Personal Computer PC*jr*
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Hardware Maintenance and Service

1502263

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Hardware Maintenance and Service

First Edition (September 1983)

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Warning: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

INSTRUCTIONS TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manual, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B 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 residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
- Ensure that side option mounting screws, attachment connector screws, and ground wires are tightly secured.
- If peripherals not offered by IBM are used with this equipment, it is suggested that you use shielded, grounded cables with in-line filters, if necessary.

If necessary, consult your dealer service representative for additional suggestions.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

CAUTION
This product is equipped with a UL listed and CSA-certified plug for the user's safety. It is to be used in conjunction with a properly grounded 115 Vac receptacle to avoid electrical shock.

Preface

The *Hardware Maintenance and Service* manual helps you isolate and repair failures of the IBM PC*jr*. You should be trained to service the IBM PC*jr* and be familiar with the Triplett Model 310 Multimeter[1] (or equivalent).

This manual consists of six sections:

Section 1, "Introduction," provides a capsule description of the IBM PC*jr* and its options.

Section 2, "Introduction to Diagnostics," lists the items you need to perform the IBM PC*jr* diagnostics. Detailed instructions explaining how to perform the advanced power-on self-test (POST) and other advanced tests are included here.

Section 3, "Problem Isolation Charts," contains the start point for IBM PC*jr* diagnostics. This section assumes you have read Section 2 and know how to perform advanced tests.

Section 4, "Removal/Replacement and Adjustments," provides all the information needed to complete a repair after the failing field replaceable unit (FRU) is identified in Section 3.

Section 5, "Locations," assists you in finding a part or FRU in the IBM PC*jr*.

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1 Manufactured by Triplett Corporation, Bluffton, Ohio 45817

Section 6, "Parts Catalog," contains part numbers for the IBM PC*jr* parts and FRUs.

Complete operating instructions for the IBM PC*jr* are in the *Guide to Operations*, IBM part numbers 1502291 and 1502292. Detailed hardware design and interface information are in the *Technical Reference*, IBM part number 1502293.

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Notes:

Section 1. Introduction

Contents

Notes:

Description

The IBM PC*jr* is a low-cost, compact, table top computer. Many programs used by the family of IBM Personal Computers can also be used by the IBM PC*jr*.

Features

The IBM PC*jr* has this basic configuration:

- IBM PC*jr* System Unit
  - 64K random access memory (RAM)
  - 64K read only memory (ROM)
  - Cassette, light pen, serial, and joystick ports
  - Direct drive video, composite video, and television ports
  - Infra-red receiver
  - Intel 8088 microprocessor
  - Three-voice sound generator
  - Two program cartridge slots
- IBM PC*jr* Cordless Keyboard
- IBM PC*jr* Power Transformer

Options

The IBM PC*jr* options are:

- IBM PC*jr* 64KB Memory and Display Expansion
- IBM PC*jr* Attachable Joystick
- IBM PC*jr* Adapter Cable for Cassette
- IBM PC*jr* Adapter Cable for Serial Devices
- IBM Connector for Television
- IBM PC*jr* Adapter Cable for IBM Color Display
- IBM PC*jr* Diskette-Drive Adapter
- IBM PC*jr* Keyboard Cord
- IBM Personal Computer Graphics Printer
- IBM Color Display
- IBM PC*jr* 5-1/4 inch Diskette Drive
- IBM PC*jr* Internal Modem
- IBM PC Compact Printer
- IBM PC*jr* Parallel Printer Attachment
- IBM Personal Computer Printer Cable
- IBM Printer Stand

Section 2. Introduction to Diagnostics

Contents

Notes:

Required Items for Diagnostics

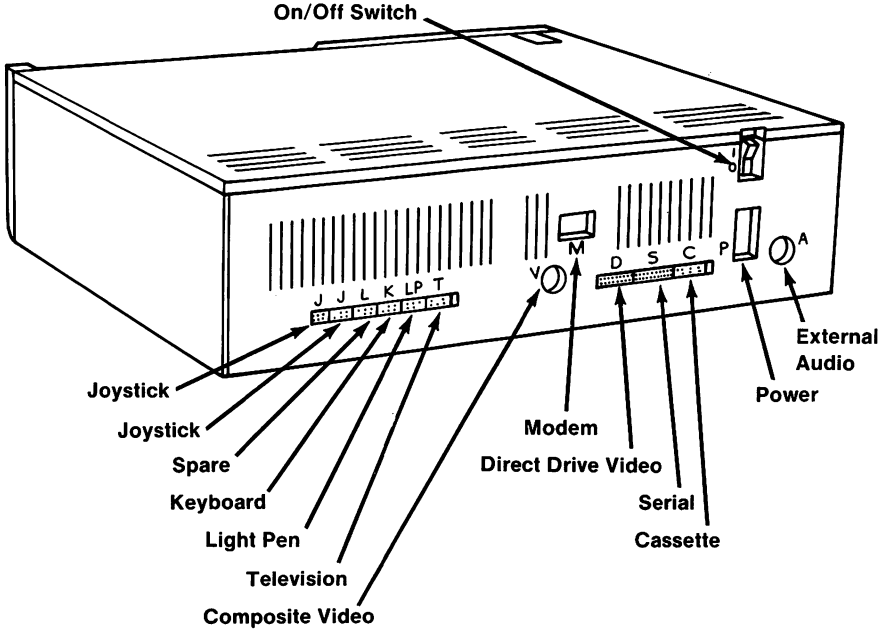
In order to perform all of the advanced diagnostics, you must have:

- A system unit
- A keyboard
- A known good television receiver
- A service plug, part number 1503441
- A POST-loop plug, part number 1503442
- A parallel printer attachment wrap plug, part number 8529228
- A serial wrap plug, part number 1503443
- A Triplett Model 310 Multimeter (or equivalent)
- Access to a set of known good replacement parts

How to Perform Advanced POST

Before you perform advanced POST, do the following:

1. Set the system unit's Power switch to Off.
2. Set the display's Power switch to Off.
3. Connect the power transformer's power cord to a functioning, properly grounded outlet.
4. Install all connectors securely in their proper locations.

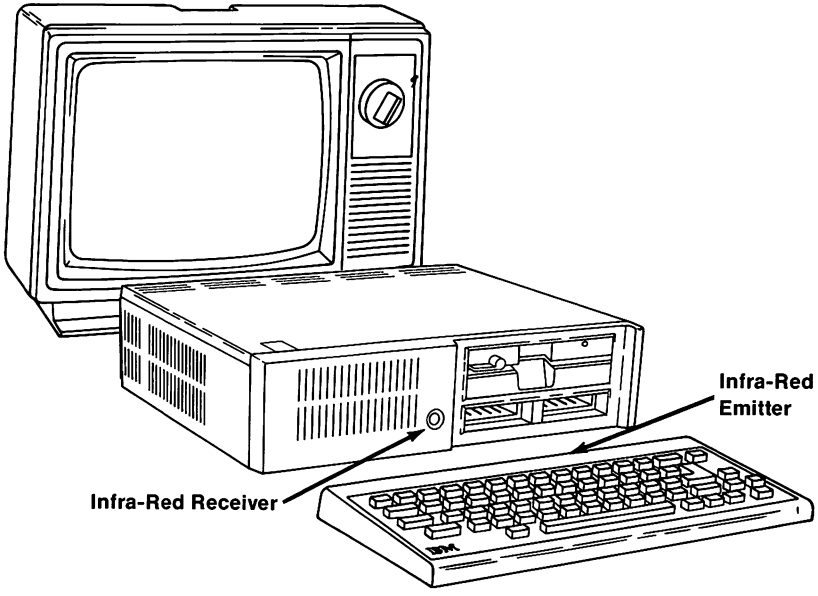


5. Remove any cartridge, cassette, or diskette from the system unit and attached devices.

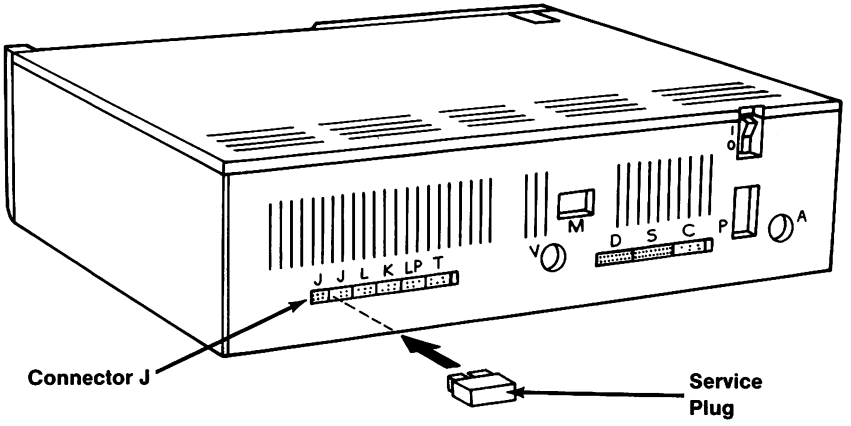
6. If the cordless keyboard is being used without its optional keyboard cord:

   - Position the keyboard within 12 inches of the front of the system unit.

   - Remove any obstructions between the infra-red (IR) emitter in the back of the keyboard and the IR receiver on the system unit.



7. Plug the service plug into the system unit connectors J.



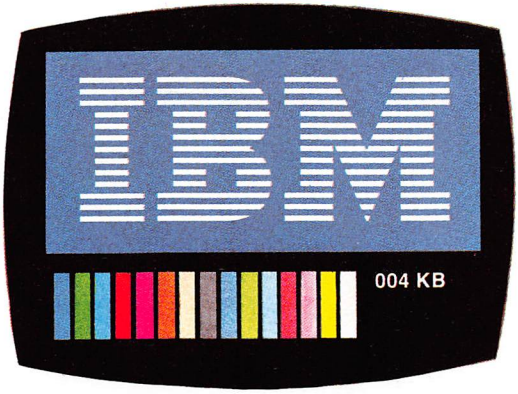
8. Turn the display's brightness, contrast, and volume controls to mid-range.

9. Set the display's Power switch to On.

10. Set the system unit's Power switch to On.

Advanced POST begins as soon as the system unit Power switch is set to On. It takes as long as one minute to complete. While advanced POST is running:

- You see a stable IBM logo and 16-color test pattern on your screen.



- You hear one beep.
- If attached, the diskette drive's red light switches on for a few seconds and then switches off.

When advanced POST completes without detecting a failure, the BASIC screen appears.

```
The IBM Personal Computer Basic
Version C1.20 Copyright IBM Corp.1981
XXXXX Bytes free
OK
_


1 LIST 2 RUN← 3 LOAD" 4 SAVE" 5 CONT←
```

If advanced POST detects a failure, you will receive an incorrect audio response (no beep, two beeps, or three beeps), an incorrect screen, an error message, or any combination of these. In these cases, see the Advanced POST Error Table on page 3-000-8 for the recommended action.

After you have followed the above steps once, all you have to do when asked to perform advanced POST is:

1. Set the system unit's Power switch to Off.
2. Wait five seconds.
3. Set the system unit's Power switch to On.

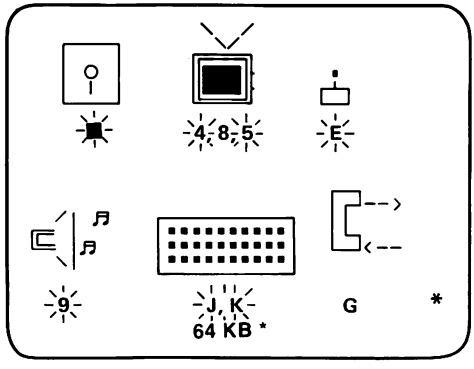
How to Perform Advanced Tests

Advanced tests are the tests you choose from the advanced-test menu. The advanced test menu is stored in the system unit's read only memory (ROM).

When you are asked to bring up the advanced-test menu, follow these steps:

1. Set the system unit's Power switch to On.
2. Wait until advanced POST completes and the BASIC screen appears.
3. Press and hold the Ctrl and Alt keys, and then press the Ins key.
4. Release all keys when the screen goes blank.

The IBM logo appears, the diskette drive (if attached) red light switches on for a moment, and you hear one beep. Then the advanced-test menu appears.

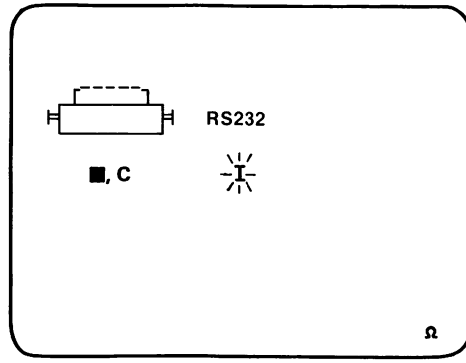


The advanced-test menu consists of symbols, with each symbol representing one area of the IBM PC*jr*. The letters or numbers below the symbols are IDs of tests you can perform. A quick way to determine if you are looking at the advanced-test menu or the customer-level test menu (they look similar) is to observe the ID under the joystick symbol. The advanced-test level has an "E" there. The customer-level has a "6."

Some symbols and IDs appear on the advanced-test menu only when their particular options are attached to the system unit. If one of these options is attached, and it's symbol or ID (shown on page 2-11) does not appear, go to the PIC for that option.

If you see a "*" in the lower right-hand corner of the advanced-test menu, the menu has another page of symbols. When the cursor is moved to the last ID on the screen, moving it again causes this next menu page to appear.

On the last menu page, a "Ω" is in the lower right-hand corner. When the cursor is moved to the last ID on this screen, moving it again causes the first menu page to reappear.

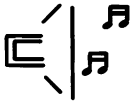


The following chart explains what the symbols on the advanced-test menu represent. An asterick (*) after a description means the symbol appears only when the option is attached to the system unit.

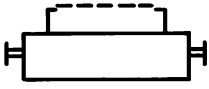
Diskette-drive test

Display and light pen test

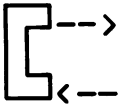
Joystick test



Sound test



Graphics printer test

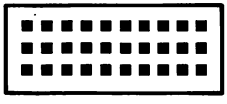


Internal modem test

Compact printer test*

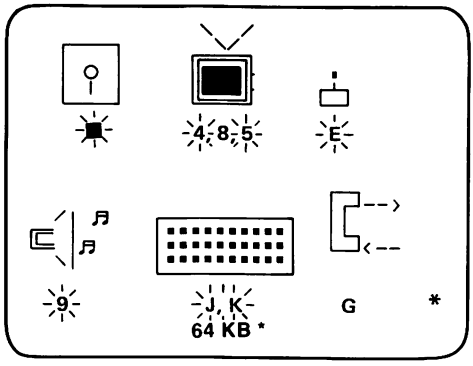
RS232

Serial port test



Keyboard test

When the IBM PC*jr* senses the presence of a device interface, the ID under the symbol for that device blinks. The device interface is the electronic circuitry necessary for the system unit to control a particular device. In the figure below, the interfaces for diskette drive, display, joystick, and sound are sensed.



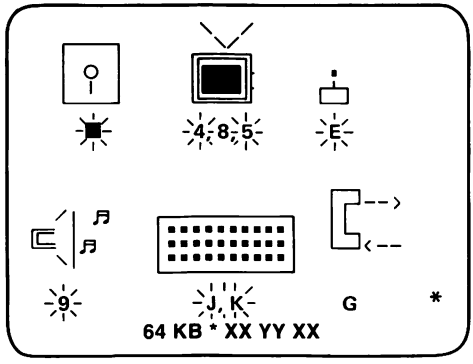
The IDs for joystick and sound always blink because their interfaces are on the system board. The blinking does NOT mean a joystick or external speaker is installed.

The diskette-drive interface is on the diskette-drive adapter. The ID under the diskette-drive symbol therefore blinks only when the diskette-drive adapter is installed.

The IDs "4" and "5" under the display symbol blink all the time. ID "8" blinks when the 64KB memory and display expansion is present. A list of interfaces and their locations follows:

Interface	Location
Compact Printer	Compact Printer
Diskette Drive	Diskette-drive adapter
Display	System board and 64KB memory and display expansion
Graphics Printer	Parallel printer attachment
Internal modem	Internal modem
Joystick	System board
Keyboard	System board
Light pen	System Board
Memory	System board and 64KB memory and display expansion
RS232	System board
Sound	System board

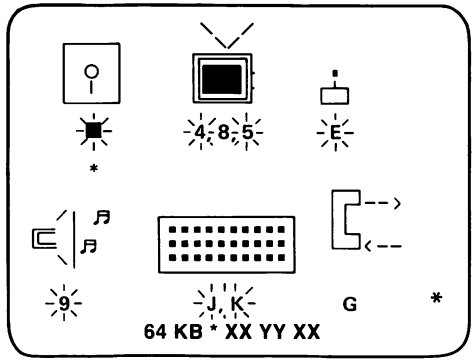
While the advanced-test menu is on your screen, a memory test is running continuously. The number incrementing at the bottom of the screen shows what segment of memory is being tested. If a memory failure is detected, the number stops incrementing and the "*" next to it is replaced by an error message. If this failure occurs, make a note of the error message and go to PIC "Memory."



Before starting an advanced test, go to the PIC for that test. At the beginning of each PIC any special requirements or set-up instructions are explained to you.

You move the cursor to the test's ID by pressing the Ins key. When you are ready to start the test, press the Enter key and the test begins.

The test is finished when a message appears under the symbol's ID. If "*" appears, no failure was detected.



If something other than "*" appears, a failure was detected and you should follow the PIC for that test.

If you want to stop a test that is running, press the Fn key, and then press the B key. Depending on which test is running, you can get one of several responses after pressing Fn-B. The following table lists the responses.

Test Running	Response to Pressing Fn-B
Diskette Drive Graphics Printer Compact Printer Internal Modem Sound	(If the system unit beeps, press Fn-B again.) Test may stop immediately. Message is "FFFF."
Display RS232	Test stops immediately. Message is "FFFF."
Keyboard	The Fn and B keys must be shown on the screen before using them to abort the test. Test stops immediately. Message is "*."
Joystick Light Pen	Test stops immediately. Message is "*."

The "FFFF" message lets you know that the test was stopped before completion.

When you want to remove the advanced-test menu from your screen, press and hold the Ctrl and Alt keys, and then press the Del key.

Section 3. Problem Isolation Charts

Contents

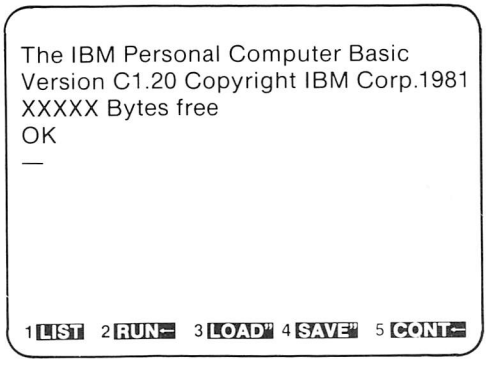
Notes:

Start

This is the entry point for using all of the PICs. Start here when beginning any service activity.

Follow the 10 steps listed in "How to Perform Advanced POST" beginning on page 2-4, then return to here.

Note: If advanced POST successfully completes, the BASIC screen appears.



DID ADVANCED POST SUCCESSFULLY COMPLETE?

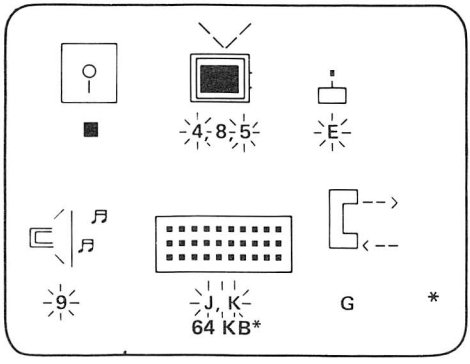
NO Make a note of how advanced POST failed.

Go to the Advanced POST Error Table on page 3-000-8.

YES

Bring up the advanced-test menu to your screen. (If you need instructions on how to bring up the advanced-test menu, go to page 2-8).

The IBM logo appears, the diskette-drive (if attached) red light switches on for a moment, and you hear one beep. Then the advanced-test menu appears.

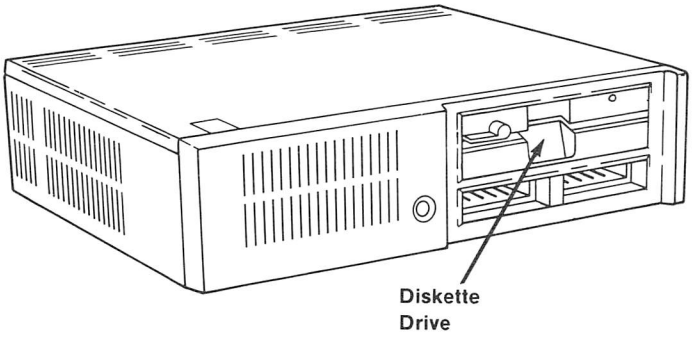


DID THE ADVANCED-TEST MENU APPEAR ON YOUR SCREEN?

NO Go to the PIC "Keyboard" on page 3-300-1.

YES

There may be a diskette drive installed in the system unit.

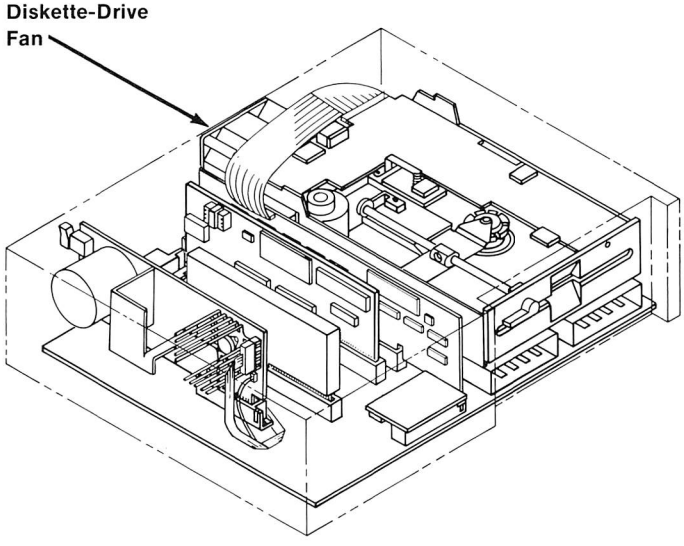


IS A DISKETTE DRIVE INSTALLED IN THE SYSTEM UNIT?

NO Go to page 3-000-5.

YES

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover.
3. Set the system unit's Power switch to On.
4. Observe the diskette-drive fan.



IS THE DISKETTE-DRIVE FAN RUNNING?

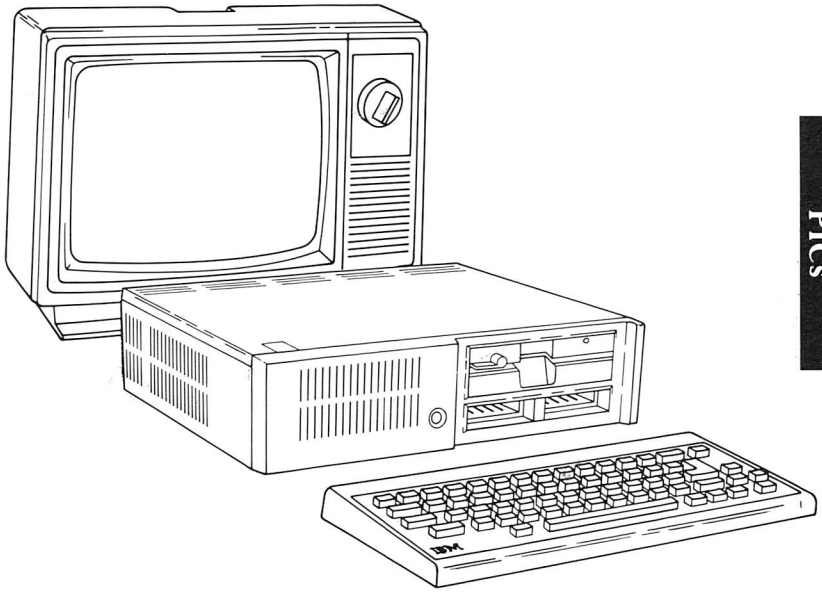
NO Go to page 3-000-6.

YES

You are now ready to proceed with the advanced tests.

If you do not know what area of the IBM PC*jr* may be failing, you have an undetermined problem.

If a failure occurs only occasionally, you have an intermittent problem.



DO YOU HAVE AN UNDETERMINED OR INTERMITTENT PROBLEM?

NO Go to the PIC for the area you want to test. (See the Contents page at the beginning of Section 3 for the PIC locations).

YES Go to the PIC "Undetermined Problem" on page 3-010-1.

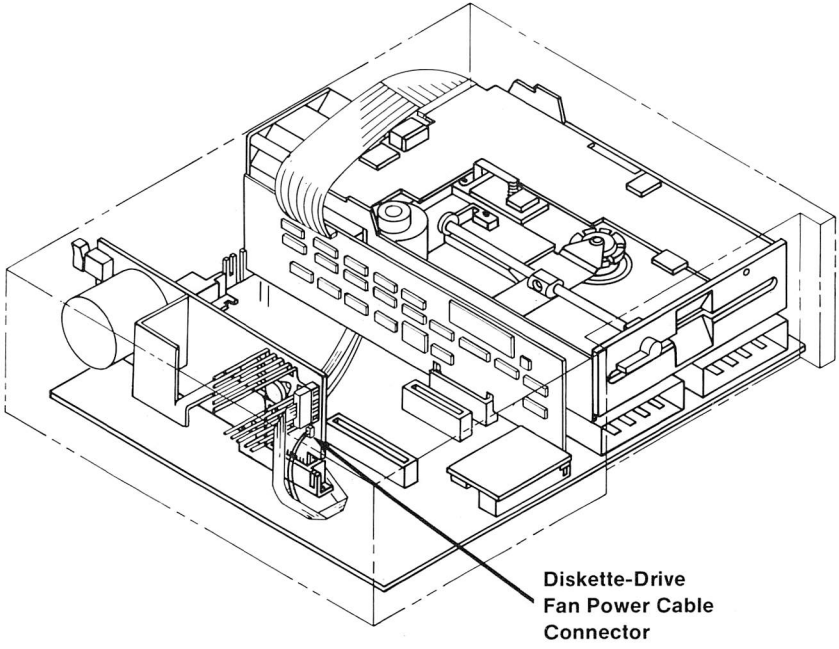
The diskette-drive fan is not running.

1. Set the system unit's Power switch to Off.

   Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit on.

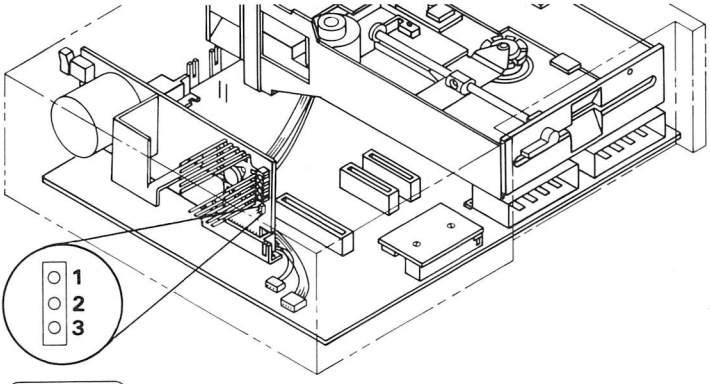
2. Allow the power board to cool.

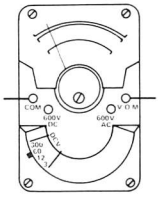
3. Disconnect the diskette-drive fan power cable from the power board.



CONTINUE

4. The voltages at the diskette-drive fan connector on the power board should be within the ranges listed below.





			Low Vdc	High Vdc
Pin 2	to	Pin 1	11.4	12.6
Pin 2	to	Pin 3	11.4	12.6

WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

NO The power board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The diskette-drive fan is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

Advanced POST Error Table (Part 1 of 4)

POST Error	Problem Area	What To Do	Page
No beep. No image or image on screen wrong	Power	Go to PIC "Power."	3-020-1
One beep. No image or image on screen wrong	Display	Go to PIC "Display."	3-500-1
Two beeps. No image or image on screen wrong	Power	Go to PIC "Power."	3-020-1
Three beeps. No image or image on screen wrong	Memory	Replace 64KB memory and display expansion. Repeat advanced POST. If same error, go to PIC "Memory."	4-200-1
"X" can be any number.			
Before replacing any item, ensure that all internal cables are correctly connected. Treat replaced items with care. You may be asked to reattach them.			

Advanced POST Error Table (Part 2 of 4)

POST Error	Problem Area	What To Do	Page
Advanced POST, or portion of it, goes into loop	System board	Replace system board.	4-100-1
No beep. ERROR 0AXX	Memory	Replace system board. Repeat advanced POST. If same error, go to PIC "Power."	4-100-1
No beep. ERROR 0BXX	Memory	Replace 64KB memory and display expansion. Repeat advanced POST. If same error, go to PIC "Memory."	4-200-1
No beep. ERROR 0CXX	Memory	Replace 64KB memory and display expansion. Repeat advanced POST. If same error, go to PIC "Memory."	4-200-1
"X" can be any number.			
Before replacing any item, ensure that all internal cables are correctly connected. Treat replaced items with care. You may be asked to reattach them.			

Advanced POST Error Table (Part 3 of 4)

POST Error	Problem Area	What To Do	Page
No beep. ERROR 1YXX	Memory	Replace system board. Repeat advanced POST. If same error, go to PIC "Power."	4-100-1
No beep. ERROR 2000	Keyboard	Replace keyboard. Repeat advanced POST. If same error, go to PIC "Keyboard."	3-300-1
No beep. ERROR 21XX	Infra-Red	Replace infra-red receiver. Repeat advanced POST. If same error, go to PIC "Keyboard."	4-300-1
No beep. ERROR 22XX	Keyboard	Replace keyboard. Repeat advanced POST. If same message, go to PIC "Keyboard."	3-300-1
"X" can be any number.			
Before replacing any item, ensure that all internal cables are correctly connected. Treat replaced items with care. You may be asked to reattach them.			

Advanced POST Error Table (Part 4 of 4)

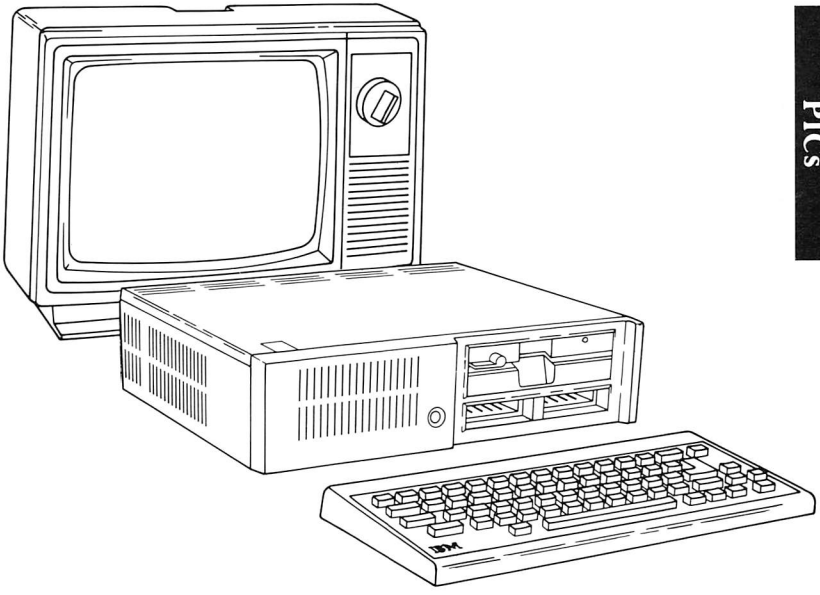
POST Error	Problem Area	What To Do	Page
No beep. ERROR 23XX	Cassette or Serial	Replace system board. Repeat advanced POST. If same error, go to PIC "Power."	4-020-1
No beep. ERROR 24XX	Modem	Replace internal modem.	4-830-1
No beep. ERROR 25XX	Cartridge	Go to PIC "Cartridge."	3-810-1
No beep. ERROR 26XX	Diskette drive	Replace diskette-drive adapter. Repeat advanced POST. Is same message, go to PIC "Diskette Drive."	4-600-1
Any ERROR message not listed in this table	Service plug	Ensure that service plug is good and installed correctly. Repeat advanced POST. If same message, replace system board.	2-6
"X" can be any number.			
Before replacing any item, ensure that all internal cables are correctly connected. Treat replaced items with care. You may be asked to reattach them.			

Notes:

Undetermined Problem

You are entering this PIC for one of the following reasons:

- You have an undetermined problem.
- You have an intermittent problem.



DO YOU HAVE AN UNDETERMINED PROBLEM?

NO Go to page 3-010-4.

YES

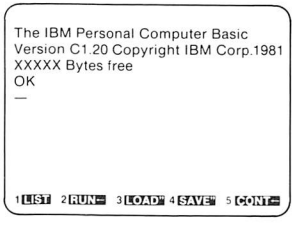
All IBM PC*jr* service activity should begin at the PIC "Start."

Start

This is the entry point for using all of the PICs. Start here when beginning any service activity.

Follow the 10 steps listed in "How to Perform Advanced POST" beginning on page 2-4, then return to here.

Note: If advanced POST successfully completes, the BASIC screen appears.



DID ADVANCED POST SUCCESSFULLY COMPLETE?

PICs

DID YOU FOLLOW THE STEPS IN THE PIC "START"?

NO Go to the PIC "Start" on page 3-000-1.

YES

1. Bring the advanced-test menu to your screen.

2. Perform the advanced tests for all devices attached to the IBM PC*jr*. Before performing an advanced test, refer to that test's PIC for special requirements and set-up instructions.

- Keyboard.
- Display.
- Sound.
- RS232.
- Diskette drive, if present.
- Internal modem, if present.
- Attachable joystick, if present.
- Light pen, if present.
- Parallel printer attachment, if present.
- Graphics printer, if present.

See the Contents page at the beginning of Section 3 for the PIC locations.

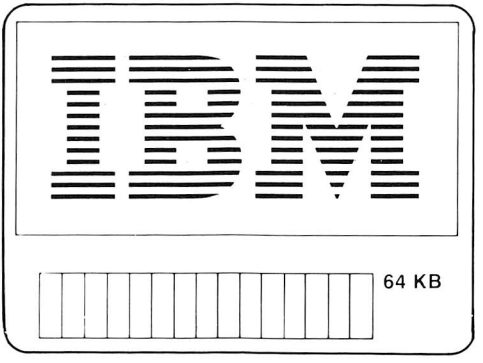
DID ANY OF THE ADVANCED TESTS FAIL?

YES Go to the PIC for the failing device.

NO

You may have an intermittent problem.

Advanced POST can be made to repeat indefinitely. It tests the system board and the memory. The loop stops if a failure in either area is detected.

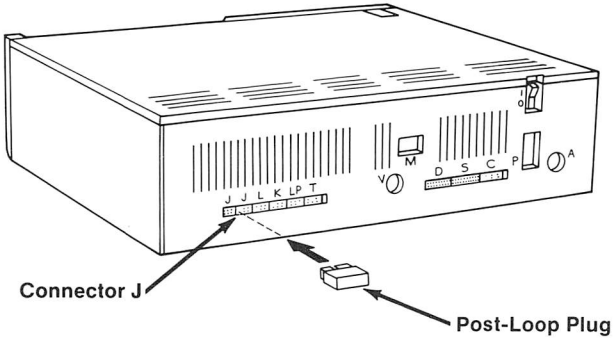


DO YOU WANT TO LOOP THE ADVANCED POST?

NO Go to page 3-010-6.

YES

1. Set the system unit's Power switch to Off.
2. Plug the POST-loop plug into the system unit connector Js.
3. Set the system unit's Power switch to On.



DID ADVANCED POST LOOP SEVERAL TIMES WITHOUT DETECTING A FAILURE?

NO Make a note of the failure.

Go to the Advanced POST Error Table on page 3-000-8.

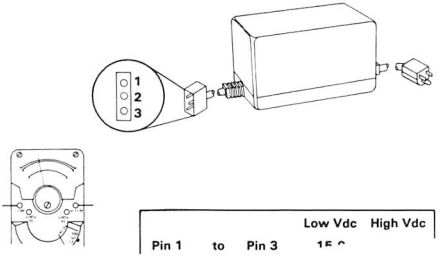
YES

1. Turn to page 3-020-8 in PIC "Power."

2. Ensure that all voltages described on pages 3-020-8 through 3-020-10 are within their specified ranges.

---

1. Set the system unit's Power switch to Off.
2. Unplug the power transformer cable from the system unit connector P.
3. The voltages at the power transformer cable plug should be within the ranges listed below.
4. Measure these voltages now.



			Low Vdc	High Vdc
Pin 1	to	Pin 3	15.0	

ARE ALL THE VOLTAGES WITHIN THEIR SPECIFIED RANGES?

NO The PIC "Power" indicates which FRU is bad. Replace that FRU.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

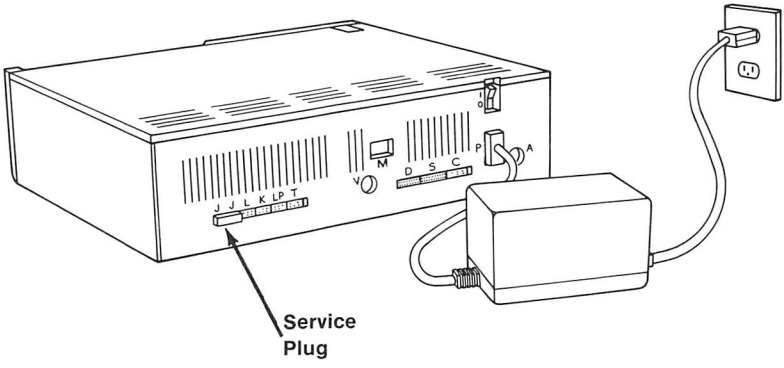
YES You have finished the undetermined problem PIC. If you still have an unsolved problem, you should seek technical assistance.

Power

You were sent here by the Advanced POST Error Table.

1. Set the system unit's Power switch to Off.

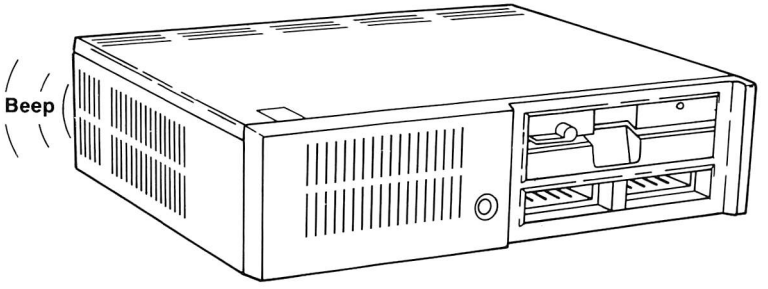
2. Disconnect all devices, except the power cable and service plug, that are attached to the outside of the system unit.



