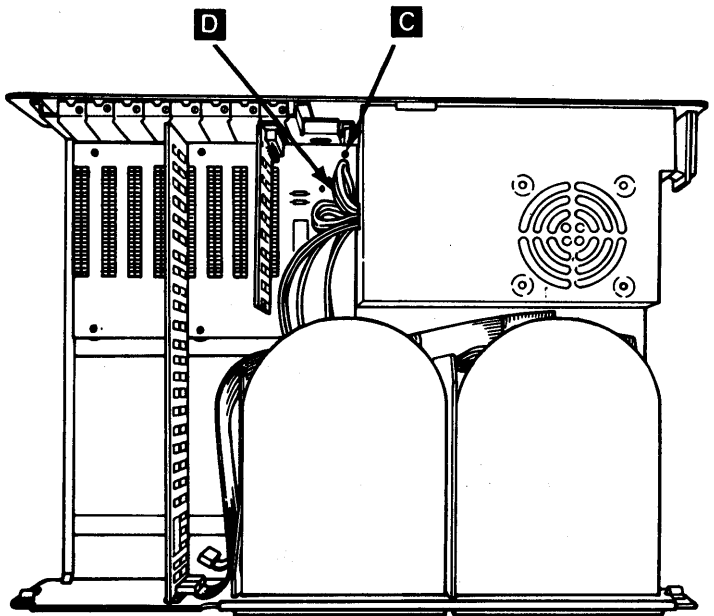
**(Side View)**

# Expansion Board Replacement

1. Insert the standoffs **C** on the expansion board into the mounting slots **D**.



2. Slide the expansion board toward the power supply and align the holes for the mounting screws.
3. Install the expansion board mounting screw **B**.
4. Install the expansion board power connectors **A**.
5. Install the option adapters, including the receiver card (5-20-5).
6. Install the cover of the expansion unit (5-100-3).



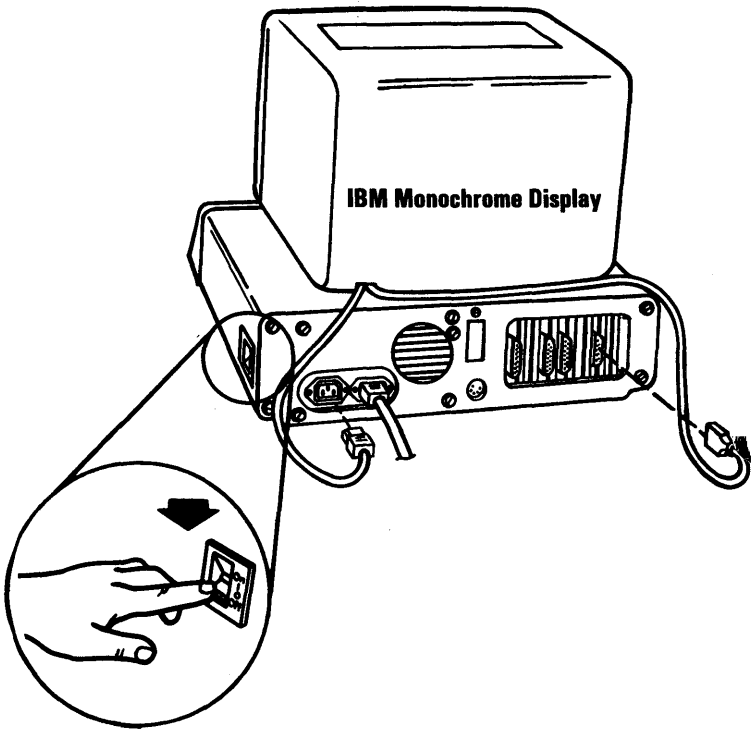


# Notes:

# Display 3200

# Monochrome Display Removal

1. Set the system unit Power switch to Off, and disconnect the display power cord from the rear of the system unit.
2. Disconnect the signal cable from the IBM Display Adapter.

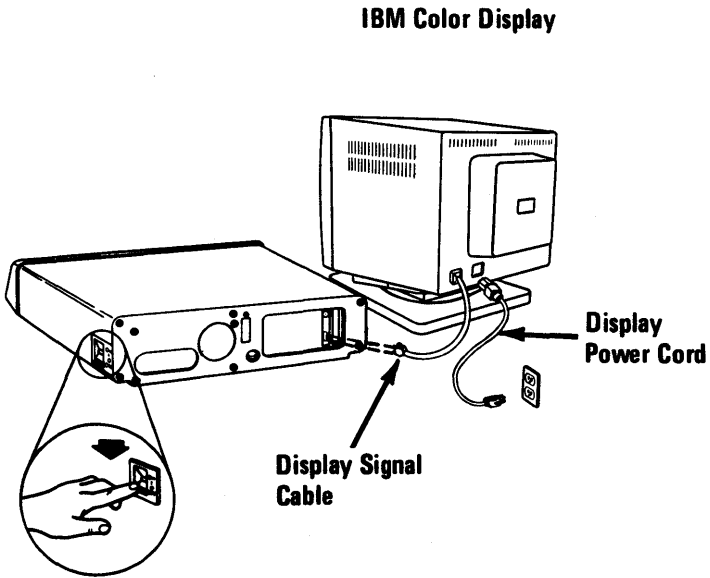


# Monochrome Display Replacement

1. Connect the signal cable from your display to the IBM Monochrome Display and Printer Adapter.
2. Connect the display power cord to the connector at the rear of the system unit.

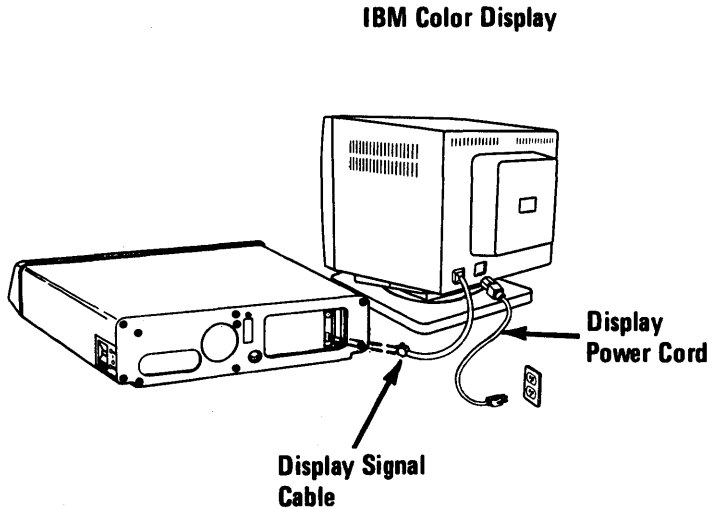
# IBM 5272 Color Display Removal

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Set the O/I switch on the display to Off (O).
3. Unplug the display power cord from the outlet.
4. Disconnect the display signal cable from the system unit.
5. Disconnect the power cord from the rear of the display.



# IBM 5272 Color Display Replacement

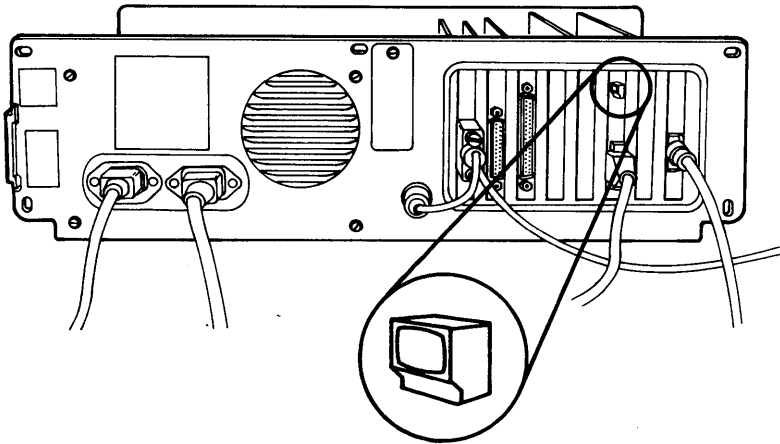
1. Connect the signal cable from the display to the Display Adapter.
2. Connect the power cord to the rear of the display.
3. Plug the power cord into the outlet.



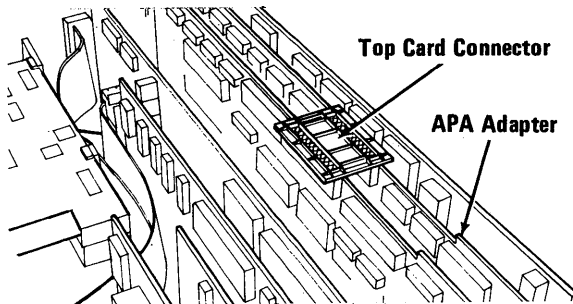
# Notes:

# All Points Addressable Adapter Removal

1. Set the On/Off switch on the system unit to Off.
2. Unplug the system unit's power cord from the wall outlet.
3. Remove the system unit cover (5-100-2).
4. Look at the back of the system unit and locate the display card. The display card retaining bracket is stamped for ease of identification (see below).

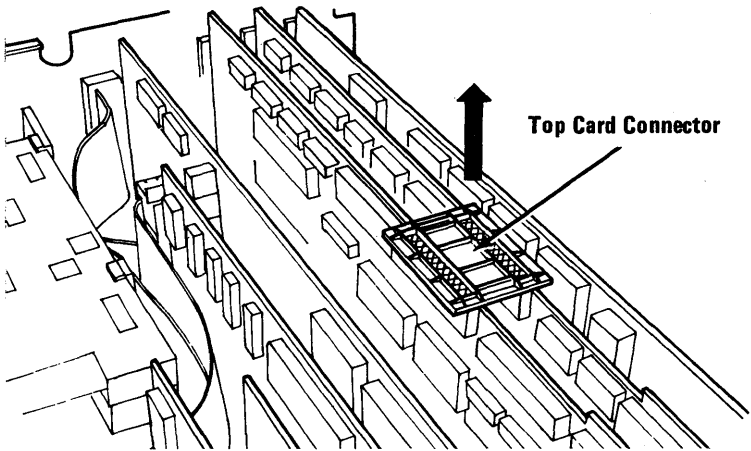


5. The all points addressable (APA) adapter should be the adapter card that is adjacent to the display adapter with one top card connector.

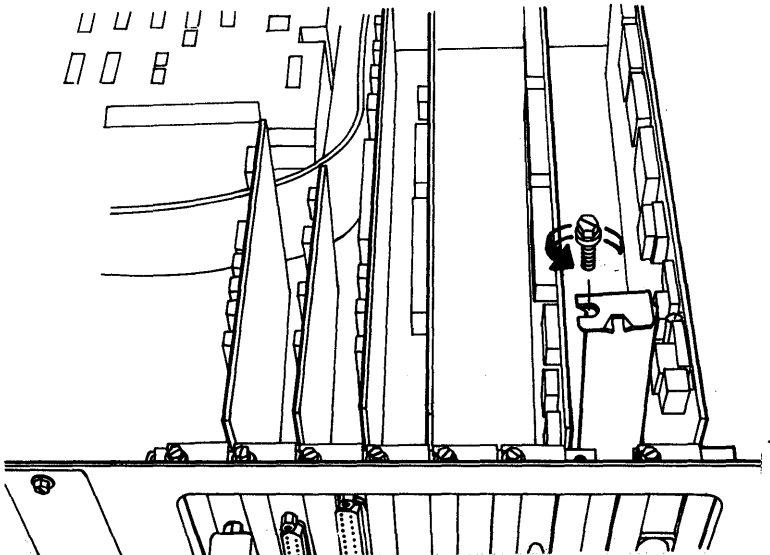




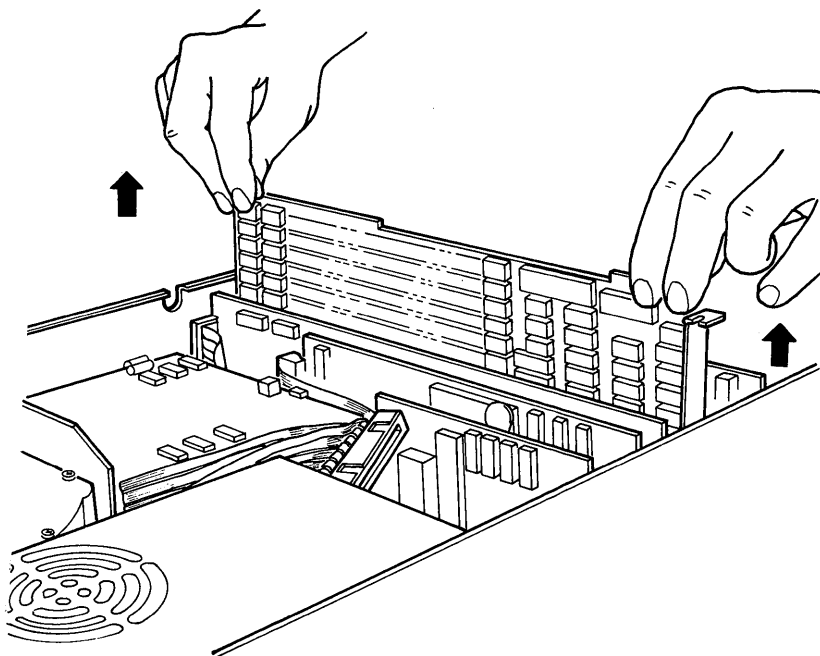
6. Remove the top card connector between the APA adapter and the display adapter by pulling upward.



7. Remove the retaining bracket mounting screw for the APA adapter.

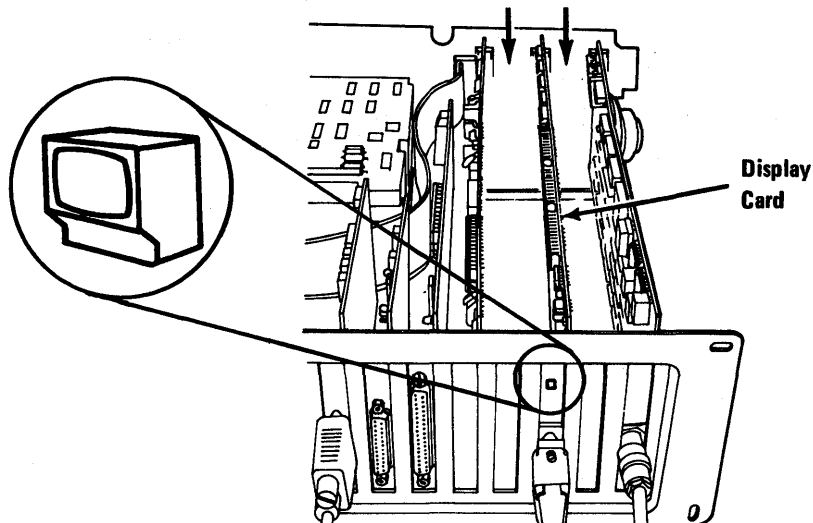


8. To remove the APA adapter card, grasp the adapter card by the top corners and lift upward.



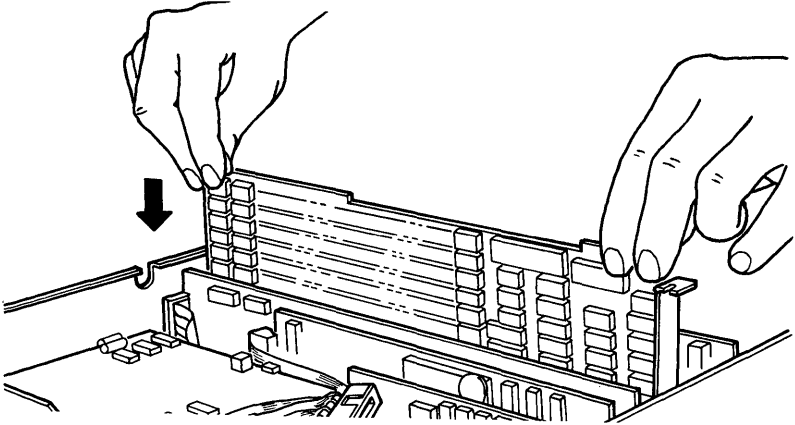
# All Points Addressable Adapter Replacement

1. The all points addressable (APA) adapter must be placed directly adjacent to the display adapter; the display adapter retaining bracket has been stamped for easy identification (see below).

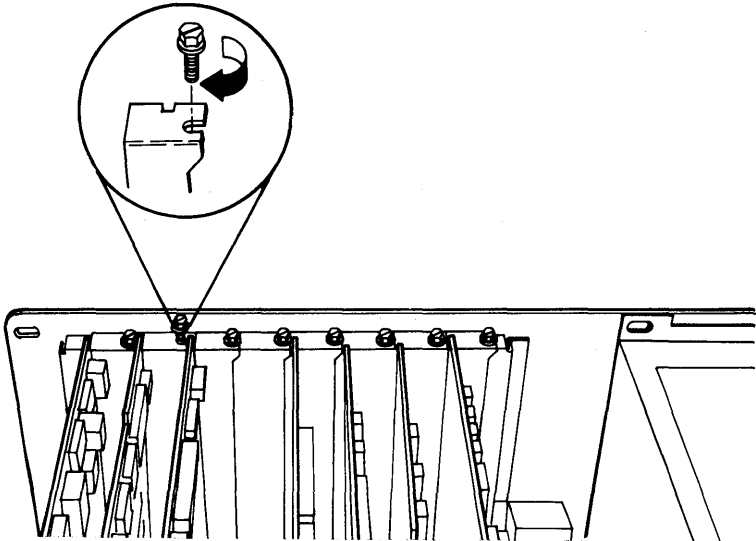


2. Position the display adapter so its front edge lines up with plastic card guide in the front of the system unit and the contacts on the bottom edge line up with the socket on the system board.

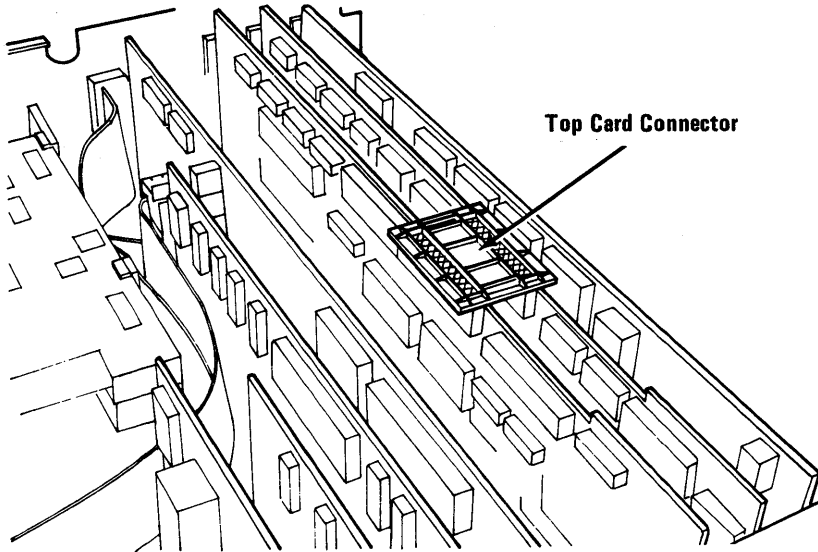
3. Hold the APA adapter by the top corners and press it into place.



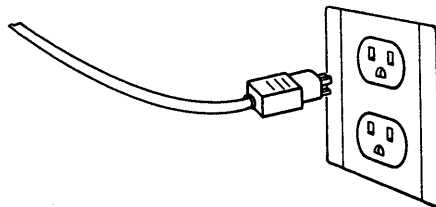
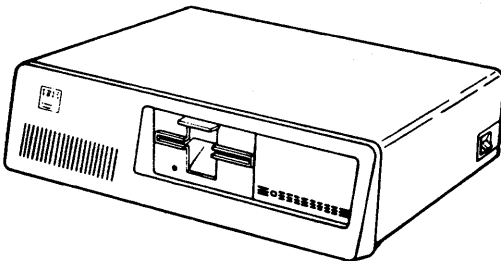
4. Install the retaining bracket mounting screw.



5. Install the top card connector; make sure the pins on the top card connector are aligned with the top edge APA and display adapter sockets then, carefully, press the connector into place.

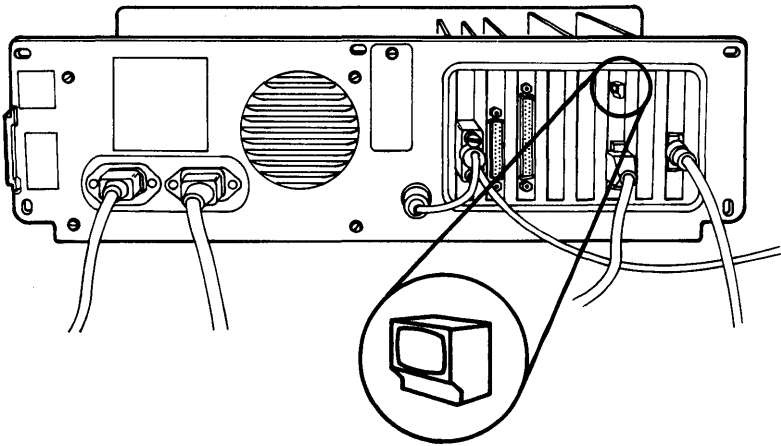


6. Put the system unit cover on (5-100-3).
7. Plug the system unit power cord into the power outlet.

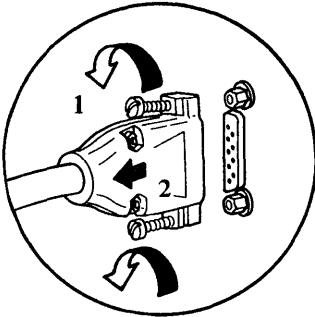


# Display Adapter Removal

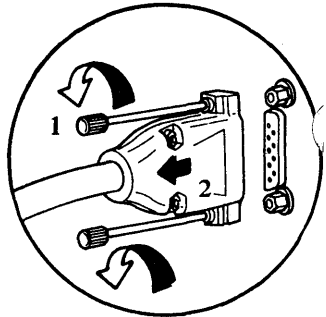
1. Set the On/Off switch on the system unit to Off.
2. Unplug the system unit's power cord from the wall outlet.
3. Remove the system unit cover (5-100-2).
4. Look at the back of the system unit and locate the display card. The display card retaining bracket is stamped for ease of identification (see below).