CONTINUE

3. Set the system unit's Power switch to On.

4. Wait one minute.



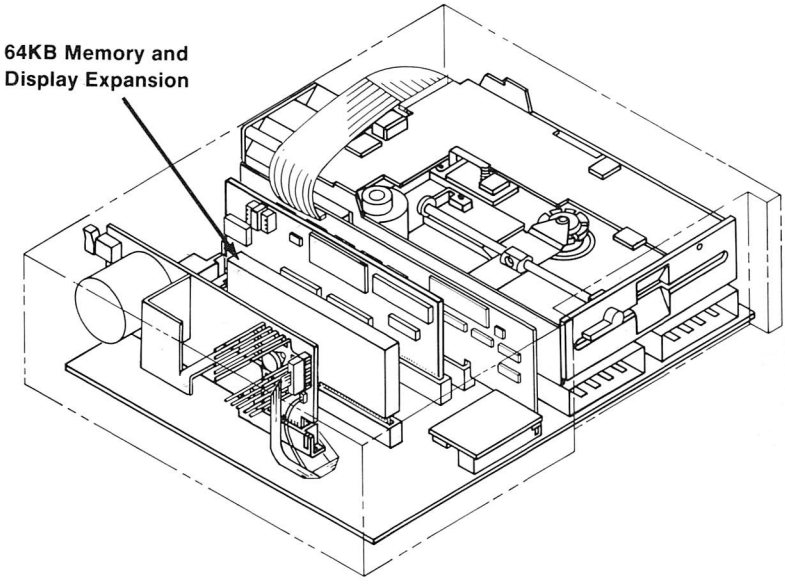
DID YOU HEAR ONE BEEP?

YES One of the detached devices is failing. Reconnect the devices one at a time. Perform advanced POST after each reconnection. (Attach the connector for television first to test it, then attach the television). When the failing symptom returns, replace the device that is causing the failure.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO

A bad 64KB memory and display expansion can cause this problem.

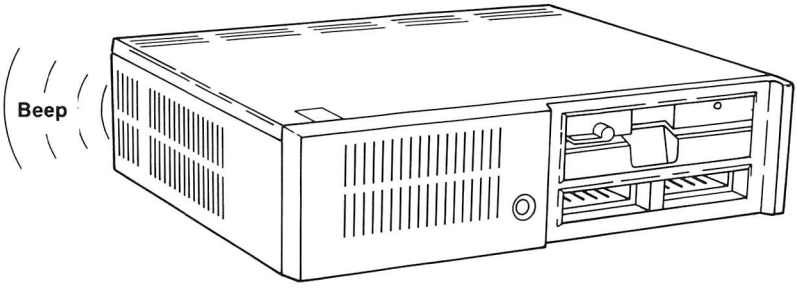


DOES THE SYSTEM UNIT CONTAIN A 64KB MEMORY AND DISPLAY EXPANSION?

NO Go to page 3-020-6.

YES

1. Set the system unit's Power switch to Off.
2. Remove the 64KB memory and display expansion and set it aside.
3. Perform advanced POST.

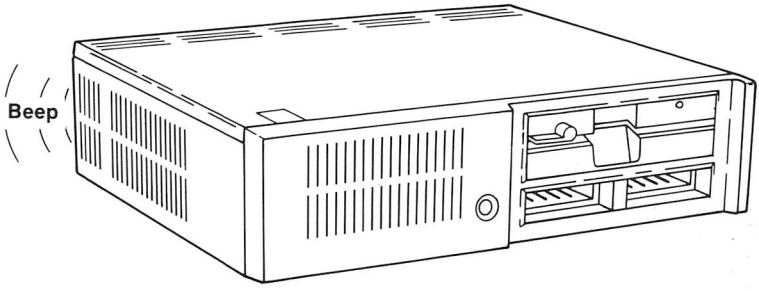


DID YOU HEAR ONE BEEP?

NO Go to page 3-020-6.

YES

1. Set the system unit's Power switch to Off.
2. Install a new 64KB memory and display expansion.
3. Perform advanced POST.



DID YOU HEAR ONE BEEP?

YES The problem has been corrected.

Reconnect all removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO The system board is bad. Replace it.

Reattach the original 64KB memory and display expansion.

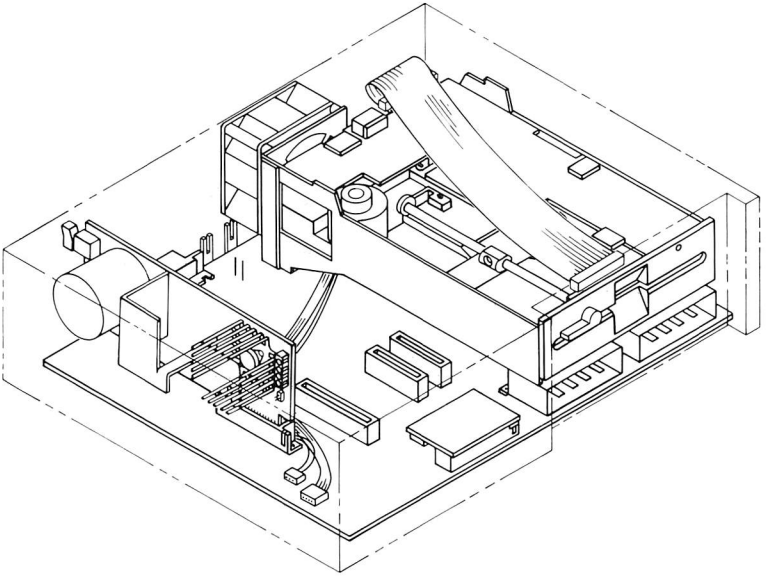
Reconnect all other removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Set the system unit's Power switch to Off.

2. If any of these items are present, disconnect them from the system board and power board.

   - Diskette-drive adapter
   - Diskette-drive power cable
   - Diskette-drive fan power cable
   - Internal modem

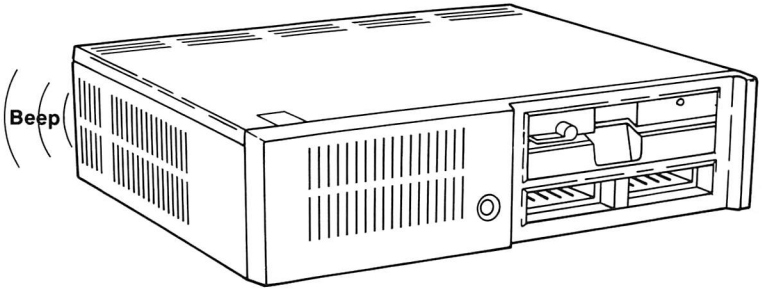
   If present, you can keep the diskette drive in the system unit.



CONTINUE

3. Set the system unit's Power switch to On.

4. Wait one minute.



DID YOU HEAR ONE BEEP?

YES One of the items removed is failing. Reconnect them one at a time. Perform advanced POST after each reconnection. When the failing symptom returns, replace the item that is causing the failure.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

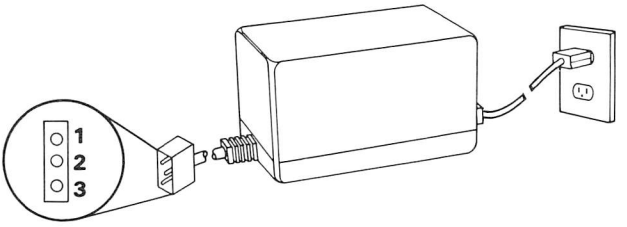
NO

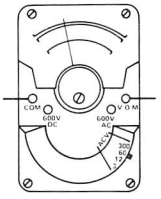
1. Set the system unit's Power switch to Off.

2. Unplug the power transformer cable from the system unit connector P.

3. The voltages at the power transformer cable plug should be within the ranges listed below.

4. Measure these voltages now.





			Low Vac	High Vac
Pin 1	to	Pin 3	15.0	30.0

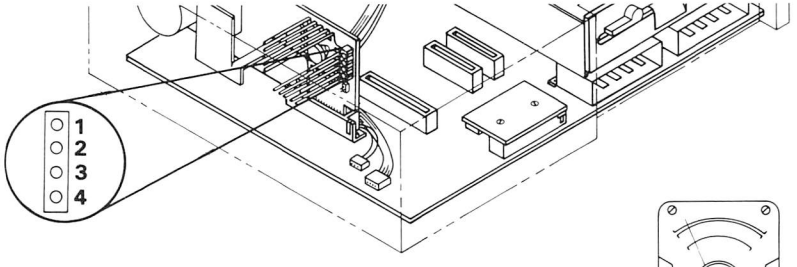
WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

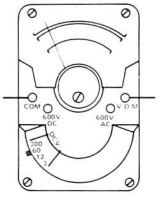
NO The power transformer is bad. Replace it.

Reconnect all removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Set the system unit's Power switch to Off.
2. Disconnect the diskette-drive power cable and the diskette-drive fan power cable.
3. Plug the power transformer cable into the system unit connector P.
4. Set the system unit's Power switch to On.
5. The voltages at the diskette-drive power cable connector on the power board should be within the ranges listed below.
6. Measure these voltages now.





			Low Vdc	High Vdc
Pin 1	to	Pin 2	11.4	12.6
Pin 4	to	Pin 3	4.7	5.3

WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

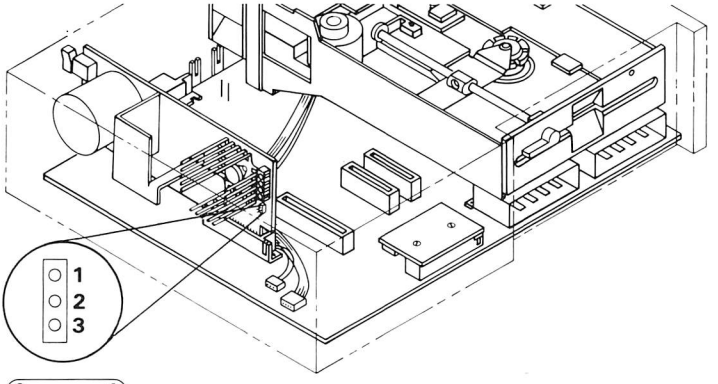
NO The power board is bad. Replace it.

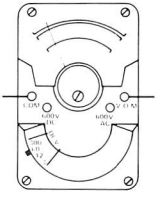
Reconnect all removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

The voltages at the diskette-drive fan power cable connector on the power board should be within the ranges listed below.

Measure these voltages now.





			Low Vdc	High Vdc
Pin 2	to	Pin 1	11.4	12.6
Pin 2	to	Pin 3	11.4	12.6

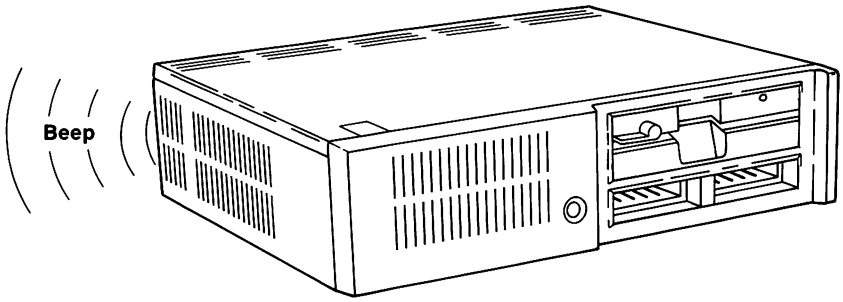
WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

NO The power board is bad. Replace it.

Reconnect all removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Set the system unit's Power switch to Off.
2. Remove the power board and set it aside. Make a note that this is power board #1.
3. Attach a new power board. Make a note that this is power board #2.
4. Set the system unit's Power switch to On.
5. Wait one minute.



DID YOU HEAR ONE BEEP?

YES The problem has been corrected. Reconnect all removed items, then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

Notes:

Memory

You are entering this PIC for one of the following reasons:

- You were sent here by the Advanced POST Error Table.
- While the advanced-test menu was on your screen, the memory test detected a failure.
- The amount of memory shown on your screen during advanced POST does not correspond to the amount of memory installed.

Advanced POST Error Table (Part 1 of 4)

POST Error	Problem Area	What To Do	Page
No beep. No image or image on screen wrong	Power	Go to PIC "Power."	3-020-1
One beep. No image or image on screen wrong	Display	Go to PIC "Display."	3-500-1

WERE YOU SENT HERE BY THE ADVANCED POST ERROR TABLE?

NO Go to page 3-200-3.

YES

You should have already replaced the 64KB memory and display expansion.

1. Replace the system board.

2. Reattach the original 64KB memory and display expansion.

3. Perform advanced POST.

DID YOU GET AN ADVANCED POST ERROR MESSAGE?

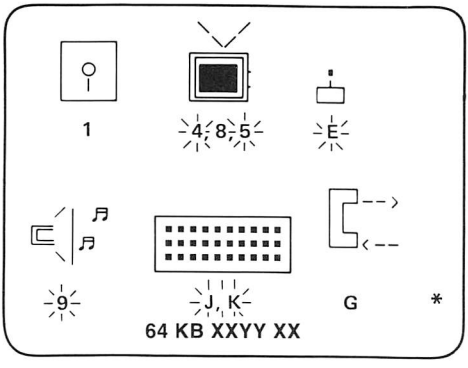
NO The problem has been corrected.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The original 64KB memory and display expansion is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

You may be here because, while the advanced-test menu was on your screen, the number at the bottom of the screen stopped incrementing and the "*" next to it was replaced by an error message. This indicates a memory failure.



DID YOU HAVE A MEMORY FAILURE AS DESCRIBED ABOVE?

NO Go to page 3-200-5.

YES

1. Note the number that replaced the "*". Its format is "XXYY XX".

2. Compare the number you noted with the numbers in the MESSAGE column of the chart below.

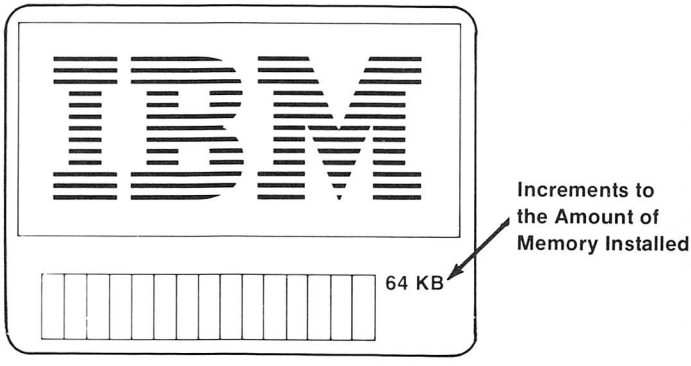
Message	Recommended Action
XX00 XX	Replace the 64KB memory and display expansion.
XX01 XX	Replace the system board.
"X" can be any number.	

Do the recommended action for your noted number.

Then repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

You may be here because the amount of memory shown on your screen during advanced POST does not correspond to the amount of memory installed in the system unit.

For example, the amount of memory shown during advanced POST may increment to only 64KB even with the 64KB memory and display expansion installed.



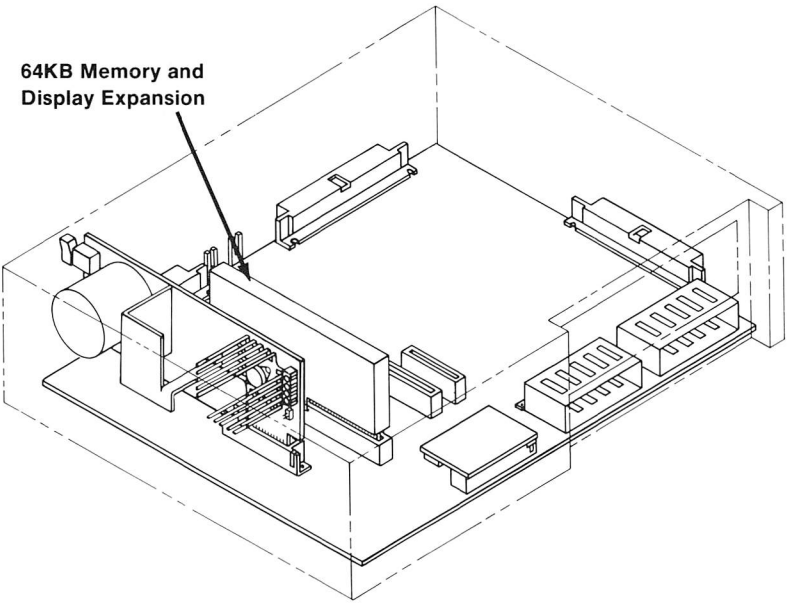
DID YOU HAVE A MEMORY FAILURE AS DESCRIBED ABOVE?

NO If you suspect an intermittent memory problem, go to the PIC "Undetermined Problem" on page 3-010-1.

You have finished the memory PIC. If you still have an unsolved problem, you should seek technical assistance.

YES

Note how much memory is installed in the system unit.



DOES THE SYSTEM UNIT CONTAIN A 64KB MEMORY AND DISPLAY EXPANSION?

NO The system board is bad. Replace it.

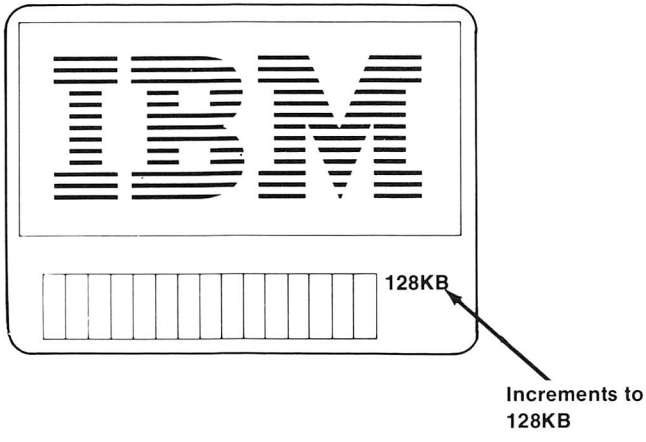
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Set the system unit's Power switch to Off.

2. Reseat the 64KB memory and display expansion by disconnecting it from the system unit, and then reconnecting it.

3. Perform advanced POST.



DOES "128KB" EVER SHOW ON YOUR SCREEN DURING ADVANCED POST?

YES The problem has been corrected.

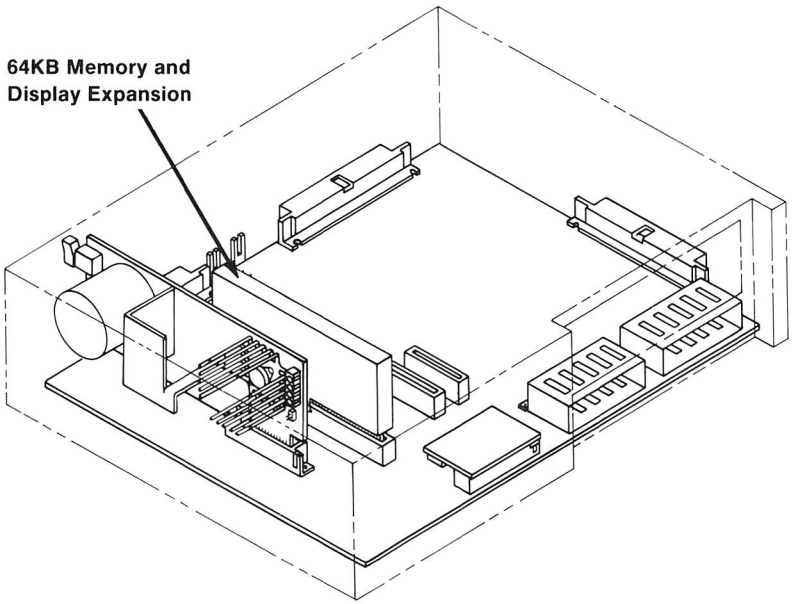
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO

1. Set the system unit's Power switch to Off.

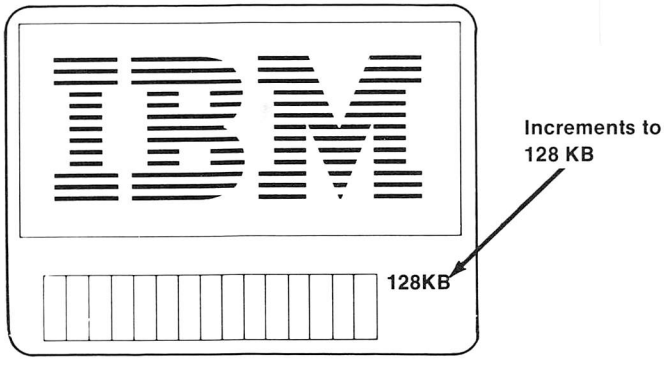
2. Remove the 64KB memory and display expansion and set it aside. Make a note that this is 64KB memory and display expansion #1.

3. Attach a new 64KB memory and display expansion. Make a note that this is 64KB memory and display expansion #2.



CONTINUE

4. Perform advanced POST.



DOES "128KB" EVER SHOW ON YOUR SCREEN DURING ADVANCED POST?

NO The system board is bad. Replace it.

Reattach the original 64KB memory and display expansion if you previously replaced it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

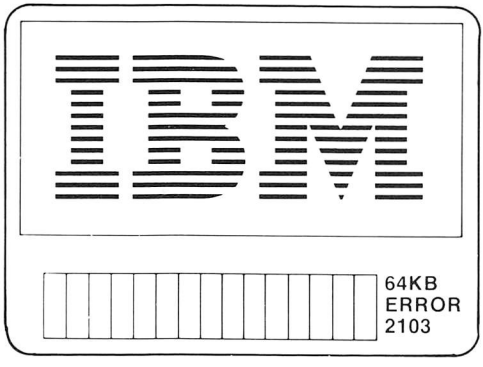
YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

Notes:

Keyboard

You are entering this PIC for one of the following reasons:

- The Advanced POST Error Table, the PIC "Start," or the PIC "Keyboard" sent you here.
- You want to perform the keyboard advanced test.

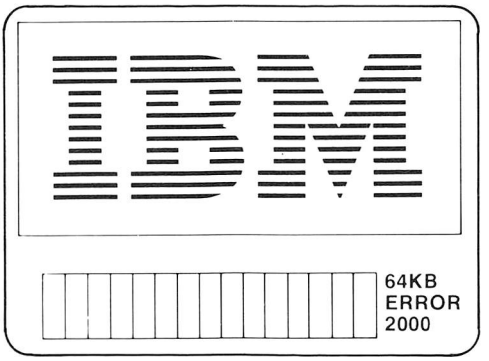


ARE YOU ENTERING THIS PIC BECAUSE ERROR "21XX" APPEARED DURING ADVANCED POST?

YES You should have already replaced the infra-red receiver. Go to page 3-300-4.

NO

Error "2000" or "22XX" may have appeared during advanced POST.



ARE YOU ENTERING THIS PIC BECAUSE ERROR "2000" OR "22XX" APPEARED DURING ADVANCED POST?

NO Go to page 3-300-5.

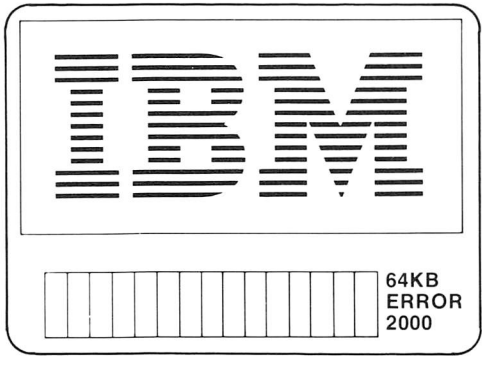
YES

You should have already replaced the keyboard.

1. Replace the infra-red receiver.

2. The original keyboard is good. Set it in front of the system unit instead of using the replacement keyboard.

3. Perform advanced POST.

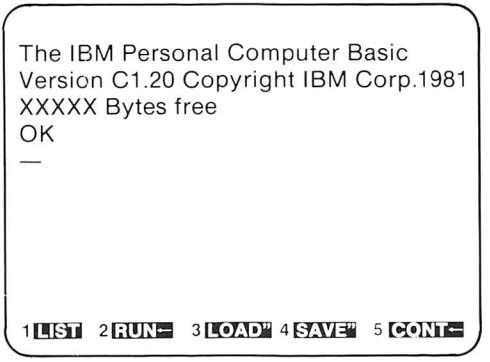


DID ADVANCED POST ERROR "2000" OR "22XX" APPEAR?

NO The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Replace the system board.
2. Reattach the original infra-red receiver.
3. Perform advanced POST.



DID ADVANCED POST SUCCESSFULLY COMPLETE?

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

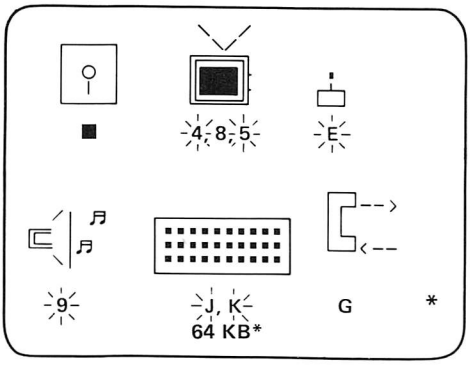
NO You have finished the keyboard PIC. If you still have an unsolved problem, you should seek technical assistance.

1. Set the system unit's Power switch to On.

2. When the BASIC screen appears, press and hold the Ctrl and Alt keys, and then press the Ins key.

3. Release the keys when the screen goes blank.

The IBM logo appears, the diskette drive (if attached) red light switches on for a moment, and the system unit beeps once. Then the advanced-test menu appears.



DID THE ADVANCED-TEST MENU APPEAR?

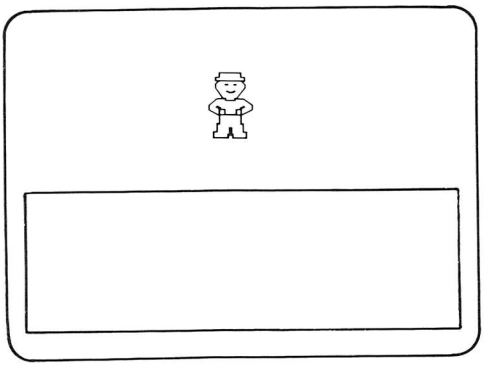
NO Go to page 3-300-10.

YES

1. Move the cursor to ID "J" under the keyboard symbol.

2. Press the Enter key.

3. The keyboard test screen should appear on your screen.



DID THE KEYBOARD TEST SCREEN APPEAR?

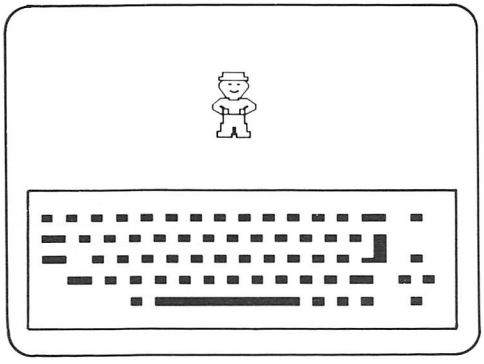
NO Go to page 3-300-10.

YES

Press each key on the keyboard once.

1. When you press a key, a block is placed inside the box. It's position corresponds with the key's approximate position on the keyboard.

2. Letters, numbers, and symbols should appear across the top of the test screen as their keys are pressed. When the top of the test screen is full, press the Enter key to erase the line of typing.



DID THE ACTIONS DESCRIBED ABOVE OCCUR?

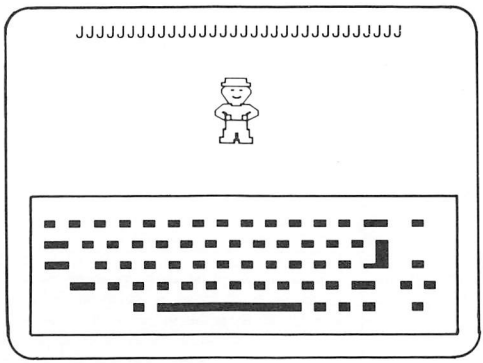
NO Go to page 3-300-10.

YES

1. Press the Enter key once.

2. Press and hold the J key.

This tests typematic action. The letter J should repeat at the top of the screen while you hold down the J key. You may press the Enter key to clear the top line and repeat the typematic test for other keys.



DID THE ACTIONS DESCRIBED ABOVE OCCUR?

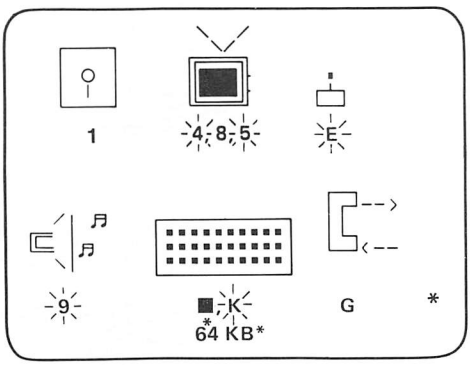
NO Go to page 3-300-10.

YES

1. Press the Fn key once.

2. Press the B key once.

The advanced-test menu should appear on your screen.

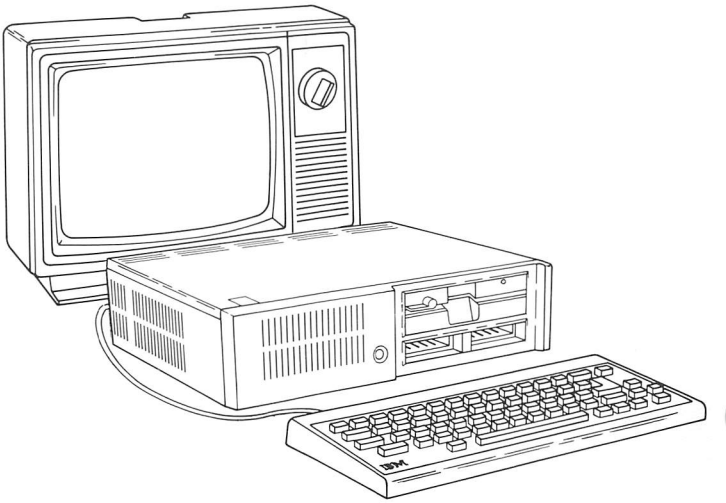


DO YOU HAVE " * " UNDER THE KEYBOARD SYMBOL?

YES You have finished the keyboard PIC. If you still have an unsolved problem, you should seek technical assistance.

NO

You have detected a keyboard failure.



ARE YOU TESTING A KEYBOARD THAT IS CONNECTED TO THE SYSTEM UNIT WITH A KEYBOARD CORD?

YES Go to page 3-300-12.

NO

Do the suggested actions listed below. After each action, go to page 3-300-1 and start the PIC "Keyboard" again. If you are sent back to this page, do the next suggested action on the list.

Note: Only one system unit using the infra-red link can be used in a room. infra-red signals from several keyboards can be received and accepted by any system unit, thereby causing input errors. If you need more than one IBM PC*jr* in a room, only one can use a keyboard not connected by keyboard cord to its system unit. (The keyboard cord disables the keyboard's infra-red transmitter and the system unit's infra-red receiver.)

Suggested actions:

1. Replace the batteries in the keyboard with good batteries. (THEN GO TO PAGE 3-300-1).

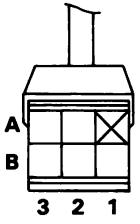
2. Replace the keyboard. (THEN GO TO PAGE 3-300-1).

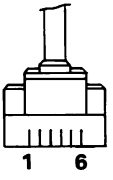
3. Replace the system board. The original keyboard is good. Set it in front of the system unit instead of using the replacement keyboard. (THEN GO TO PAGE 3-300-1).

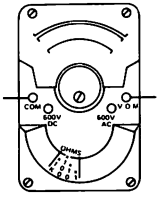
4. You have finished the keyboard PIC. If you still have an unsolved problem, you should seek technical assistance.

You are testing the keyboard with the keyboard cord attached.

1. Set the system unit's Power switch to Off.
2. Disconnect the keyboard cord from the system unit and the keyboard.
3. Check the continuity of the keyboard cord.







2 x 3 Connector from Pin:	Keyboard Plug to pin:
A2	5
B2	2
B3	4

IS THE CORD OK?

NO The keyboard cord is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES Reattach the keyboard cord.

Go to page 3-300-11 and follow its procedure. Ignore suggested action 1.

Display

You are entering this PIC for one of the following reasons:

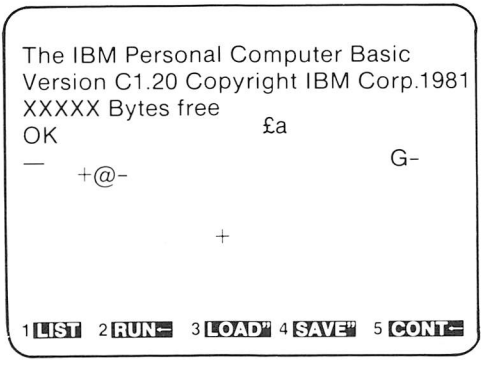
- The Advanced POST Error Table sent you here.
- Characters or symbols randomly appear on your screen.
- You have another display problem.

When using this PIC, you may notice that some colors on your display are different from those in the manual. This is not necessarily an error condition. Different brands and types of displays exhibit slight color differences.

You should be concerned with the shape and positioning of the figures on the screen more than their tints.

CONTINUE 

Characters or symbols may randomly appear on your screen while the IBM PC*jr* is being used.



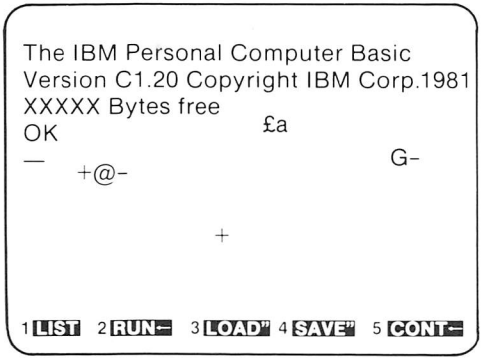
DO CHARACTERS OR SYMBOLS RANDOMLY APPEAR ON YOUR SCREEN?

NO Go to page 3-500-4.

YES

You have a memory problem.

1. Set the system unit's Power switch to Off.
2. Replace the 64KB memory and display expansion.
3. Perform advanced POST.



DO CHARACTERS OR SYMBOLS RANDOMLY APPEAR ON YOUR SCREEN?

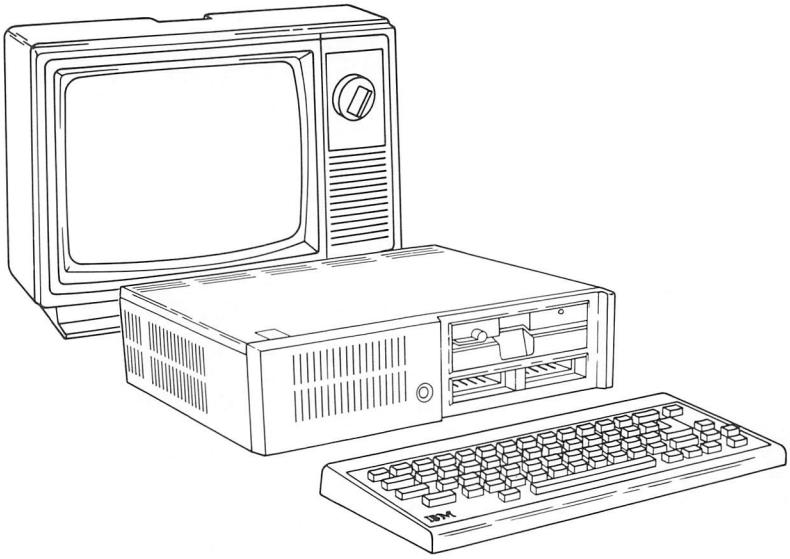
YES The system board is bad. Replace it.

Reinstall the original 64KB memory and display expansion.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

You may have something other than a television attached to the system unit.

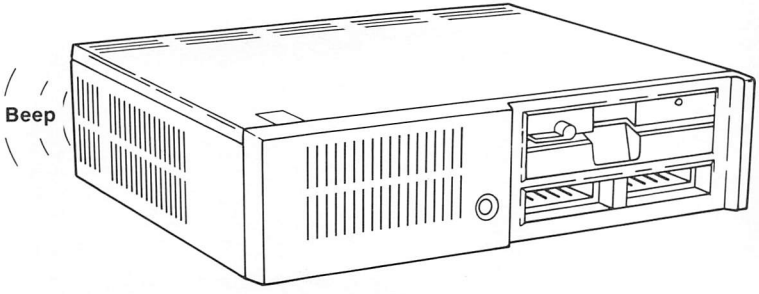


IS A TELEVISION ATTACHED TO THE SYSTEM UNIT?

NO Go to page 3-500-21.

YES

1. Perform advanced POST.
2. Wait one minute.

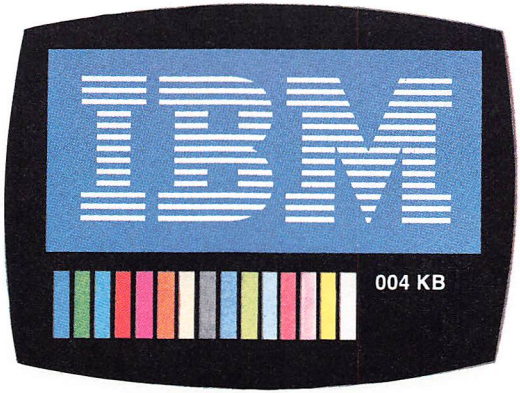


DID YOU HEAR ONE BEEP?

NO Go to the PIC "Power" on page 3-020-1.

YES

1. Be sure that the television is functioning correctly.
2. Set the channel select switch on the connector for television to the proper channel (3 or 4) for your area.
3. Set the Computer/Television switch on the connector for television to "Computer."
4. Turn the television's brightness and contrast controls to the mid-range.
5. Perform advanced POST.

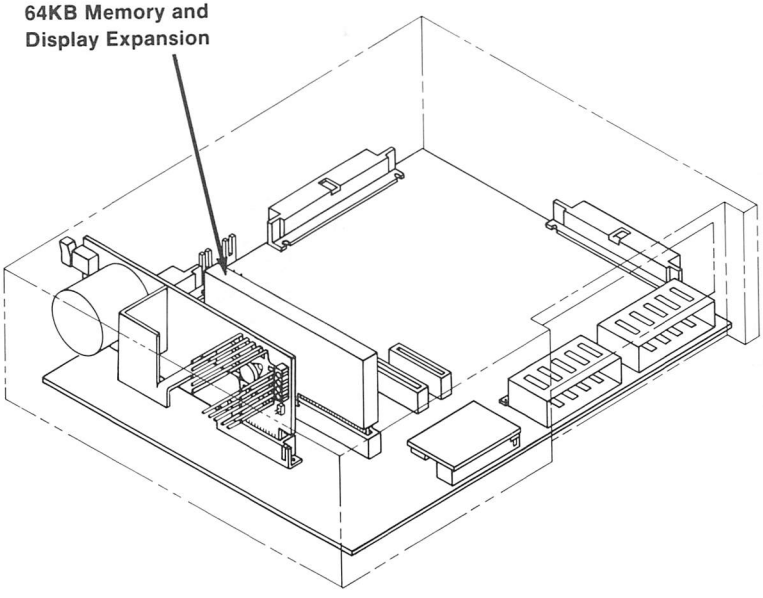


DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

YES Go to page 3-500-11.