5. Remove the display signal cable from the back of the display adapter.

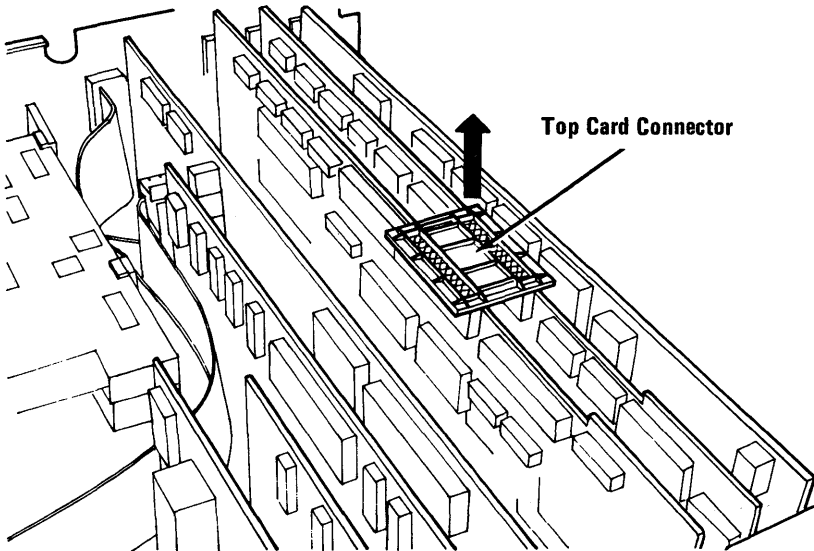


Monochrome

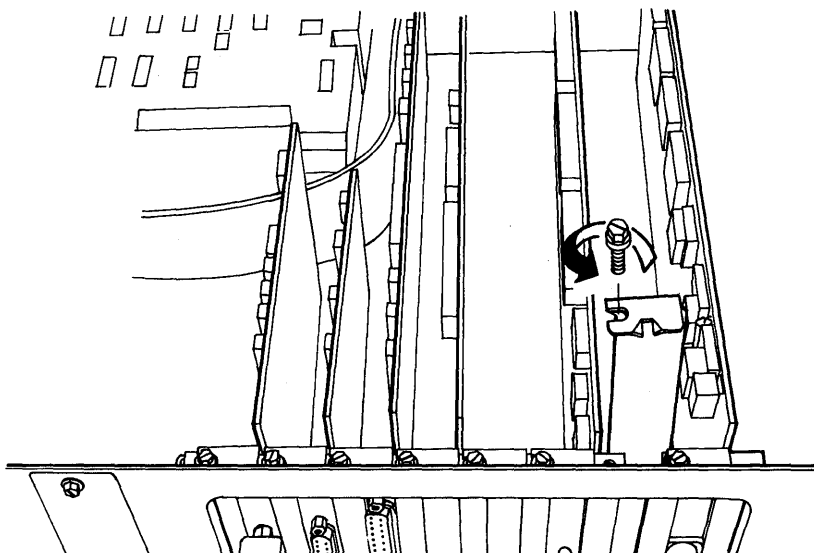


Color

6. If present, remove any top card connectors attached to the display adapter by pulling upward.

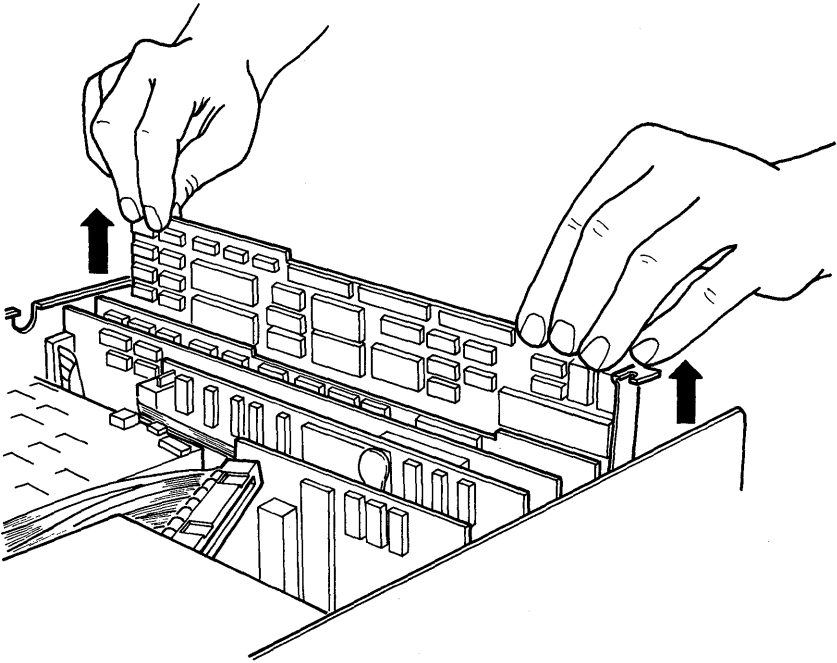


7. Remove the retaining bracket mounting screw for the display adapter.



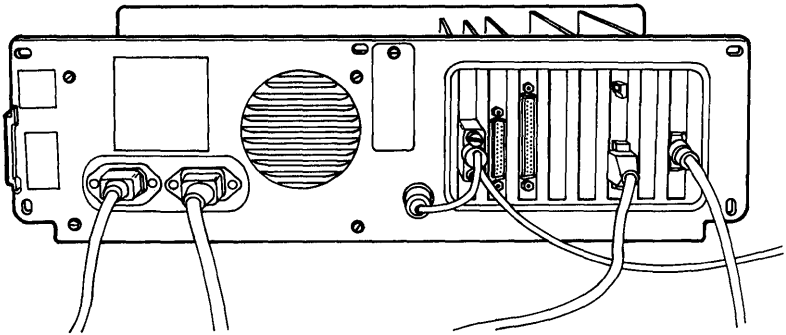


8. To remove the display adapter card, grasp the adapter card by the top corners and lift upward.

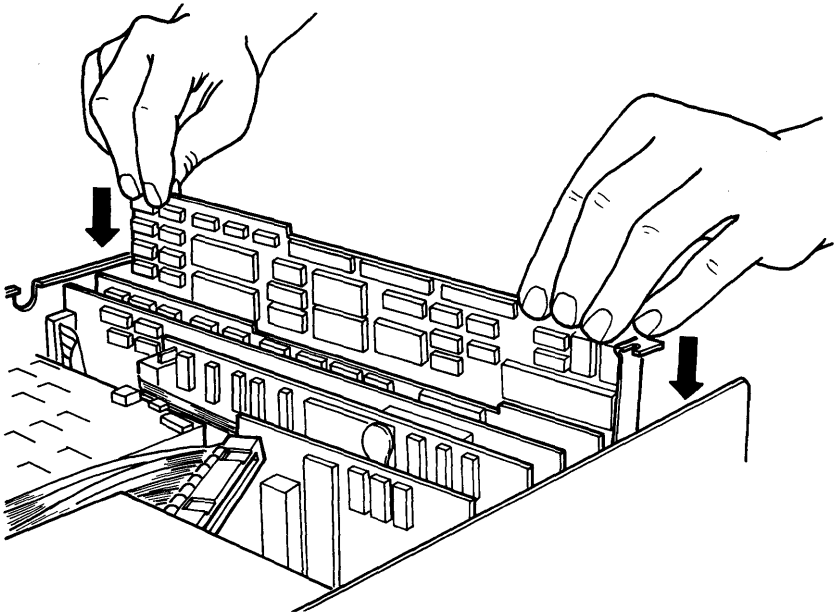


# Display Adapter Replacement

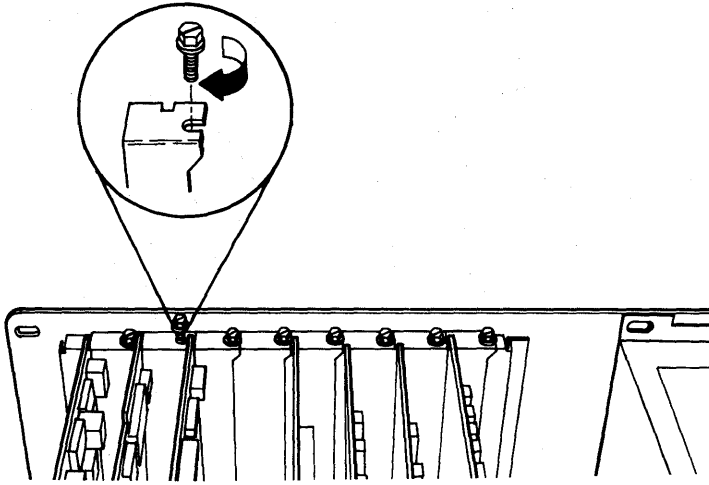
1. The display adapter should be installed in expansion slot number three.



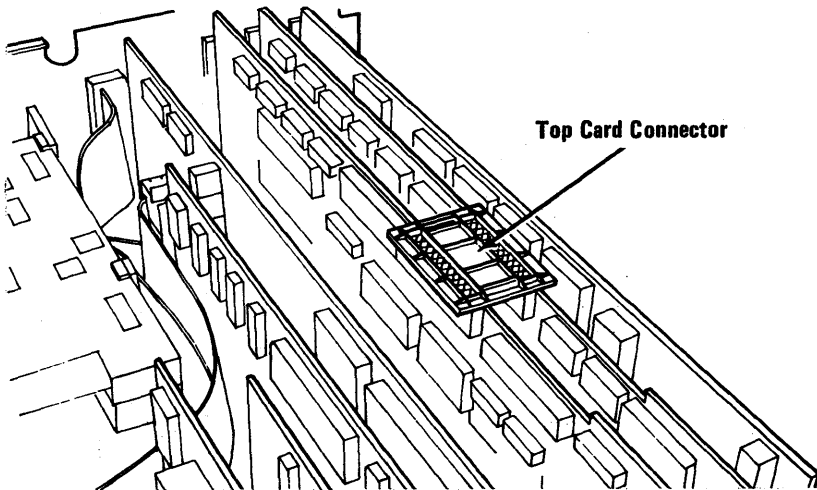
2. Position the display adapter so its front edge lines up with plastic card guide in the front of the system unit and the contacts on the bottom edge line up with the socket on the system board.
3. Hold the display adapter by the top corners and press it into place.



4. Install the retaining bracket mounting screw.

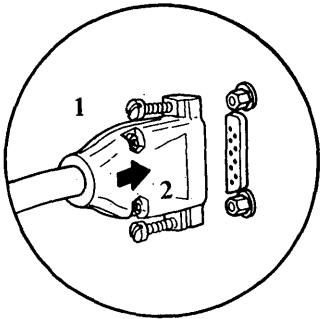


5. If you have the Programmed Symbols adapter or the All Points Addressable adapter reinstall the top card connector(s) between these adapters and the display card.

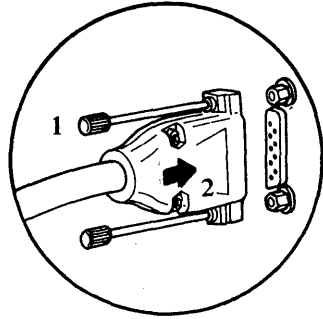


6. Put the system unit cover on (5-100-3).

7. Reconnect the display signal cable.

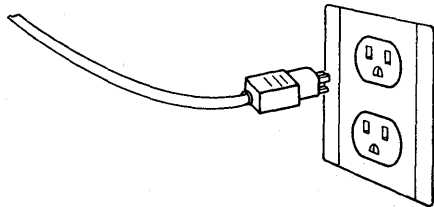
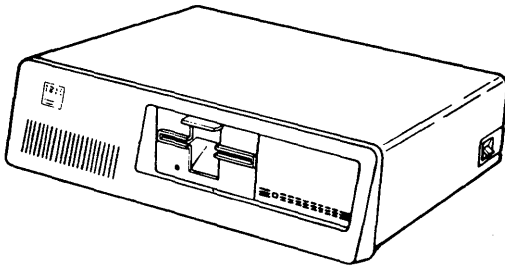


**Monochrome**



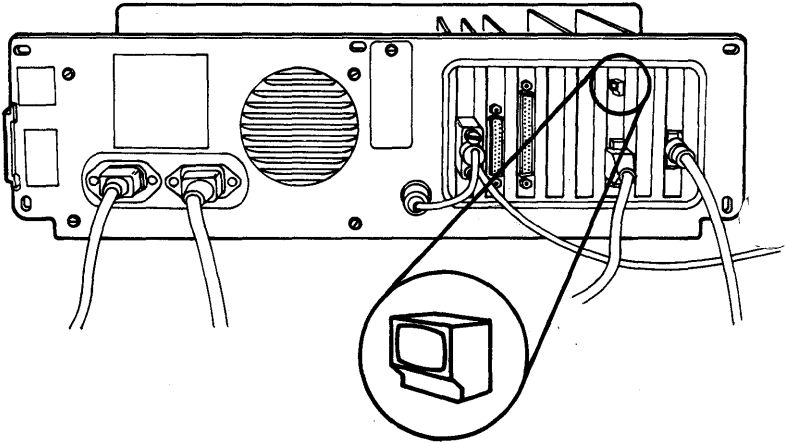
**Color**

8. Plug the system unit power cord into the power outlet.

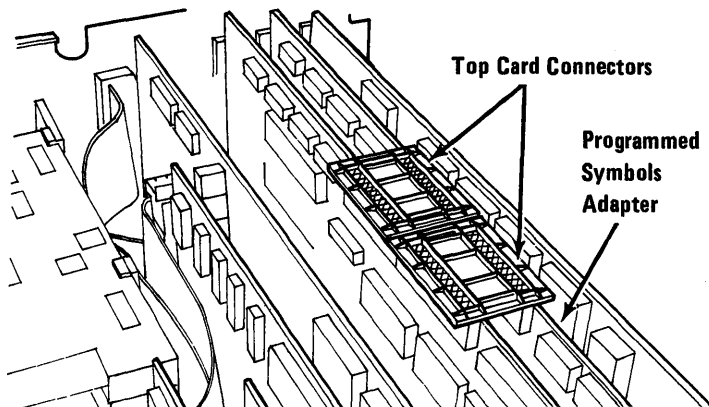


# Programmed Symbols Adapter Removal

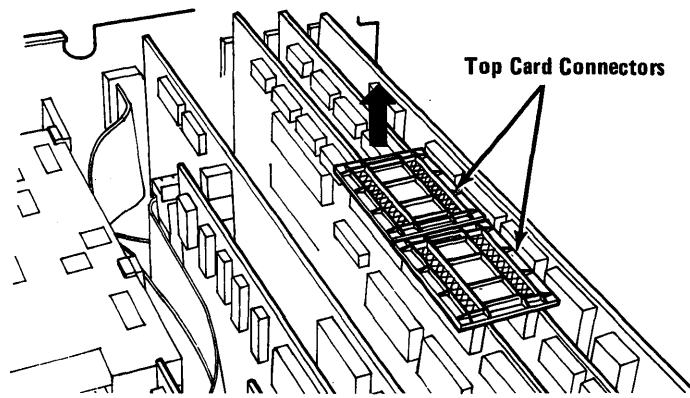
1. Set the On/Off switch on the system unit to Off.
2. Unplug the system unit's power cord from the wall outlet.
3. Remove the system unit cover (5-100-2).
4. Look at the back of the system unit and locate the display card. The display card retaining bracket is stamped for ease of identification (see below).



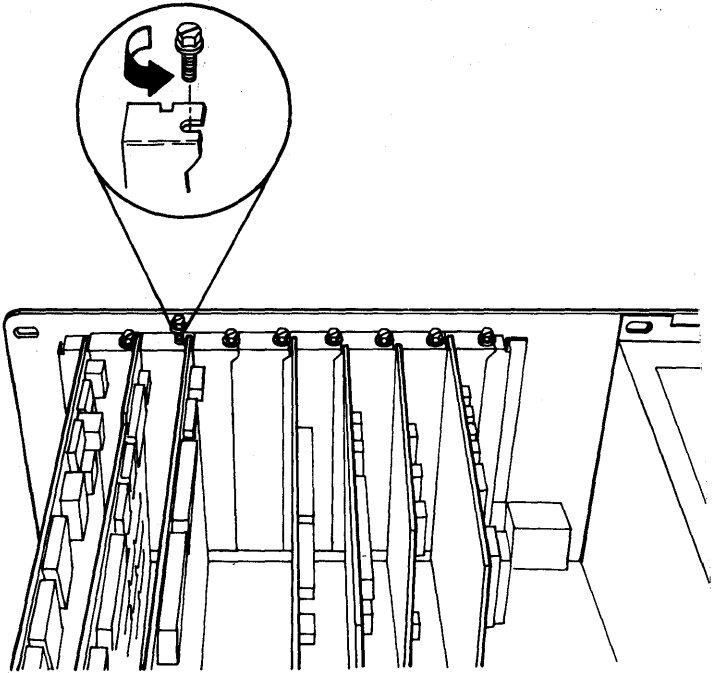
5. The Programmed Symbols (PS) adapter should be the adapter card that is adjacent to the display adapter with two top card connectors.



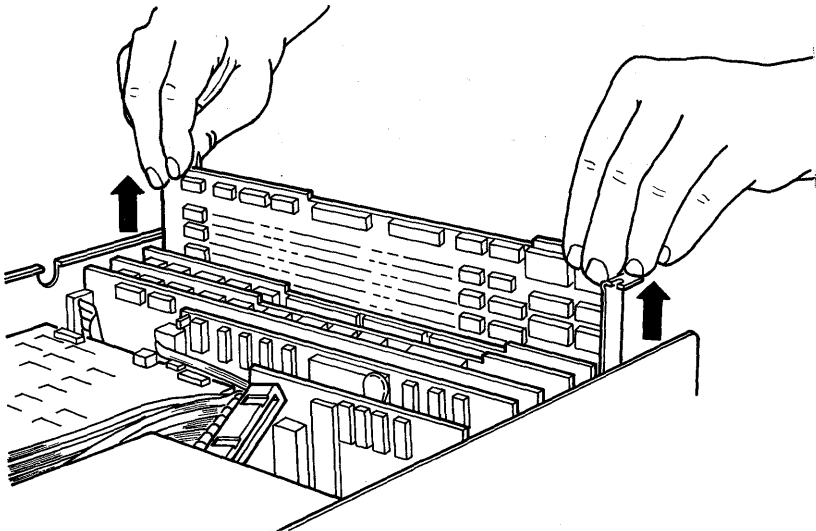
6. Remove the top card connector between the PS adapter and the display adapter by pulling upward.



7. Remove the retaining bracket mounting screw for the PS adapter.

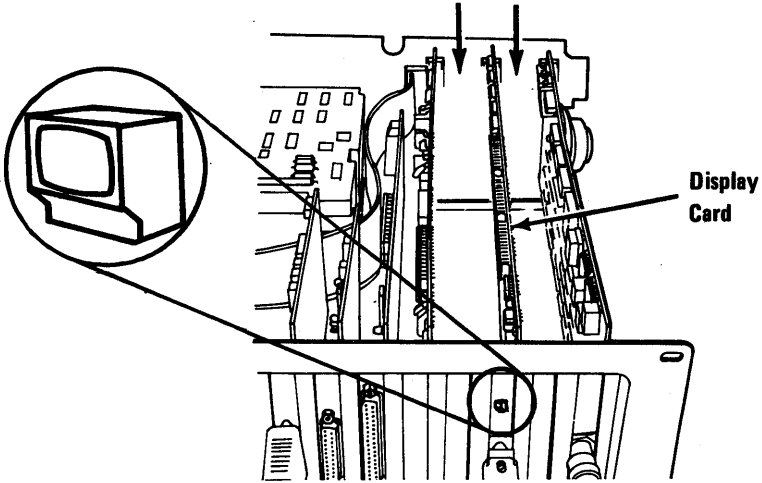


8. To remove the PS adapter card, grasp the adapter card by the top corners and lift upward.



# Programmed Symbols Adapter Replacement

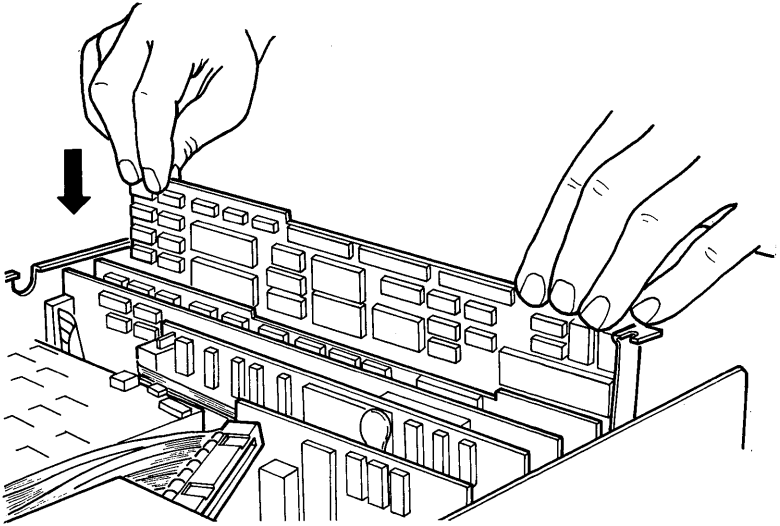
1. The programmed symbols (PS) adapter must be placed directly adjacent to the display adapter; the display adapter retaining bracket has been stamped for easy identification (see below).



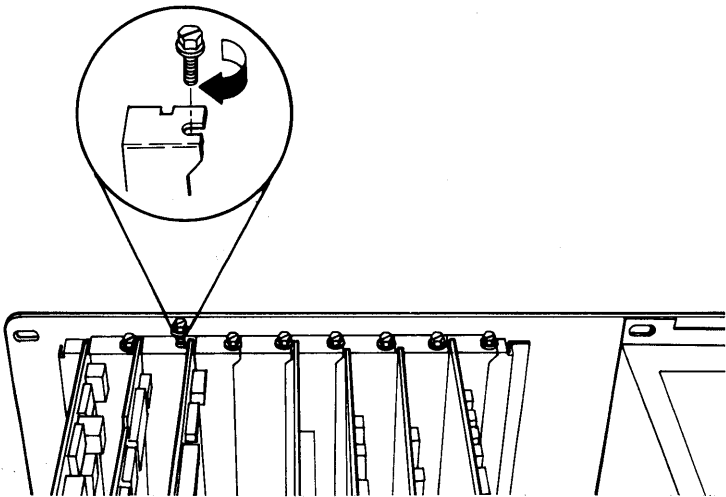
2. Position the PS adapter so its front edge lines up with plastic card guide in the front of the system unit and the contacts on the bottom edge line up with the socket on the system board.



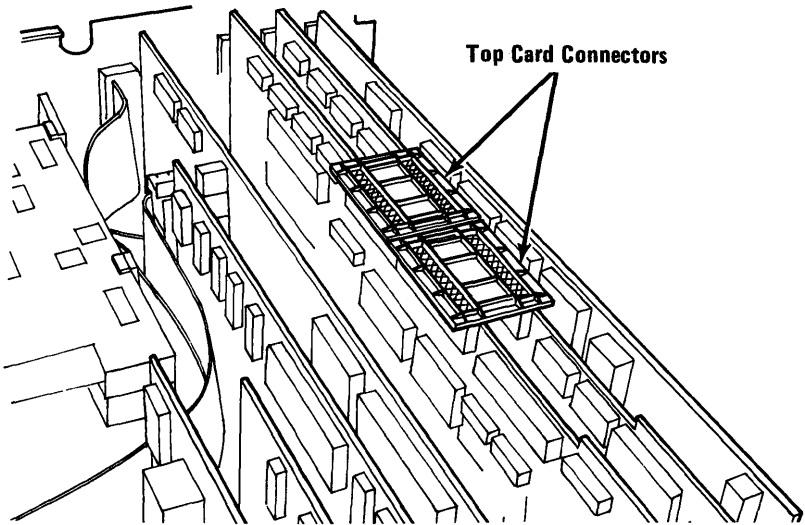
3. Hold the PS adapter by the top corners and press it into place.



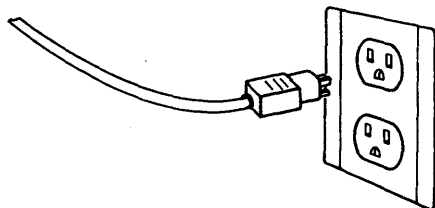
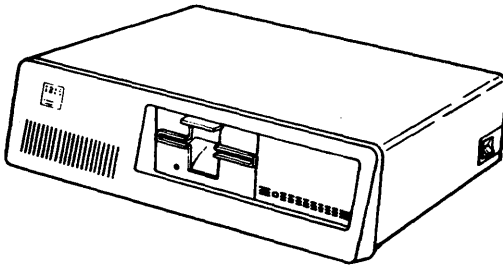
4. Install the retaining bracket mounting screw for the PS adapter.



5. Install the top card connector; make sure the pins on the top card connector are aligned with the top edge PS and display adapter sockets then carefully press the connector into place.



6. Put the system unit cover on (5-100-3).
7. Plug the system unit power cord into the power outlet.





# Section 6. Switch Settings

Introduction .....	6-2
System Board Switches .....	6-3
Coprocesor .....	6-4
System Board Memory .....	6-5
Displays .....	6-6
5-1/4 Inch Diskette Drives .....	6-6
Extender Card Switch Settings ...	6-7
Memory Option Switches .....	6-8

# Introduction

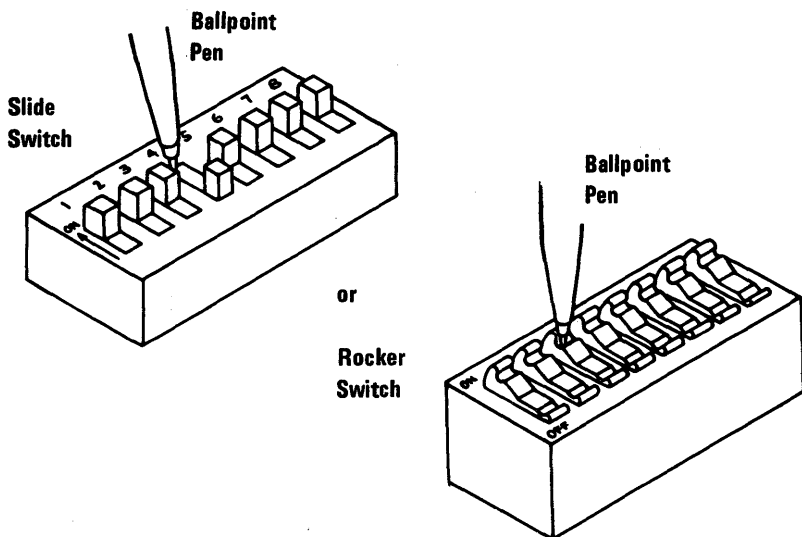
This section describes the switch setting for the System Board and the various option adapters that can be installed in the IBM 3270 Personal Computer.

**Warning:** Before you change any switch settings, make a note of how the switches are presently set.

Set a rocker switch by pressing down the rocker to the desired position. Push a slider switch to the desired position.

The following notation is used throughout this section:

- 0 Is used to indicate a switch setting should be in the **Off** position.
- 1 Is used to indicate a switch setting should be in the **On** position.
- x An "x" is used when a setting is not important for the discussion.



# System Board Switches

The eight position DIP switch is used to provide the IBM 3270 Personal Computer with information on what it has installed. The function of the individual positions is indicated below. Specific information on the proper switch settings for the IBM 3270 Personal Computer are indicated on the following pages.

## Switch Function

- |     |  |
|-----|--|
| 1   | Normal operation; always Off                   |
| 2   | Coprocessor                                    |
| 3-4 | Amount of memory on the system board           |
| 5-6 | Type of display attached                       |
| 7-8 | Number of 5-1/4 inch diskette drives installed |

# Coprocessor

System board switch 2 is set to indicate if the coprocessor is installed.

## With Math Coprocessor

1	2	3	4	5	6	7	8
x	0	x	x	x	x	x	x

## Without Math Coprocessor

1	2	3	4	5	6	7	8
x	1	x	x	x	x	x	x

# System Board Memory

The following figure shows the settings for switches 3 and 4 for the amount of memory on the system board.

**256KB**

1	2	3	4	5	6	7	8
x	x	0	0	x	x	x	x



# Displays

The following figures show how switches 5 and 6 for the IBM 3270 Personal Computer Displays.

## Displays

1	2	3	4	5	6	7	8
x	x	x	x	1	1	x	x

# 5-1/4 Inch Diskette Drives

The following figures show how switches 7 and 8 must be set for the number of diskette drives installed.

## 1 Drive

1	2	3	4	5	6	7	8
x	x	x	x	x	x	1	1

## 2 Drives

1	2	3	4	5	6	7	8
x	x	x	x	x	x	0	1

# Extender Card Switch Settings

The extender card is the adapter card you install in the system unit when you connect an expansion unit to your work station. This card has a set of switch settings that must match the amount of memory installed in the system unit. The chart below indicates the proper switch settings for the extender card.

System Memory	Switch Settings
256K	1 2 3 4 1 0 1 1
320K	1 2 3 4 1 0 1 0
384K	1 2 3 4 1 0 0 1
448K	1 2 3 4 1 0 0 0
512K	1 2 3 4 0 1 1 1
576K	1 2 3 4 0 1 1 0
640K	1 2 3 4 0 1 0 1

# Memory Option Switches

The charts below show the switch settings for the memory expansion options that can be installed in the IBM 3270 Personal Computer.

These options are:

- 64/256KB Memory Expansion Option Adapter, referred to as the “64/256KB Adapter” in the chart below.
- 128KB Memory-Printer Adapter, referred to as the “Memory-Printer” in the chart below.
- 256KB Memory-Printer Expansion Card, referred to as the “256KB Plug-On Card” in the chart below.

(The switches discussed are on the adapters.)

The Dual Inline Package (DIP) switch setting charts in the following pages will show the correct settings for your memory configuration. Each chart shows the four or eight switches that appear in each bank and a 1 or 0 to determine on or off. The 1 under a switch number means that the switch should be set on. The 0 under a switch number means that the switch should be set off.

**320KB Total Memory  
64KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>
(1) 64/256KB Option with 64KB installed	1 2 3 4 5 6 7 8 1 0 1 1 1 0 0 0

**384KB Total Memory  
128KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>	<b>Memory-Printer Adapter</b>
(1) 64/256KB Option with 128KB installed	1 2 3 4 5 6 7 8 1 0 1 1 0 1 0 0	
(1) Memory-Printer Adapter(128KB)		1 2 3 4 0 1 0 1

**448KB Total Memory  
192KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>	<b>Memory-Printer Adapter</b>
(1) 64/256KB Option with 192KB installed	1 2 3 4 5 6 7 8 1 0 1 1 0 0 1 0	
(1) Memory-Printer Adapter (128KB)	1 2 3 4 5 6 7 8 1 0 0 1 1 0 0 0	1 2 3 4 0 1 0 1
(1) 64/256KB Option with 64KB installed		

**512KB Total Memory  
256KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>	<b>Memory-Printer Adapter</b>
(1) 64/256KB Option with 256KB installed	1 2 3 4 5 6 7 8 1 0 1 1 0 0 0 1	
(1) Memory-Printer Adapter (128KB)	1 2 3 4 5 6 7 8 1 0 0 1 0 1 0 0	1 2 3 4 0 1 0 1
(1) 64/256KB Adapter with 128KB installed		

**576KB Total Memory  
320KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>	<b>Memory-Printer Adapter</b>
(1) Memory-Printer Adapter (128KB)	1 2 3 4 5 6 7 8 1 0 0 1 0 0 1 0	1 2 3 4 0 1 0 1
(1) 64/256KB Option with 192KB installed		
(1) 64/256KB Option with 256KB installed	1 2 3 4 5 6 7 8 1 0 1 1 0 0 0 1	
(1) 64/256KB Option with 64KB installed	1 2 3 4 5 6 7 8 0 1 1 1 1 0 0 0	



**640KB Total Memory  
384KB + (256KB on System Board)**

	<b>64/256KB Option Card Switches</b>	<b>Memory-Printer Adapter</b>
(1) Memory-Printer Adapter (128KB) with (1) 256KB Plug-On Card		1 2 3 4 1 0 0 1
(1) Memory-Printer Adapter (128KB)  (1) 64/256KB Adapter with 256KB installed	1 2 3 4 5 6 7 8 1 0 0 1 0 0 0 1	1 2 3 4 0 1 0 1
(1) 64/256KB Adapter with 256KB installed  (1) 64/256KB Adapter with 128KB installed	1 2 3 4 5 6 7 8 1 0 1 1 0 0 0 1  1 2 3 4 5 6 7 8 0 1 1 1 0 1 0 0	

# Section 7. Parts Catalog

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How to USE This Parts Catalog . . . . .	7-3
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Expansion Unit . . . . .	7-8
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Color Display . . . . .	7-14
Diskette Drive . . . . .	7-16
Fixed Disk Drive . . . . .	7-24
Keyboard . . . . .	7-26
Matrix/Matrix Graphics Printer . . . . .	7-28
Chart I. Line Cord Assemblies . . . . .	7-32

## **LIMITED WARRANTY IBM SERVICE PARTS**

The International Business Machines Corporation warrants that each IBM Service Part for an IBM Personal Computer Product will be free from defects in materials and workmanship under conditions of normal use for a period of 90 days from the date of purchase from IBM. Service Parts will be either reconditioned parts or new parts. Should an IBM Service Part fail to be free from defects in materials or workmanship at any time during the 90-day warranty period, IBM will, at its option, repair or replace this Service Part at no charge. All replaced Service Parts will become the property of IBM. This limited warranty does not include damage to the Service Part resulting from accident, disaster, misuse, abuse, or non-IBM modification of the Service Part.

Limited Warranty service may be obtained by delivering the defective Service Part to the IBM location where the part was purchased and providing proof of purchase date. Contact IBM by writing to IBM National Parts Center, P.O. Box 481, Greencastle, Indiana 46135 for further information.