NO

A bad 64KB memory and display expansion can cause this problem.

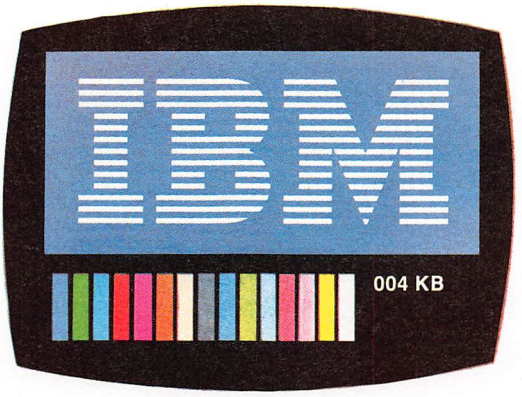


DOES THE SYSTEM UNIT CONTAIN A 64KB MEMORY AND DISPLAY EXPANSION?

NO Go to page 3-500-9.

YES

1. Set the system unit's Power switch to Off.
2. Remove the 64KB memory and display expansion.
3. Perform advanced POST.



DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

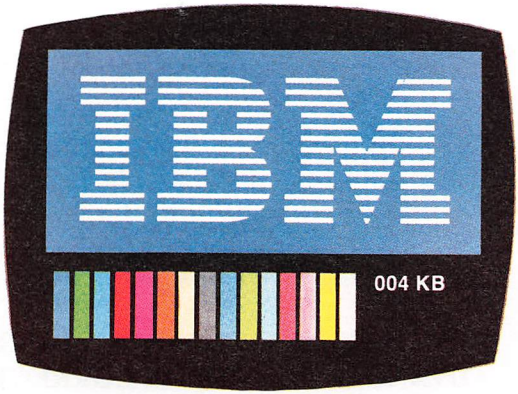
YES The 64KB memory and display expansion is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO Reattach the 64KB memory and display expansion.

Continue to the next page.

1. Set the system unit's Power switch to Off.
2. Remove the power board and set it aside. Make a note that this is power board #1.
3. Attach a new power board. Make a note that this is power board #2.
4. Perform advanced POST.



DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO Reattach the original power board (Power board #1).

Continue to the next page.

1. Set the system unit's Power switch to Off.

2. Remove the connector for television and set it aside. Make a note that this is connector for television #1.

3. Attach a new connector for television. Make a note that this is connector for television #2.

4. Perform advanced POST.

DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO The system board is bad. Replace it.

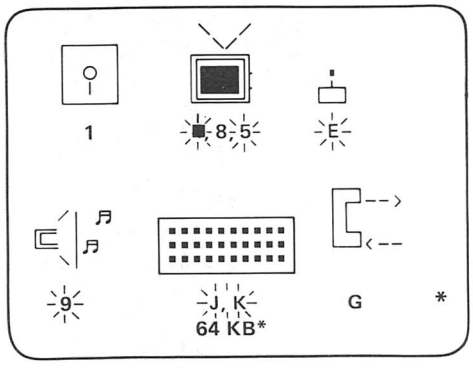
Reattach the original connector for television (connector for television #1)

Repeat the advanced POST and advanced tests to ensure that the IBM PC*jr* is operating correctly.

You heard one beep and the IBM logo looked correct during advanced POST.

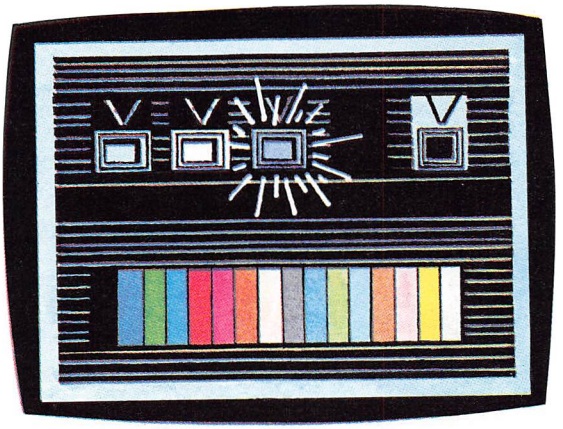
1. Bring the advanced-test menu to your screen.

2. Move the cursor to ID "4" under the display symbol.



CONTINUE

Press the Enter key once.



1. White
2. Hi-intensity White
3. Blinking
4. Blank
5. Reverse Image

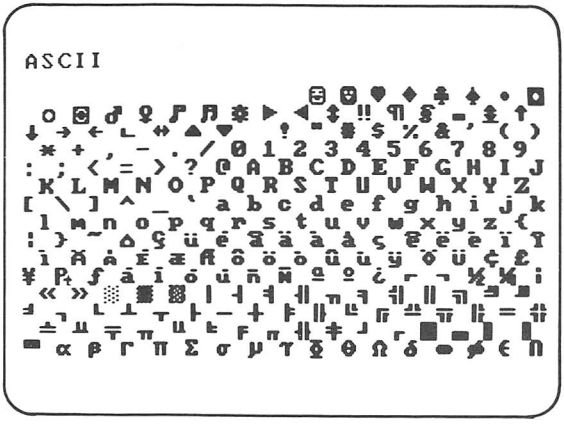
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



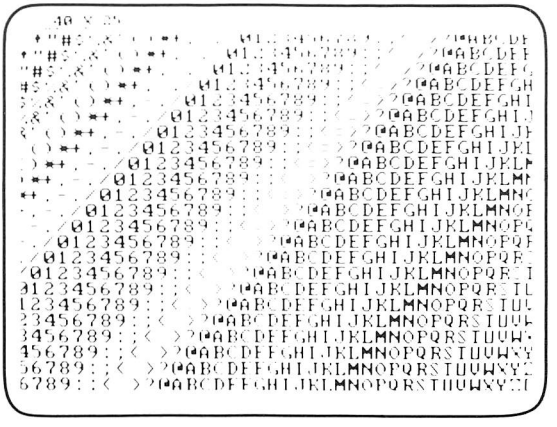
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



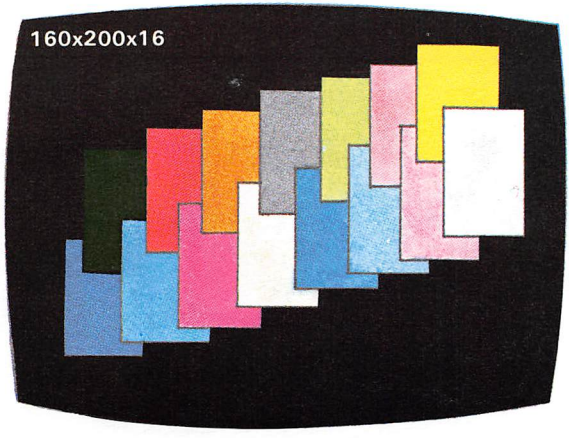
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

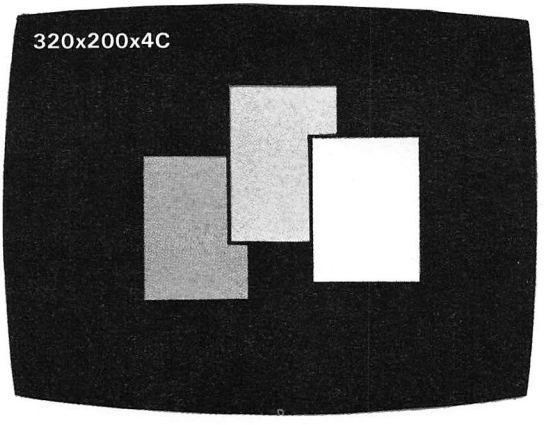
NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.

- If a television or composite display is attached to the system unit, the image should be in black and white.
- If an RGB display is attached to the system unit, the image should be in color.



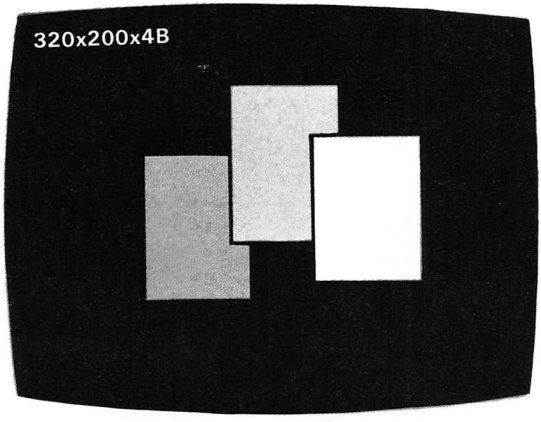
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



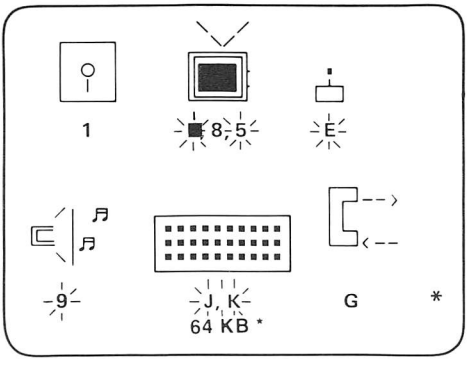
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

The PIC now branches according to whether you selected ID "4" or ID "8" from under the display symbol.



DID YOU SELECT ID "4" TO PERFORM THIS TEST?

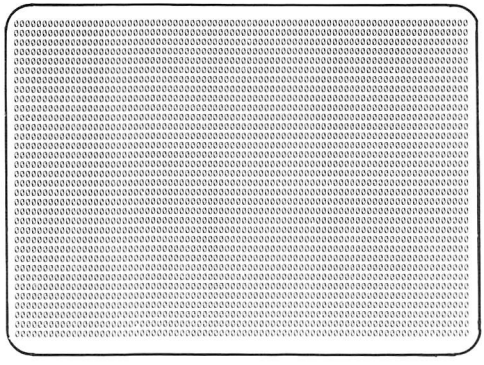
NO Go to page 3-500-33.

YES

Press the Ins key once.

Video page 0 should be on your screen.

Press the Ins key seven times to scroll through the video pages 0 through 7. Look for any discrepancy in the listings of numbers on each page.



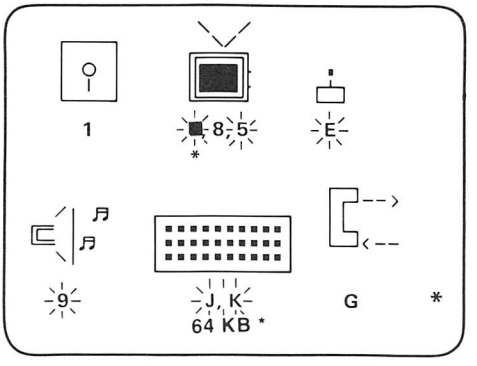
WERE ALL VIDEO PAGES DISPLAYED CORRECTLY?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

If you still have video page 7 on your screen, press the Ins key. Several uniformly colored screens will scroll by (gray shades on televisions and composite displays, color on RGB displays); then the advanced-test menu will appear.



DO YOU HAVE " * " UNDER THE DISPLAY SYMBOL?

NO The system board is bad. Replace it.

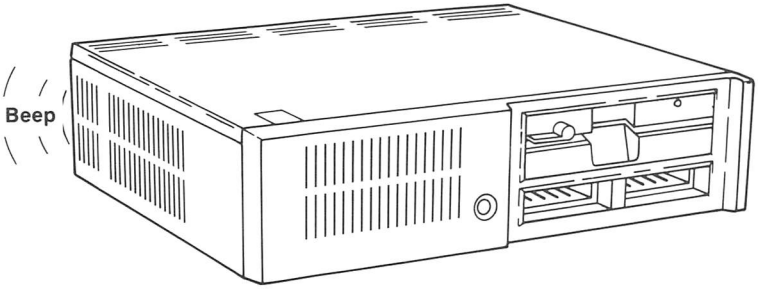
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES You have finished the display PIC. If you still have an unsolved problem, you should seek technical assistance.

You have something other than a television attached to the system unit.

1. Perform advanced POST.

2. Wait one minute.

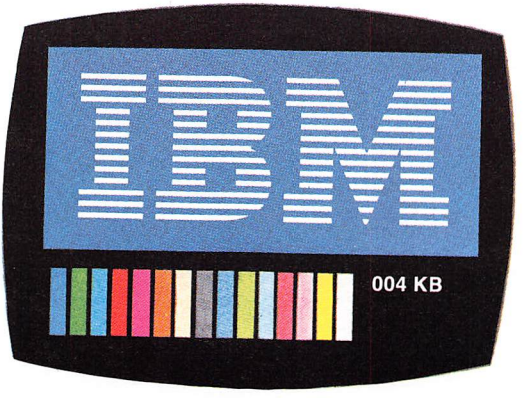


DID YOU HEAR ONE BEEP?

NO Go to the PIC "Power" on page 3-020-1.

YES

Perform advanced POST.

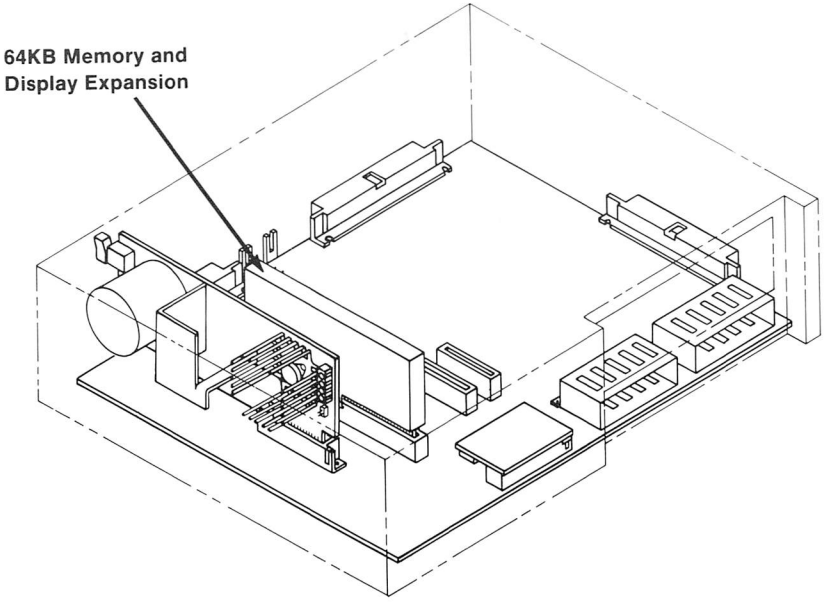


DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

YES Go to page 3-500-25.

NO

A bad 64KB memory and display expansion can cause this problem.

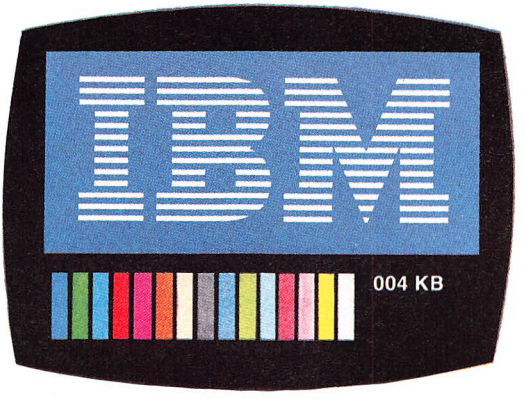


DOES THE SYSTEM UNIT CONTAIN A 64KB MEMORY AND DISPLAY EXPANSION?

NO Go to page 3-500-25.

YES

1. Set the system unit Power switch to Off.
2. Remove the 64KB memory and display expansion.
3. Perform advanced POST.



DID THE IBM LOGO SHOWN DURING ADVANCED POST LOOK CORRECT AND STABLE?

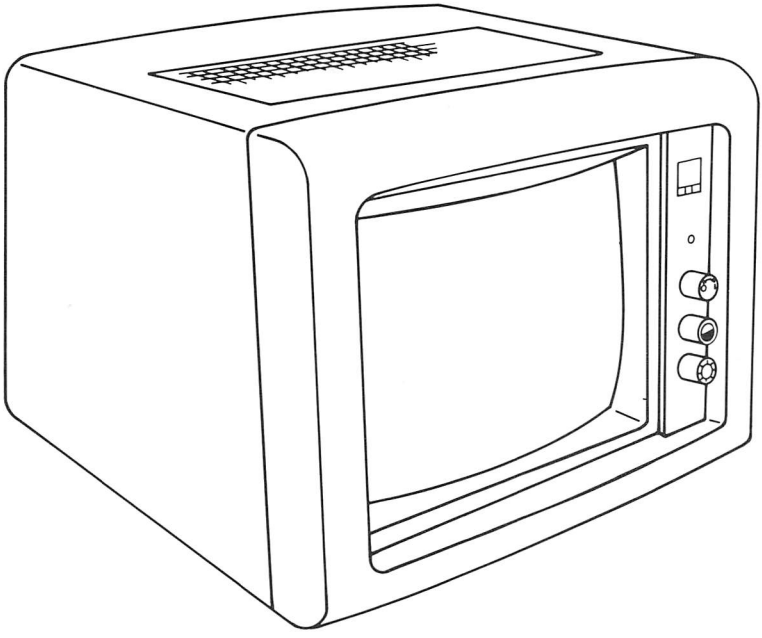
YES The 64KB memory and display expansion is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO Reattach the 64KB memory and display expansion.

Continue to the next page.

You might be testing an IBM Color Display.

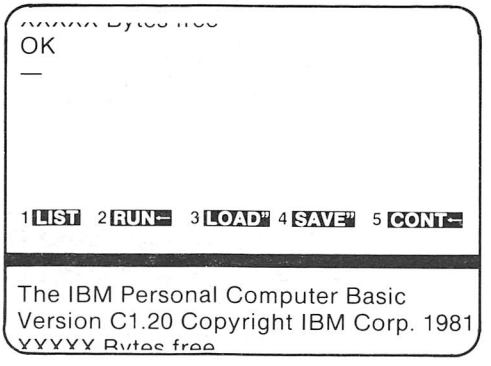


DO YOU HAVE AN IBM COLOR DISPLAY ATTACHED TO THE SYSTEM UNIT?

NO Go to page 3-500-28.

YES

The problem with your IBM Color display may be that the screen is rolling top-to-bottom or bottom-to-top (vertical hold not properly adjusted).

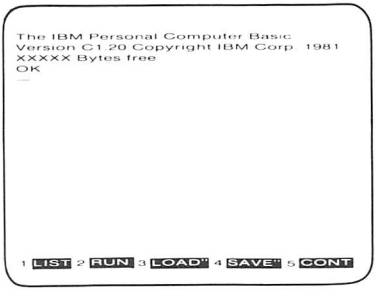


IS THE SCREEN STABLE?

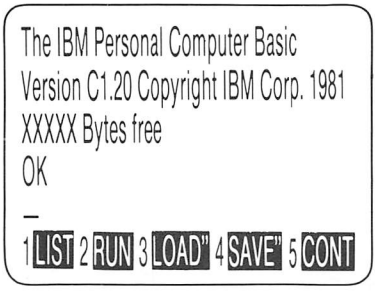
NO Go to Section 4, "Removal/Replacement and Adjustments," and perform the IBM Color Display Vertical Hold Adjustment. Then go to page 3-500-27.

YES

The problem with your IBM Color display may be that the characters on the screen are the wrong size (vertical size not properly adjusted).



Too Short



Too Tall

PICs

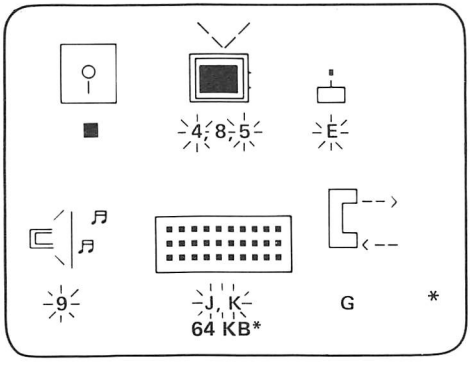
ARE THE CHARACTERS THE CORRECT SIZE?

NO Go to Section 4, "Removal/Replacement and Adjustments," and perform the IBM Color Display Vertical Size Adjustment. Then go to page 3-500-28.

YES

Bring the advanced-test menu to your screen.

The advanced-test menu may be unstable and as a result unreadable.

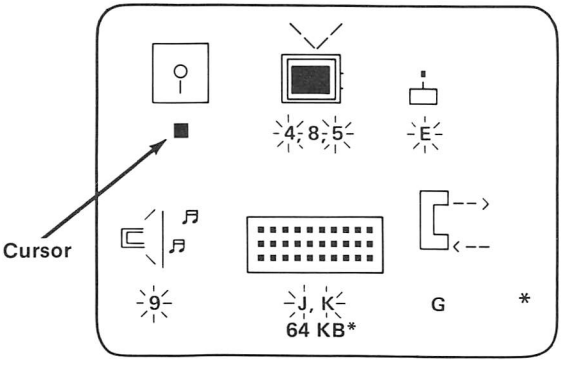


IS THE ADVANCED-TEST MENU STABLE ON YOUR SCREEN?

NO Go to page 3-500-38.

YES

The display may function correctly except that the cursor is missing.



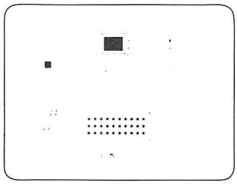
IS THE CURSOR VISIBLE?

NO The system board is bad. Replace it.

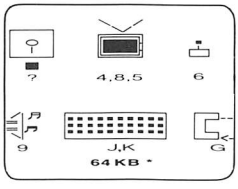
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

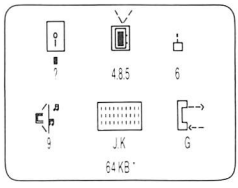
The screen may be distorted or the characters may be the wrong size.



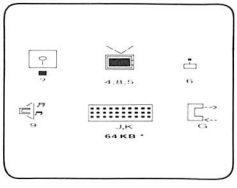
Too Dim



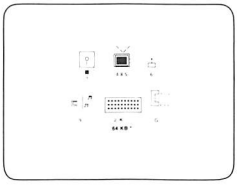
Too Wide



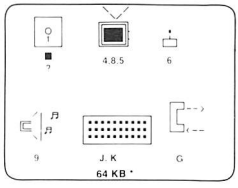
Too Narrow



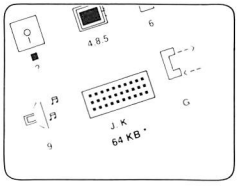
Too Short



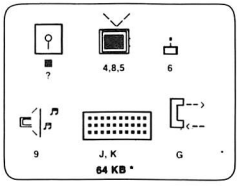
Shrunken



Changes Size When Brightness Control Turned



Tilted



Out of Focus

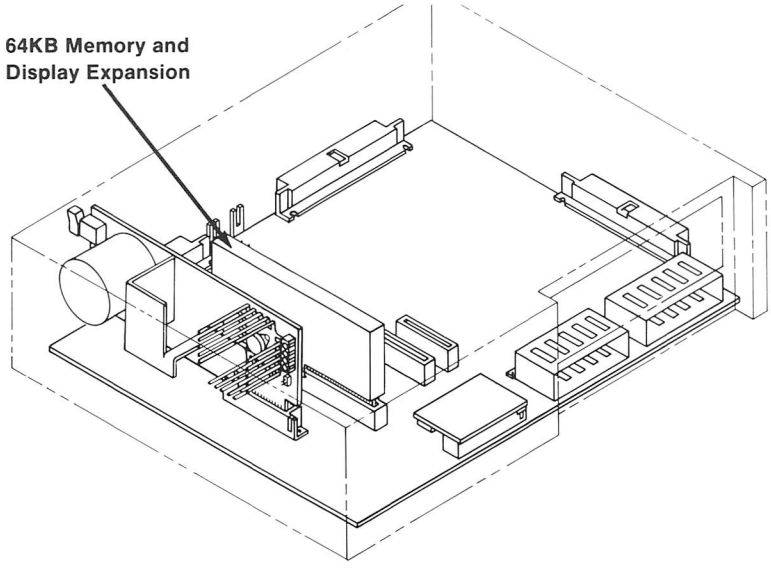
DOES YOUR SCREEN LOOK SIMILAR TO ONE OF THE EXAMPLES?

YES Go to page 3-500-38.

NO

High-resolution (80-column) test screens are shown if you chose ID "8" under the display symbol.

To show these high-resolution test screens, the system unit must have the 64KB memory and display expansion installed.



IS A 64KB MEMORY AND DISPLAY EXPANSION INSTALLED?

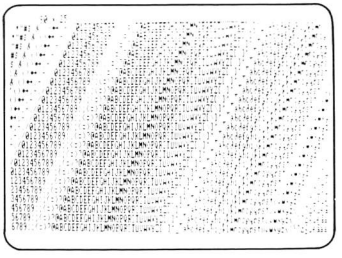
NO You cannot choose test ID "8."

Move the cursor to "4" under the display symbol.

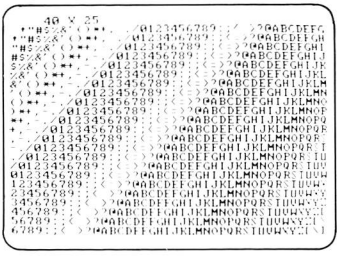
Go to page 3-500-12.

YES

The only difference between the ID "8" test and the ID "4" test is that the ID "4" test does not show high-resolution screens.



High-resolution



Medium-resolution

DO YOU WANT TO DO CHOOSE ID "8"?

NO Move the cursor to "4" under the display symbol.

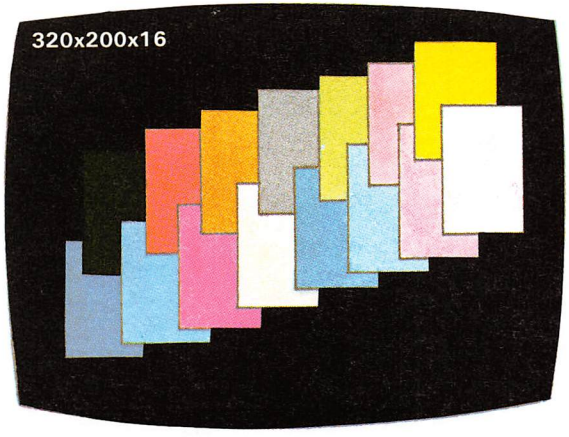
Go to page 3-500-12.

YES Move the cursor to "8" under the display symbol.

Go to page 3-500-12.

You are here to check the high-resolution screens.

Press the Ins key once.



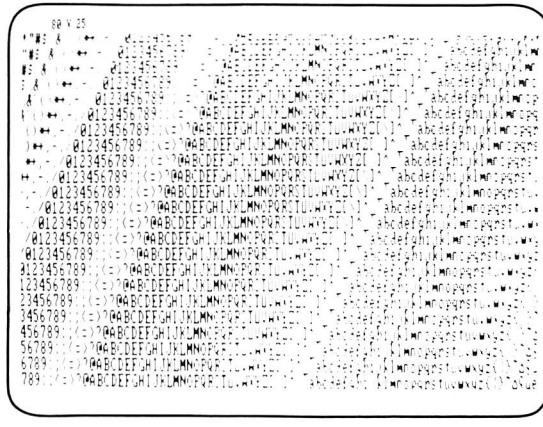
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



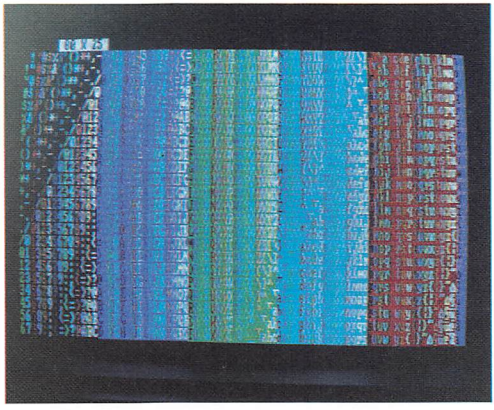
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



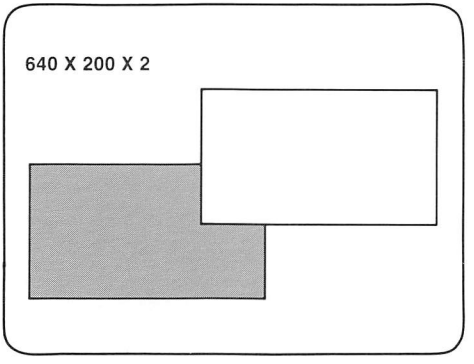
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



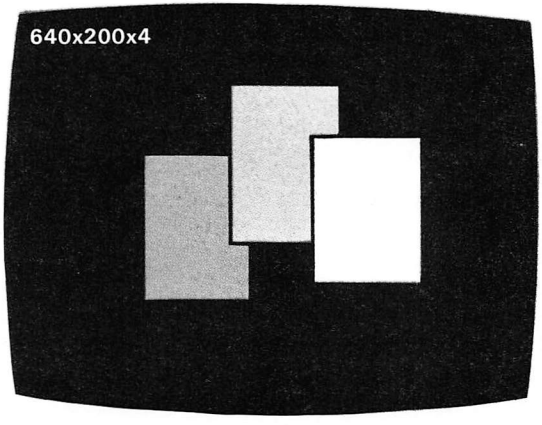
DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Press the Ins key once.



DID THE CORRECT IMAGE APPEAR ON YOUR SCREEN?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES Go to page 3-500-19.

1. Set the system unit's Power switch to Off.

2. Unplug the service plug.

3. Disconnect the display signal cable from its system unit connector.

4. Set the system unit's Power switch to On.

5. Immediately after the Power switch is set to On, tap the Ins key repeatedly with your finger until you hear two beeps.

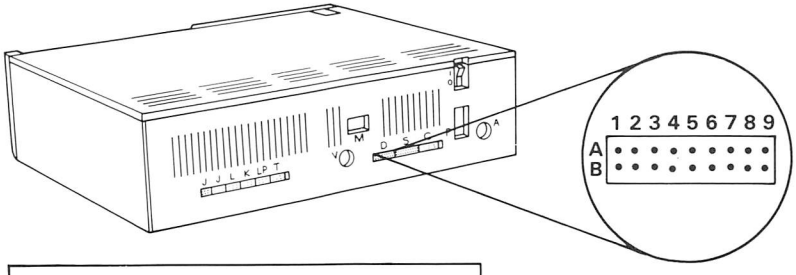
6. Press and hold the Ctrl and Alt keys.

7. While still holding the Ctrl and Alt keys, tap the Del key repeatedly with your finger until you hear two beeps.

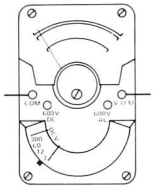
CONTINUE

The voltage between the inside and outside of the phono-jack at connector V should be between 0.5 and 0.7 Vdc. The voltages at connector D should be within the ranges listed below.

8. Measure these voltages now.



			Low Vdc	High Vdc
Pin A2	to	Pin A4	0.0	1.0
		Pin A5	0.0	1.0
		Pin A6	0.0	1.0
		Pin A7	0.0	1.0
		Pin B1	0.1	0.3
Pin A2	to	Pin B3	0.3	0.5



WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

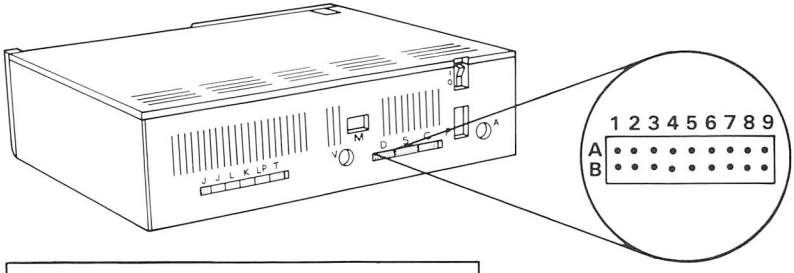
PICs

1. Set the system unit's Power switch to Off, wait five seconds, and then set the Power switch to On.
2. Wait until you hear one beep.
3. If a diskette drive is attached, wait for its red light to switch on and then off.
4. Press and hold the Ctrl and Alt keys.
5. While still holding the Crtl and Alt keys, press the Ins key.
6. Release all keys immediately.
7. Wait until you hear one beep.
8. Press the Ins key three times.
9. Press the Enter key once.

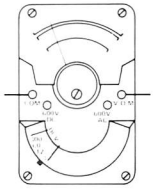
CONTINUE

The voltage between the inside and outside of the phono-jack at connector V should be between 0.9 and 1.1 Vdc. The voltages at connector D should be within the ranges listed below.

10. Measure these voltages now.



			Low Vdc	High Vdc
Pin A2	to	Pin A4	1.9	2.3
		Pin A5	1.8	2.3
		Pin A6	0.0	1.0
		Pin A7	1.7	2.3
		Pin B1	0.1	0.3
Pin A2	to	Pin B3	0.3	0.5



WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

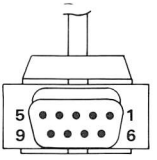
NO The system board is bad. Replace it.

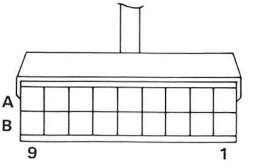
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

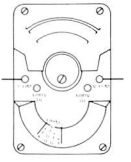
YES

PICs

Check the continuity of the Adapter Cable for IBM Color Display.







9 Pin Connector from Position:	2 x 9 Pin Connector to Position:
1	B9
2	B5
3	A5
4	A7
5	A4
6	A6
Not Used	
8	B3
9	B1

IS THE CABLE OK?

NO The Adapter Cable for IBM Color Display is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The display is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

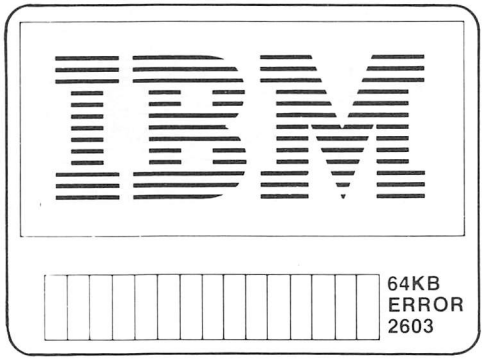
If you still have an unsolved problem, you should seek technical assistance.

Diskette Drive

You are entering this PIC for one of the following reasons:

- You were sent here from the Advanced POST Error Table.
- You want to perform the diskette-drive advanced test.

> **Note:** If you have intermittent diskette drive problems, try moving the system unit away from your display.

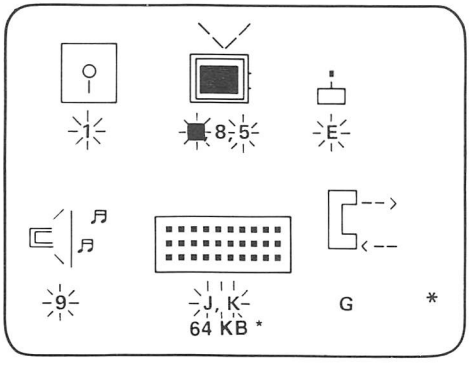


DID THE ERROR "26XX" APPEAR DURING ADVANCED POST?

YES Go to page 3-600-18.

NO

1. Set the system unit's Power switch to On.
2. Bring the advanced-test menu to your display screen.
3. Press the Ins key to move the cursor away from the diskette-drive symbol.



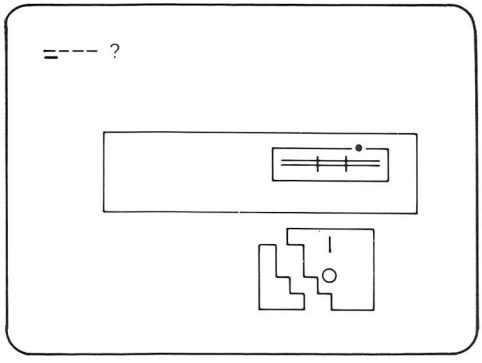
IS THE ID UNDER THE DISKETTE-DRIVE SYMBOL BLINKING?

NO Go to page 3-600-15.

YES

1. Move the cursor to the diskette-drive symbol if it is not already there.

2. Press the Enter key.



You have just seen an animated warning. Translated, it means:

> **Warning:** THE DISKETTE-DRIVE TEST WILL ERASE ALL DATA ON THE DISKETTE.

Insert a 5-1/4 inch diskette into the diskette drive. Close the diskette-drive lever. (The lever will not close if there is no diskette inserted.) The test will start when you type the correct code word.

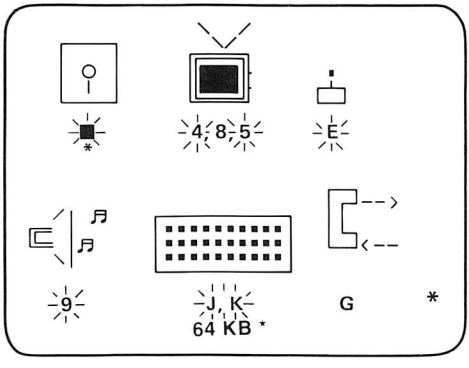
CONTINUE

Warning: THE DISKETTE-DRIVE TEST WILL ERASE ALL DATA ON THE DISKETTE.

3. Type the code word MPNP.

4. Press the Enter key.

The advanced test is over when the advanced-test menu returns to your screen.



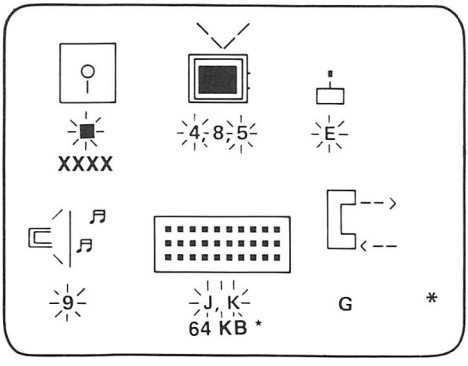
DO YOU HAVE " * " UNDER THE DISKETTE-DRIVE SYMBOL?

YES Go to page 3-600-24.

NO

The advanced test detected a failure.

1. Make a note of the number under the diskette-drive symbol.



CONTINUE

2. Compare the number you noted with the numbers in the MESSAGE column of the chart below.

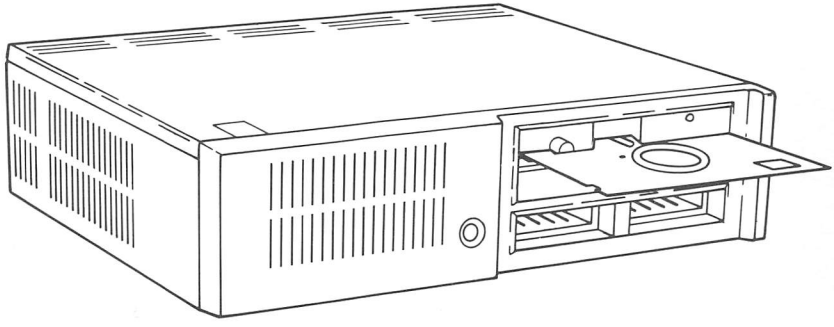
   If the noted number is not listed here, go to page 3-600-8.