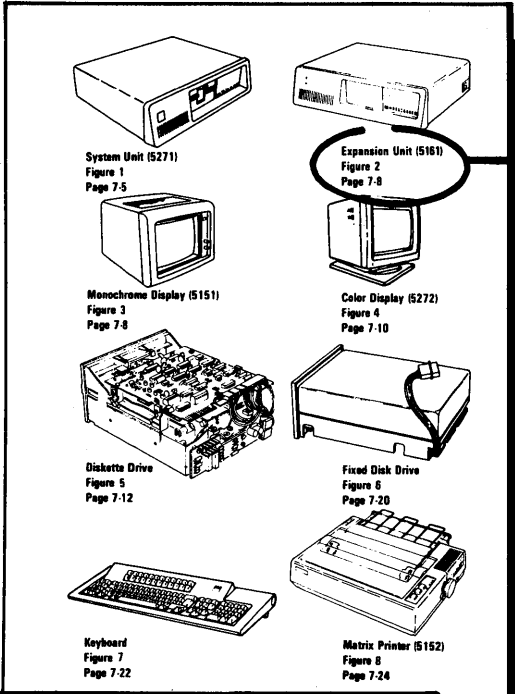
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# How To Use This Parts Catalog



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

**Figure 1. System Unit (5271)**

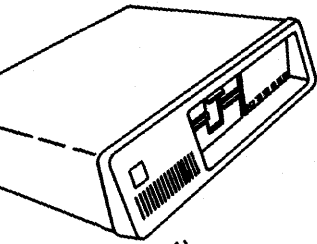
**System Unit (5271)**

Figure Index Number	Part Number	Description
1-1	8579163	Bezel Assembly
1-2	8525162	Cover Assembly
<b>1-3</b>	<b>8654388</b>	<b>Logo/Label Kit</b>
		front system panel ECC Label

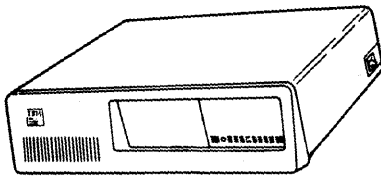
A callout line from the '3' instruction points to the '1-3 8654388 Logo/Label Kit' entry in the table, which is circled.

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

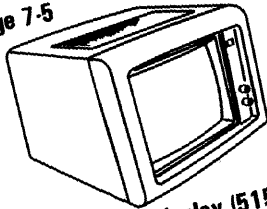
**3**  
Using the index number shown with the part, refer to the accompanying listing to obtain major unit code, part number and description



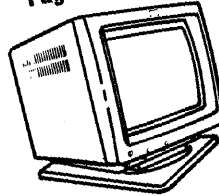
**System Unit (5271)**  
Figure 1  
Page 7-5



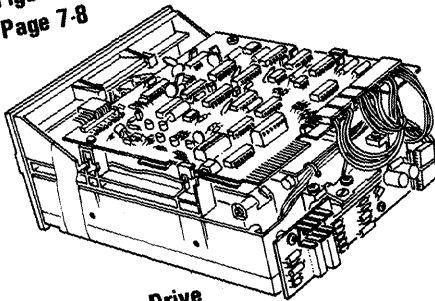
**Expansion Unit (5161)**  
Figure 2  
Page 7-8



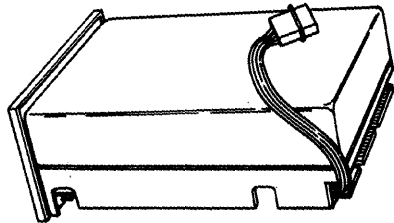
**Monochrome Display (5151)**  
Figure 3  
Page 7-8



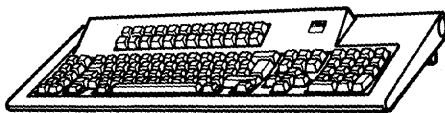
**Color Display (5272)**  
Figure 4  
Page 7-10



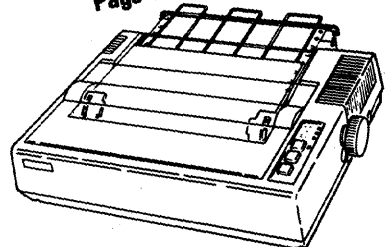
**Diskette Drive**  
Figure 5  
Page 7-12



**Fixed Disk Drive**  
Figure 6  
Page 7-20

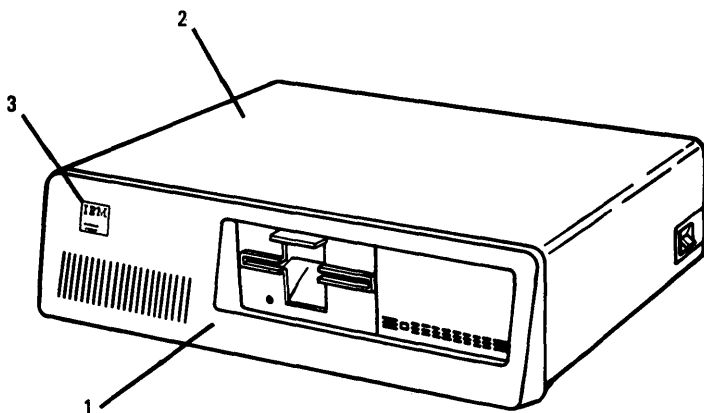


**Keyboard**  
Figure 7  
Page 7-22



**Matrix Printer (5152)**  
Figure 8  
Page 7-24

## Visual Index



**Figure 1. System Unit (5271)**

### System Unit (5271)

	<b>Figure Index Number</b>	<b>Part Number</b>	<b>Description</b>
	1-1	8529163	Bezel Assembly
	1-2	8654209	Top Cover (No Bezel)
	1-2	8529162	Cover Assembly
	1-3	8654388	Logo/Label Kit, US and Canada
	1-3	8654394	Logo/Label Kit, Non-US and Canada
			— Consisting of —
			Front Name Plate
			Rear Name Plate
			Information Plate

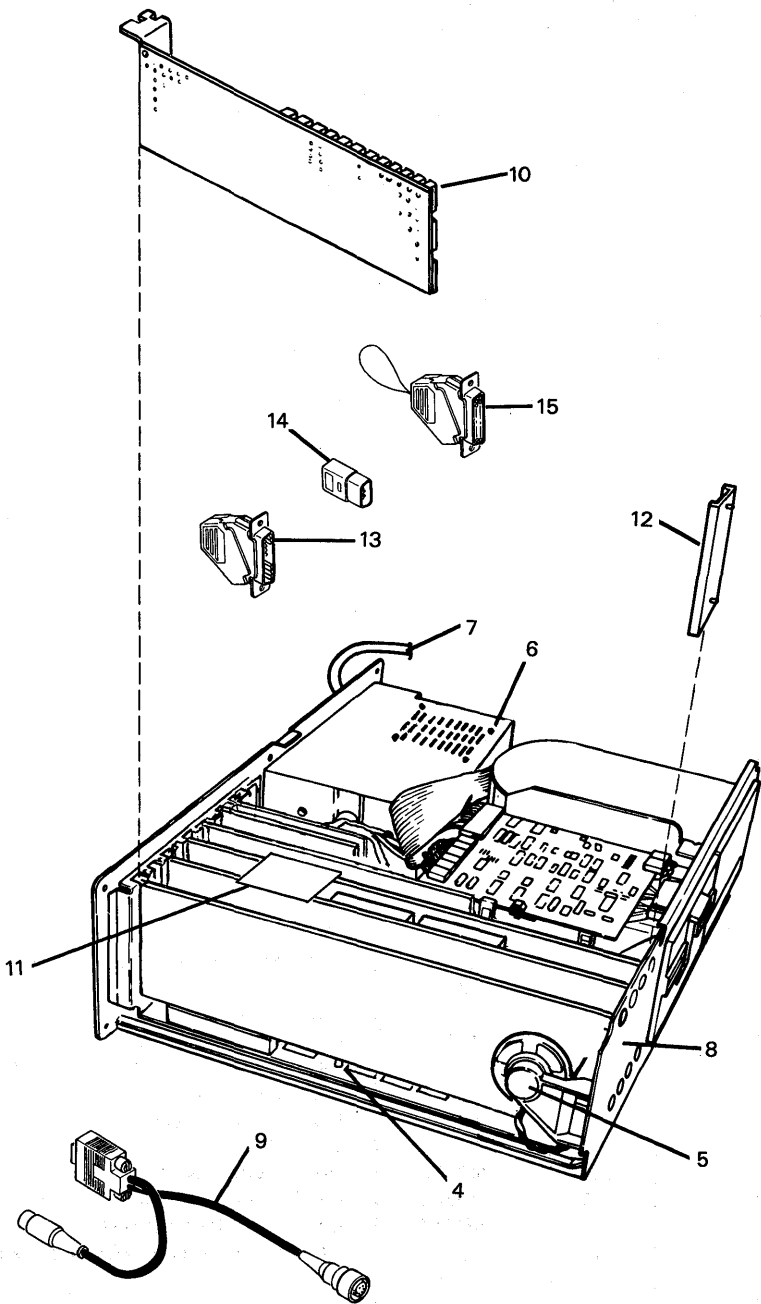
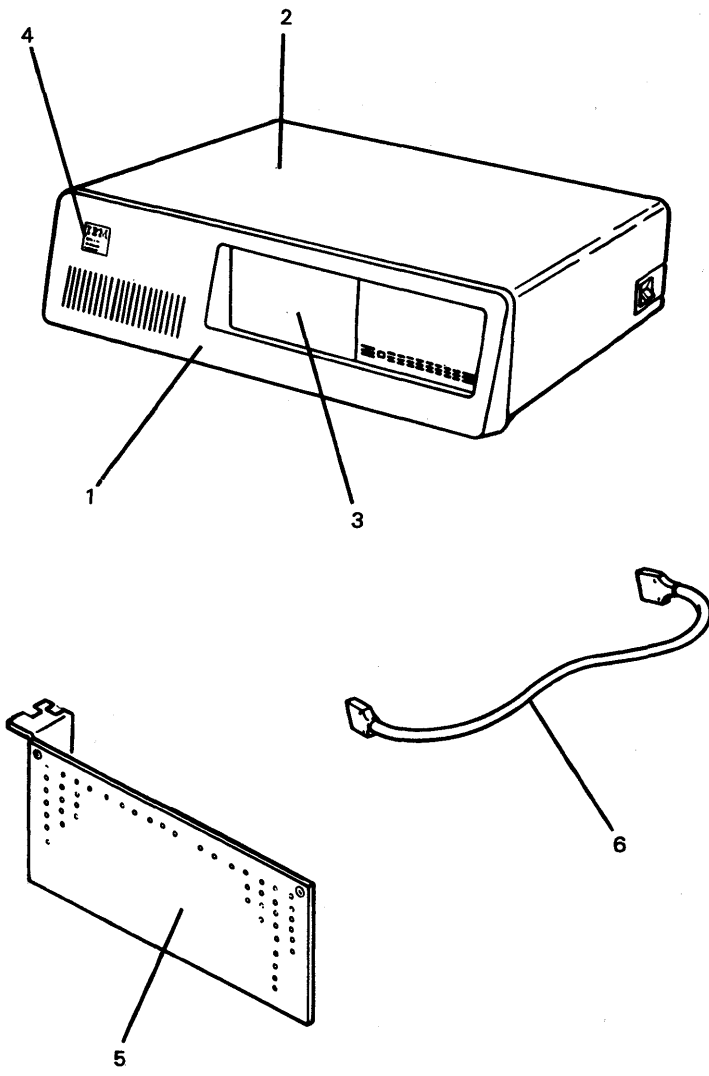


Figure 1. System Unit (5271)

# System Unit (5271)

Figure Index Number	Part Number	Description
1-4	8529254	System Board 256K Memory
1-5	8529143	Speaker and Cable
1-6	6347754	Power Supply 120V
1-6	6347755	Power Supply 240V
1-7	No. No.	Line Cord
		Power Cord Asm. See Chart 1 7- 32
1-8	8529248	Base Assembly
1-9	8654377	Keyboard Adapter Cable
	8529165	Misc. Parts Kit
		— Consisting of —
		Screw-Flange
		Clip-Bezel
		Clip-Blank Bezel
		Foot Pad-Keyboards
		Foot Pad-System Unit
1-10	8529211	64KB Memory Module (Kit)
		Adapter Cards
1-10	8654378	Distributed Function Communication Adapter
1-10	8654386	Display Adapter-Domestic
1-10	2683125	Display Adapter-WTC
1-10	8529269	Fixed Disk Adapter
1-10	8529152	5 1/4 Diskette Drive Adapter
1-10	8654395	Printer/Memory/Adapter
1-10	8529149	Printer Adapter
1-10	2683110	NMI Keyboard Adapter
1-10	8654376	Keyboard Adapter
1-10	8529212	64/256K Memory Expansion
1-10	2683116	256K Memory Expansion (Piggy Back Card)
1-10	8529150	Asynchronous Communication Adapter
1-10	8654381	Programmed Symbols Adapter
1-10	8654390	All Points Addressable Adapter
		Refer to Sys. Unit Layout, Section 4 for Card Configuration.
1-11	8654385	Card, Top Card Connector
1-12	8529156	Card Guide
1-13	8529228	Printer Adapter Wrap Plug
1-13	8529280	IBM Communications Adapter Wrap Plug
1-14	6217063	NMI Keyboard Adapter Wrap Plug
1-15	6423211	Communications Adapter Wrap Plug Set (2 Plugs)

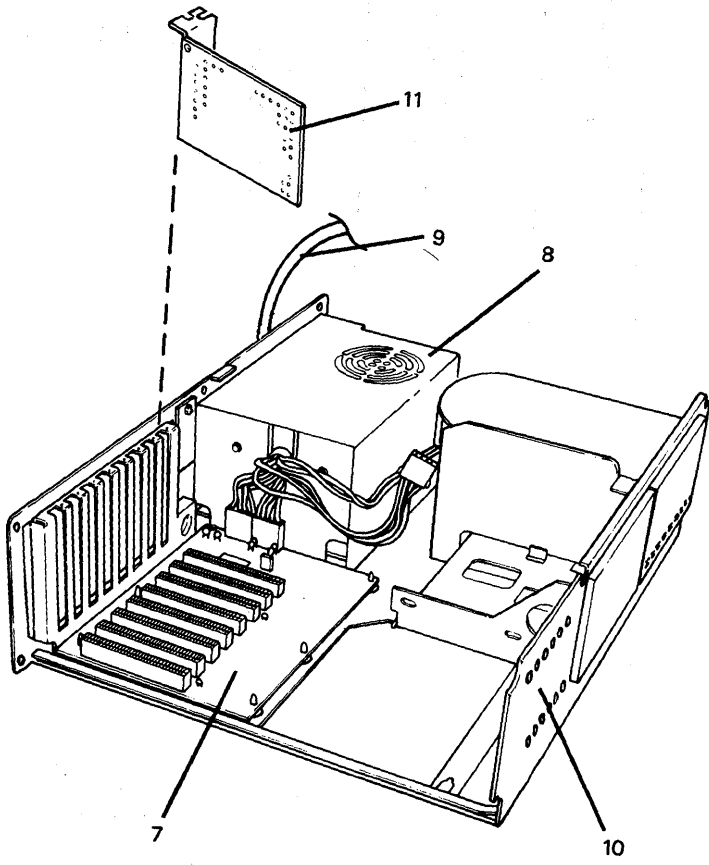




**Figure 2. Expansion Unit (5161)**

# Expansion Unit (5161)

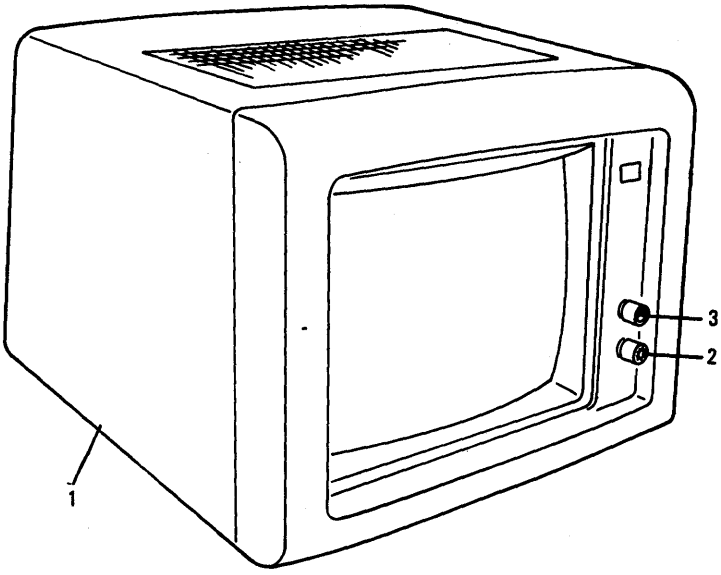
Major Unit Code	Figure Index Number	Part Number	Description
	2-1	8529163	Bezel Assembly
	2-2	8529162	Cover Assembly
	2-3	8529204	Disk Cover Plate
	2-4	8529164	Logo/Label Kit - Consisting of - Logo Rear Name Plate FCC Label
	2-5	8529252	Extender Card (Must be installed in System Unit).
	2-6	8529253	Expansion Unit Cable



**Figure 2. Expansion Unit (5161)**

# Expansion Unit (5161)

Major Unit Code	Figure Index Number	Part Number	Description
	2-7	8529250	Expansion Board
	2-8	8529247	Power Supply
	2-9	8529158	Line Cord
	2-10	8529248	Base Assembly
	2-11	8529251	Receiver Card



**Figure 3. Monochrome Display (5151)**

# Monochrome Display (5151)

Major Unit Code	Figure Index Number	Part Number	Description
	3-1	8529171	Display Assembly 120V
	3-1	8529209	Display Assembly 220/240V
	3-2	8529177	Brightness Knob
	3-3	8529178	Contrast Knob
	3-3	8529179‡	Logo/Label Kit 120V
	3-3	8654205‡	Logo/Label Kit 220/240V — Consisting of — Nameplate, 1 Ea. Front & Rear Label F.C.C. — U.S. Only 1 Ea. Label: Caution, Warning & Flyback Label World Trade
		8529229‡	Front Panel
		8529230‡	Back Cover
		8529231‡	Upper Cover Plug
		8529232‡	Foot
		8529176‡	Power Cord Holder
		8529173‡	Signal Cable
		8529235‡	Transformer 120V
		8654206‡	Transformer 220/240V
		8529237‡	Control Support
		8529236‡	Transformer Support
		8529175‡	Fuse 0.75Amp for 120V
		8654204‡	Fuse 0.5Amp for 220/240V
		8529233‡	Analog Card
		8529234‡	PC Card
		8529174‡	Power Cable 120V
		8654203‡	Power Cable 220/240V
		8529180‡	Display Misc. Hardware Kit — Consisting of — CRT Mounting Screw Transformer Screw CRT Mounting Support CRT Bracket to Front Panel Transformer Support Front Panel Rubber Bushing Screw & Nut Cable Restraint Screw Star Washer
			‡Restricted availability.

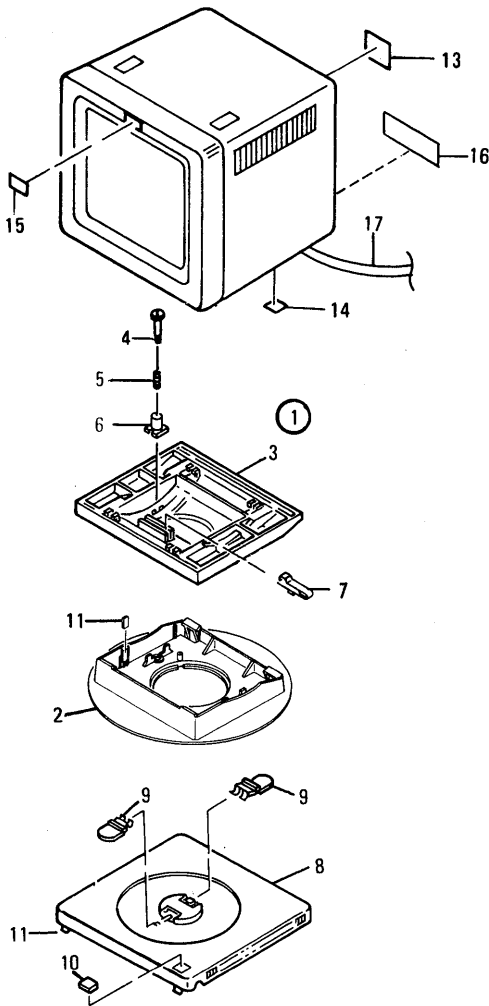


Figure 4. Color Display (5272)

# Color Display (5272)

	Figure Index Number	Part Number	Description
	4-1	6871672	Pedestal/Swivel ASM — Consisting Of —
	4-2	5954154	Swivel Cover
	4-3	5954155	Tilt Cover
	4-4	5954158	Stud
	4-5	5954157	Spring
	4-6	5954156	Friction Pad
	4-7	5954159	Stopper
	4-8	6870744	Base
	4-9	5954169	Latch
	4-10	1836154	Logo
	4-11	6871638	Foot
		6341710	Felt Pad
			— ** —
	4-12		Display Assembly
	4-12		Display Assembly — Part Number Determined by Global Region Intended for Installation
	4-12	6931932	125V USA, Canada, Bermuda
	4-12	2719903	125V Japan, Korea, Taiwan, Jamaica, Mexico, Bahamas, Dominica Rep., Haiti, Guatemala, Nicaragua, Honduras, Panama, Costa Rica, El Salvador, Guyana, Colombia, Trinidad, Barbados, Venezuela, Netherlands Antilles, Saudi Arabia
	4-12	2719904	125V Philippines, Burma, Bolivia, Ecuador
	4-12	2719831	240V Europe, Egypt, Algeria, Jordan, Kuwait, Lebanon, Syria, Israel, Qatar, Bahrain
	4-12	2719905	240V Australia, New Zealand
	4-12	2719906	240V Uruguay, Paraguay, Sri Lanka, Malaysia, Singapore, Indonesia, Brunei, Chile, Argentina, Cameroon, Sierra Leone, C. Africa, S. Africa
	4-12	2719907	240V Hong Kong, Thailand, Surinam, Bangladesh, Pakistan, Afghanistan, Peru, Sudan
	4-13	5894225	Label-Rear
	4-14	4761473	Label-Bottom Small
	4-15	5954188	Plate-Logo
	4-16	1838641	Information Label 125V
	4-16	4804566	Information Label 240V
	4-17		Line Cord
			Power Cord Asm. See Chart 1 7-32 (Color Display 5272)



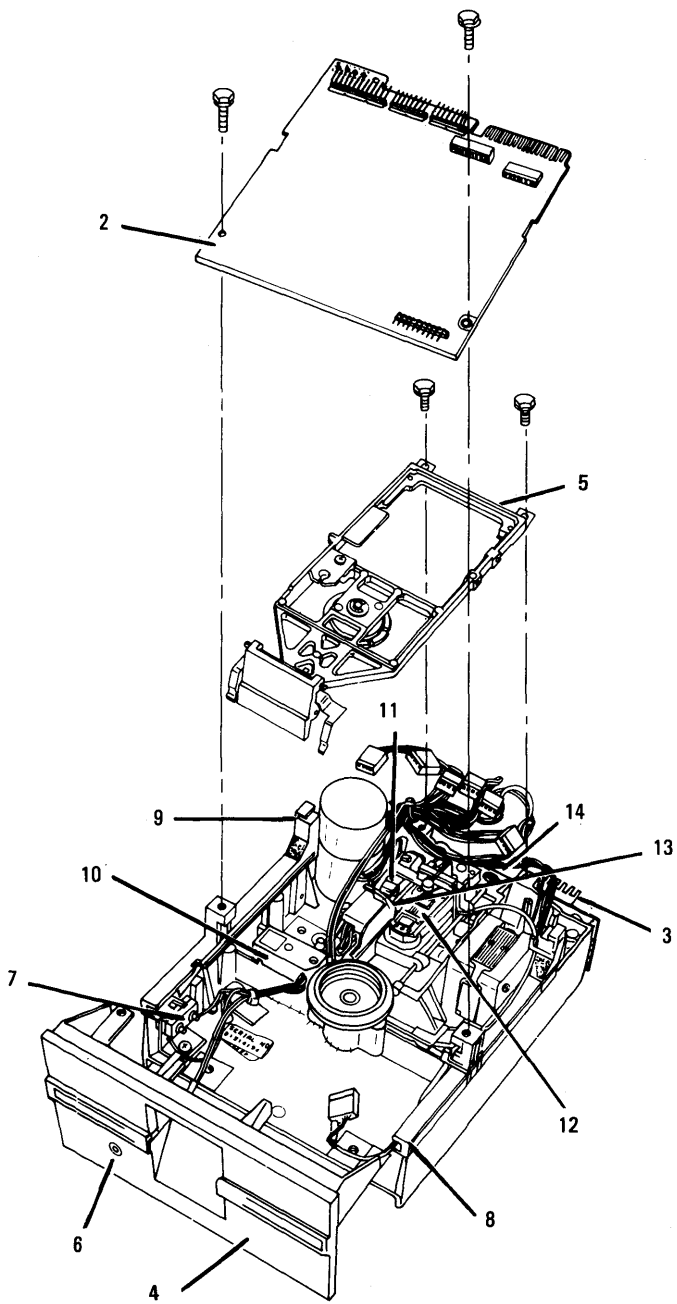


Figure 5. Diskette Drive Type 1

# Diskette Drive Parts Type 1

Use only in drives that have an A or B or no prefix in front of the serial number. The serial number is visible from the top of the drive.

	Figure Index Number	Part Number	Description
	5-1	8529153	Diskette Drive Assembly/160k
	5-1	8529206	Diskette Drive Assembly/320k
	5-2	8529226	Diskette Drive Logic Printed Circuit Board
	5-3	8529256	Servo Board
	5-4	8529293	Front Panel
	5-5	8529267	Cone Lever Assembly — Consisting of — Cone Lever Arm Cone Assembly Mounting Clips Latch Assembly
	5-6	8529258	LED Assembly
	5-7	8529225	Write Protect Switch
	5-8	8529261	Guide Right
	5-9	8529262	Guide Left
	5-10	8528257‡	Index Assembly
	5-11	8529224‡	Track 0 Switch
	5-12	8529264‡	Module SSR/160K
	5-12	8529210‡	Module DSR/320K
	5-13	8529265‡	SSR Upper Arm
	5-14	8529266‡	Track 0 Stop
			‡Restricted availability