Message	Recommended Action
XX02 XX03 XX82 XX83	Go to page 3-600-7.
XX01 XX09 XX81 XX89	Go to page 3-600-10.
XX97 XX98	No diskette drive is sensed. Do the diskette-drive speed adjustment (page 4-600-16). If the speed cannot be set correctly, replace the diskette drive.
XX99	Go to page 3-600-12.
FFFF	Test stopped by Fn-B.
"X" can be any number.	

3. Follow the recommended action for the noted number.

The diskette may be bad or write-protected.

Repeat the test using a known good 5-1/4 inch diskette that is not write-protected.



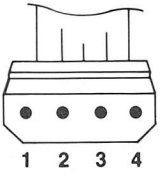
DO YOU HAVE " * " UNDER THE DISKETTE-DRIVE SYMBOL?

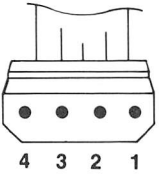
YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

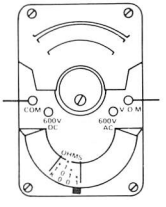
NO 

1. Disconnect the diskette-drive power cable from the diskette drive and the power board.

2. Check the continuity of the diskette-drive power cable.







The Pins Labeled 1 Should Have Continuity Between Themselves, as Should the Pins Labeled 2, and so on.

IS THE CABLE OK?

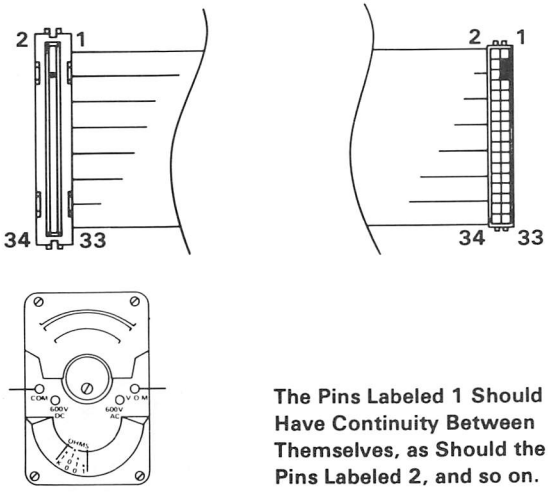
NO The diskette-drive power cable is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Disconnect the diskette-drive signal cable from the diskette drive and the diskette-drive adapter.

2. Check the continuity of the diskette-drive signal cable.



The Pins Labeled 1 Should Have Continuity Between Themselves, as Should the Pins Labeled 2, and so on.

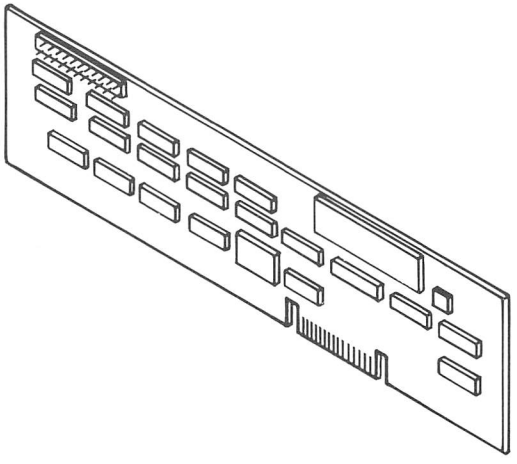
IS THE CABLE OK?

NO The diskette-drive signal cable is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

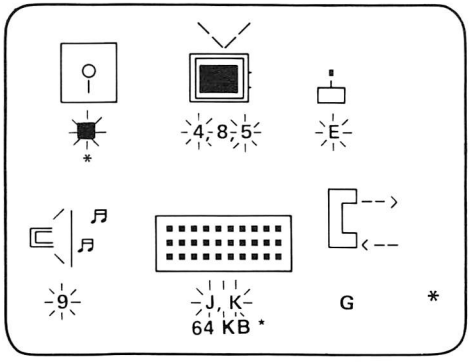
YES

1. Set the system unit's Power switch to Off.
2. Remove the diskette-drive adapter and set it aside. Make a note that this is diskette-drive adapter #1.
3. Attach a new diskette-drive adapter. Make a note that this is diskette-drive adapter #2.
4. Reattach the diskette-drive power and signal cables.



CONTINUE

5. Set the system unit's Power switch to On.
6. Bring the advanced-test menu to your display screen.
7. Move the cursor to the diskette-drive symbol.
8. Press the Enter key.
9. Enter the code word when prompted.



DO YOU HAVE " * " UNDER THE DISKETTE-DRIVE SYMBOL?

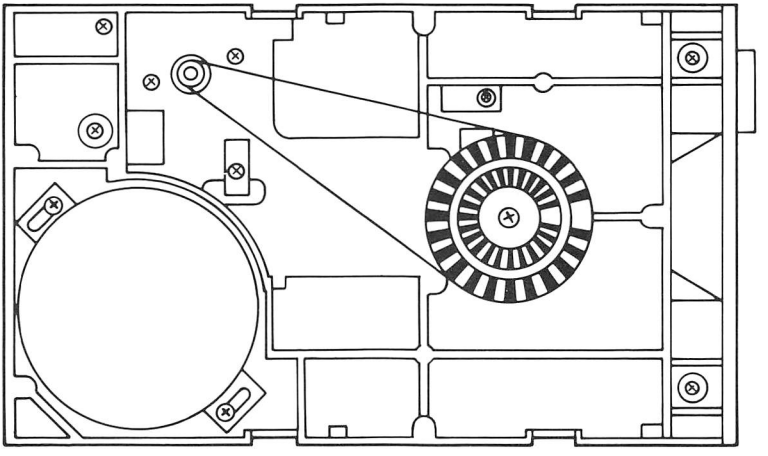
YES The problem has been corrected.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO Reattach the original diskette-drive adapter (diskette-drive adapter #1).

Continue to the next page.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive.
3. Turn the diskette drive on its back and check the diskette-drive drive belt.



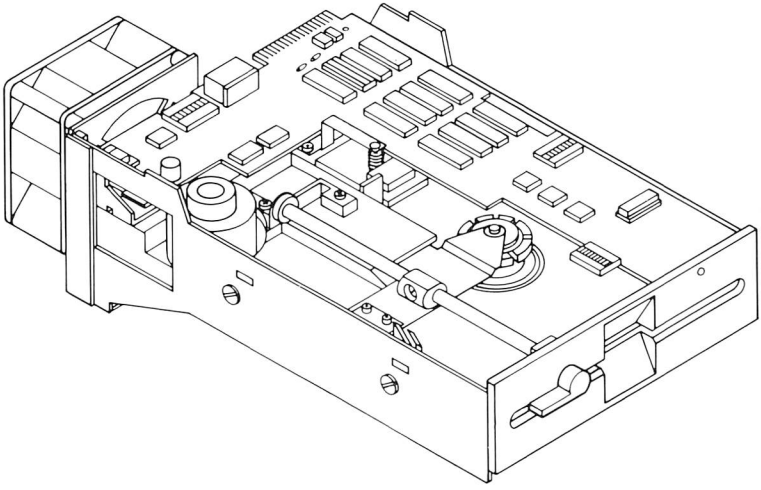
IS THE DRIVE BELT INSTALLED ON THE PULLEYS AND IN GOOD CONDITION?

NO Replace the diskette-drive drive belt.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

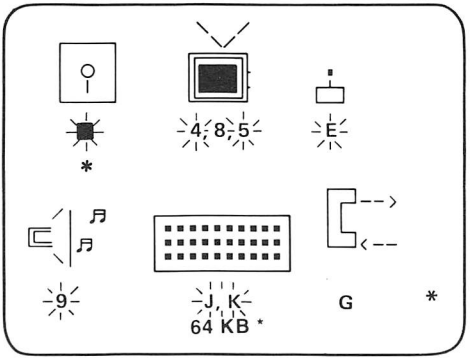
YES

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive and set it aside. Make a note that this is diskette drive #1.
3. Attach a new diskette drive. Make a note that this is diskette drive #2.



CONTINUE

4. Set the system unit's Power switch to On.
5. Bring the advanced-test menu to your display screen.
6. Move the cursor to the diskette-drive symbol.
7. Press the Enter key.
8. Enter the code word when you are prompted.



DO YOU HAVE " * " UNDER THE DISKETTE-DRIVE SYMBOL?

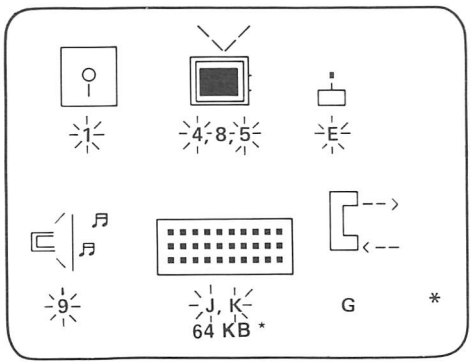
NO The system board is bad. Replace it.

Reattach the original diskette drive.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Set the system unit's Power switch to Off.
2. Reseat the diskette-drive adapter by disconnecting it from the system unit, and then reconnecting it.
3. Set the system unit's Power switch to On.
4. Bring the advanced-test menu to your screen.



IS THE ID UNDER THE DISKETTE-DRIVE SYMBOL BLINKING?

YES The problem has been corrected.

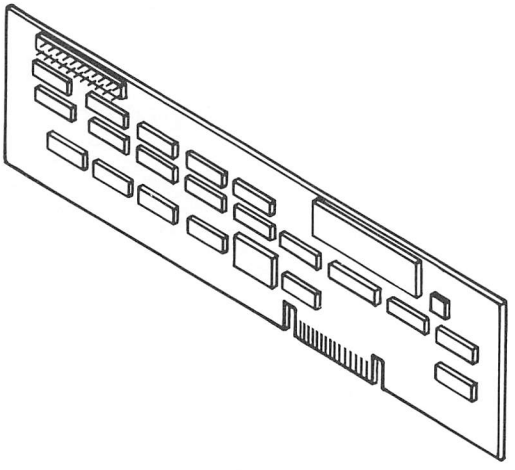
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO

1. Set the system unit's Power switch to Off.

2. Remove the diskette-drive adapter and set it aside. Make a note that this is diskette-drive adapter #1.

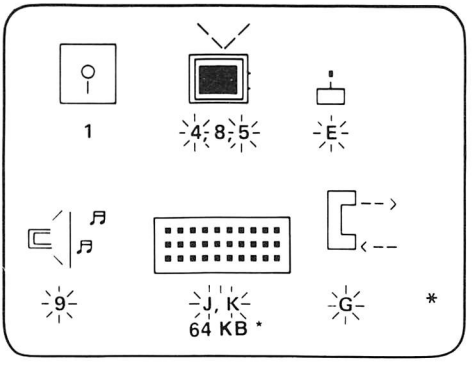
3. Attach a new diskette-drive adapter. Make a note that this is diskette-drive adapter #2.



CONTINUE

3. Set the system unit's Power switch to On.

4. Bring the advanced-test menu to your screen.



IS THE ID UNDER THE MODEM SYMBOL BLINKING?

NO Go to page 3-830-5.

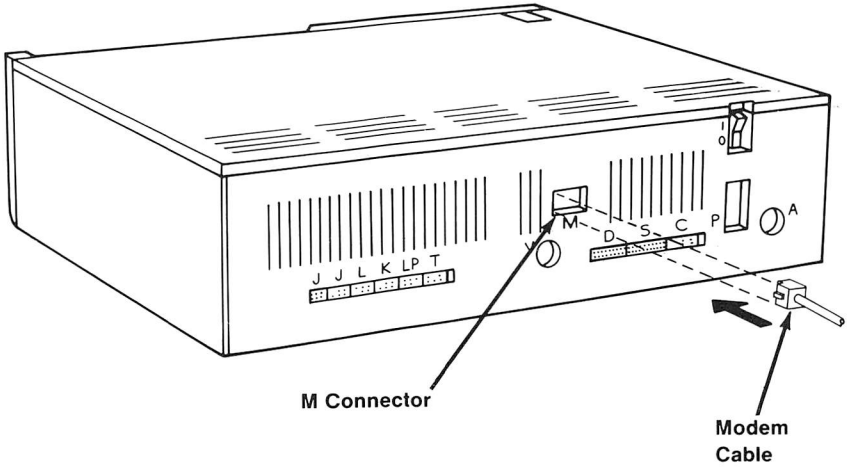
YES

Internal Modem

You are entering this PIC because you suspect the internal modem is failing.

1. Set the system unit's Power switch to Off.

2. Unplug the modem cable from the system unit connector M.



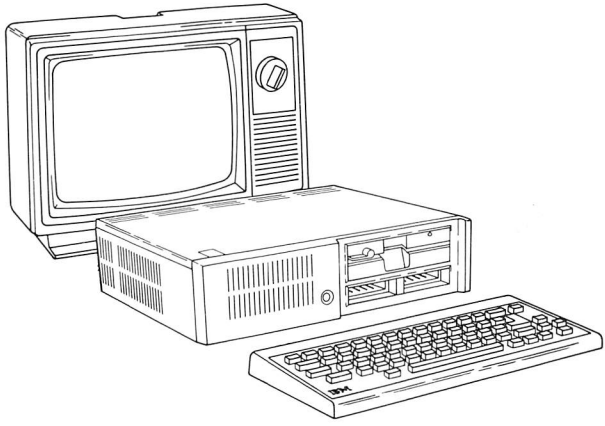
CONTINUE

Notes:

1. Be sure that:

   a. Your external speaker is functioning.
   b. The volume control is set to the mid-range.
   c. If you are using a television, the switch box is set to COMPUTER.
   d. All cable connections are correct.

2. Repeat the advanced sound test.



DID ANY PARTS OF THE SOUND TEST FAIL?

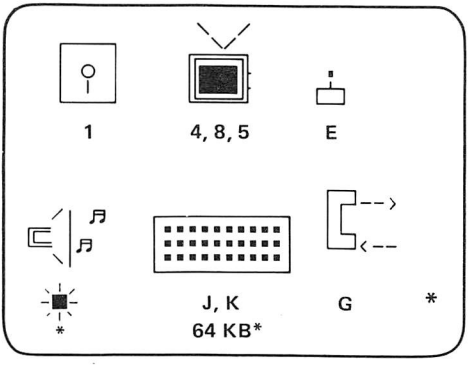
NO The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

When you start the next part of the test, you will hear a sound coming from the external speaker (not the system unit) that sounds like a burst of noise from a television with the volume turned up and no broadcast signal. It is commonly called white noise.

The advanced test menu will appear on the screen and there will be a "*" under the sound test symbol.



DID THE ACTIONS DESCRIBED ABOVE OCCUR?

YES You have completed the sound PIC. If you still have an unsolved problem, you should seek technical assistance.

NO

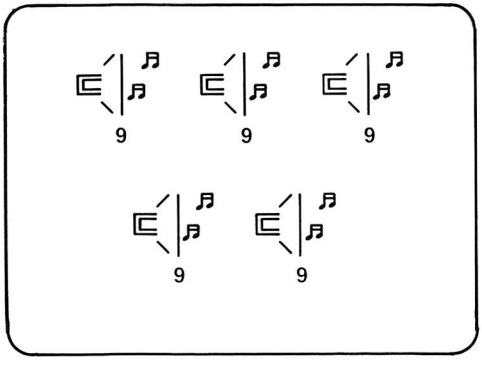
When you start the next part of the test, you will hear a sound coming from the external speaker (not the system unit) that sounds like a motorcycle gradually accelerating, remaining at the same speed (frequency) for a moment, and then fading away.

A fifth sound symbol will appear on the screen.

As you do this part of the sound test, listen for these failures:

1. No sound is heard at all.
2. Something other than a smooth increase in frequency occurs.
3. The volume diminishes abruptly rather than smoothly.

Press the Ins key once to start the next part of the sound test.

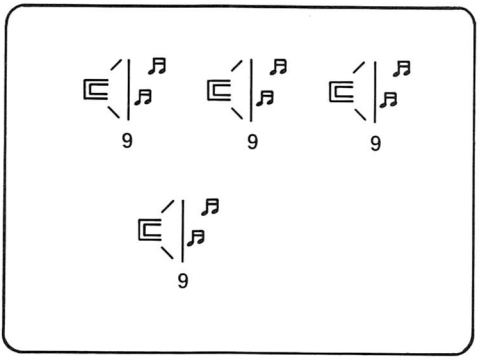


DID ANY FAILURE AS DESCRIBED ABOVE OCCUR?

YES Go to page 3-820-9.

NO

Press the Ins key once to listen to voice #3.

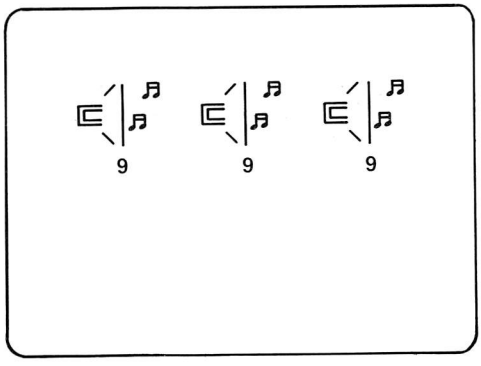


DID ANY FAILURE AS DESCRIBED ON PAGE 3-820-3 OCCUR?

YES Go to page 3-820-9.

NO

Press the Ins key once to listen to voice #2.



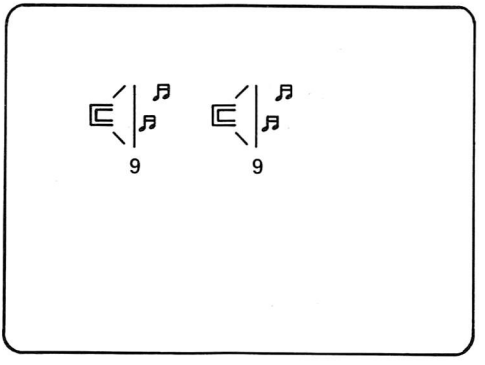
PICs

DID ANY FAILURE AS DESCRIBED ON PAGE 3-820-3 OCCUR?

YES Go to page 3-1900-9.

NO

4. Press the Ins key once to listen to voice #1.



DID ANY FAILURE AS DESCRIBED ON PAGE 3-820-3 OCCUR?

YES Go to page 3-820-9.

NO

When you start the next part of the test, you will hear a low-frequency sound coming from the external speaker (not the system unit). The sound's frequency (pitch) increases smoothly until it reaches 523 Hz and holds steady. Then its volume diminishes until the sound is gone.

Another sound symbol will appear on the screen.

As you do this part of the sound test, listen for these failures:

1. No sound is heard at all.

2. Something other than a smooth increase in frequency occurs.

3. The volume diminishes abruptly rather than smoothly.

   Note: You may hear the volume decrease in small steps. This is normal and is not a failure.

CONTINUE

1. Set the volume control on the television to the medium range.

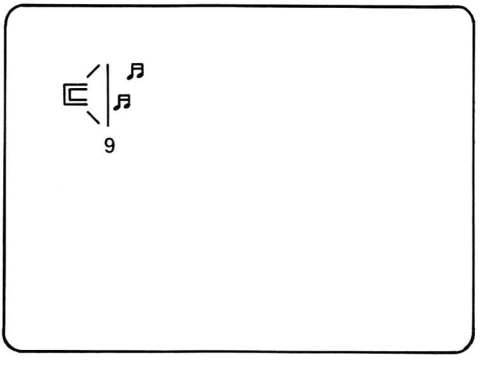
2. Bring the advanced-test menu to your screen.

3. Move the cursor to the sound symbol.

4. When you start the test, this will happen:

   a. The screen will go blank.
   b. You will hear a beep from both the system unit and the external speaker.
   c. A sound symbol will appear on the screen.

5. Press the Enter key once to start the test.



DID THE ACTIONS DESCRIBED ABOVE OCCUR?

NO Go to page 3-820-9.

YES

Sound

You are entering this PIC because you suspect the sound is failing.

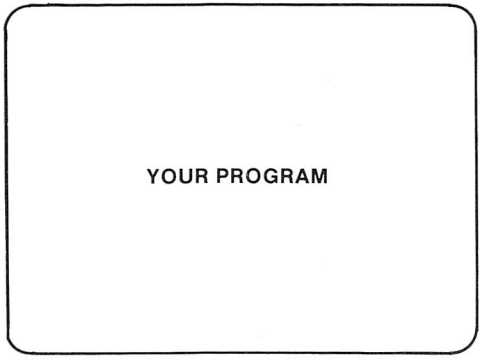
The sound test sends different sounds through your externally-mounted speaker. You listen to these sounds to decide if the system unit's sound circuitry is working correctly.

The speaker in the television is used in this test. (An external amplifier and speaker plugged into the system unit's external audio connector A will also produce the sounds.)

CONTINUE

3. The system unit should reset and the program should begin.

The documentation that comes with the program cartridge explains how the program should work.



DOES THE PROGRAM CARTRIDGE PROGRAM OPERATE CORRECTLY?

NO The program cartridge is bad. Replace it.

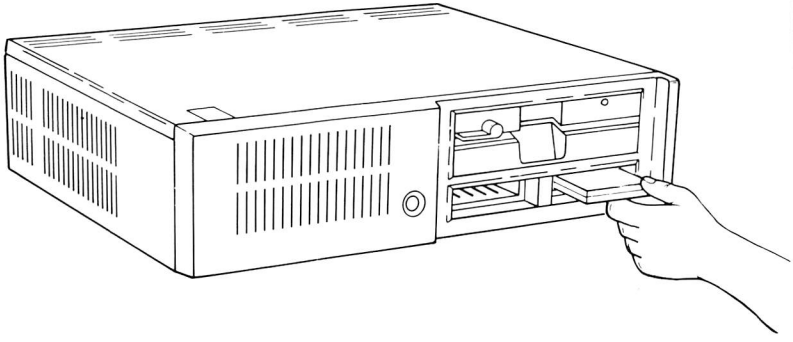
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Remove the program cartridge from the system unit's left slot.

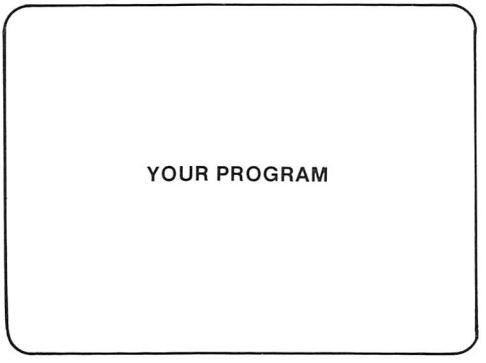
2. Plug the program cartridge into the system unit's right slot.



CONTINUE

3. The system unit should reset and the program should begin.

The documentation that comes with the program cartridge explains how the program should work.



DOES THE PROGRAM CARTRIDGE PROGRAM OPERATE CORRECTLY?

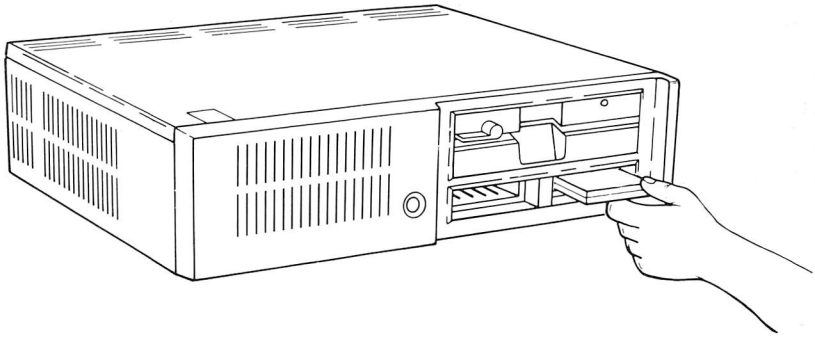
NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES You have completed the program cartridge PIC. If you still have an unsolved problem, you should seek technical assistance.

1. Remove the program cartridge from the system unit's left slot.

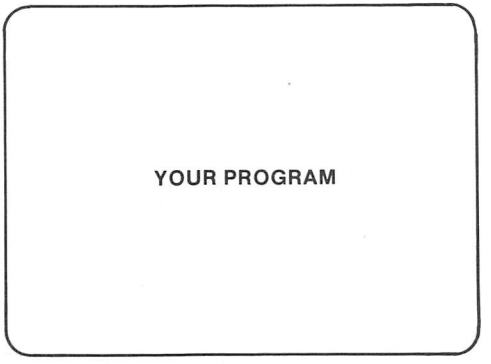
2. Plug the program cartridge into the system unit's right slot.



CONTINUE

5. The system unit should reset and the program should begin.

The documentation that comes with the program cartridge explains how the program should work.



DOES THE PROGRAM CARTRIDGE PROGRAM OPERATE CORRECTLY?

NO Go to page 3-810-5.

YES

Cartridge

You are entering this PIC because you are having problems using a program cartridge.

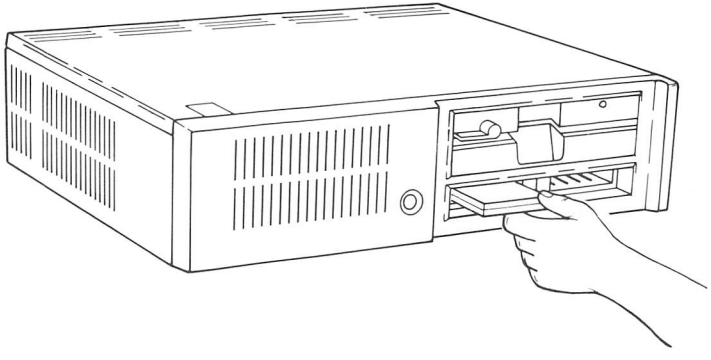
1. Do the advanced tests for all areas of the IBM PC*jr* the program cartridge uses. The usual areas are:

   - Keyboard
   - Display
   - Sound

2. Remove any cassette or diskette from the system unit and attached devices.

3. Set the system unit's Power switch to On.

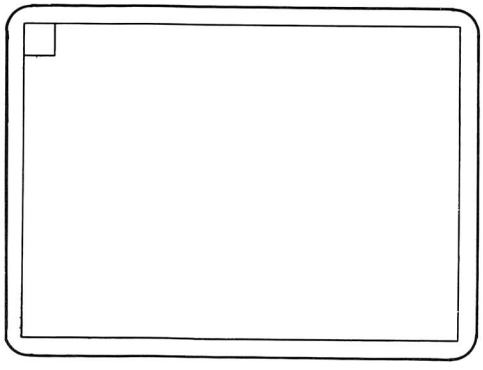
4. Plug the program cartridge into the system unit's left cartridge slot.



CONTINUE

Notes:

4. Set the system unit's Power switch to On.
5. Bring the advanced-test menu to your display screen.
6. Move the cursor to ID "5" under the display symbol.
7. Press the Enter key.
8. Follow the light pen instructions and use the light pen to erase the white.



DOES THE LIGHT PEN OPERATE AS DESCRIBED ON PAGE 3-800-2?

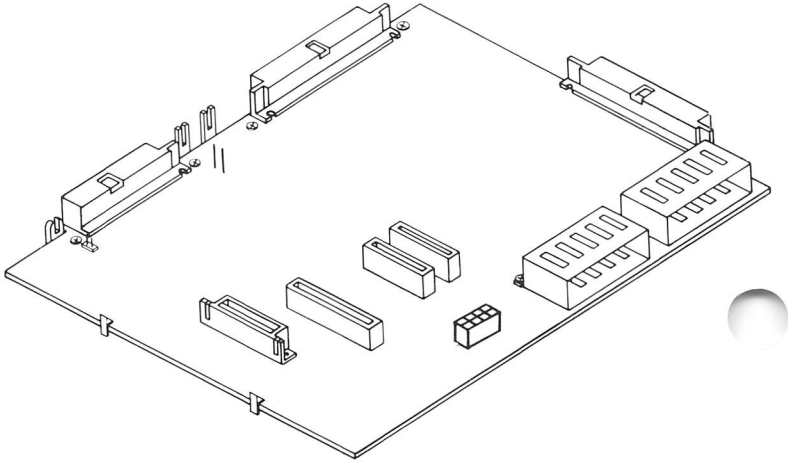
NO The light pen is bad. Replace it.

Reattach the original system board.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Set the system unit's Power switch to Off.
2. Remove the system board and set it aside. Make a note that this is system board #1.
3. Attach a new system board. Make a note that this is system board #2.

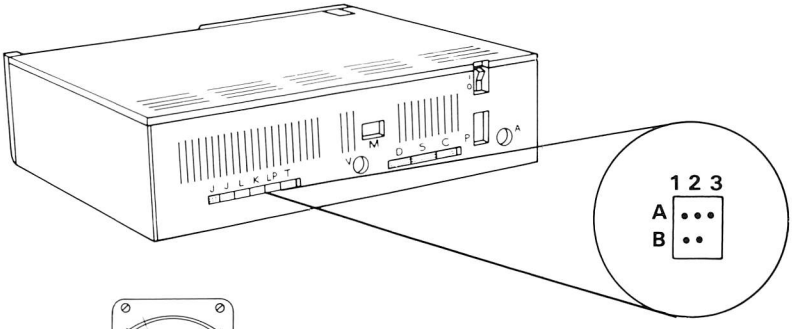


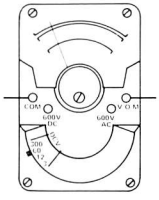
CONTINUE

1. The voltages at connector LP should be within the ranges listed below.

   Warning: Do not short pin A1 to any other pin. A short will damage the system board.

2. Measure the voltages now.





			Low Vdc	High Vdc
Pin B1	to	Pin A1	11.5	12.5
Pin B1	to	Pin A3	4.5	5.5

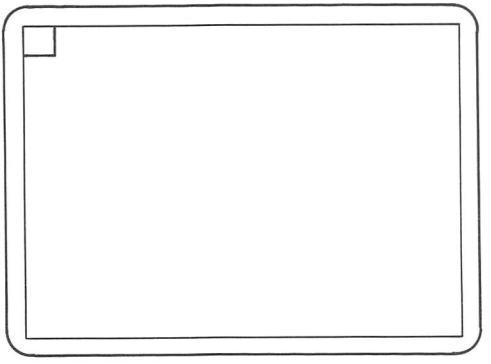
WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

7. Follow the light pen instructions and use the light pen to erase the white. Erasures should occur within one inch of the tip of the light pen. If you touch an edge of the screen with the light pen, the erasing can affect the opposite edge of the screen. Also, it is normal for some spraying (random erasures) to happen.
8. Restore the white foreground by pressing the light pen to the yellow box.



DID THE LIGHT PEN OPERATE AS DESCRIBED ABOVE?

YES The light pen is operating correctly.

You have completed the light pen PIC. If you still have an unsolved problem, you should seek technical assistance.

NO

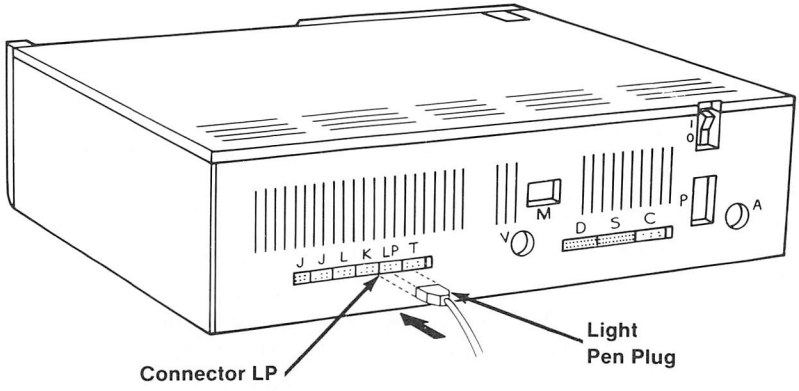
Light Pen

You are entering this PIC because you have problems when using a light pen.

Note: Do the Display advanced-test before doing the Light Pen advanced-test.

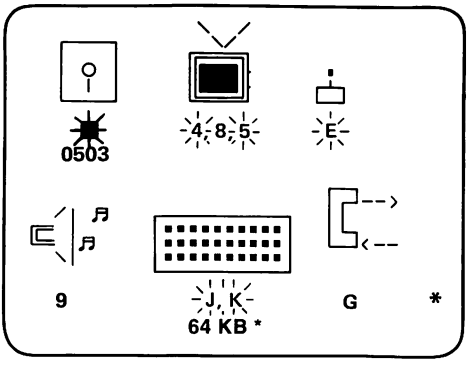
1. Set the system unit's Power switch to Off.
2. Plug the light pen into system unit connector LP.
3. Set the system unit's Power switch to On.
4. Bring the advanced-test menu to your screen.
5. Move the cursor to ID "5" under the display symbol.
6. Press the Enter key.

   You have a white screen with a yellow square in the upper left corner.



CONTINUE

1. Remove the diskette from the diskette drive.
2. Turn the diskette upside-down.
3. Insert the upside-down diskette into the diskette drive.
4. Perform the diskette-drive advanced test (enter the code word when you are prompted).



DO YOU HAVE "0503" UNDER THE DISKETTE-DRIVE SYMBOL?

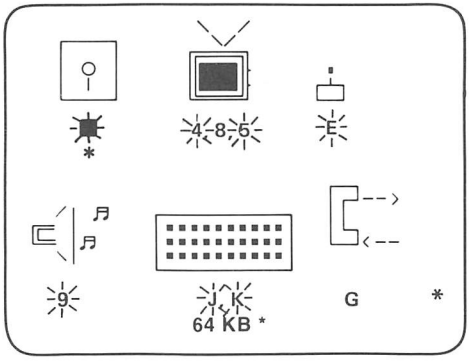
NO The diskette drive is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The advanced test successfully detected a write-protected diskette.

You have completed the diskette drive PIC. If you still have an unsolved problem, you should seek technical assistance.

5. Set the system unit's Power switch to On.
6. Bring the advanced-test menu to your display screen.
7. Move the cursor to the diskette-drive symbol.
8. Press the Enter key.
9. Enter the code word when you are prompted.



DO YOU HAVE " * " UNDER THE DISKETTE-DRIVE SYMBOL?

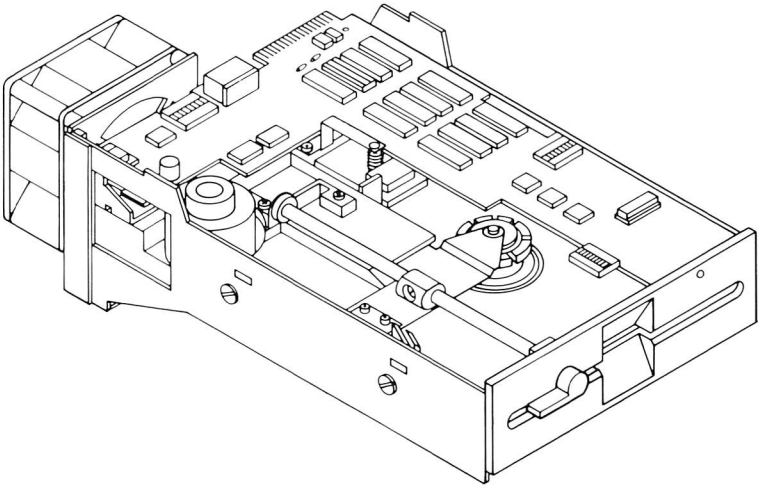
NO The system board is bad. Replace it.

Reattach the original diskette drive.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive and set it aside. Make a note that this is diskette drive #1.
3. Attach a new diskette drive. Make a note that this is diskette drive #2.
4. Reattach the diskette-drive power and signal cables.

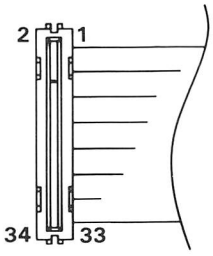


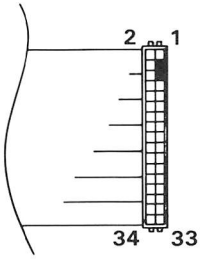
CONTINUE

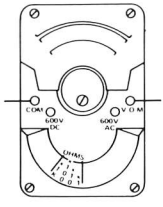
1. Set the system unit's Power switch to Off.

2. Disconnect the diskette-drive signal cable from the diskette-drive adapter and the diskette drive.

3. Check the continuity of the diskette-drive signal cable.







The Pins Labeled 1 Should Have Continuity Between Themselves, as Should the Pins Labeled 2, and so on.

IS THE CABLE OK?

NO The diskette-drive signal cable is bad. Replace it.

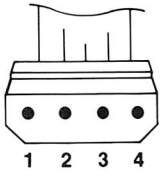
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

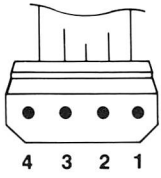
YES

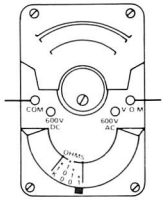
1. Set the system unit's Power switch to Off.

2. Disconnect the diskette-drive power cable from the power board and the diskette drive.

3. Check the continuity of the diskette-drive power cable.







The Pins Labeled 1 Should Have Continuity Between Themselves, as Should the Pins Labeled 2, and so on.

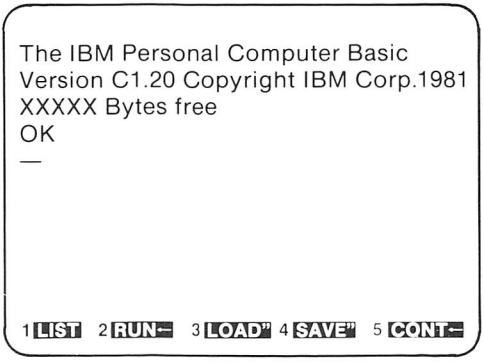
IS THE CABLE OK?

NO The diskette-drive power cable is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES 

1. Set the system unit's Power switch to Off.
2. Remove the 64KB memory and display expansion and set it aside.
3. Perform advanced POST.



DID ADVANCED POST SUCCESSFULLY COMPLETE?

YES The 64KB memory and display expansion is bad. Replace it.

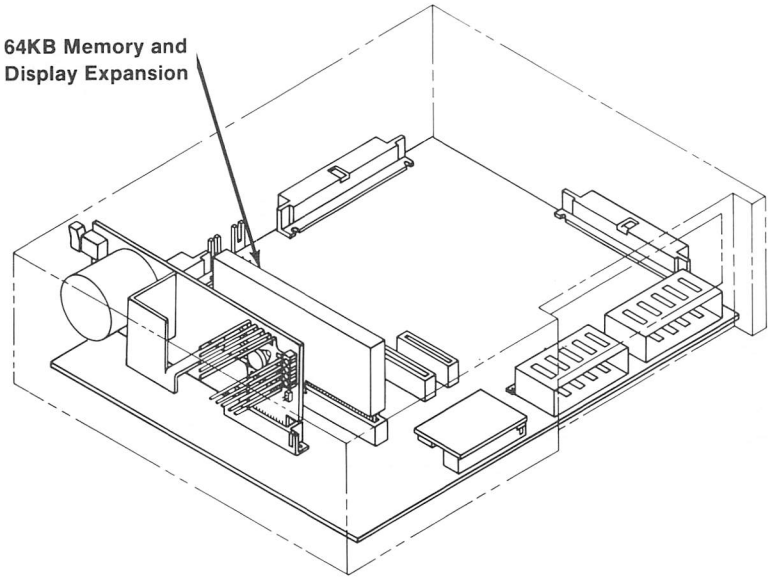
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO Reattach the 64KB memory and display expansion.

Continue to the next page.

The diskette-drive adapter has been replaced and the message "26XX" still appears during advanced POST.

Reattach the original diskette-drive adapter.

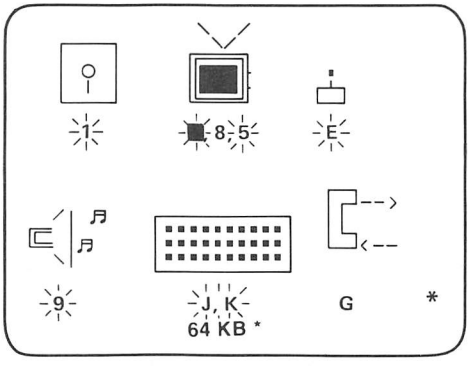


DOES THE SYSTEM UNIT CONTAIN A 64KB MEMORY AND DISPLAY EXPANSION?

NO Go to page 3-600-20.

YES

4. Set the system unit's Power switch to On.
5. Bring the advanced-test menu to your screen.
6. Press the Ins key to move the cursor away from the diskette-drive symbol.



IS THE ID UNDER THE DISKETTE-DRIVE SYMBOL BLINKING?

NO The system board is bad. Replace it.

Reinstall the original diskette-drive adapter.

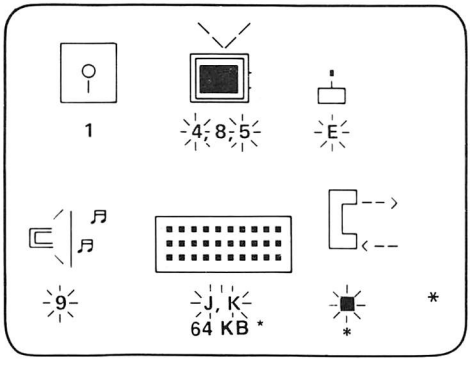
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

The modem advanced test takes as long as three minutes to complete.

1. Move the cursor to the ID under the modem symbol.

2. Press the Enter key.



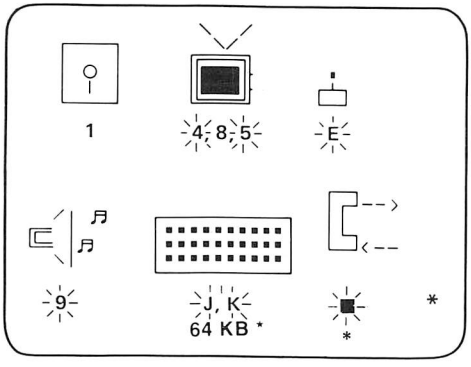
DO YOU HAVE " * " UNDER THE MODEM SYMBOL?

YES Go to page 3-830-7.

NO

The modem may be bad.

1. Remove the modem and set it aside. Make a note that this is modem #1.
2. Attach a new modem to the system board. Make a note that this is modem #2.
3. Repeat the modem advanced test.



DO YOU HAVE " * " UNDER THE MODEM SYMBOL?

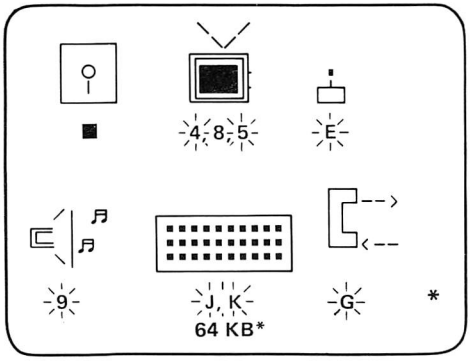
YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO The system board is bad. Replace it.

Reattach the original modem (modem #1).

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

1. Set the system unit's Power switch to Off.
2. Reseat the modem by pulling it straight up from its connector, then pushing it back down.
3. Set the system unit's Power switch to On.
4. Bring the advanced-test menu to your screen.



IS THE ID UNDER THE MODEM SYMBOL BLINKING?

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO

1. Set the system unit's Power switch to Off.
2. Remove the modem and set it aside. Make a note that this is modem #1.
3. Attach a new modem to the system board. Make a note that this is modem #2.
4. Set the system unit's Power switch to On.
5. Bring the advanced-test menu to your display screen.

IS THE ID UNDER THE MODEM SYMBOL BLINKING?

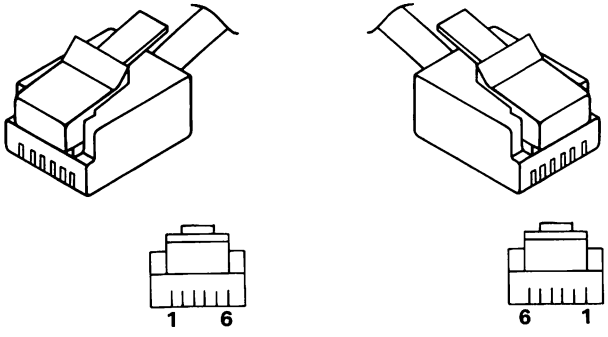
NO Replace the system board.

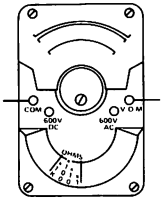
Reattach the original modem (modem #1).

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

Check the continuity of the wires in the modem cable.





The Pins Labeled 1 Should Have Continuity Between Themselves, as Should the Pins Labeled 2, and so on.

IS THE CABLE OK?

NO Replace the modem cable.

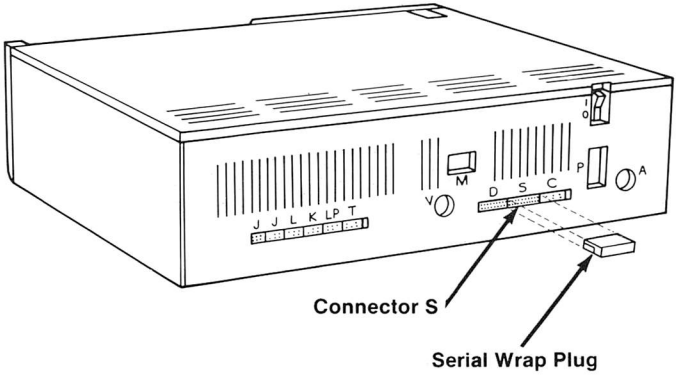
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES You have completed the internal modem PIC. If you still have an unsolved problem, you should seek technical assistance.

Notes:

RS232

1. Set the system unit's Power switch to Off.
2. Disconnect any cable connected to the system unit's connector S.
3. Plug the serial wrap plug into the system unit connector S.



CONTINUE

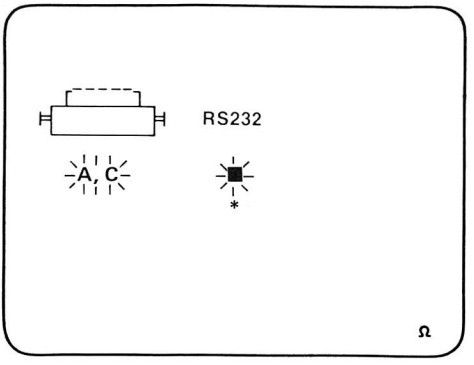
4. Set the system unit's Power switch to On.

5. Bring the advanced-test menu to your screen.

6. Move the cursor to the ID "I" under the RS232.

7. Press the Enter key.

The test takes approximately four minutes to complete.



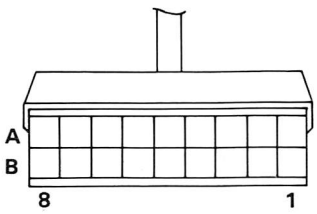
DO YOU HAVE " * " UNDER THE RS232?

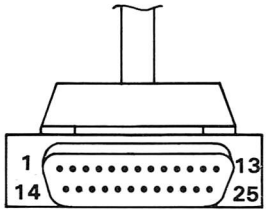
NO The system board is bad. Replace it.

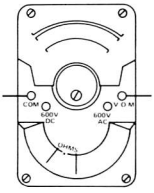
Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

Check the continuity of the wires in the adapter cable for serial devices, if it is present.







25 Pin Connector from Position:	2 x 8 Connector to Position:
1	B1
2	A4
3	A8
4	A3
5	A7
6	A6
7	B2
8	A5
20	A2

IS THE CABLE OK?

NO The adapter cable for serial devices is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The RS232 interface is working correctly.

You have completed the RS232 PIC. If you still have an unsolved problem, you should seek technical assistance.

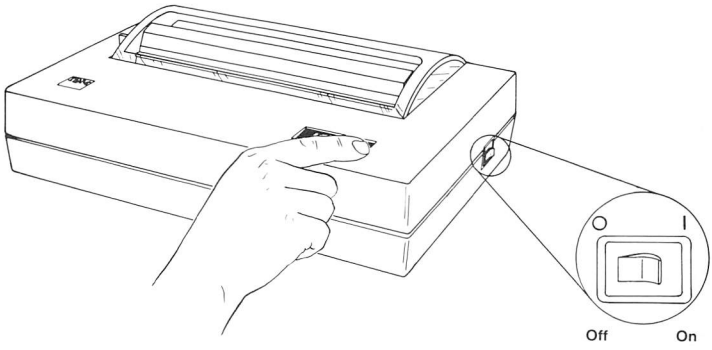
Notes:

Compact Printer

You are entering this PIC because you have a problem with your IBM PC Compact Printer.

> **Note:** Before beginning the IBM PC Compact Printer test, you must first complete the RS232 Advanced Test.

1. Set the system unit's Power switch to Off.
2. Set the printer's Power switch to Off.
3. Verify that forms are properly inserted.
4. Press and hold the paper feed button while setting the printer's Power switch to On. (This is the Printer Self Test. To end the test, set the printer's Power switch to Off.)

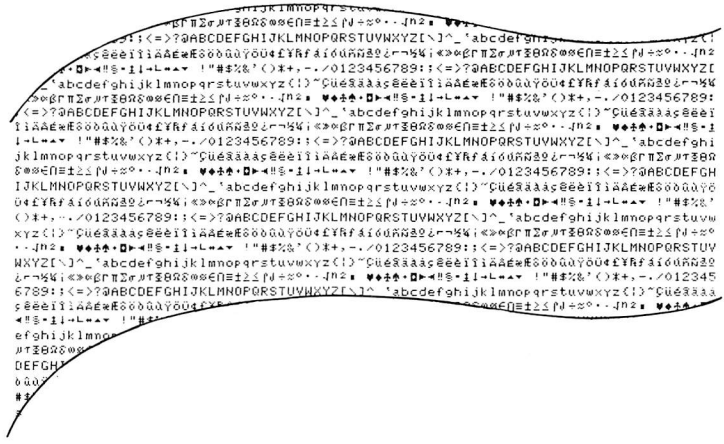


DOES THE PRINTER BEGIN TO PRINT?

NO Go to page 3-850-7.

YES

Compare your printout with the one below.

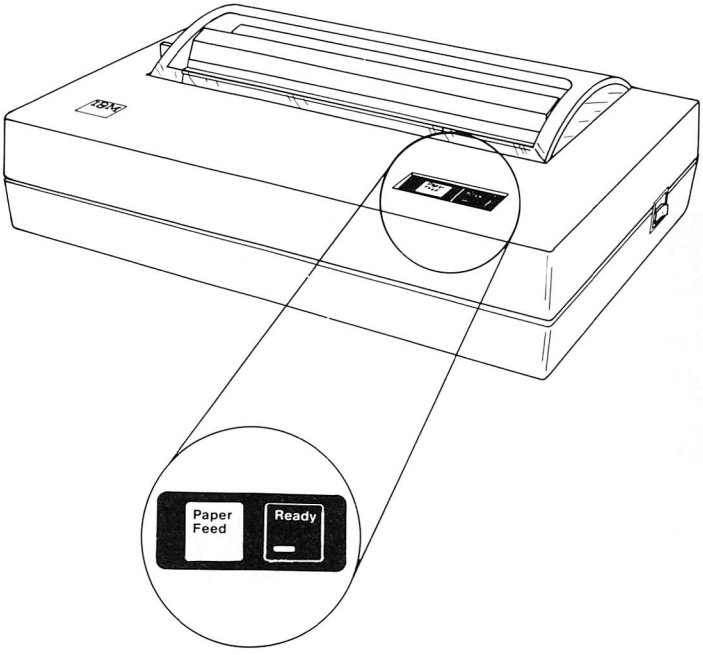


DOES YOUR PRINTOUT MATCH WITHOUT ANY ERRORS?

NO Go to the Failure Symptom Table on page 3-850-17.

YES

Observe the control panel.



IS THE READY LIGHT ON?

NO Go to page 3-850-6.

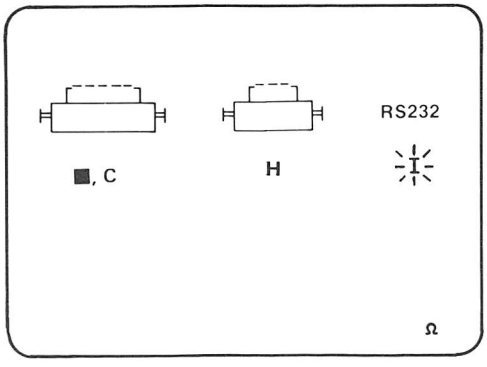
YES

1. Verify that the printer is properly cabled to the system unit.

2. Set the system unit's Power switch to On.

3. Bring the advanced-test menu to your screen.

4. Move the cursor to the second advanced-test menu page.



IS THE COMPACT PRINTER SYMBOL ON YOUR SCREEN?

NO The logic card is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES

1. Move the cursor to ID "H" under the Compact printer symbol.

2. Press the Enter key.

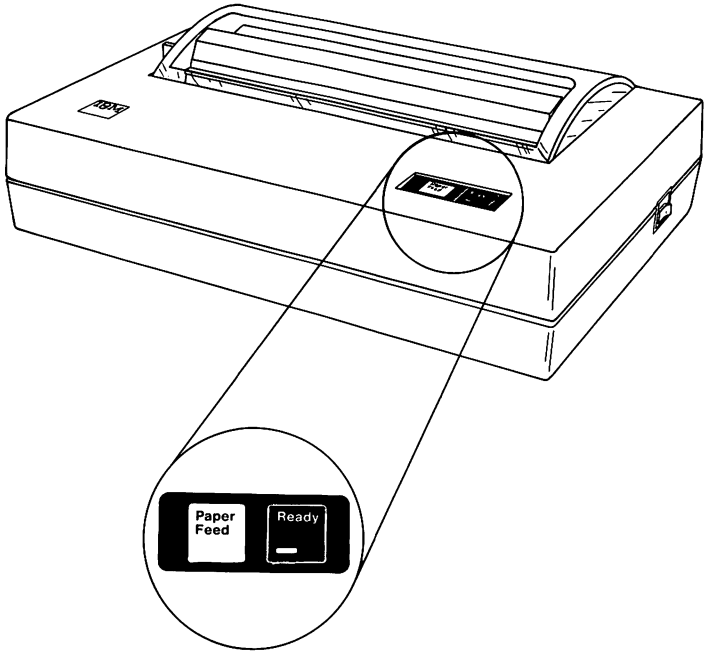
3. Compare your printout with the one below.

DOES YOUR PRINTOUT MATCH WITHOUT ANY ERRORS?

NO The logic card is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES You have finished the Compact Printer PIC. If you still have an unsolved problem, you should seek technical assistance.

1. Set the printer's Power switch to Off.
2. Remove the printer top cover.
3. Replace the logic card.
4. Install the printer top cover.
5. Set the printer's Power switch to On.



IS THE READY LIGHT ON?

NO The IBM PC Compact printer is bad. Replace it.

YES The problem has been corrected. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

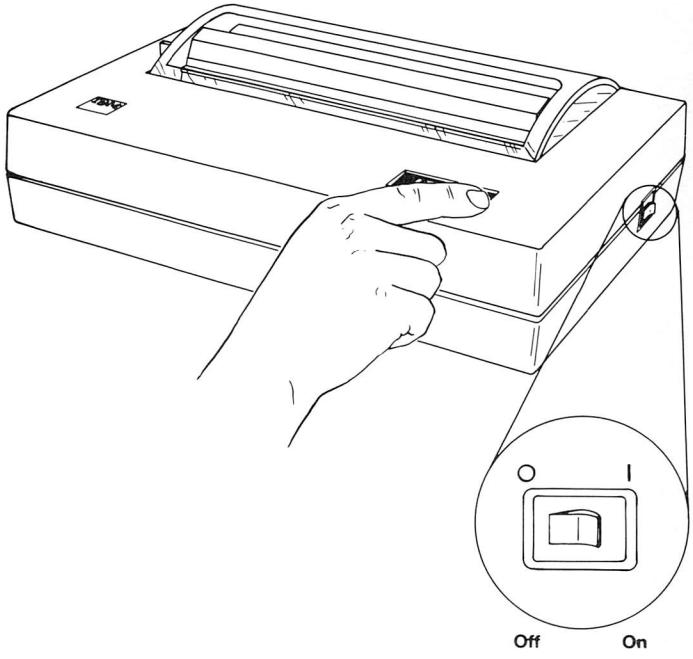
1. Set the printer's Power switch to Off.

2. Remove the thermal forms from the printer.

3. Insert a sheet of plain bond paper into the printer.

4. Press and hold the paper feed button while setting the printer's Power switch to On.

5. Allow the printer to run for the entire sheet of paper, and then set the printer's Power switch to Off. (No printing will appear on non-thermal paper.)



CONTINUE

6. Remove the plain bond paper and reinstall thermal forms into the printer.

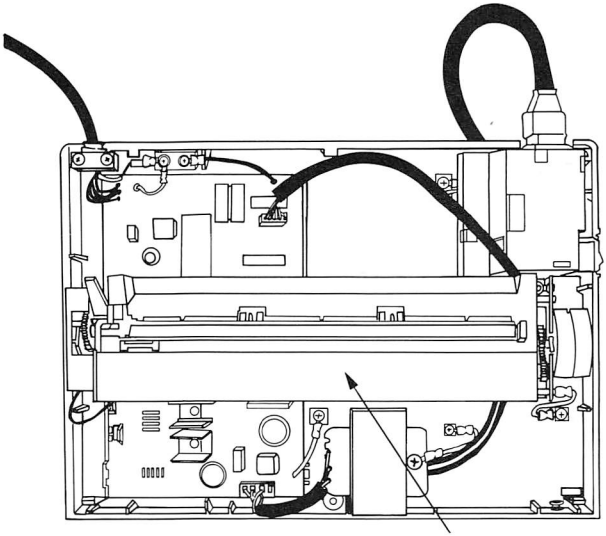
7. Press and hold the paper feed button while setting the printer's Power switch to On.

DOES THE PRINTER BEGIN TO PRINT?

YES Go to page 3-850-2.

NO

1. Set the printer's Power switch to Off.
2. Remove the printer top cover.
3. Inspect the print mechanism for :
   - Any weak or broken springs.
   - Any worn or broken gears.
   - A damaged platen.



ARE ALL OF THE PARTS IN GOOD CONDITION?

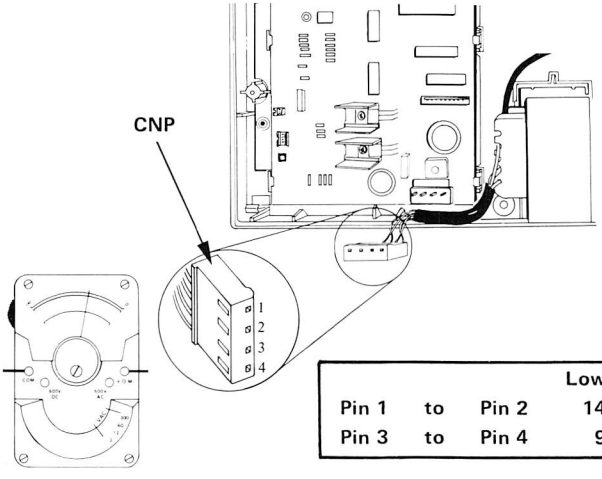
NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES

1. Disconnect CNP from the logic card.
2. Plug the printer's power cord into a properly grounded outlet.
3. Set the printer's Power switch to On.

DANGER
LINE VOLTAGE IS PRESENT ON THE POWER SUPPLY CARD AND TRANSFORMER ASSEMBLY.

4. The voltages on the CNP connector should be within the ranges listed below.
5. Measure these voltages now.



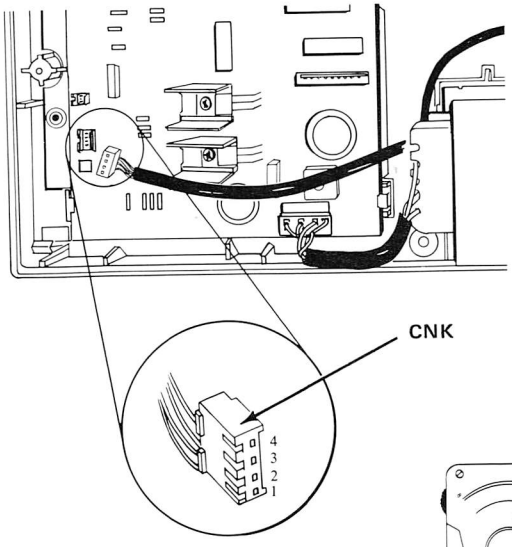
			Low Vac	High Vac
Pin 1	to	Pin 2	14.5	16.0
Pin 3	to	Pin 4	9.0	10.5

WERE YOU ABLE TO READ THE CORRECT VOLTAGES?

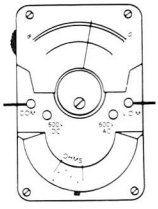
NO The IBM PC Compact Printer is bad. Replace it.

YES

1. Set the printer's Power switch to Off.
2. Disconnect CNK from the logic card.
3. Measure the resistance on the CNK connector while pressing and releasing the paper feed button.
4. Measure these resistances now.



	Low Ohm	High Ohm
Pin 3 to Pin 4 (Pressed)	0	2
Pin 3 to Pin 4 (Released)	∞	

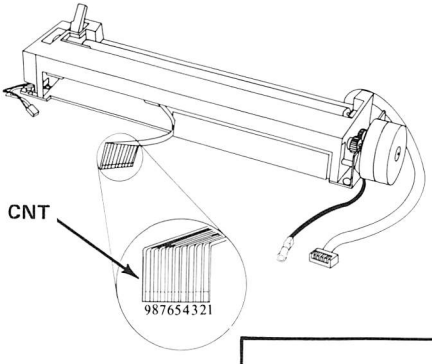


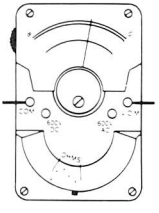
WERE YOU ABLE TO READ THE CORRECT RESISTANCES?

NO The IBM PC Compact Printer is bad. Replace it.

YES

1. Set the printer's Power switch to Off.
2. Remove the print mechanism.
3. The resistances on the CNT connector should be within the ranges listed below.
4. Measure these resistances now.





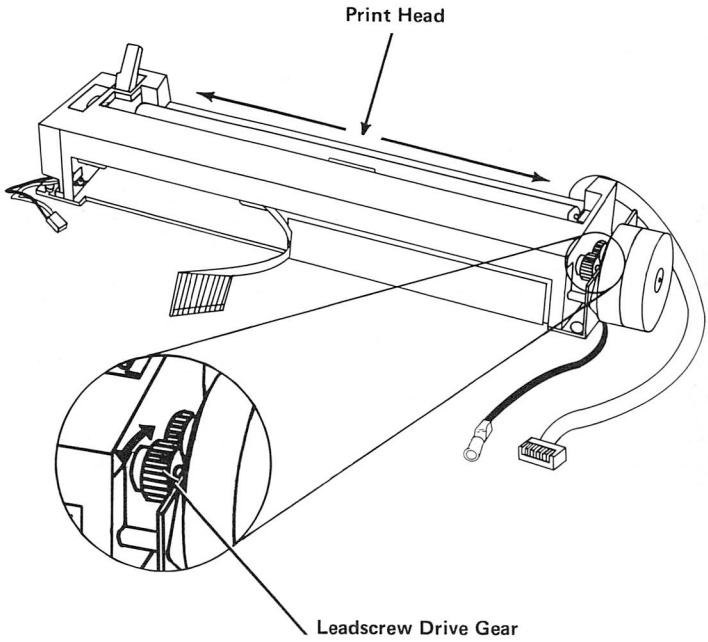
			Low Ohm	High Ohm
Pin 1	to	Pin 9	36	50
Pin 2			36	50
Pin 3			36	50
Pin 4			36	50
Pin 5			36	50
Pin 6			36	50
Pin 7			36	50
Pin 8	to	Pin 9	36	50

WERE YOU ABLE TO READ THE CORRECT RESISTANCES?

NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES

Rotate the leadscrew drive gear in both directions.



DID THE PRINT HEAD MOVE SMOOTHLY IN BOTH DIRECTIONS?

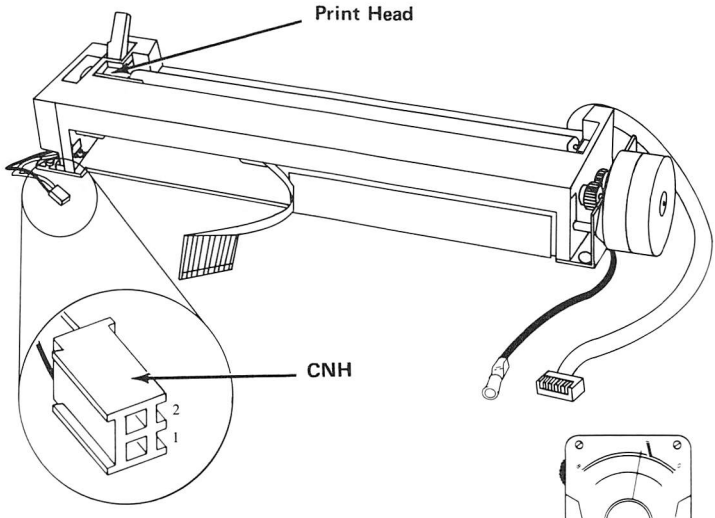
NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

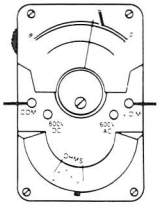
YES

1. Rotate the leadscrew drive gear to move the print head to it's left-most position.

2. The resistance on the CNH connector should be within the range listed below.

3. Measure this resistance now.





			Low Ohm	High Ohm
Pin 1	to	Pin 2	0	2

WERE YOU ABLE TO READ THE CORRECT RESISTANCE?

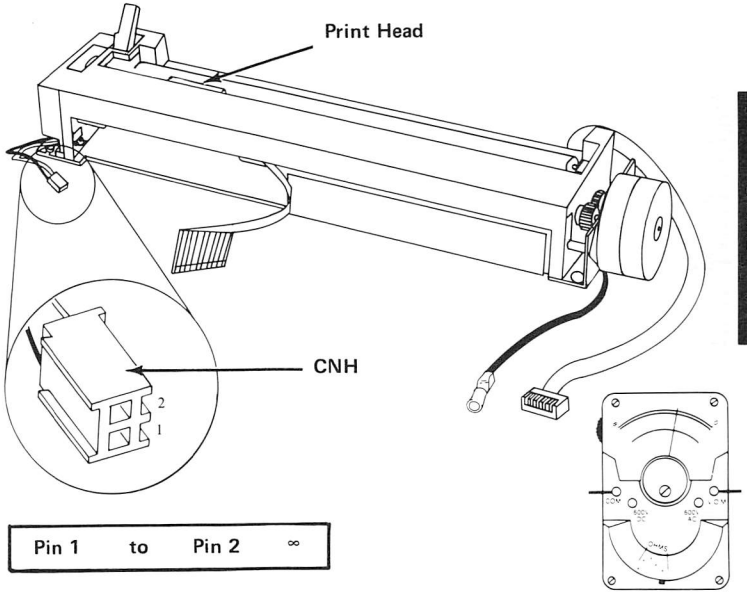
NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES

1. Rotate the leadscrew drive gear counter-clockwise to move the print head approximately one inch from the left side frame.

2. The resistance on the CNH connector should be infinity.

3. Measure this resistance now.



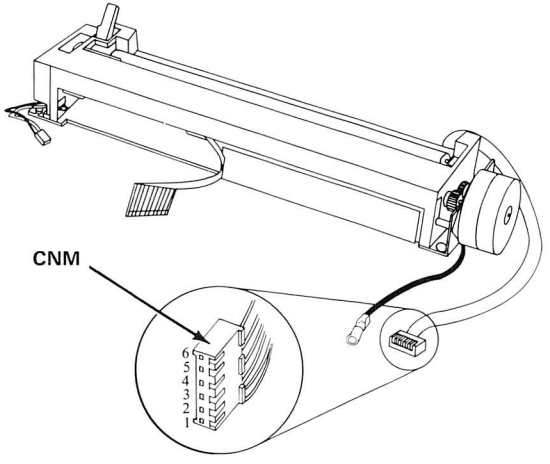
WERE YOU ABLE TO READ THE CORRECT RESISTANCE?

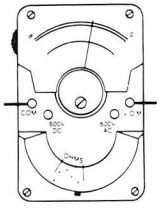
NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES

1. The resistances on the CNM connector should be within the ranges listed below.

2. Measure these resistances now.





			Low Ohm	High Ohm
Pin 1	to	Pin 3	24	36
Pin 1	to	Pin 5	24	36
Pin 2	to	Pin 4	24	36
Pin 2	to	Pin 6	24	36

WERE YOU ABLE TO READ THE CORRECT RESISTANCES?

NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

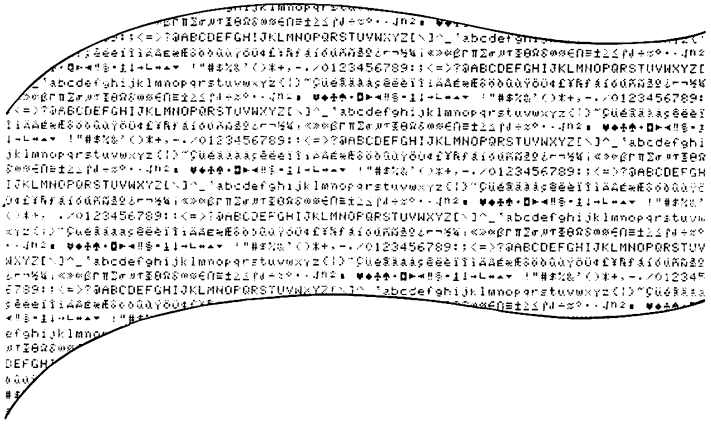
YES The logic card is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

Failure Symptom Table

Failure Symptom	Go To Page
Print Quality	3-850-18
Print Dots (Missing, Extra or Random)	3-850-19
Forms Feeding (Erratic or No Feeding)	3-850-20
Erratic Carriage Motion	3-850-19

Print Quality

1. Set the system unit's Power switch to Off.
2. Set the printer's Power switch to Off.
3. Disconnect the printer cable from the system unit.
4. Replace the forms in your printer with new forms.
5. Press and hold the paper feed button while setting the printer's Power switch to On. (This is the Printer Self-Test. To end the test, set the printer's Power switch to Off.)



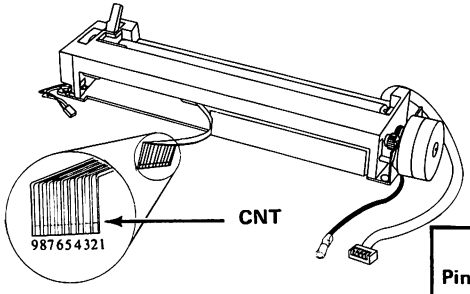
DOES THE PRINT QUALITY PROBLEM STILL EXIST?

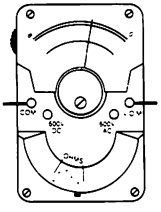
NO The problem has been corrected. Repeat the advanced test to ensure that the IBM PC Compact Printer is operating correctly.

YES The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

Print Dots

1. Set the printer's Power switch to Off.
2. Remove the printer top cover.
3. Remove the print mechanism.
4. The resistances at CNT should be within the ranges listed below.
5. Measure these resistances now.





			Low Ohm	High Ohm
Pin 1	to	Pin 9	36	50
Pin 2			36	50
Pin 3			36	50
Pin 4			36	50
Pin 5			36	50
Pin 6			36	50
Pin 7			36	50
Pin 8	to	Pin 9	36	50

WERE YOU ABLE TO READ THE CORRECT RESISTANCES?

NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

YES The logic card is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

Forms Feeding

Inspect the forms path for any obstructions.

> **Note:** Forms must be aligned parallel to the sides of the printer for proper feeding.

DID YOU FIND ANY OBSTRUCTIONS?

YES Remove any obstructions.

NO The print mechanism is bad. Replace it. Repeat the advanced test to ensure that the IBM PC Compact printer is operating correctly.

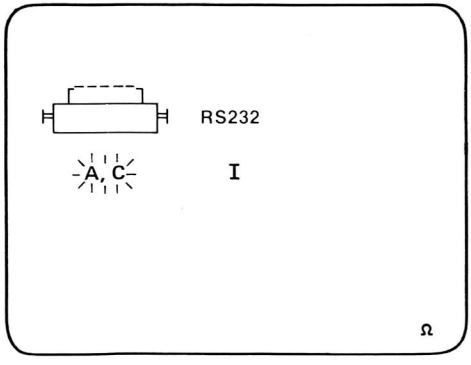
Parallel Printer Attachment

There are two IDs under the graphics printer symbol on the advanced-test menu. The IDs represent these tests:

- "A" is the graphics printer print test.
- "C" is the parallel printer attachment test (it requires the parallel printer attachment wrap plug).

1. Set the system unit's Power switch to On.

2. Bring the advanced-test menu to your screen.



ARE "A" AND "C" UNDER THE GRAPHICS PRINTER SYMBOL BLINKING?

NO Go to page 3-900-12.

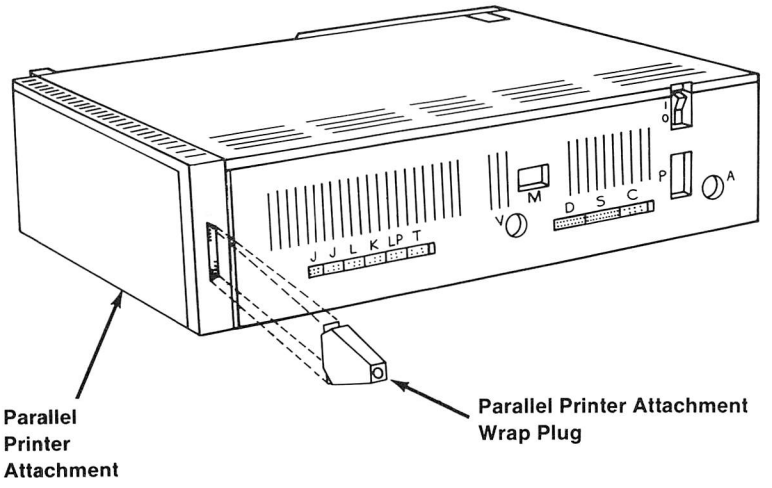
YES

1. Set the system unit's Power switch to Off.

2. Set the graphics printer Power switch to OFF.

3. Disconnect the printer cable from the parallel printer attachment.

4. Plug the parallel printer attachment wrap plug into the parallel printer attachment.



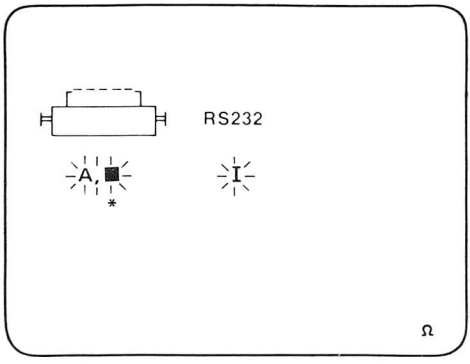
CONTINUE

5. Set the system unit's Power switch to On.

6. Bring the advanced-test menu to your screen.

7. Move the cursor to the ID "C" under the graphics printer symbol.

8. Press the Enter key.



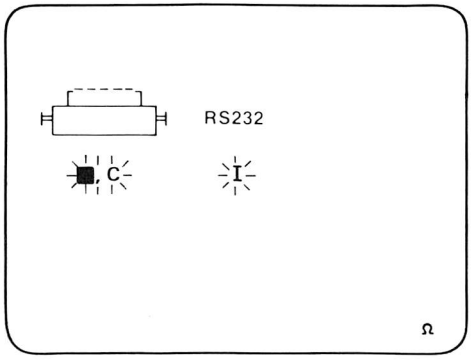
DO YOU HAVE " * " UNDER THE GRAPHICS PRINTER SYMBOL?

NO Replace the parallel printer attachment.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

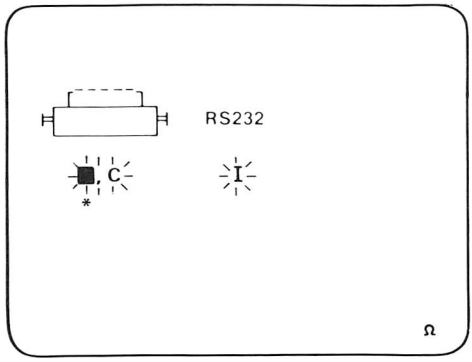
1. Set the system unit's Power switch to Off.
2. Unplug the parallel printer attachment wrap plug from the parallel printer attachment.
3. Plug the printer cable into the parallel printer attachment.
4. Set the system unit's Power switch to On.
5. Set the graphics printer's Power switch to ON.
6. Bring the advanced-test menu to your display screen.
7. Move your cursor to ID "A" under the graphics printer symbol.
8. Press the Enter key.



CONTINUE

The graphics printer should have typed several lines.

The menu should have reappeared with "*" under the graphics printer symbol.

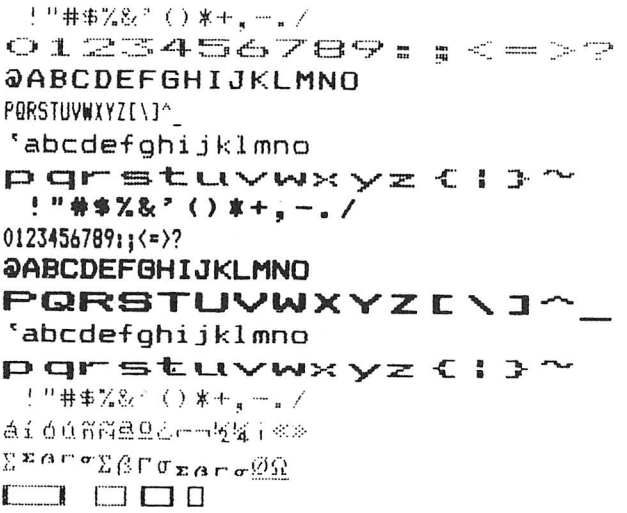


DO YOU HAVE " * " UNDER THE GRAPHICS PRINTER SYMBOL?