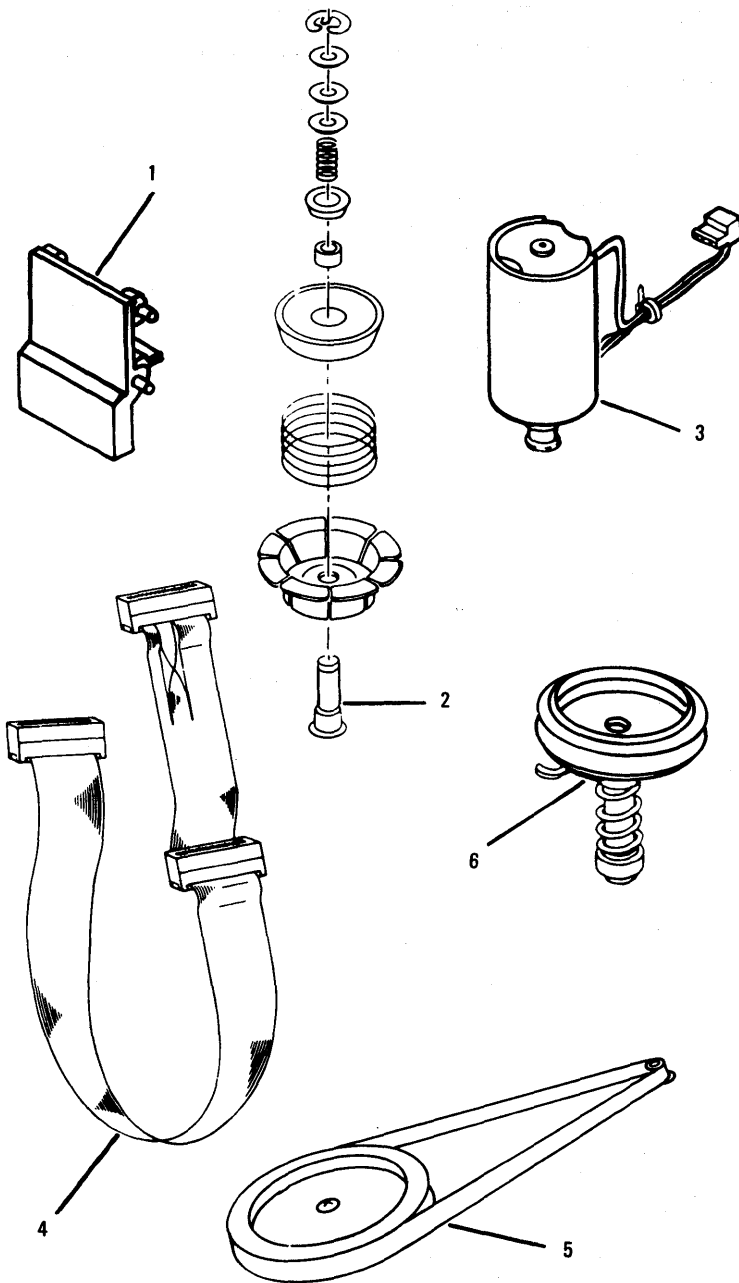
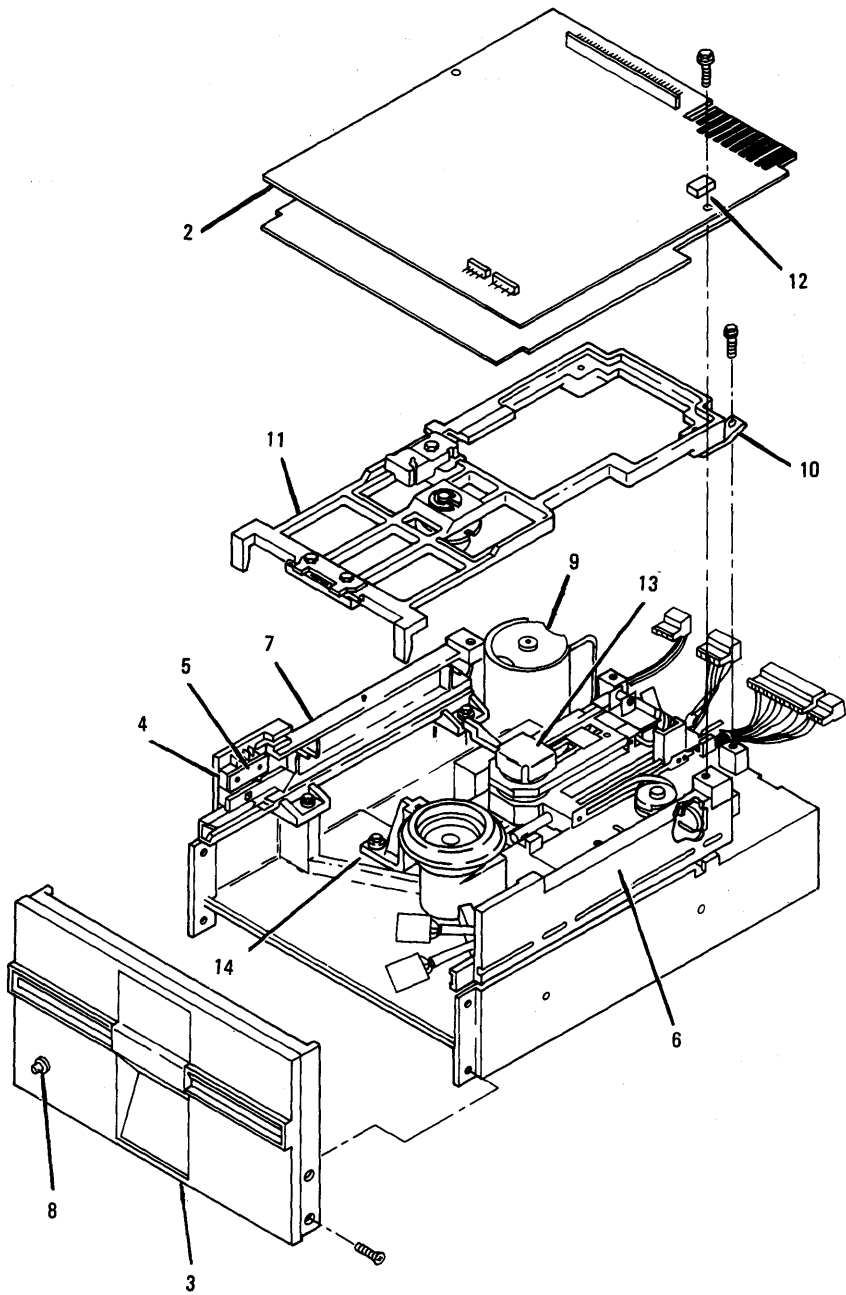


Figure 5. Diskette Drive Type 1

# Diskette Drive Parts Type 1

Use only in drives that have an A or B or no prefix in front of the serial number. The serial number is visible from the top of the drive.

	Figure Index Number	Part Number	Description
	5-1	8529260	Latch Assembly
	5-2	8529259	Cone
	5-3	8529223	Diskette Drive Motor
	5-4	8529159	Signal Cable
	5-5	8529154	Diskette Drive Belt
	5-6	8529263	Spindle Assembly — Consisting of — Spindle (1) Bearings (2) Spring (1) Sleeve (1)
	5-6	8529294	Misc. Parts Kit — Consisting of — Servo Board Spacer Cone Shaft E Ring Cone Shaft Washers Front Panel Bushings Drive Motor Shouldered Washer Track 0 Adj. Switch Screw Track 0 Adj. Switch Screw E Carrier Ecc. Stud Carrier Ecc. Stud E Ring  ‡Restricted availability

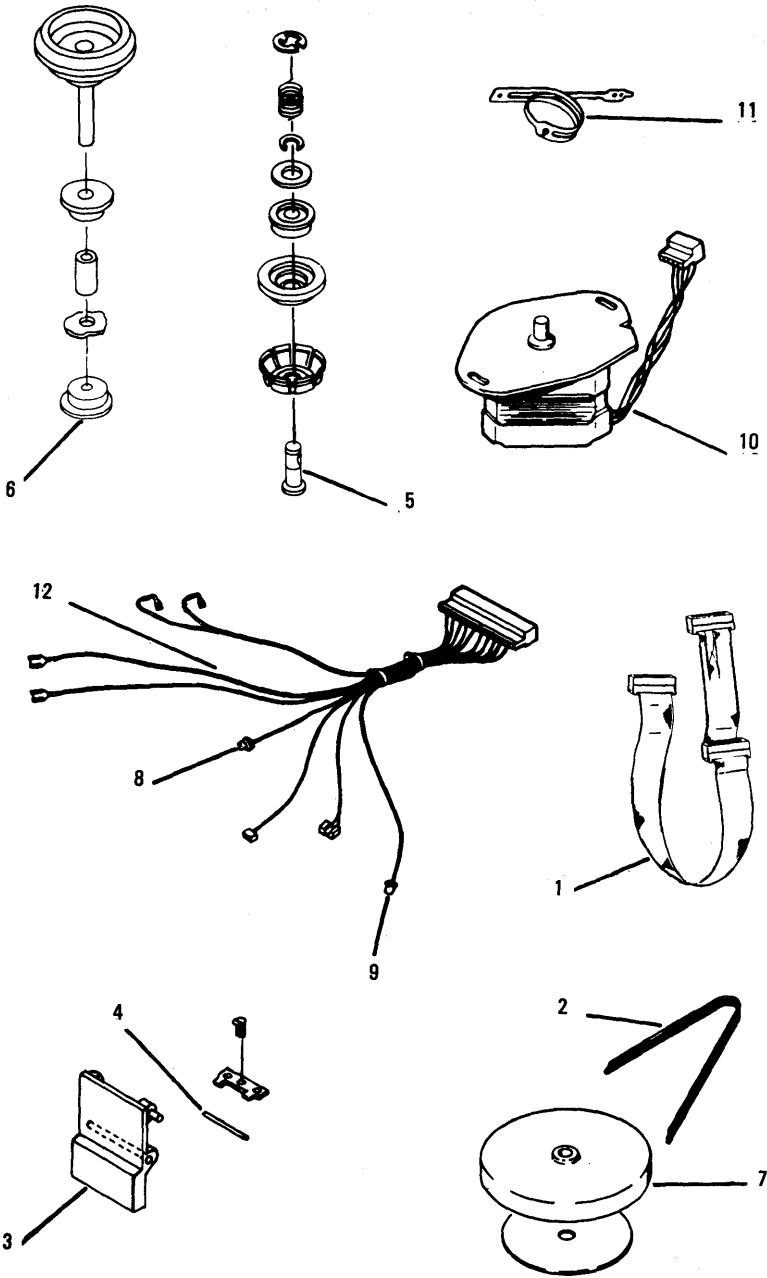


**Figure 5. Diskette Drive Type 2**

# Diskette Drive Parts 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.

	Figure Index Number	Part Number	Description
		8429206	Diskette Drive/320K
	5-2	8654241	Logic Board
	5-3	8654254	Front Panel
	5-4	8654250	Write Protect Switch
	5-5	8654260	Nut Plate (write protect)
	5-6	8654245	Guide Right
	5-7	8654244	Guide Left
	5-8	8654249	LED Assembly
	5-9	8654240	Drive Motor
	5-10	8654261	Leaf Spring
	5-11	8654243	Cone Lever Arm Assembly
	5-12	8654252 ‡	Shunt, Dip
	5-13	8654239 ‡	Module DSR/320K (head)
	5-14	8654255 ‡	Index Housing (lower)
	5-14	8654259	Misc. Parts Kit – Consisting of – Screws (11 different 2 of each) Washers (2 different 2 of each) Set Screw (2) Pin Clamp (2)
			‡Restricted availability



**Figure 5. Diskette Drive Type 2**

# Diskette Drive Parts 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.

	Figure Index Number	Part Number	Description
	5-1	8529159	Diskette Drive Signal Cable
	5-2	8654251	Diskette Drive Belt
	5-3	8654242	Latch
	5-4	8654262	Latch Pin
	5-5	8654258	Cone Assembly – Consisting of – Retaining Clip Washer, Special Spring Washer Clip Bearing Insert Cone Cone Shaft
	5-6	8654256	Spindle Assembly – Consisting of – Bearing (2) Washer Spindle
	5-7	8654257	Pulley Kit – Consisting of – Pulley Disk, (strobe)
	5-8	8654247‡	Index Sense (upper)
	5-9	8654248‡	Index Sense (lower)
	5-10	8654237‡	Stepper Assembly (motor)
	5-11	8654238‡	Band (head)
	5-12	8654253‡	Index Harness
			‡Restricted availability



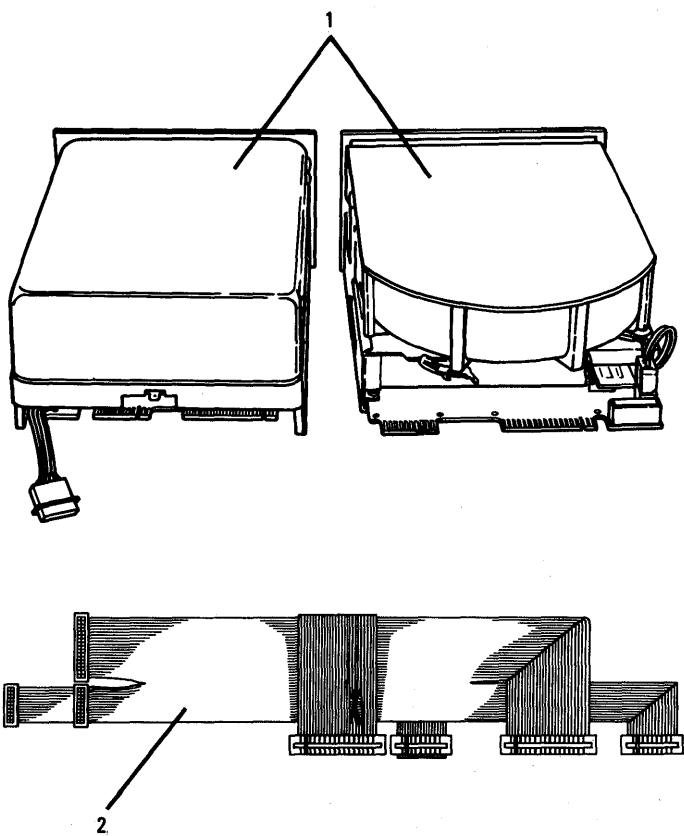
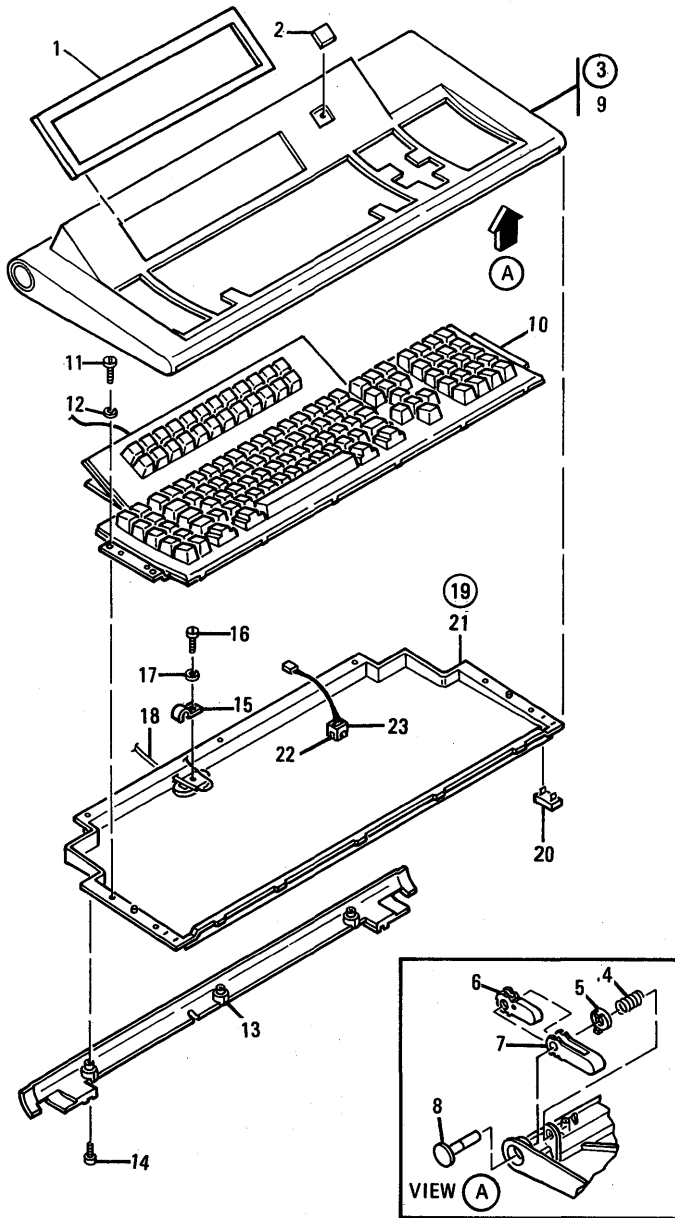