NO Go to page 2-900-7.

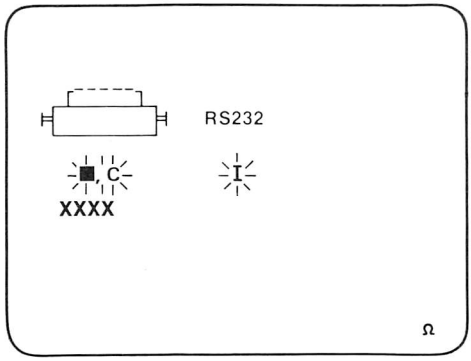
YES

Examine the printer output. The output should match the illustration below.



If you have no printer output, if your printout does not look the same as the above example, or if you think you have a problem with the printer, go to the PIC "Graphics Printer" on page 3-1400-1.

The advanced test detected an error.



1. Make a note of the number under the graphics printer symbol.

CONTINUE

2. Compare the number you noted with the numbers in the MESSAGE column of the chart below.

3. Follow the recommended action for your noted number.

Message	Recommended Action
4100	No parallel printer attachment sensed. Replace the parallel printer attachment.
4200	Out of paper. Correct the problem, then repeat the test. If you get the same error, go to the PIC "Parallel Printer" on page 3-1400-1.
4300	Continue to the next page.
4400	Printer error. Go the PIC "Parallel Printer" on page 3-1400-1.
4500	Replace the parallel printer attachment.

4. When the problem is corrected, repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

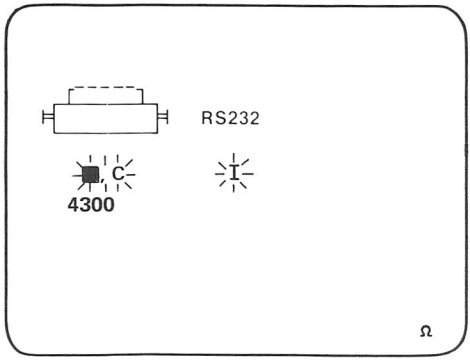
Error message "4300" appeared.

1. Ensure that the graphics printer's power cord is connected to a functioning, properly grounded outlet.

2. Ensure that the printer cable is connected to the graphics printer and system unit correctly.

3. Set the graphics printer's Power switch to OFF, then to ON.

4. Repeat the advanced test (ID "A").



DO YOU HAVE "4300" UNDER THE GRAPHICS PRINTER SYMBOL?

NO The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

1. Set the system unit's Power switch to Off.

2. Set the graphics printer's POWER switch to OFF.

3. Remove the parallel printer attachment and set it aside. Make a note that this is parallel printer attachment #1.

4. Attach a new parallel printer attachment. Make a note that this is parallel printer attachment #2.

5. Repeat the graphics printer advanced test (ID "A").

DO YOU HAVE "4300" UNDER THE GRAPHICS PRINTER SYMBOL?

NO The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES Reattach the original parallel printer attachment.

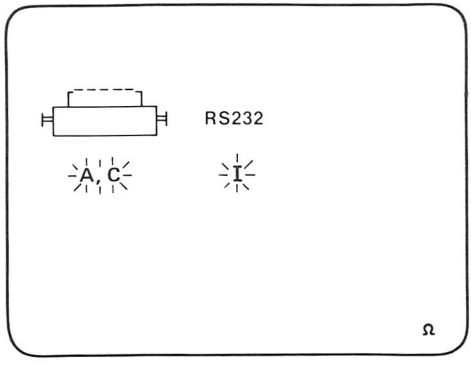
Go to the PIC "Graphics Printer" on page 3-1400-1.

1. Set the system unit's Power switch to Off.

2. Reseat the parallel printer attachment by disconnecting it from the system unit, and then reconnecting it.

3. Set the system unit's Power switch to On.

4. Bring the advanced-test menu to your display screen.



ARE THE IDS UNDER THE GRAPHICS PRINTER SYMBOL BLINKING?

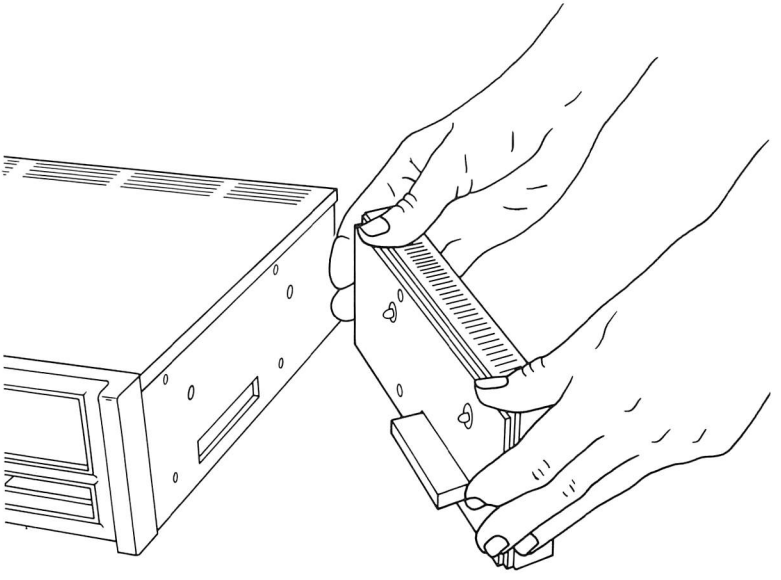
YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

NO

1. Set the system unit's Power switch to Off.

2. Remove the parallel printer attachment and set it aside. Make a note that this parallel printer attachment #1.

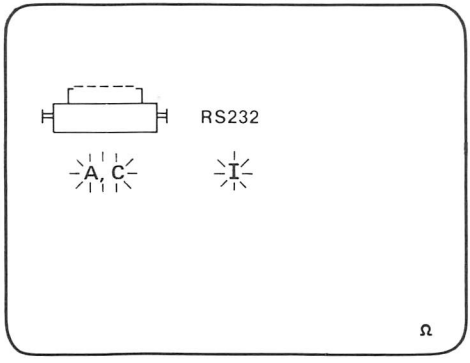
3. Attach a new parallel printer attachment. Make a note that this is parallel printer attachment #2.



CONTINUE

4. Set the system unit's Power switch to On.

5. Bring the advanced-test menu to your screen.



ARE THE IDS UNDER THE GRAPHICS PRINTER SYMBOL BLINKING?

NO The system board is bad. Replace it.

Reattach the original parallel printer attachment (attachment #1).

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES The problem has been corrected. Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

Notes:

Joystick

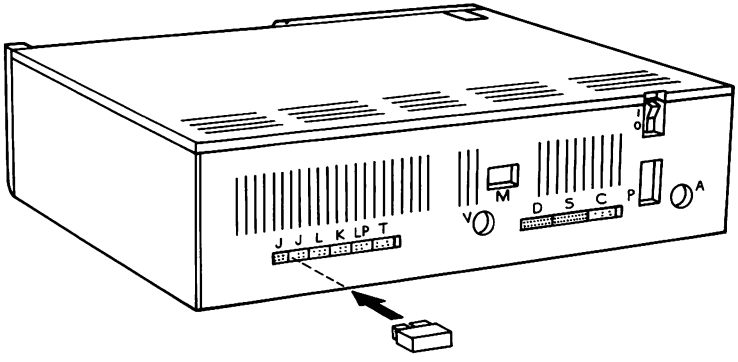
You are entering this PIC because you suspect that an attachable joystick is failing.

The attachable joystick test has two parts.

- The attachable joystick interface on the system board is checked by using a wrap plug.
- The attachable joystick itself is checked using customer-level tests.

The service plug is used as the attachable joystick wrap plug.

1. Set the system unit's Power switch to Off.
2. Unplug all attachable joysticks, if present, from the system unit.
3. Be sure that the service plug is plugged securely into the system unit connectors J.



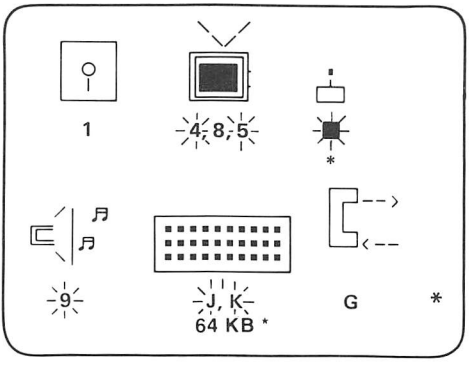
CONTINUE

4. Set the system unit's Power switch to On.

5. Bring the advanced-test menu to your display screen.

6. Move the cursor to the joystick symbol.

7. Press the Enter key.



DO YOU HAVE " * " UNDER THE JOYSTICK SYMBOL?

NO The system board is bad. Replace it.

Repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

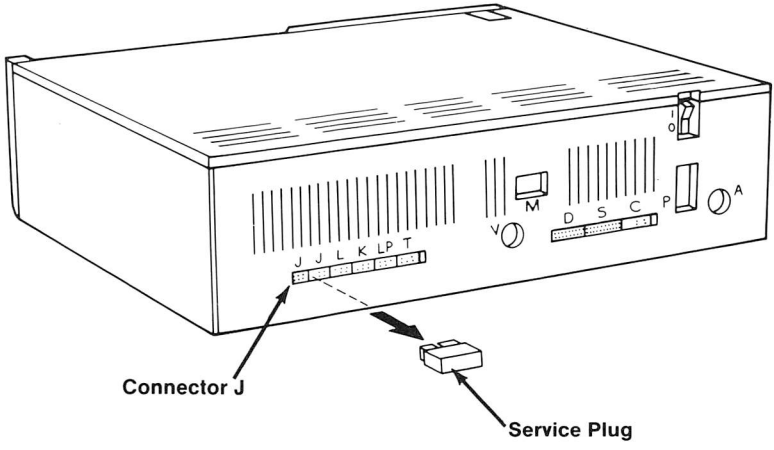
YES

The system board is operating correctly.

To test the attachable joystick, you use the customer-level joystick test.

1. Set the system unit's Power switch to Off.

2. Remove the service plug and set it aside.

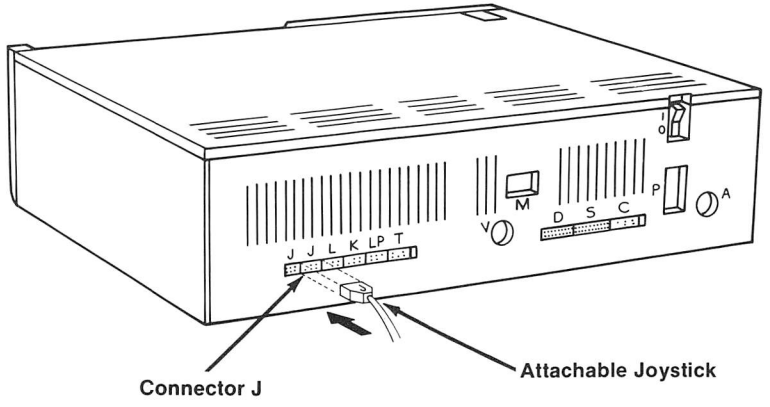


CONTINUE

1. Make sure that the system unit's Power switch is set to Off.

2. Plug in one attachable joystick. It does not matter which connector J you use.

3. Set the system unit's Power switch to On.



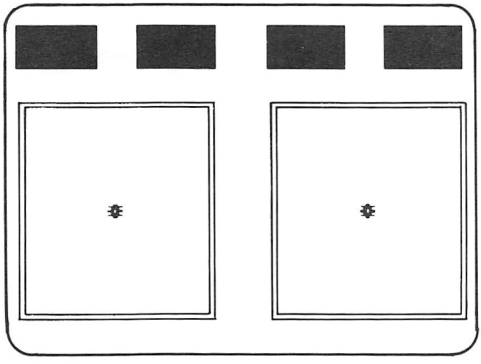
CONTINUE

4. Bring up the customer-level test menu to your screen by pressing and holding the Ctrl and Alt keys, and then pressing the Ins key. Release all keys when the screen goes blank.

5. Move the cursor to the joystick symbol.

6. Press the Enter key.

7. The joystick test screen should appear and remain on your screen.



DOES THE JOYSTICK TEST SCREEN REMAIN ON YOUR SCREEN?

NO The attachable joystick is bad. Replace it.

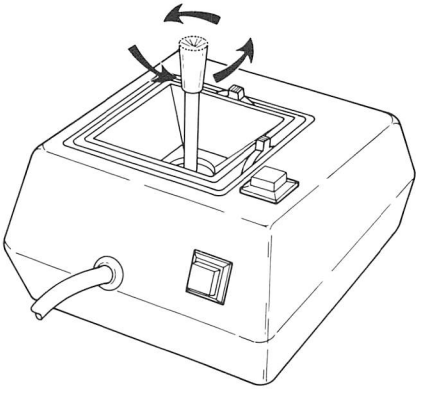
If you have another attachable joystick to test, go to page 3-1300-4. Otherwise, repeat advanced POST and advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

There are two large boxes on the joystick test screen. One has a "✱" in the middle.

Move the stick on the attachable joystick. The "✱" should move inside its box as you move the stick.

As you move the stick, the joystick test screen may disappear abruptly and be replaced by the customer-level test menu with a two letter error message under the joystick symbol.



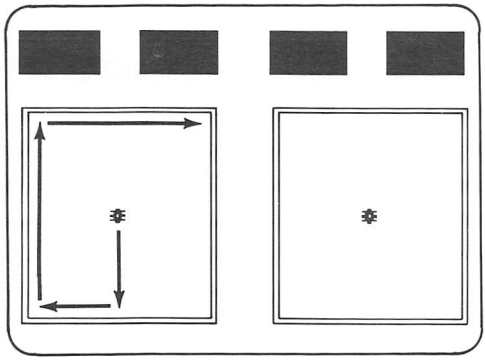
DID THE JOYSTICK TEST SCREEN REMAIN AS YOU MOVED THE STICK?

NO The attachable joystick is bad. Replace it.

If you have another attachable joystick to test, go to page 3-1300-4. Otherwise, repeat advanced POST and advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

By moving the stick, you should be able to move the "✱" all around the inside edge of its box.



CAN YOU MOVE THE "✱" TO FOLLOW THE INSIDE EDGE OF ITS BOX?

NO The attachable joystick is bad. Replace it.

If you have another attachable joystick to test, go to page 3-1300-4. Otherwise, repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

YES

The four blocks at the top of the screen represent buttons on the attachable joystick.

1. Press one button on the attachable joystick, and then release the button.

   One of the blocks on the screen should become smaller, and then return to its normal size.

2. Test all the joystick buttons. Each button should affect one block on the screen.

DID EACH JOYSTICK BUTTON AFFECT ONE BLOCK ON THE SCREEN AS DESCRIBED ABOVE?

NO The attachable joystick is bad. Replace it.

If you have another attachable joystick to test, go to page 2-1300-4. Otherwise, repeat advanced POST and the advanced tests to ensure that the IBM PC*jr* is operating correctly.

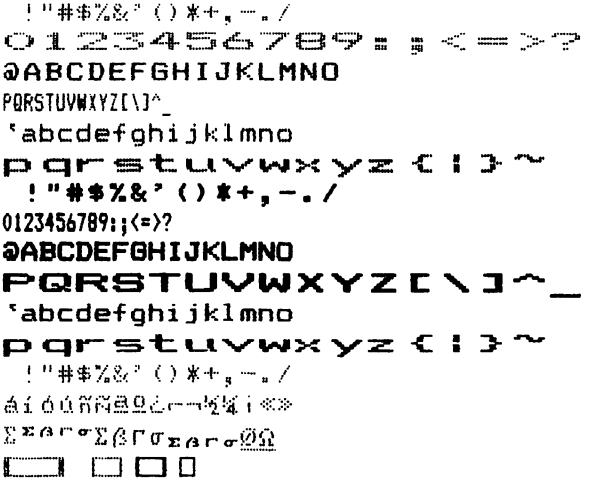
YES The attachable joystick is operating correctly.

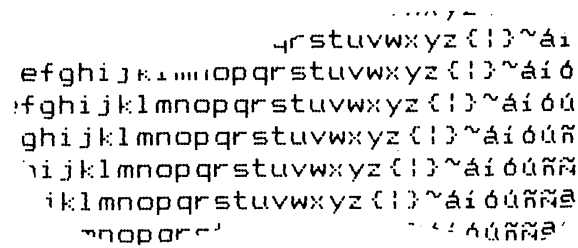
You have completed the Joystick PIC. If you still have an unsolved problem, you should seek technical assistance.

If you have another attachable joystick to test, go to page 3-1300-4.

Graphics Printer

Error Description	Diagnostic Action
1400 Printer Entry **Note: Do the parallel printer attachment advanced-test before doing this Graphics Printer test.**	1. Set printer Power switch to OFF. Verify forms are properly inserted. Move print head to left-most position. Set Printer Power switch to ON. Are the Power, Ready and Online lights on? YES: Go to step 2. NO: Go to page 3-1400-25, "Control Panel," and follow each step until failing FRU is isolated. 2. Press Online switch. Does Online light go out? YES: Go to step 3. NO: Go to page 3-1400-25, "Control Panel." 3. Press Line Feed and Forms Feed. Do forms step when each switch is pressed? YES: Go to step 4. NO: Do forms step when either the Line Feed or the Forms Feed is pressed? YES: Go to page 3-1400-25, "Control Panel." NO: Go to page 3-1400-14, "Forms Do Not Advance," and follow each step until failing FRU is isolated. 4. Remove forms. Press Online switch. Does alarm sound and No Paper light go on? YES: Power Off. Reload forms. Power On. Go to step 5. NO: Go to page 3-1400-25, "Control Panel."

Error Description	Diagnostic Action
1400 Printer Entry	5. Bring the advanced-test menu to your screen. 6. Move the cursor to ID "A" under the graphics printer symbol. 7. Press the Enter key. Does the printer fail to print? YES: Go to step 8. NO: Compare printout with this one. **IBM Personal Computer Graphics Printer**  Any errors? YES: Go to step 8. NO: Go to page 3-1400-4, "Failure Symptom" chart. If a failure symptom still exists, proceed to the corresponding PIC and follow each step until the failing FRU is isolated.

Error Description	Diagnostic Action
1400 Printer Entry	8. Power off the printer and the system unit. Disconnect the signal cable at the printer and the system unit. Run the Offline Diagnostic Test (see page 3-1400-33). Does the printer fail to print? YES: Go to page 3-1400-10, "No Printing," and follow each step until the failing FRU is isolated. NO: Compare the printout with the one below. **IBM Personal Computer Graphics Printer**  Any errors? YES: Go to page 3-1400-4, "Failure Symptom" chart. Proceed to the corresponding page and follow each step in PIC procedure until the failing FRU is isolated. NO: Go to step 9. 9. Check the printer cable. See Section 5, "Locations." Check all pins, pin to pin, on the cable for shorts or opens. Any shorts or opens? YES: Replace printer cable. NO: Replace control cards in printer. See Section 4, "Removable/Replacement and Adjustments."

PICs

Error Description	Diagnostic Action
Power Supply Check	1. Set printer Power switch to OFF. Unplug printer power cord. Position printer Power switch to ON. Measure 2 to 12 ohms between voltage terminals on power cord. Does the resistance = 2 to 12 ohms? YES: Go to step 3. NO: Check for open fuse. See Section 5, "Locations." Is the fuse open? YES: Replace fuse. See Section 4, "Removal/Replacement and Adjustments." Power off. Plug in printer power cord. Power on for 1 minute. Does the fuse open? YES: Go to step 2. NO: Problem resolved. NO: Check for approximately 12 ohms on primary side of power transformer. See Section 5, "Locations." Does the resistance = 12 ohms? **DANGER:** Static voltage may be present on the fuse-filter card. Use extreme caution in this area. YES: Replace fuse-filter card. See Section 4, "Removal/Replacement and Adjustments." NO: Replace power transformer. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Power Supply Check	2. Set printer Power switch to OFF. Unplug printer cord. Replace fuse. See Section 4, "Removal/Replacement and Adjustments." Disconnect power transformer connector from fuse-filter card. See Section 5, "Locations." Plug in printer power cord. Power on for 1 minute then power off. Unplug printer power cord and check for open fuse. Is the fuse open? **DANGER:** Static voltage may be present on the fuse-filter card. Use extreme caution. YES: Replace Fuse-Filter card. See Section 4, "Removal/Replacement and Adjustments." NO: Replace power transformer. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Power Supply Check	3. Disconnect CN2. See Section 5, "Locations." Plug in printer power cord. Set printer Power switch to ON. Measure voltages on the plug side of CN2 according to the chart below. **DANGER:** Line voltage is present on the AC filter, circuit board and transformer. Caution should be exercised when measuring secondary voltages.

Color	+ Lead	- Lead	Min. Voltage	Max. Voltage
Gray	CN2-1	CN2-2	7.6 Vac	10.4 Vac
Orange	CN2-3	CN2-4	19.5 Vac	26.5 Vac
Red	CN2-5	CN2-6	8.1 Vac	10.9 Vac
Blue	CN2-7	CN2-8	13.0 Vac	17.6 Vac

Are the voltages in range?

YES: Go to step 4.
NO: Replace power transformer. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Power Supply Check	4. Set the printer Power switch to OFF. Connect CN2. See Section 5, "Locations." Power ON then measure voltages at CN3 (see Section 5, "Locations") as shown in the chart below. Use the ground pin on the drive circuit card. **DANGER:** Line voltage is present on the AC filter, circuit board and transformer. Caution should be exercised when measuring DC voltages. Are + 5 and + 14 Vdc within range? YES: Go to step 5. NO: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments."

Pin No.	Min. Voltage	Max. Voltage
CN3-16	4.5 Vdc	5.5 Vdc
CN3-20	11.0 Vdc	15.4 Vdc

Error Description	Diagnostic Action
Power Supply Check	5. Measure the +24 Vdc (use ground pin on the driver circuit card). Is +24 Vdc within range? YES: Power supply checks good. NO: Go to step 6. 6. Measure DC voltages (on 60-volt scale) on pins CN6-1 and CN6-2 located on control circuit card (use the DC ground pin on the driver circuit card for common lead). Find the difference in the two readings. Is the difference 0.5 to 0.9 Vdc? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Replace the heat sink/power transistor assembly. See Section 4, "Removal/Replacement and Adjustments."

Pin No.	Min. Voltage	Max. Voltage
CN3-18	21.6 Vdc	26.4 Vdc

Error Description	Diagnostic Action
No Printing	1. Does print head carriage move back and forth normally when attempting to print? YES: Go to page 3-1400-19, "Row(s) of Print Dots Missing." NO: Go to step 2. 2. Check for a loose or broken carriage belt. Replace if broken, adjust if loose. See Section 4, "Removal/Replacement and Adjustments." 3. Remove ribbon cartridge. Turn knob on cartridge to check for jamming. Replace if jammed. See Section 4, "Removal/ Replacement and Adjustments." 4. Check print head for broken wires. Replace print head if wires are damaged. See Section 4, "Removal/ Replacement and Adjustments." 5. Set printer Power switch to OFF. Move print head assembly and check for smooth mechanical operation. Is there smooth operation? YES: Go to step 6. NO: Check for worn or broken gears in Carriage Drive assembly. Are any gears worn or broken? YES: Replace carriage drive assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
No Printing	6. Set the printer Power switch to ON. Move the print head to the left-most position. Check for an Up level (approximately +5 Vdc) to a Down level (approximately 0 Vdc) meter deflection at CN6-20 on the driver circuit card (see Section 5, "Locations,") while moving the print head to the center of the print line. Use the ground pin on the driver circuit card for common. Is there an Up level to a Down level meter deflection? YES: Go to step 7. NO: Is there a constant Down level? YES: Go to page 3-1400-5, "Power Supply Check." Replace the left margin sensor if the power supply checks good. See Section 4, "Removal/ Replacement and Adjustments." NO: Set the printer Power switch OFF. Check continuity from CN6-20 (driver circuit card) to left margin sensor terminal 1 and from CN6-15 to left margin sensor terminal 2. See Section 5, "Locations." Is either line open? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace left margin sensor. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
No Printing	7. Check for a meter deflection from an Up level (approximately +5 Vdc) to a Down level (approximately 0 Vdc) on pin CN6-19 on the driver circuit card (see Section 5, "Locations,") while applying slight left or right pressure to the print head without advancing the print head to the next detented position. Use the driver circuit card ground pin for common. Is there an Up level to a Down level meter deflection? YES: Go to step 8. NO: Is there a constant Up level? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Check for +5 Vdc at CN5-18. See Section 5, "Locations." Is there +5 Vdc? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Go to page 3-1400-5, "Power Supply Check."

Error Description	Diagnostic Action
No Printing	8. Set printer Power switch to OFF. Measure resistance between pin CN6-13, (driver circuit card), and pins CN6-21, 22, 23 and 24 (stepper motor coils) on cable end for a reading of approximately 45 ohms. Does the resistance = 45 ohms? YES: Replace control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print mechanism assembly. See Section 4, "Removal/ Replacement and Adjustments."
Print Head Carriage Not Moving	1. Go to page 3-1400-10, "No Printing."

Error Description	Diagnostic Action
Forms Do Not Advance **Overprinting** **Forms Jamming or Tearing**	1. Check position of forms feeding into printer. Forms path must be parallel to printer sides. Reposition forms for parallel feeding. 2. Check forms path for any obstructions (for example, jagged edges on forms box, torn paper in print mechanism). Remove any obstructions. 3. Inspect left and right forms tractors. — Poor positioning — Loose covers — Loose lock levers — Worn springs — Broken feed pins Replace left or right forms tractors if damaged. See Section 4, "Removal/ Replacement and Adjustments." 4. Check for a loose or broken carriage belt. Check for broken cogs on the belt. Adjust if loose or replace if broken. See Section 4, "Removal/Replacement and Adjustments." 5. Inspect print head for broken wires. Replace if wires damaged. See Section 4, "Removal/Replacement and Adjustments." 6. Check print head gap adjustment. Adjust if out of tolerance. See Section 4, "Removal/ Replacement and Adjustments." 7. Check for bent or pitted ribbon shield. Replace shield if damaged. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Forms Do Not Advance **Overprinting**	8. Check for damaged platen. Replace print mechanism assembly if platen is damaged. See Section 4, "Removal/Replacement and Adjustments."
Forms Jamming or Tearing	9. Set printer Power switch to OFF. Advance forms by turning forms advance knob. Check intermediate gear for worn or broken teeth and replace gears if damaged. Check left and right tractors for broken feedpins and replace if broken. See Section 4, "Removal/Replacement and Adjustments." 10. Check for 45 ohms resistance on forms feed motor coils between pin CN6-14 and pins CN6-25, 26, 27 and 28 on driver circuit card. See Section 5, "Locations." Does the resistance = 45 ohms? YES: Check for +24 Vdc at CN3-18. See Section 5, "Locations." Is there +24 Vdc? YES: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." NO: See page 3-1400-5, "Power Supply Check." NO: Replace print mechanism assembly. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Ribbon Jammed	1. Remove ribbon cartridge. Try a print operation to verify that print head carriage functions normally. If carriage fails, see page 3-1400-10, "No Printing." 2. Check ribbon cartridge for binding by manually advancing ribbon and replace if binding. 3. Visually check for worn or broken ribbon drive gears and replace carriage drive assembly if damaged. See Section 4, "Removal/Replacement and Adjustments." 4. Check for bent ribbon shield and replace if necessary. See Section 4, "Removal/Replacement and Adjustments." 5. Check print head for broken or binding wires. Replace print head if wires are broken or bound. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Printing Too Light **Poor Print Quality**	1. Check for adequate ink on ribbon or damaged ribbon and replace cartridge if needed. 2. Check ribbon cartridge for binding by manually advancing ribbon and replace if binding. 3. Visually check for worn or broken ribbon drive gears and replace carriage drive assembly if damaged. See Section 4, "Removal/Replacement and Adjustments." 4. Check for bent ribbon shield and replace if necessary. See Section 4, "Removal/Replacement and Adjustments." 5. Check print head for broken or binding wires. Replace print head if wires are broken or bound. See Section 4, "Removal/Replacement and Adjustments." 6. Verify that print head gap is 0.6 to 0.65 mm (.024 to .026″) with the lever in the center position. See Section 4, "Removal/Replacement and Adjustments." 7. Check print head for loose mounting. See Section 4, "Removal/Replacement and Adjustments. 8. Check for loose or damaged platen, print head carriage shafts, or print mechanism frame. Replace print mechanism if needed. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Smudged Printing	1. Check ribbon cartridge for: — Jammed — Seated improperly — Excessive ink — Oily or dirty 2. Check for dirty, oily, or damaged platen. Replace print mechanism if platen is damaged. See Section 4, "Removal/ Replacement and Adjustments." 3. Check for dirty print head and print wires. Clean if dirty. 4. Check for dirty or bent ribbon shield and replace shield if damaged. See Section 4, "Removal/Replacement and Adjustments." 5. Visually check for worn or broken ribbon drive gears and replace carriage drive assembly if damaged. See Section 4, "Removal/Replacement and Adjustments."
Uneven Printing **No bottom of character** **Left/right of print line**	1. No adjustment can be made; replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments."

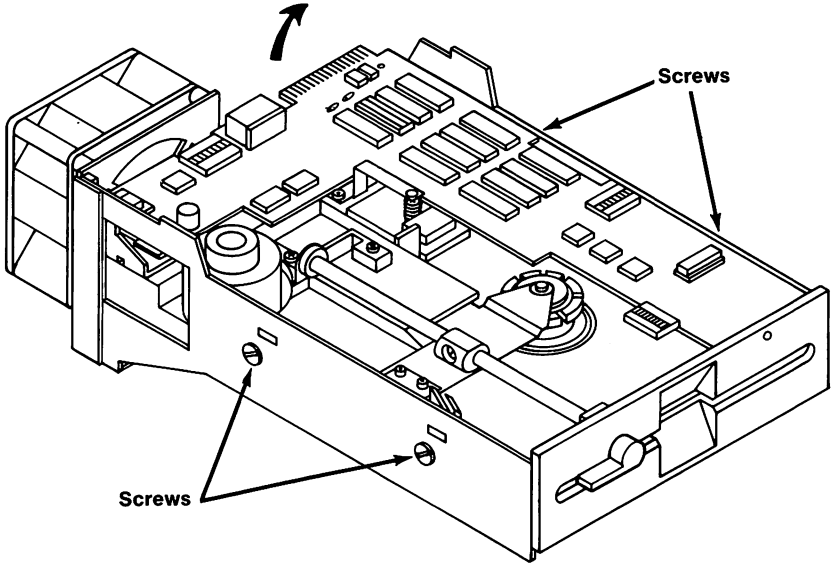
Error Description	Diagnostic Action
Row(s) of Print Dots Missing	1. Check ribbon for damage (folds, holes, tears). Replace cartridge if damaged. 2. Verify print head gap adjustment is between 0.6 to 0.65 mm (.024 to .026″) at center position of adjusting lever. See Section 4, "Removal/Replacement and Adjustments." 3. Check for damaged platen. Replace print mechanism if platen is damaged. See Section 4, "Removal/Replacement and Adjustments." 4. Check print head for broken wires. If wires are broken, replace print head. See Section 4, "Removal/Replacement and Adjustments." 5. Remove CN6 on driver circuit card. See Section 5, "Locations." Measure approximately 22 ohms between pin CN6-10 (male side) and each head coil pin (CN6-1 to 9 [male side]). Does the resistance = 22 ohms? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Disconnect print head cable and check pins 1 through 9 on print head cable for approximately 22 ohms in respect to common. See Section 5, "Locations." Does the resistance = 22 ohms? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print head. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Random Print Dots Missing	1. Check ribbon for damage (folds, holes, tears). Replace if damaged. 2. Verify print head gap adjustment is between 0.6 to 0.65 mm (.024 to .026″) at center position of adjusting lever. See Section 4, "Removal/Replacement and Adjustments." 3. Check for damaged platen. Replace print mechanism if platen is damaged. See Section 4, "Removal/Replacement and Adjustments." 4. Check print head for broken wires. If wires are broken, replace print head. See Section 4, "Removal/Replacement and Adjustments." 5. Remove CN6 on driver circuit card. See Section 5, "Locations." Measure approximately 22 ohms between pin CN6-10 (male side) and each head coil pin (CN6-1 to 9 [male side]). Does the resistance = 22 ohms? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Disconnect print head cable and check pins 1 through 9 on print head cable for approximately 22 ohms in respect to common. See Section 5, "Locations." Does the resistance = 22 ohms? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print head. See Section 4, "Removal/Replacement and Adjustments."

Diskette-Drive Mounting Bracket Removal 620

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive (610).
3. Remove the 4 screws holding the mounting bracket to the diskette drive.
4. Separate the mounting bracket from the diskette drive.



5. Connect the diskette-drive fan power cable to the power board.

6. Connect the diskette-drive power cable to the power board.

7. Connect the diskette-drive signal cable to the rear of the diskette drive.

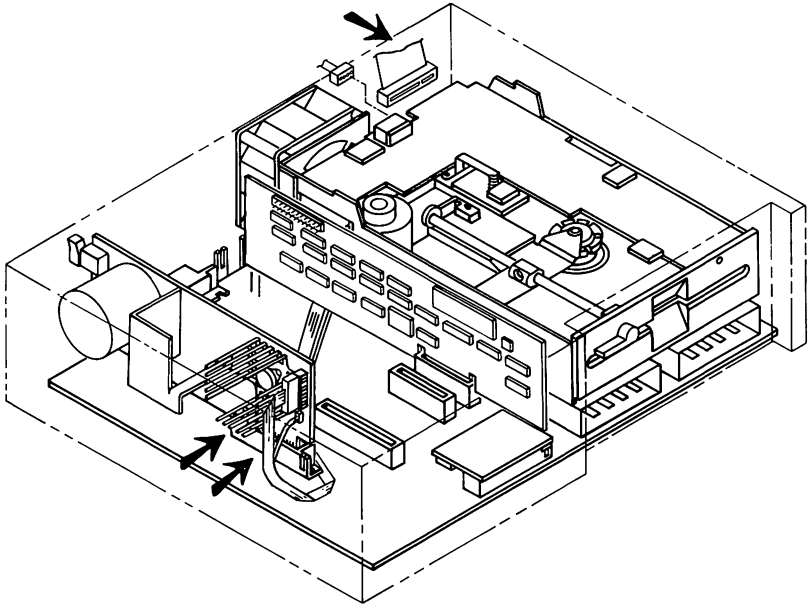
8. Replace the diskette-drive adapter (605).

9. Connect the diskette-drive signal cable to the diskette-drive adapter.

10. Replace the internal modem, if removed (835).

11. Replace the 64KB memory and display expansion, if removed (205).

12. Replace the system unit top cover (105).



Diskette Drive Replacement 615

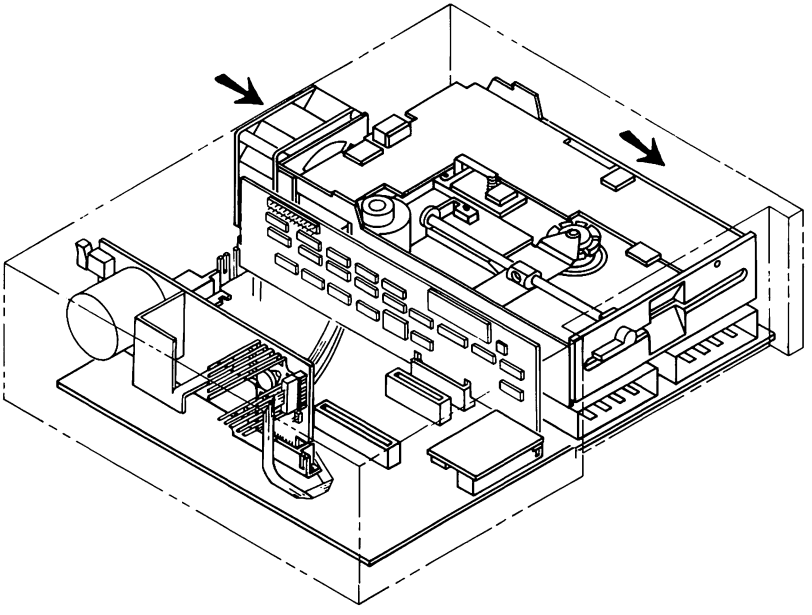
Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Attach the diskette-drive mounting bracket to the diskette drive (625).

2. Place the diskette drive into the bottom cover.

3. Slide the diskette drive to the the front until its mounting bracket studs align with the holes in the system board.

4. Gently press down on the back of the diskette drive until the diskette drive is fully seated. DO NOT PUSH ON THE CIRCUIT BOARD.

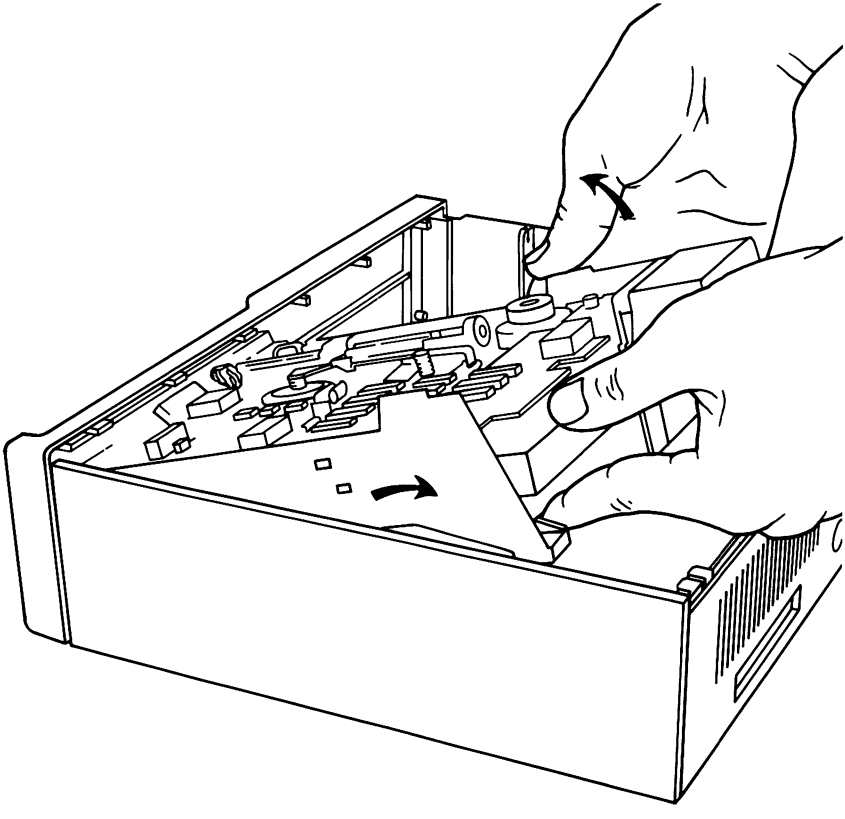


8. Two studs hold the rear of the diskette drive to the system board. Pull up on the rear of the diskette-drive mounting bracket until the studs are clear of the system board. DO NOT PULL ON THE CIRCUIT BOARD.

9. Slide the diskette drive and its mounting bracket to the rear until they are clear of the front cover opening.

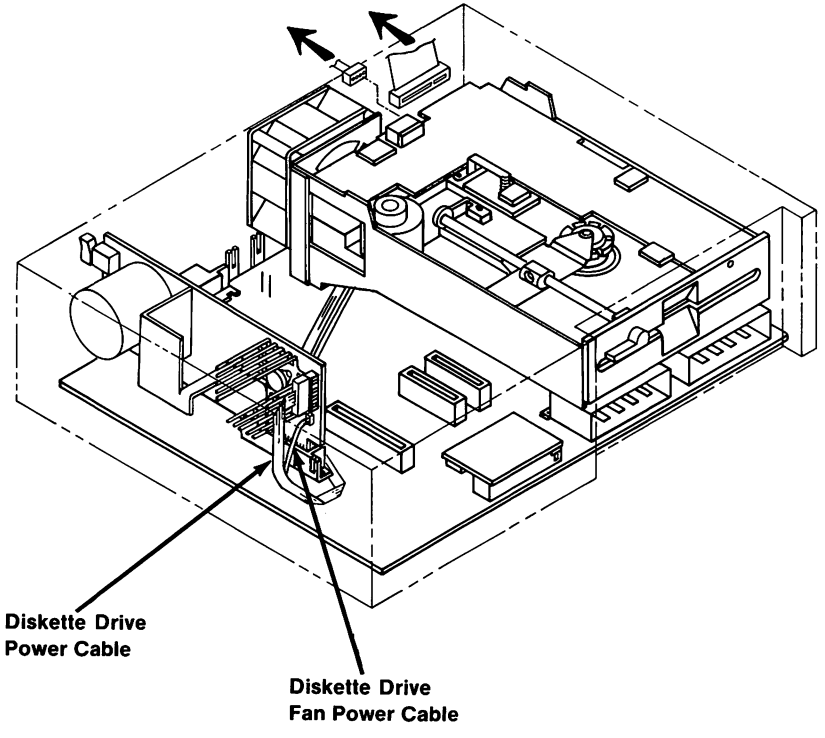
10. Lift the diskette drive out of the bottom cover.

11. Remove the diskette-drive mounting bracket from the diskette drive (620).



6. Disconnect the diskette-drive fan power cable from the diskette-drive.

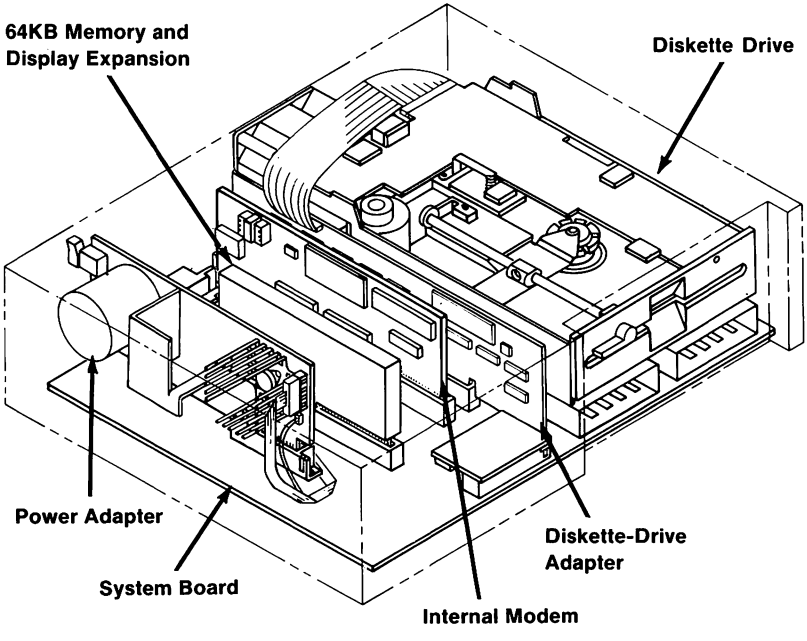
7. Disconnect the diskette-drive power cable from the diskette-drive.



Diskette Drive Removal 610

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Remove the internal modem, if installed (830).
4. Remove the 64KB Memory and Display Expansion, if installed (200).
5. Remove the diskette-drive adapter (600).



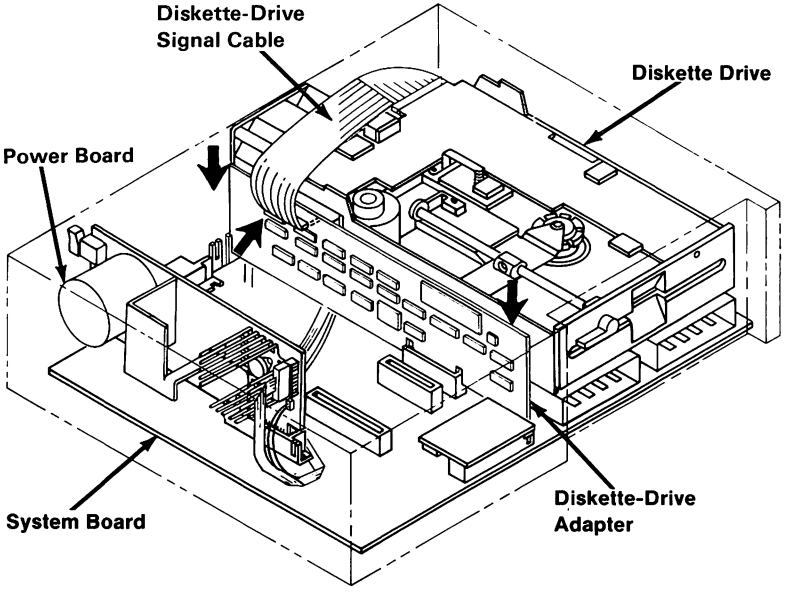
Diskette-Drive Adapter Replacement 605

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Connect the diskette-drive signal cable to the diskette-drive adapter.

2. Plug in the diskette-drive adapter by gently pushing it straight down into its system board connector, making sure that the adapter rests in the notch at the rear of the case.

3. Replace the system unit top cover (105).

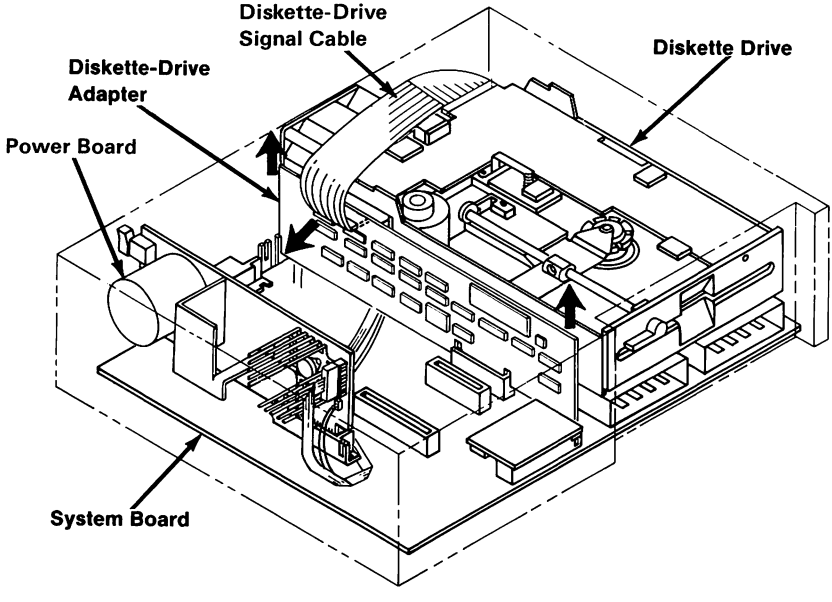


Diskette Drive

Diskette-Drive Adapter Removal 600

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Remove the diskette-drive signal cable from the diskette-drive adapter.
4. Gently pull the diskette-drive adapter straight up from the system board.

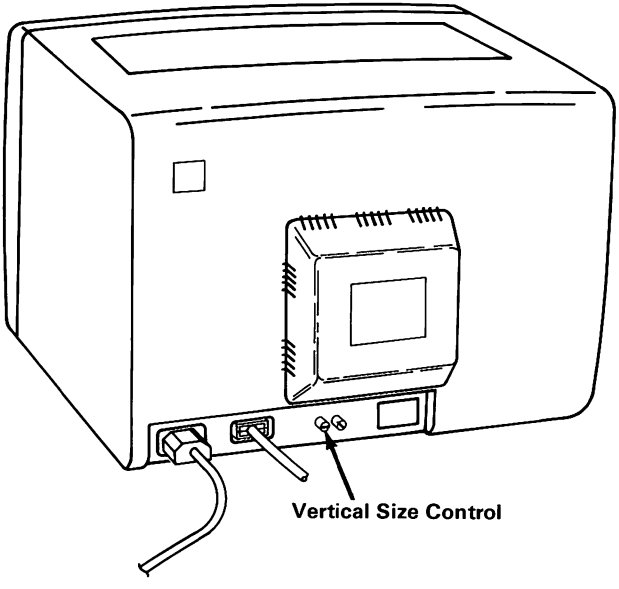


Notes:

4. Turn the vertical size control fully counterclockwise. A black area should appear across the bottom and top of the screen.

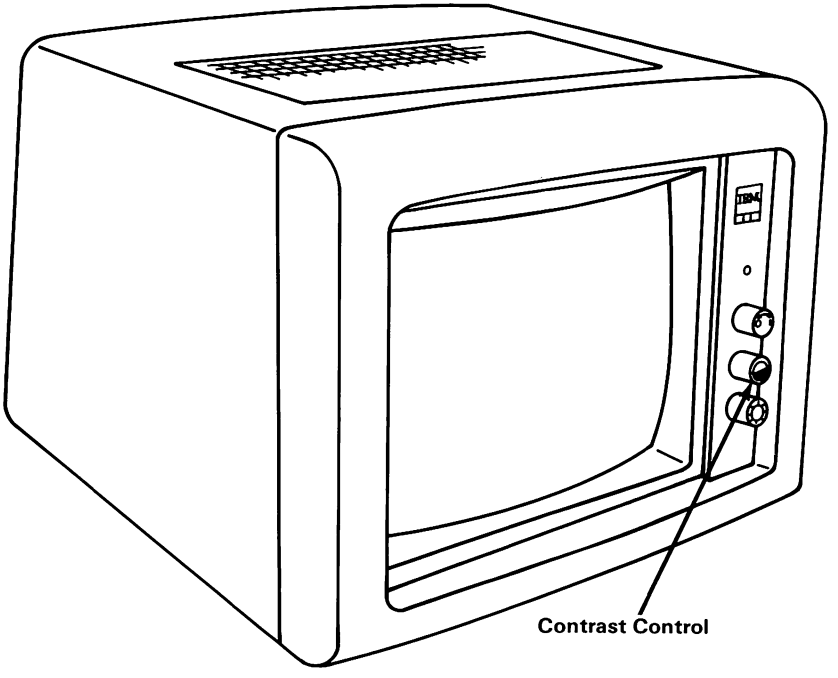
5. Turn the vertical size control clockwise until the black areas at the top and bottom of the screen just disappear. If one of the black areas disappears before the other, continue to turn the control until the second black area also disappears.

6. Adjust the brightness and contrast controls for eye comfort.



IBM Color Display Vertical Size Adjustment 515

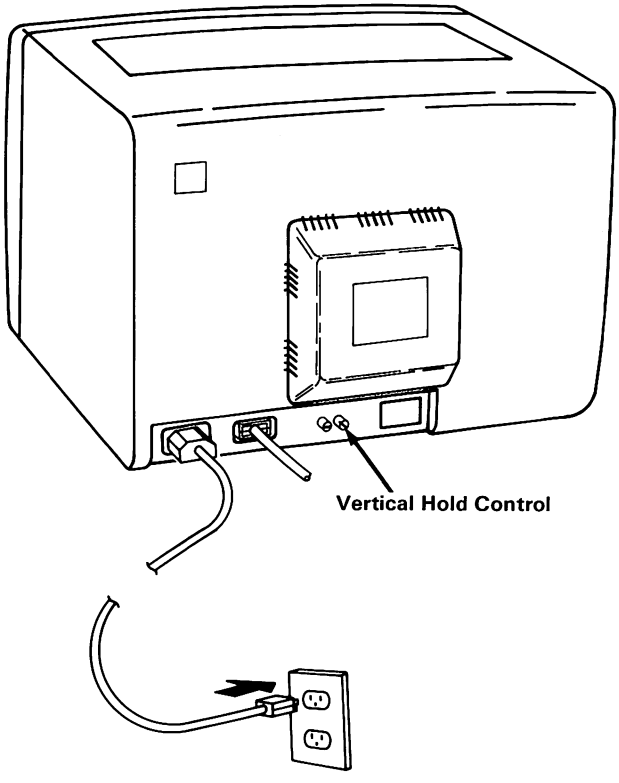
1. Set the system unit's Power switch to Off.
2. Set the display's Power switch to On.
3. Turn the brightness and contrast controls fully clockwise.



IBM Color Display Vertical Hold Adjustment 510

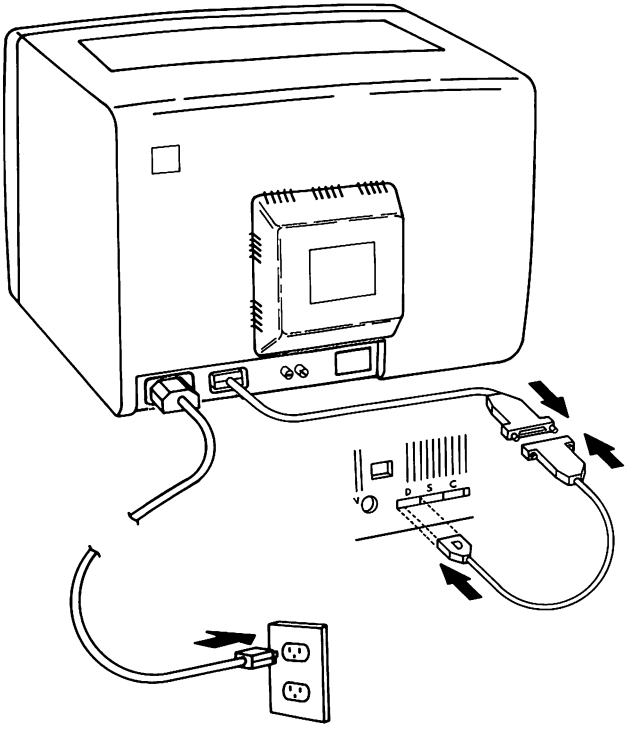
Note: This adjustment is required only if your IBM display has a vertical hold problem (screen rolling top-to-bottom or bottom-to-top).

1. Set the display's Power switch to On.
2. Set the system unit's Power switch to On.
3. Wait for POST to complete.
4. Turn the vertical hold control clockwise as far as it will go, then turn it counterclockwise until the screen stops rolling and is stable.



IBM Color Display Replacement 505

1. Set the system unit's Power switch to Off.
2. Set the display's Power switch to Off.
3. Plug the display's signal cable into the IBM Adapter Cable for IBM Color Display.
4. Plug the IBM Adapter Cable for IBM Color Display into system unit connector D.
5. Plug the display's power cord into the wall outlet.

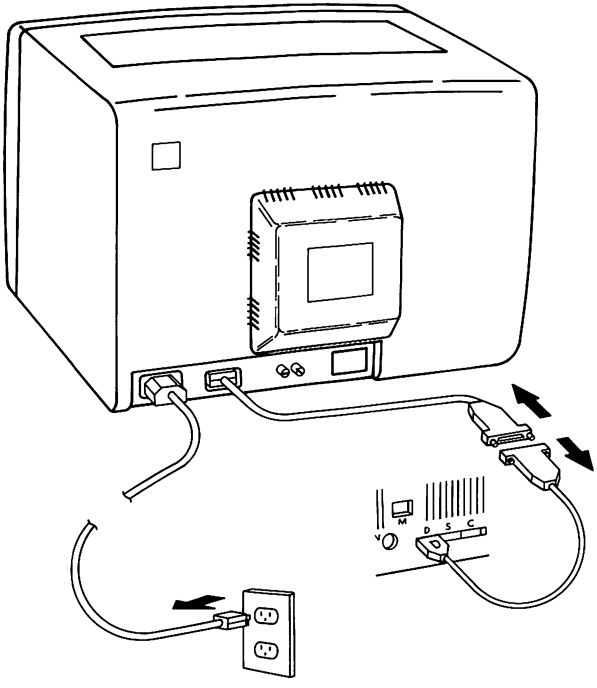


CAUTION:
Connect to a properly grounded wall outlet.

Display

IBM Color Display Removal 500

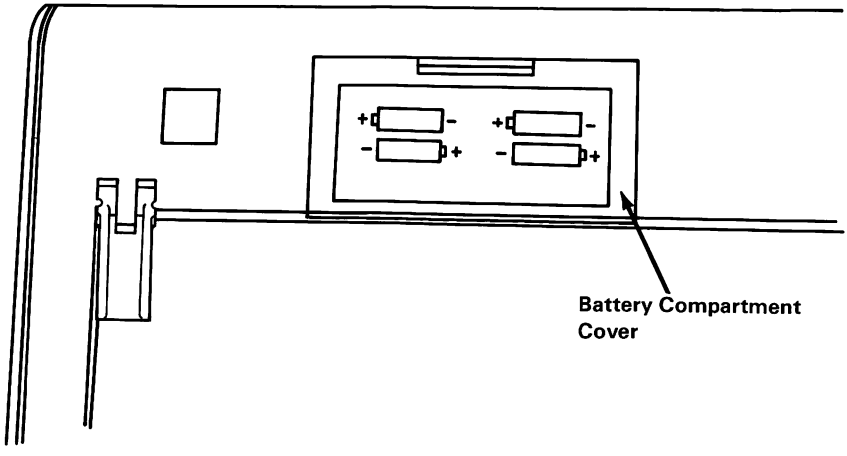
1. Set the display's Power switch to Off.
2. Set the system unit's Power switch to Off.
3. Disconnect the display's power cord from the wall outlet.
4. Disconnect the display's signal cable from the IBM Adapter Cable for IBM Color Display at the rear of the system unit.



Notes:

Keyboard Battery Replacement 310

1. Set the system unit's power switch to Off.
2. Turn the keyboard bottom-side up.
3. Slide the battery compartment cover open.
4. Follow the instructions on the battery cover and replace the batteries.
5. Slide the battery compartment cover closed.
6. Turn the keyboard right-side up.



Infra-Red Receiver Replacement 305

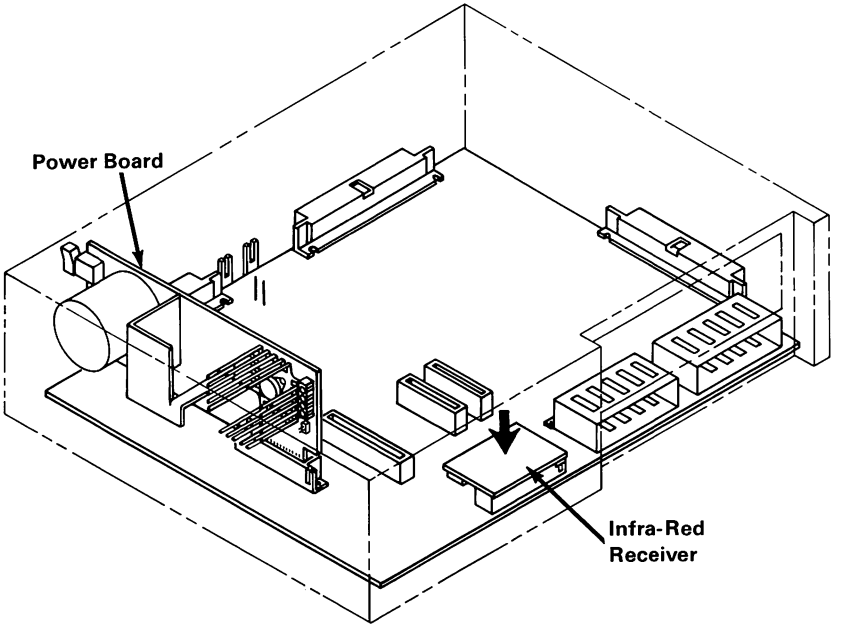
Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Place the infra-red receiver on top of the mounting posts.

2. Align the pins of the infra-red receiver with the system board connector, and the mounting posts with the holes in the infra-red receiver.

3. Plug in the infra-red receiver by gently pushing it straight down into its system board connector. Make sure that the mounting posts are in place and are holding the infra-red receiver securely.

4. Replace the system unit top cover (105).

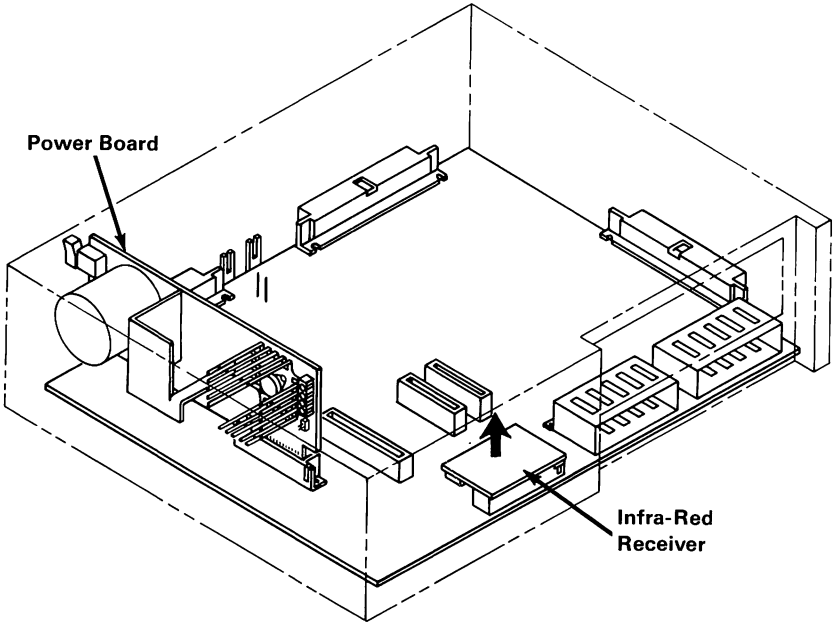


Keyboard

Infra-Red Receiver Removal 300

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Gently pull the infra-red receiver straight up from its system board connector. (You may have to rock the infra-red receiver from side to side to free it from the mounting posts.)

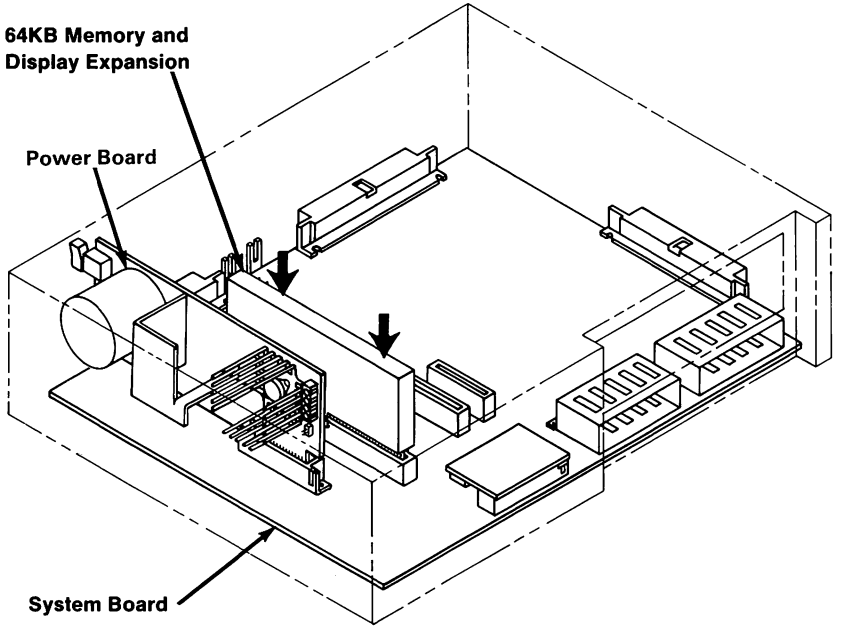


64KB Memory and Display Expansion Replacement 205

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Plug in the 64KB memory and display expansion by gently pushing it straight down into its system board connector.

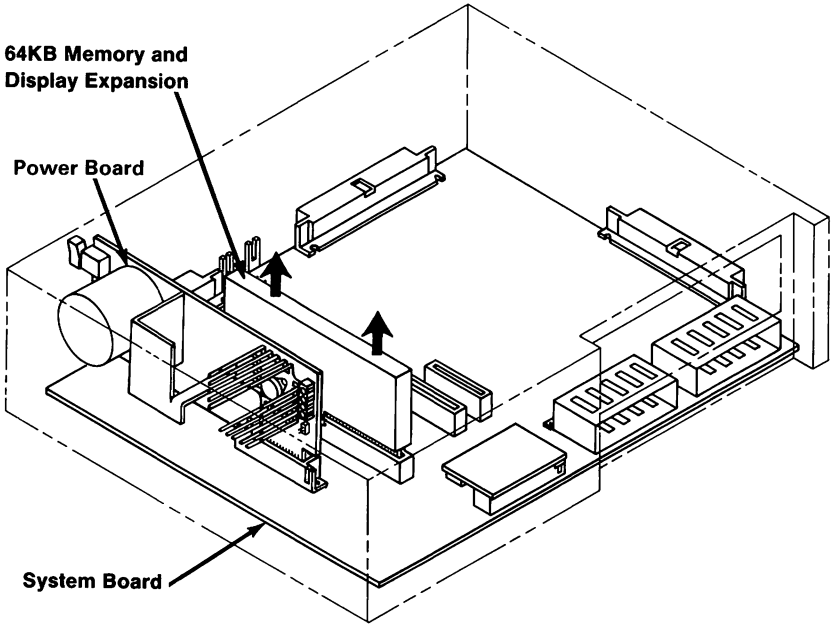
2. Replace the system unit top cover (105).



64KB Memory and Display Expansion Removal 200

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Gently pull the 64KB memory and display expansion straight up from its system board connector.



Notes:

6. Replace the power board (025).

7. Replace the infra-red receiver (305).

8. Replace the diskette-drive face plate, if present (665).

9. Replace the diskette drive, if present (615).

10. Replace the diskette-drive adapter, if present (605)

11. Replace the internal modem, if present (835).

12. Replace the 64KB memory and display expansion, if present (205).

13. Replace the system unit top cover (105).

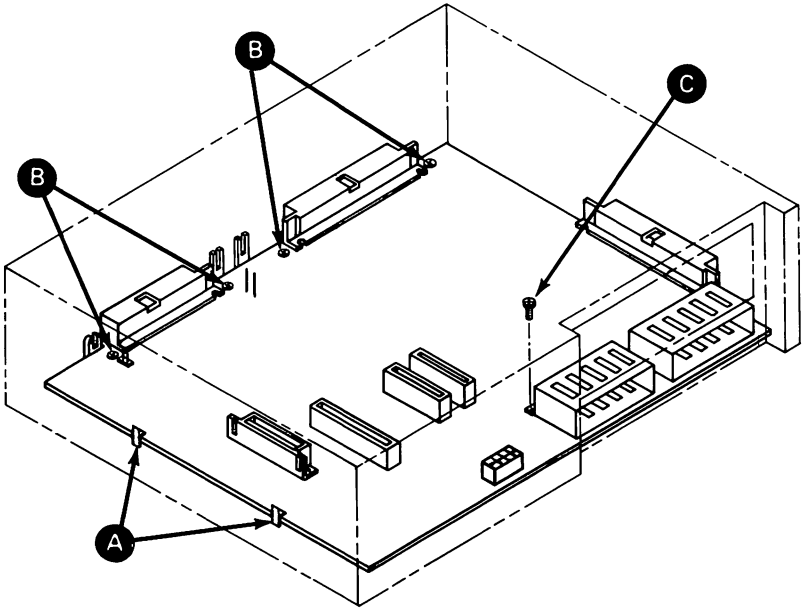
14. Replace the parallel printer attachment, if present (905).

15. Plug the cables into the back of the system unit.

3. Apply gentle pressure to the hold-down latches (A) until the system board clears them to slip underneath.

4. Install the four system board mounting screws (B).

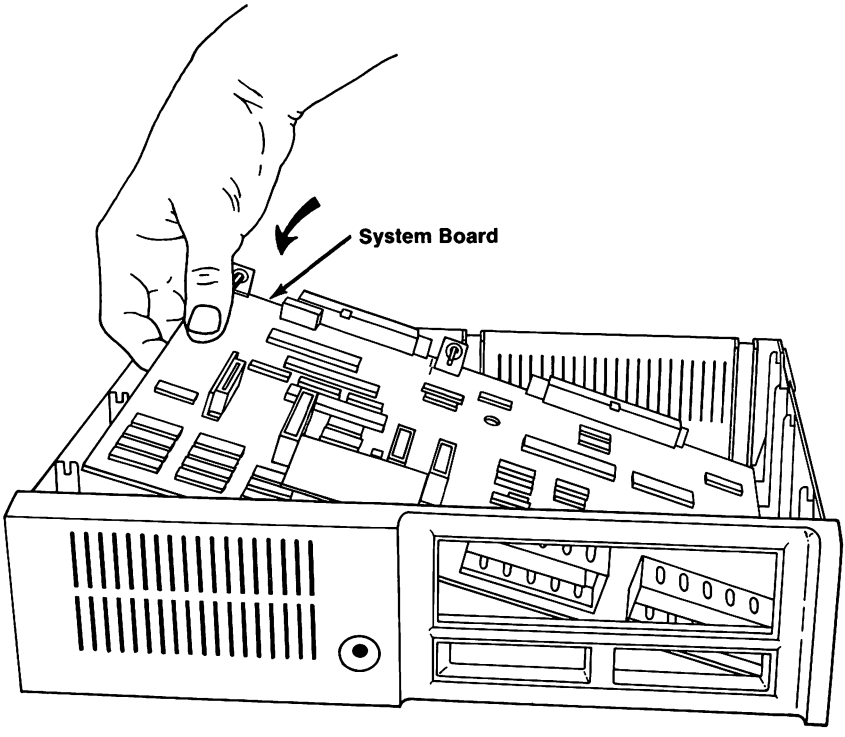
5. Install the system board mounting screw (C), if present.



System Board Replacement 125

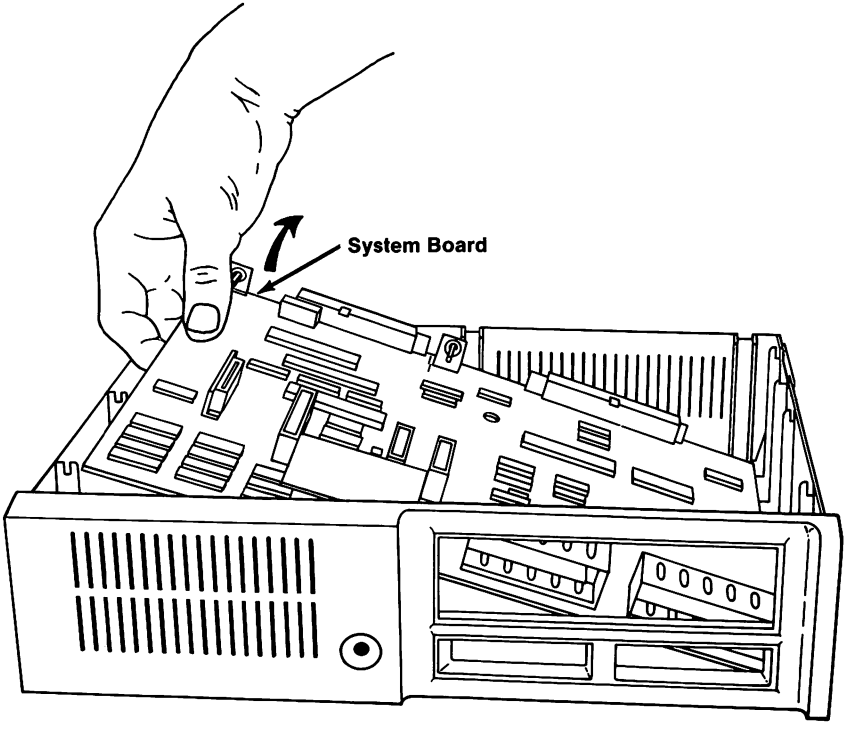
1. Place the system board into the base.

2. Slide the system board toward the right side until it is in its mounting slot.



16. Slide the system board toward the left to clear the mounting slot on the right side.

17. Lift the system board out of the bottom cover.

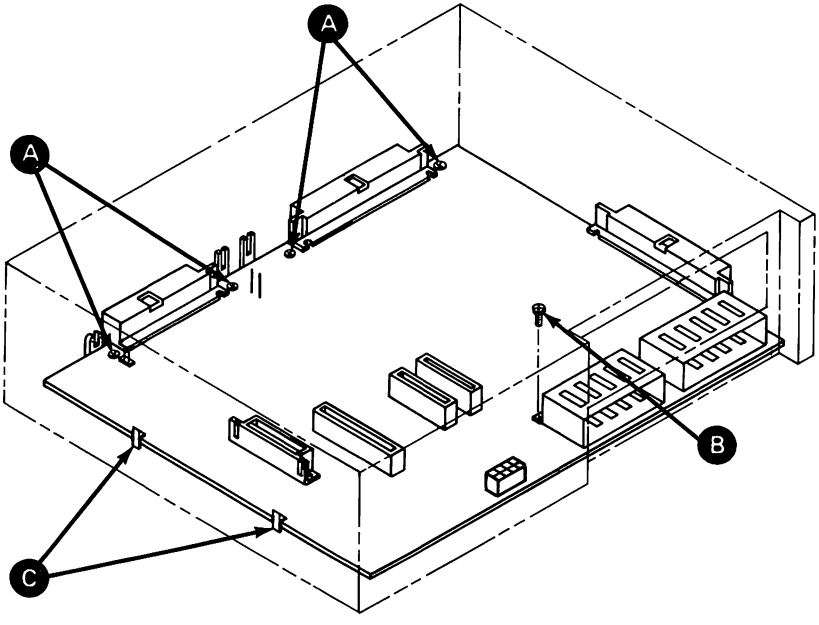


13. Remove the four system board mounting screws (A).

14. Remove the system board mounting screw (B), if present.

15. Use your finger to apply pressure to the hold-down latches (C) and lift the system board enough to clear the latches.

    Note: The system board is held by two hold-down latches on the left side and a mounting slot on the right.



6. Remove the 64KB memory and display expansion, if present (200).

7. Remove the internal modem, if present (830).

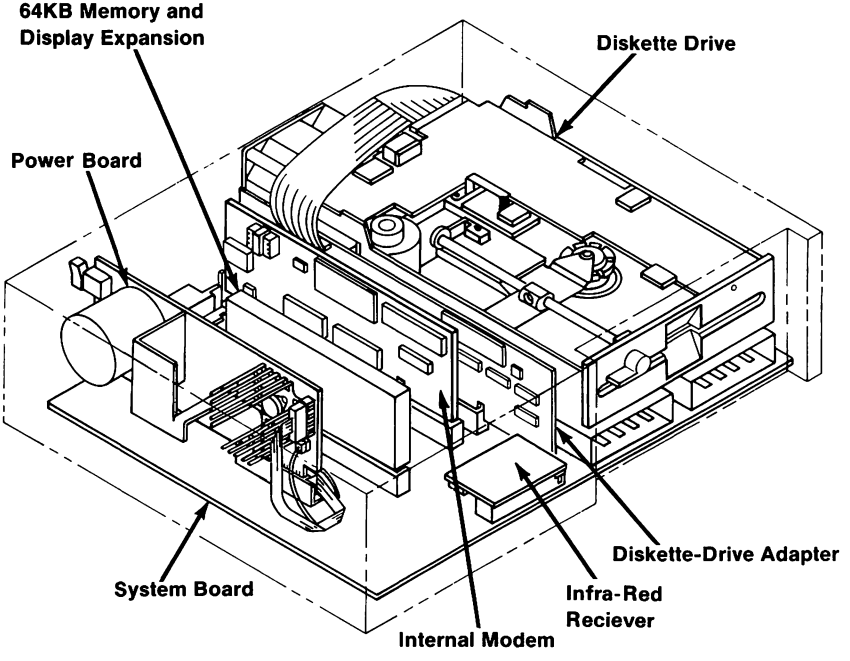
8. Remove the diskette-drive face plate, if present (660).

9. Remove the diskette-drive adapter, if present (600).

10. Remove the diskette drive, if present (610).

11. Remove the power board (020).

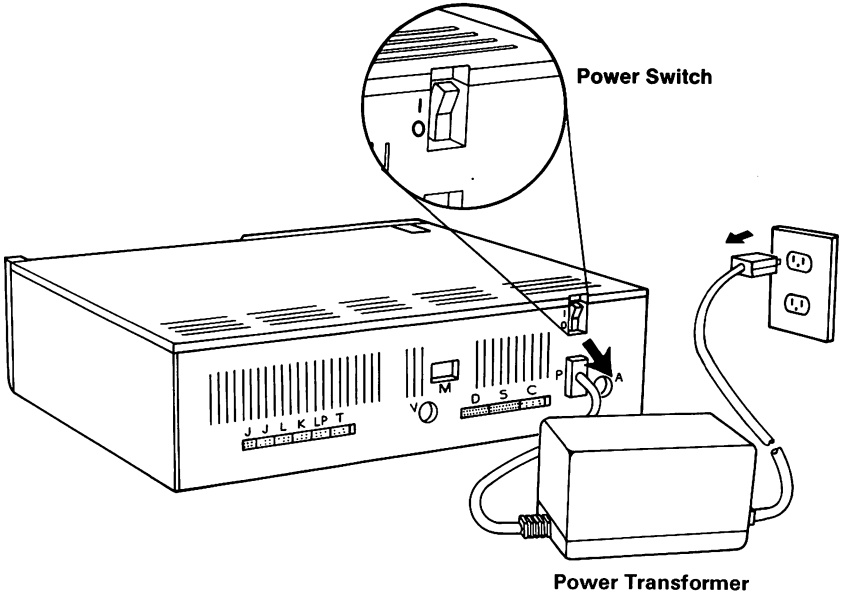
12. Remove the infra-red receiver (300).