Figure 6. Fixed Disk Drive

# Fixed Disk Drive

	<b>Figure Index Number</b>	<b>Part Number</b>	<b>Description</b>
	6-1	8529275	Fixed Disk Drive
	6-2	8529271	Data/Control Cable



**Figure 7. Keyboard**

# Keyboard

	Figure Index Number	Part Number	Description
	7-0	6110344	Keyboard Asm – USA, Canada
	7-0	1445095	Keyboard Asm – United Kingdom, English
	7-0	1385096	Keyboard Asm – French
	7-0	1445097	Keyboard Asm – Spanish
	7-0	1445098	Keyboard Asm – Italian
	7-0	1445099	Keyboard Asm – German
			Accessory Keyboard Overlays
	7-1	1837469	Keyboard Overlay – English Kit
	7-1	6018060	Keyboard Overlay – United Kingdom, English Kit
	7-1	6018061	Keyboard Overlay – French Kit
	7-1	6018062	Keyboard Overlay – German Kit
	7-1	6018063	Keyboard Overlay – Italian Kit
	7-1	6018064	Keyboard Overlay – Spanish Kit
	7-2	6018074	Logo
	7-3	4178210	Cover Asm – Consisting of –
	7-4	6016746	Spring
	7-5	6016744	Clutch
	7-6	6016741	Leg-12 °
	7-7	6016742	Leg-18 °
	7-8	6016743	Button
	7-9	4178205	Cover
	7-10	8502468	Keyboard CSA – USA, Canada
	7-10	1445090	Keyboard CSA – United Kingdom, English
	7-10	1445091	Keyboard CSA – French
	7-10	1445092	Keyboard CSA – Spanish
	7-10	1445093	Keyboard CSA – Italian
	7-10	1445094	Keyboard CSA – German
	7-11	7362130	Screw
	7-12	1622346	Lockwasher
	7-13	4178204	Cowl
	7-14	1621813	Screw
	7-15	4178256	Clamp
	7-16	7362130	Screw
	7-17	1622346	Lockwasher
	7-18	2452659	Cable Assembly
	7-19	6110310	Base Assembly – Consisting of –
	7-20	6016737	Foot
	7-21	6110309	Base Pan
	7-22	6124115	Switch Assembly
	7-23	6124114	Housing
	7-23	6110501	CE Repair Label
	7-23	6110502	RYO Label
	7-23	5641662	Clear Label

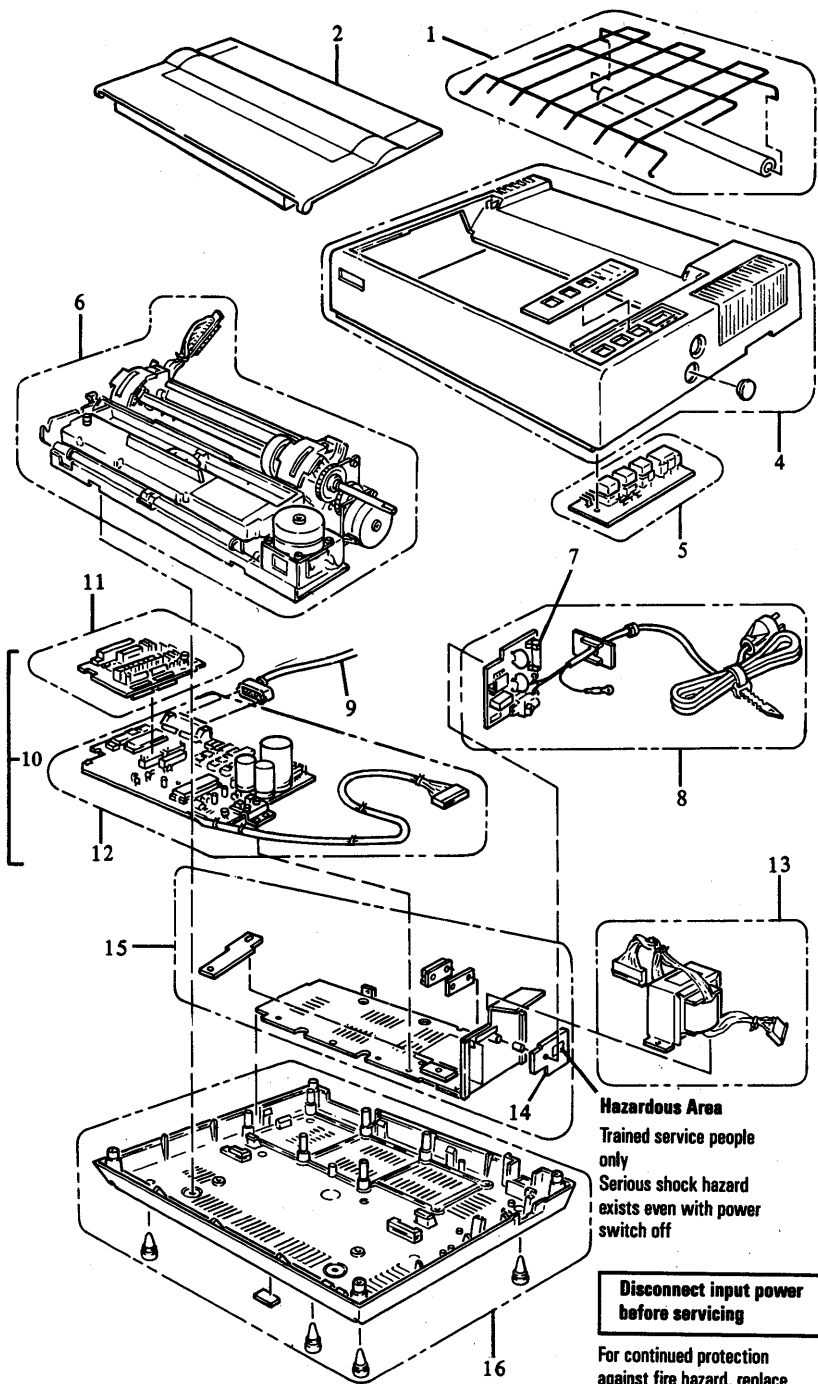


Figure 8. Printer (5152)

# Matrix Printer (5152)

	Figure Index Number	Part Number	Description
	8-1	8529191	Forms Rack
	8-2	8529185	Access Cover
	8-3	8529186	Logo/Label Kit – Consisting of – Control Panel Label Nameplate Logo-Front Nameplate Logo-Rear Warning Label Bottom Label-FCC Warning Label-Safety Shield 1 Ea. 120, 220, 240 Label-Rear
	8-4	8529182	Top Cover
	8-5	8529184	Control Panel
	8-6	8529198	Print Mechanism Assembly
	8-7	8529220	Fuse-2A
	8-7	8529278	Fuse 315mA for 220/240V
	8-8	8529187	Fuse-Filter Card/Power Cord for 120V
	8-9	8529214	Printer Cable Assembly
	8-10	8529268	Control Cards, Graphics Printer – Consisting of –
	8-11	8529221‡	Driver Card
	8-12	8529276‡	Logic Card
	8-10	8529197‡	Control Cards, Matrix Printer – Consisting of –
	8-11	8529221‡	Driver Card
	8-12	8529222‡	Logic Card
	8-13	8529196	Power Transformer 120V
	8-13	8654236	Power Transformer 220V
	8-13	8529277	Power Transformer 240V
	8-14	8529215	Safety Shield
	8-15	8529217	Heat Sink/Power Transistor
	8-16	8529181	Base Assembly
	8-17	8529279	Fuse-Filter Card/AC Socket for 220/240V
	8-18		Power Cord (Detachable)

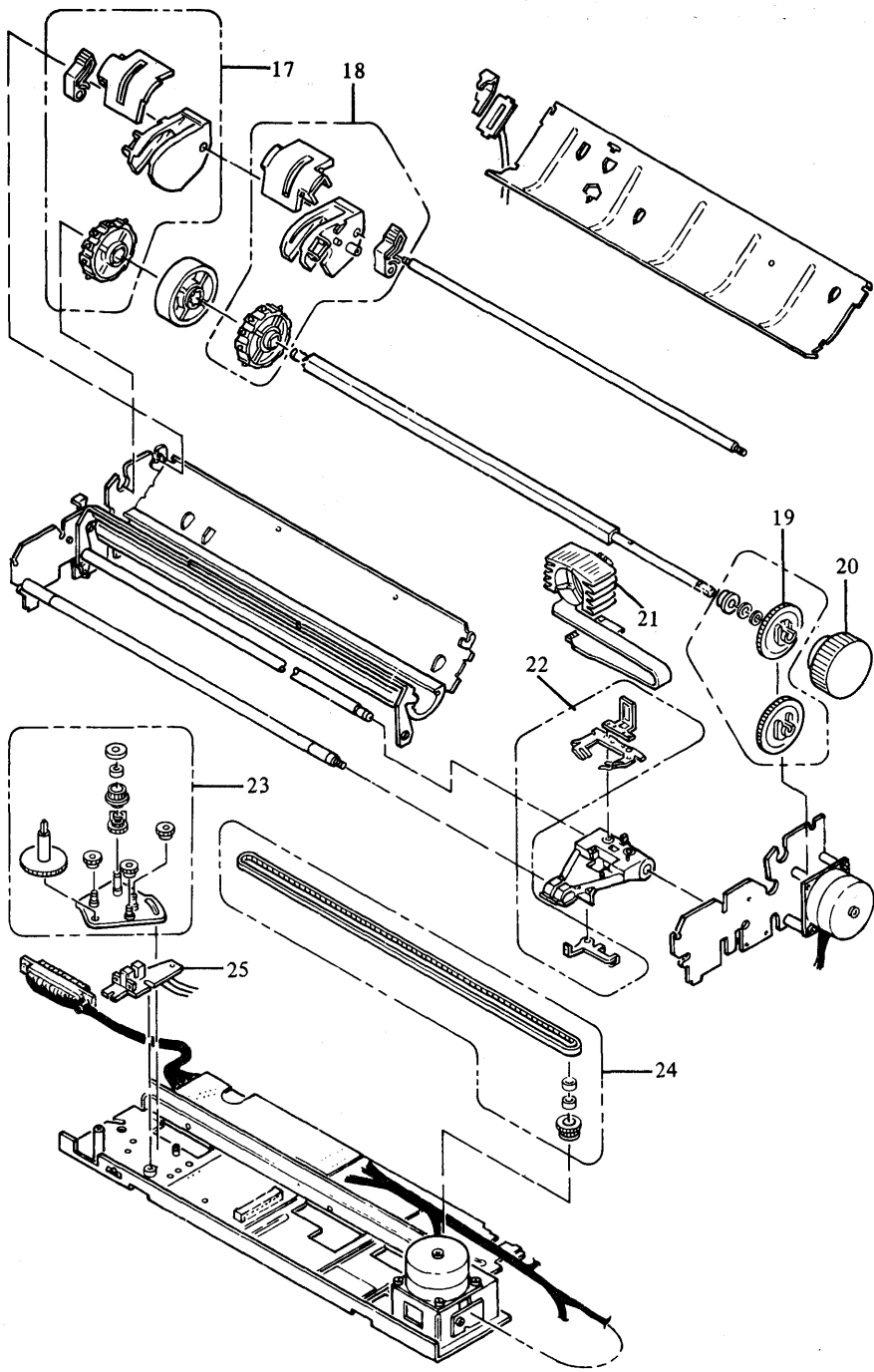

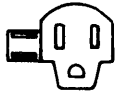
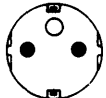
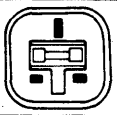
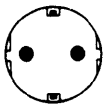






Figure 8. Printer (5152)

# Matrix Printer (5152)

	Figure Index Number	Part Number	Description
	8-17	8529188	Forms Tractor Assembly, Left
	8-18	8529216	Forms Tractor Assembly, Right
	8-19	8528184	Intermediate Gear
	8-20	8529193	Forms Feed Knob
	8-21	8529183	Print Head
	8-22	8529192	Ribbon Shield
	8-23	8529195	Carriage Drive Assembly
	8-24	8529190	Carriage Belt
	8-25	8529189	Left Margin Assembly
	8-25	8529200	Printer Misc. Hardware – Consisting of – Plane Washers C.T.P. Screws Retaining Rings, Type E CP Screws with OW Cup Screws Spacers Outside Toothed Lock Washers CP Screws with SW Cup Screw (Binding Head) Hexagon Nuts CB Screws
	8-25	8529218	Printer Misc Springs – Consisting of – Spring Pin Leaf Spring Leaf Spring PE Lever Spring Scale Spring, Left Scale Spring, Right Paper Holding Cover Spring
	8-25	8529219	Printer Misc Parts – Consisting of – Board Spacing Paper Guide Roller Grommet Rubber Bumper A Rubber Bumper B Wire Band



PLUG PIN SIDE VIEW	PART NUMBER	LG	COUNTRIES	DESCRIPTION
	8529158	1.8M	USA, Brazil, Japan, Saudi Arabia (Use on System Unit 5271)	125V, 6A
	6128849	1.8M	USA, Brazil, Japan, Saudi Arabia (Use on Color Display 5272)	125V, 6A
	5640661	3.0M	Austria, Belgium, France, Germany, Spain **	250V, 6A
	5640662	3.0M	United Kingdom, Ireland, Hong Kong, Malaysia, Singapore **	250V, 5A Fuse Part Number 4422260 (13A)
	5640663	3.0M	Indonesia **	250V, 6A
	5640664	3.0M	Australia, New Zealand **	250V, 6A
	5640665	3.0M	Switzerland **	250V, 6A
	5640666	4.3M	South Africa **	250V, 5A Fuse Part Number 4422260 (13A)
	5640668	4.3M	Italy **	250V, 6A

\*\*Use on System Unit 5271 and Color Display 5272

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**Maintenance Information**

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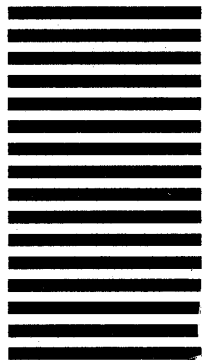
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