System Board Removal 120

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

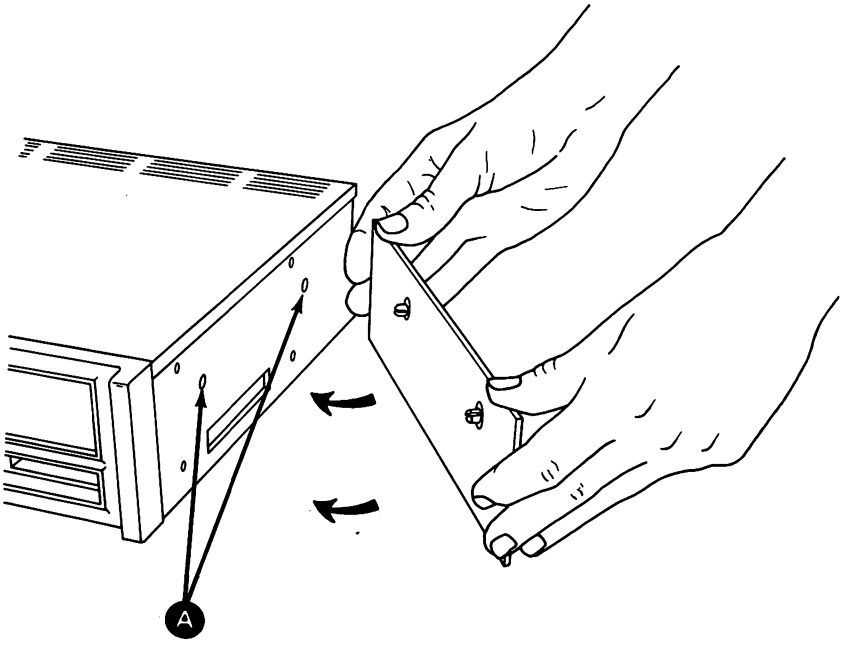
1. Set the system unit's Power switch to Off.
2. Remove any cartridges from the cartridge slots.
3. Remove all cables plugged into the back of system unit.
4. Remove the parallel printer attachment, if present (900).
5. Remove the system unit top cover (100).



Side Cover Replacement 115

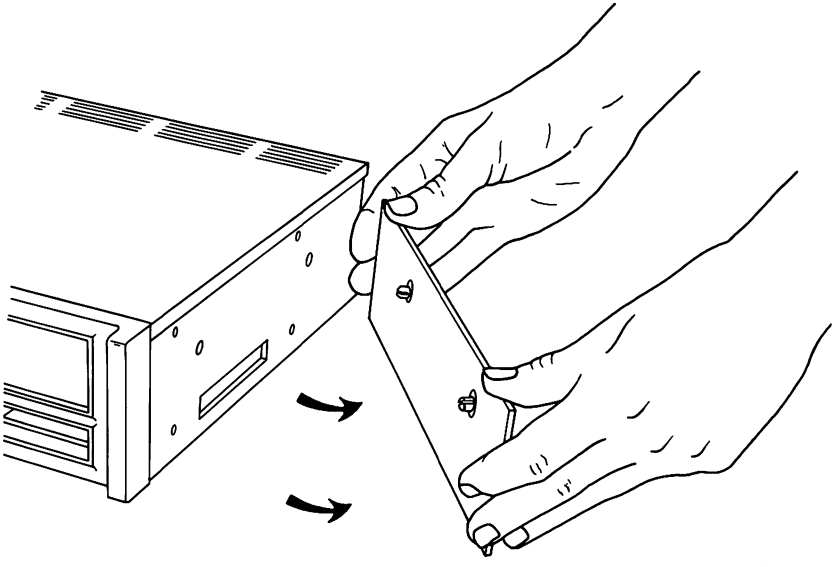
1. Align the studs of the side cover with the mounting holes (A).

2. Snap the studs into the mounting holes.



Side Cover Removal 110

1. Gently pry the side cover from its mounting holes.



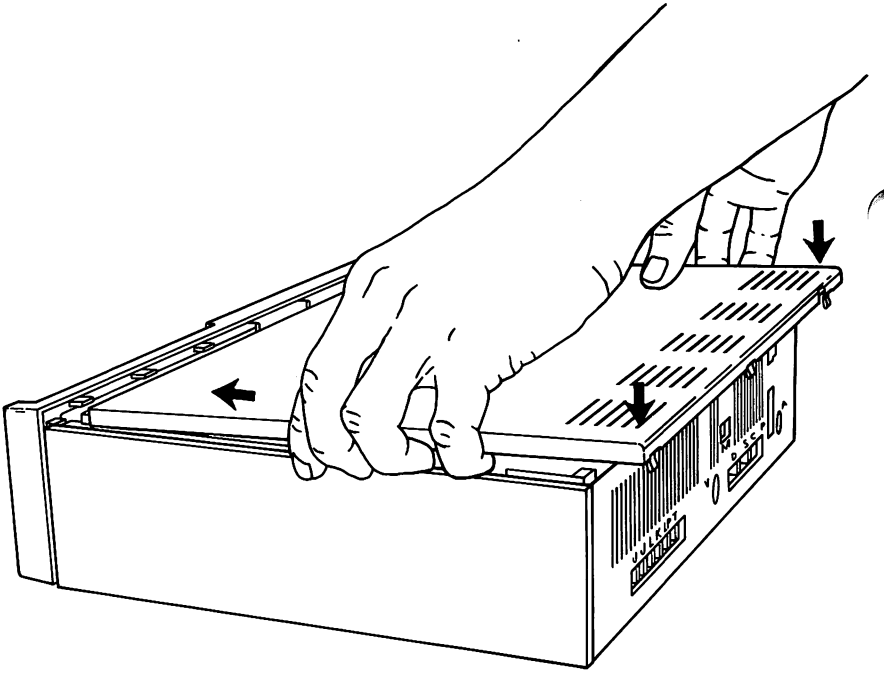
System Unit Top Cover Replacement 105

1. Set the system unit's Power switch to Off.

2. Slide the top cover toward the front of the unit, making sure its front lip is inside the groove in the front of the system unit.

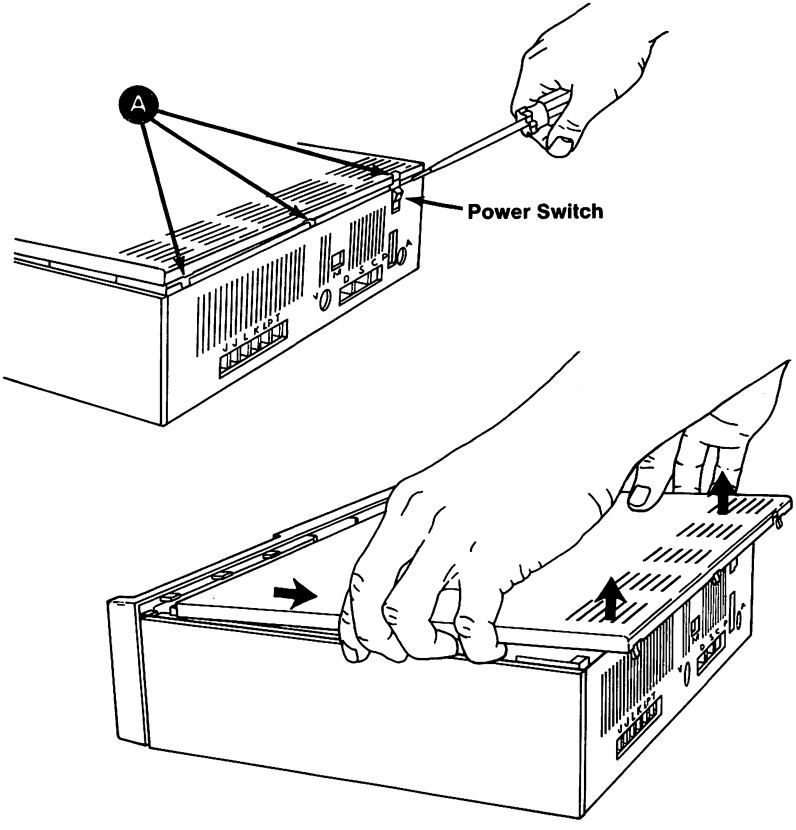
3. Align the top cover tabs with the slots in the rear of the bottom cover.

4. Gently press down on the top cover at the rear corners and rear middle until it snaps into place.



System Unit Top Cover Removal 100

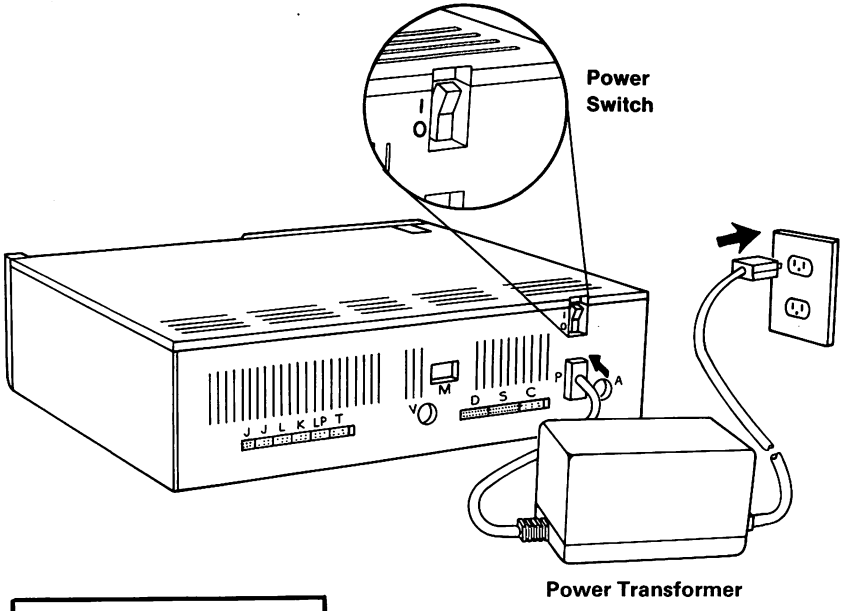
1. Set the system unit's Power switch to Off.
2. Gently pry up the rear corners and middle of the top cover at points (A).
3. Lift the rear edge of the top cover until its tabs are clear of the bottom cover.
4. Slide the top cover toward the rear and up.



5. Replace the system unit top cover (105).

6. Plug the power cable from the power transformer into system unit connector P.

7. Plug the power transformer's power cord into the wall outlet.



CAUTION:
Connect to a properly grounded wall outlet.

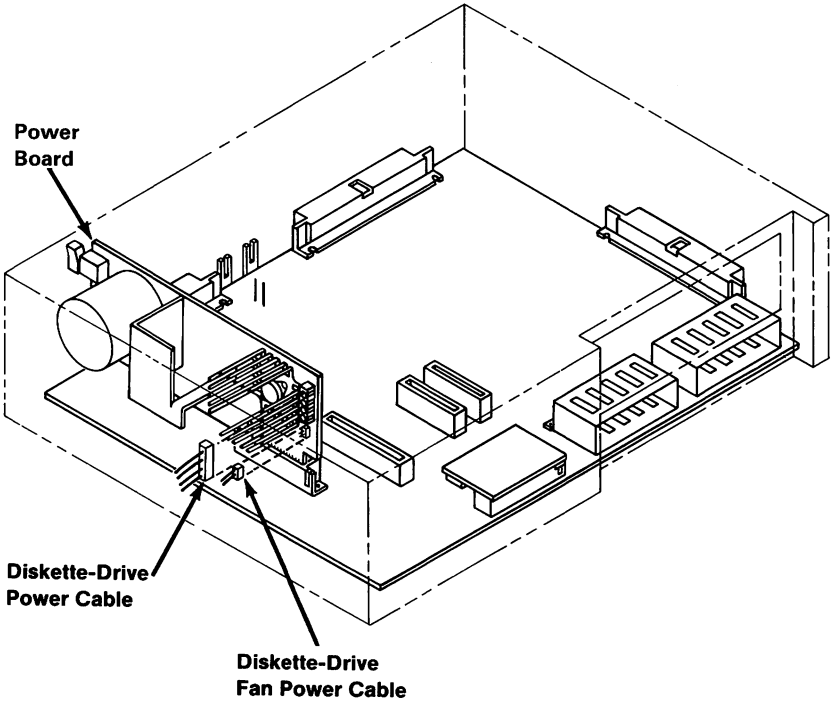
Power Board Replacement 025

1. Set the Power switch on the power board to Off.

2. Plug in the power board by gently pushing it straight down into its two system board connectors. Make sure that the power board rests in the notch at the rear of the base.

3. Connect the diskette-drive power cable, if present, to the power board.

4. Connect the diskette-drive fan power cable, if present, to the power board.

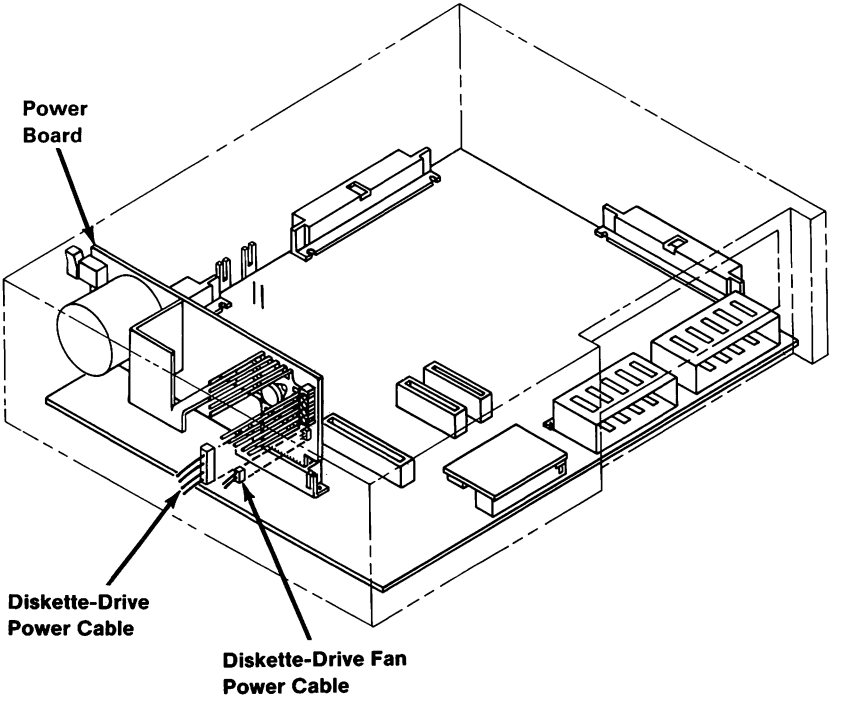


5. Allow the power board to cool.

6. Disconnect the diskette-drive power cable, if present, from the power board.

7. Disconnect the diskette-drive fan power cable, if present, from the power board.

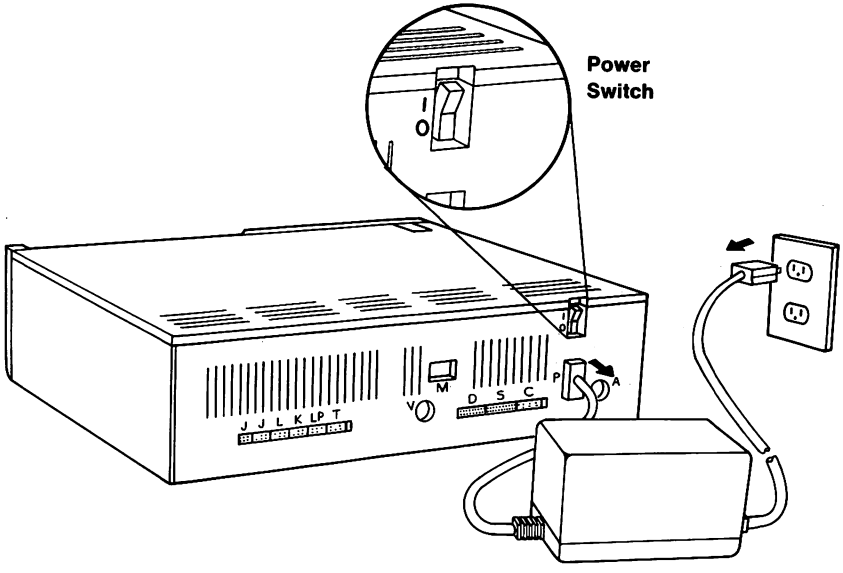
8. Gently pull the power board straight up from its system board connector.



Power Board Removal 020

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Unplug the power transformer's power cord from the wall outlet.
3. Unplug the power transformer's power cable from the system unit.
4. Remove the system unit top cover (100).



Notes:

How to Use this Section

Every removal, replacement, and adjustment procedure is identified by a number. If you are following a procedure with a step that is fully explained in another procedure, that procedure is referenced by a number in parentheses. An example is:

1. Set the system unit's Power switch to Off.

2. Remove the system unit's top cover (100).

3. Remove the ...

Step 2 refers you to procedure 100, which has complete instructions for removing the system unit top cover. You should use this reference to perform a step correctly.

If you cannot find a specified part while using one of these procedures, go to Chapter 5, "Locations," to locate the specified part.

Section 4. Removal Replacement and Adjustments

Contents

Notes:

Offline Diagnostic Test

Description

An offline diagnostic test can be run to verify correct operation of the printer mechanism (motors, ribbon drive, print head, etc.) and print quality. A sample of the ripple patterns is shown below.

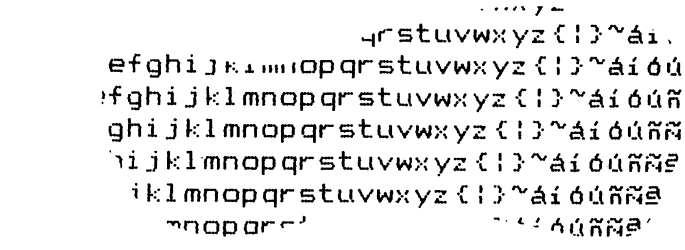
Operating Procedure

Press and hold the line feed switch while you position the printer Power switch to ON.

To stop the test before it is completed:

Set the printer Power switch to OFF.

IBM Personal Computer Graphics Printer



Error Description	Diagnostic Action
Control Panel	10. Does the No Paper light go on? YES: Control panel checks good. Return to page 3-1400-1, "Printer Entry." NO: Measure for approximately +10 to +12 Vdc at pin 3 of control panel. Is there +12 Vdc? YES: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	9. Remove forms from printer. Press the online switch. Does the alarm sound? YES: Go to step 10. NO: Measure for approximately +5 Vdc from pin CN6-18 on driver circuit card to ground pin on driver circuit card. Is there +5 Vdc? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Measure for a voltage pulsing from 0 to +12 Vdc at pin 10 of control panel. Use pin 8 for ground. See Section 5, "Locations." Power off and back on before taking voltage reading. It will only pulse eight times. Does voltage pulse 0 to +12 Vdc? YES: Replace control panel. See Section 4, "Removal/Replacement and Adjustments." NO: Replace control cards. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	8. Press the forms feed switch. Do forms advance? YES: Go to step 9. NO: Measure for approximately +4 to +5.5 Vdc on pin 6 of control panel. Use pin 8 for ground. See Section 5, "Locations." Is there +5 Vdc? NO: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." YES: Press and hold form feed switch. Measure 0 to +1.5 Vdc on pin 6 of control panel. Is there +1.5 Vdc? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	7. Press the line feed switch. Do forms step? YES: Go to step 8. NO: Measure for approximately +4 to +5.5 Vdc on pin 7 of control panel. Use pin 8 for ground. See Section 5, "Locations." Is there +5 Vdc? NO: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." YES: Press and hold line feed switch. Measure 0 to +1.5 Vdc on pin 7 of control panel. Is there +1.5 Vdc? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	6. Set the printer Power switch to OFF. Insert forms under end-of-forms switch. Set the printer Power switch to ON. Press the online switch. Is the online light off? YES: Go to step 7. NO: Measure for approximately +4 to +5.5 Vdc on pin 5 of control panel. Use pin 8 for ground. See Section 5, "Locations." Is there +5 Vdc? NO: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." YES: Press and hold online switch. Measure 0 to +1.5 Vdc on pin 5 of control panel. Is there +1.5 Vdc? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	5. Is the ready light on? YES: Go to step 6. NO: Measure for approximately +10 to +12 Vdc at pin 4 on the control panel. Use ground pin on the driver circuit card. See Section 5, "Locations." Is there +12 Vdc? YES: Replace control cards. See Section 4, "Removal/ Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	3. Is the power light on? YES: Go to step 4. NO: Measure for approximately +10 Vdc to +12 Vdc at pin 9 on the control panel. Use pin 8 for ground. See Section 5, "Locations." Is there +12 Vdc? YES: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments." NO: Go to page 3-1400-5, "Power Supply Check." 4. Is the online light on? YES: Go to step 5. NO: Measure for approximately +10 to +12 Vdc at pin 1 on control panel. Use ground pin on driver circuit card. See Section 5, "Locations." Is there +12 Vdc? YES: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." NO: Replace control panel. See Section 4, "Removal/ Replacement and Adjustments."

Error Description	Diagnostic Action
Control Panel	1. Set printer Power switch to ON. Measure voltages at CN3 as shown in the chart below. Use ground on the Driver Circuit card.

Pin No.	Min. Voltage	Max. Voltage
CN3-16	4.5 Vdc	5.5 Vdc
CN3-20	11.0 Vdc	15.4 Vdc
CN3-8	21.6 Vdc	26.4 Vdc

Are the voltages correct?

YES: Go to step 2.
NO: Go to page 3-1400-5, "Power Supply Check."

2. Power off the printer. Disconnect the printer cable at the printer. Insert forms and Power on.

   Are the Power, Ready, and Online lights on?

   YES: Go to step 6.
   NO: Is the alarm sounding and the no paper light on?

      YES: Go to page 3-1400-23, "False End-of-Forms Alarm."
      NO: Go to step 3.

Error Description	Diagnostic Action
Uneven Horizontal Spacing	1. Check for a loose print head carriage belt and adjust belt tension if needed. See Section 4, "Removal/Replacement and Adjustments." 2. Check for a loosely mounted print head. See Section 4, "Removal/Replacement and Adjustments." 3. Check for worn gears in carriage drive assembly and replace assembly if needed. See Section 4, "Removal/Replacement and Adjustments." 4. Check for bent or binding carriage shafts and replace print mechanism if needed. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
False End-of-Forms Alarm	1. Is the no paper light off? YES: Go to step 2. NO: Are forms inserted properly? YES: Go to page 3-1400-22, "Printing Continues Beyond End-of-Forms." NO: Insert forms properly. 2. Power printer off, then Power back on. Is the alarm still sounding? YES: Measure for +10.5 to 12.5 Vdc on pin 1 of control panel. See Section 5, "Locations." Is there +12 Vdc? YES: Replace both control cards. See Section 4, "Removal/ Replacement and Adjustments." NO: Replace Control Panel. See Section 4, "Removal/ Replacement and Adjustments." NO: Run Offline Diagnostic Test. See page 3-1400-33. Does the alarm sound? YES: Replace print mechanism. See Section 4, "Removal/ Replacement and Adjustments." NO: Go to page 3-1400-1, "Printer Entry," if printer failure is suspected.

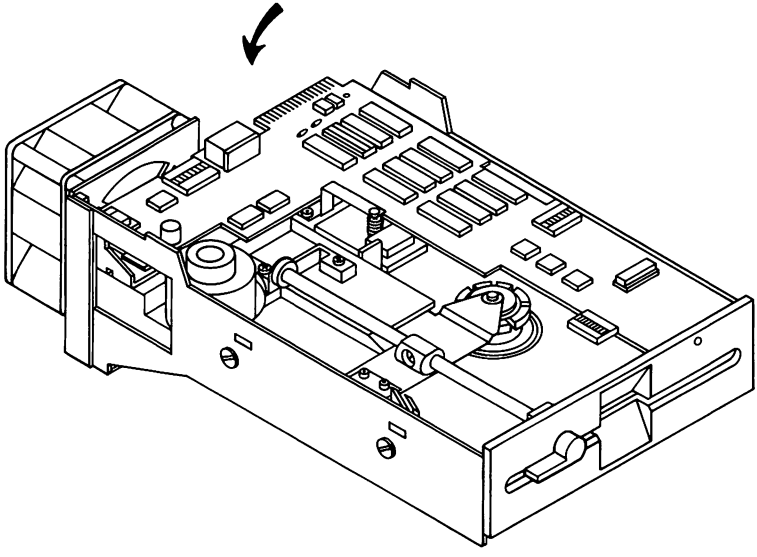
Error Description	Diagnostic Action
Extra Print Dots	1. Measure resistance between pins CN6-1 to 9 (see Section 5, "Locations") with respect to every other pin. Are any pins shorted together? NO: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." YES: Disconnect print head cable and recheck pins CN6-1 to 9 with respect to every other pin. Are any pins shorted together? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print head. See Section 4, "Removal/ Replacement and Adjustments."
Printing Continues Beyond End-of-Forms	1. Set printer Power switch to OFF. Check continuity of end-of-forms switch from pin CN6-18 on driver circuit card (see Section 5, "Locations") to ground pin on driver circuit card (open when forms inserted and shorted when forms removed). Replace print mechanism assembly if switch fails. See Section 4, "Removal/ Replacement and Adjustments." 2. Check for +5 Vdc at CN6-18 on driver circuit card (see Section 5, "Locations") with forms inserted. Check power supply if 0 Vdc. Use ground pin on the driver card.
Doublespacing or Abnormal Characters	1. Replace both control cards. See Section 4, "Removal/Replacement and Adjustments."

Error Description	Diagnostic Action
Extra Print Dots	1. Run "Offline Diagnostic Test" (see page 3-1400-33). Examine the / and Y — characters for extra dots. 2. Remove CN6 on driver circuit card. See Section 5, "Locations." Measure approximately 22 ohms between pin CN6-10 (male side), and each head coil pin (CN6-1 to 9 [male side]). Does the resistance = 22 ohms? YES: Replace both control cards. See Section 4, "Removal/Replacement and Adjustments." NO: Disconnect print head cable and check pins 1 through 9 on print head cable for approximately 22 ohms in respect to common. See Section 5, "Locations." Does the resistance = 22 ohms? YES: Replace print mechanism assembly. See Section 4, "Removal/Replacement and Adjustments." NO: Replace print head. See Section 4, "Removal/Replacement and Adjustments."

Diskette-Drive Mounting Bracket Replacement 625

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

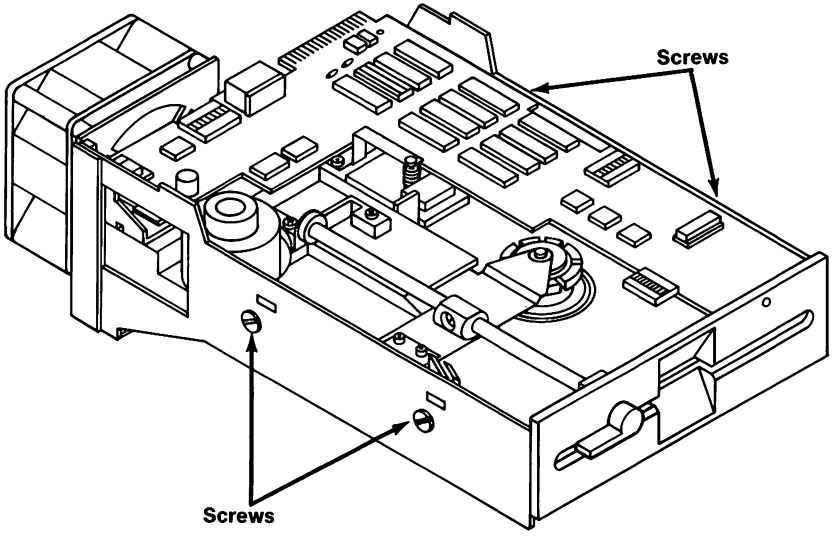
1. Place the diskette drive into the mounting bracket.
2. Adjust the diskette-drive mounting bracket (630).
3. Replace the diskette drive (615).



Diskette-Drive Mounting Bracket Adjustment 630

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive (610).
3. Loosen the 4 screws holding the mounting bracket to the diskette drive.
4. Install the diskette drive into the system unit with the mounting bracket screws loose. Do not connect any cables at this time.



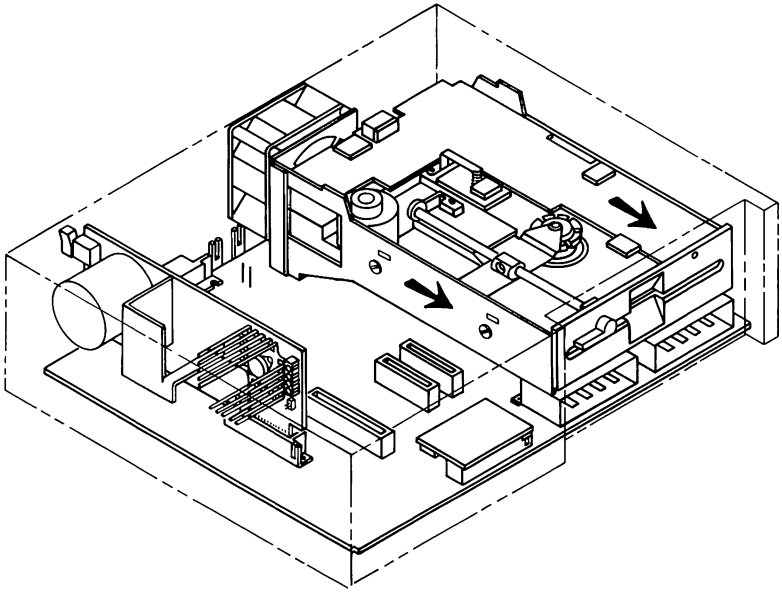
5. Push the diskette drive to the front, so that the diskette drive slides forward in the mounting bracket and rests against the opening in the front of the system unit.

6. Tighten the left mounting bracket screws.

7. Remove the diskette drive from the system unit.

8. Tighten the right mounting bracket screws.

9. Replace the diskette drive (615).



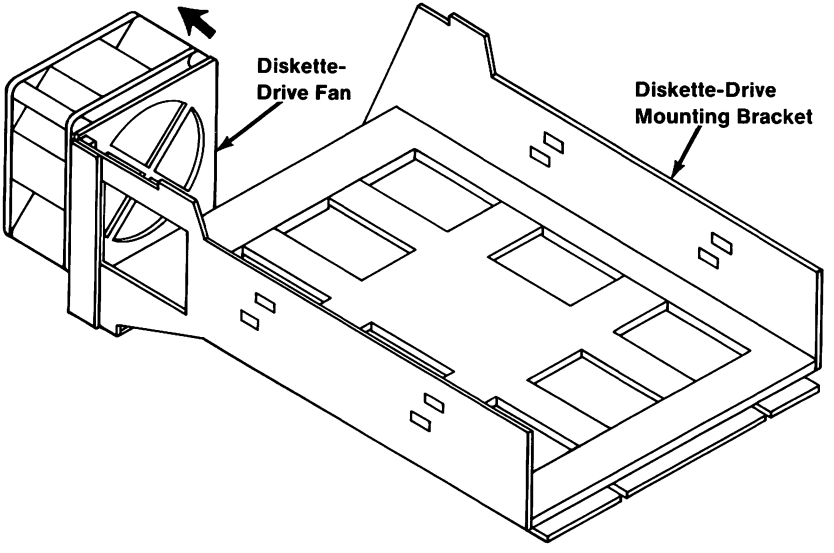
Diskette-Drive Fan Removal 635

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive (610).
3. Remove the two screws holding the fan to the mounting bracket.

   Note: The diskette-drive fan is held to the mounting bracket by two pins molded into the mounting bracket and two screws.

4. Remove the fan.



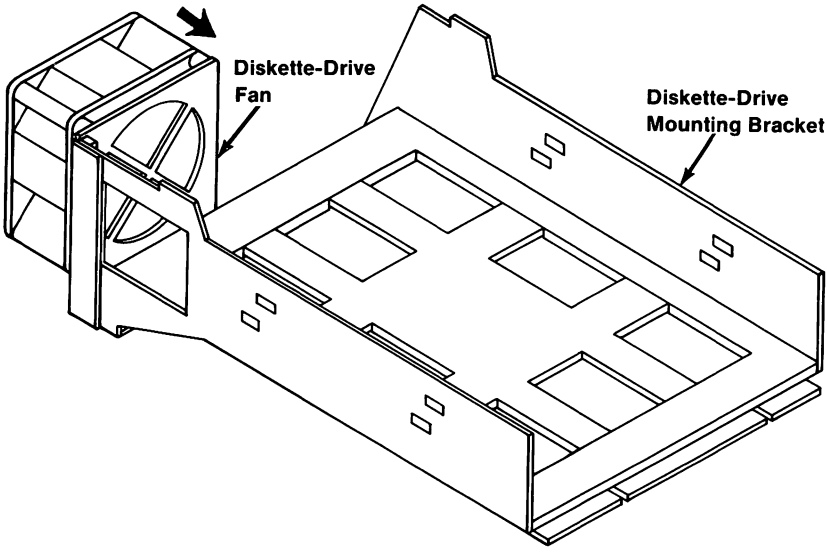
Diskette-Drive Fan Replacement 640

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

Align the diskette-drive fan so that the pins molded into the mounting bracket mate with the holes in the fan.

1. Use two screws and fasten the fan assembly to the diskette-drive mounting bracket.

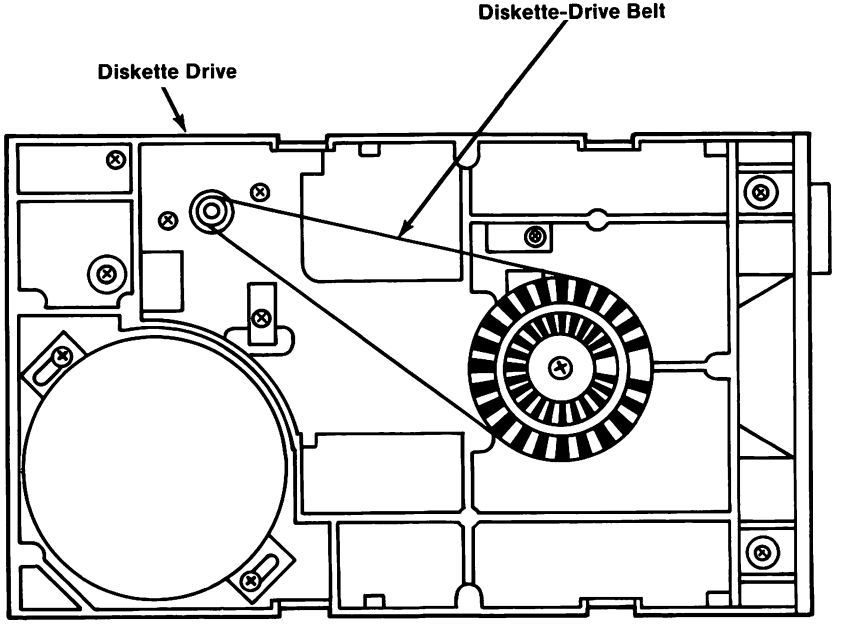
2. Replace the diskette drive (615).



Diskette-Drive Belt Removal 645

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive (610).
3. Remove the diskette-drive mounting bracket (620).
4. Turn the diskette drive on its back.
5. Remove the drive belt by sliding it off the large pulley, and then the small pulley.



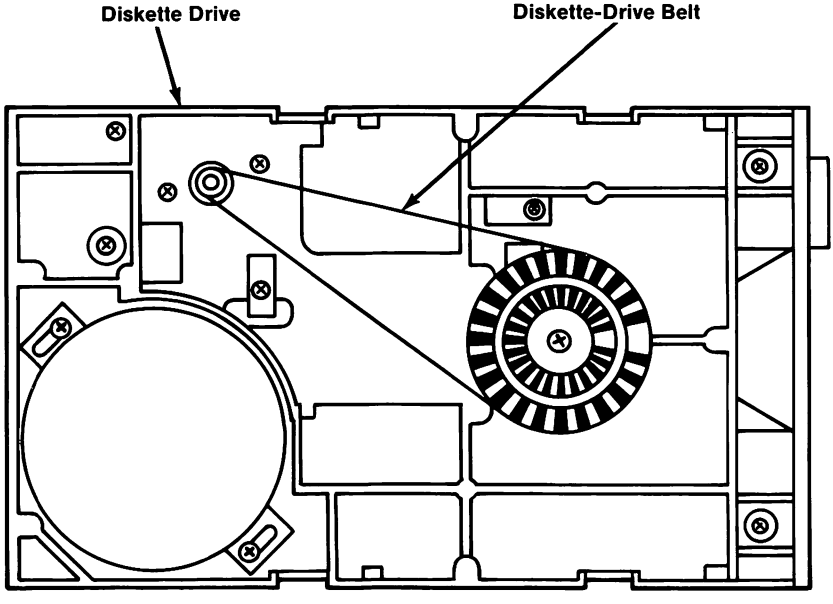
Diskette-Drive Belt Replacement 650

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Turn the diskette drive on its back.
2. Place the drive belt over both pulleys, small pulley first.

   Note: The smooth side of the belt goes against the pulleys.

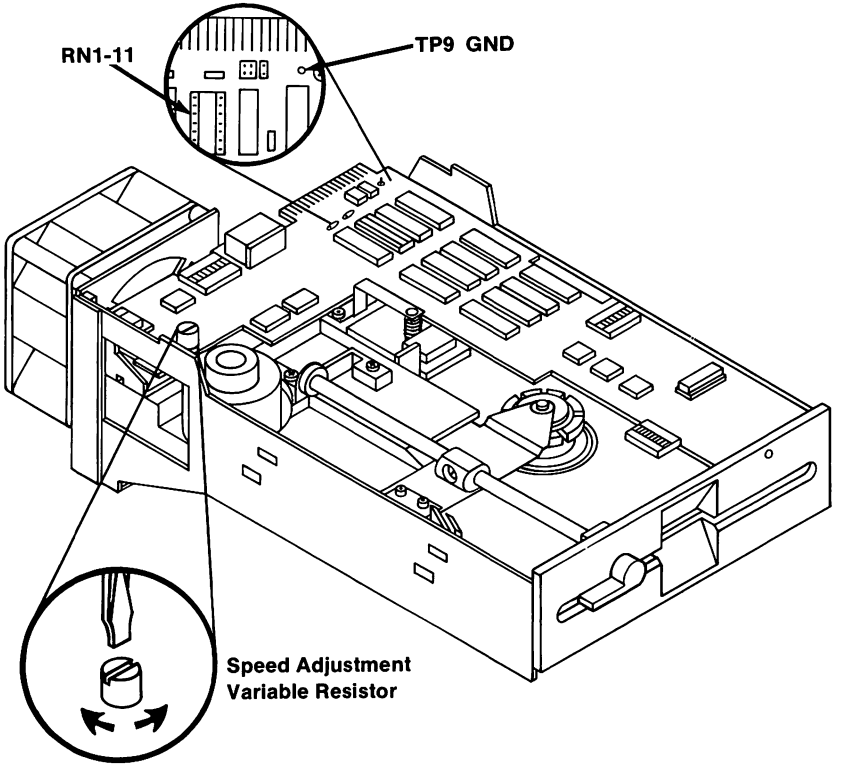
3. Replace the diskette-drive mounting bracket (625).
4. Replace the diskette drive (615).



Diskette-Drive Speed Adjustment 655

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the diskette drive (610).
3. Remove the diskette drive from its mounting bracket (620).
4. Jumper test point 9 to position 11 of the resistor block RN1.



5. Plug the diskette-drive power cable into the diskette drive.

6. Turn the diskette drive on its back.

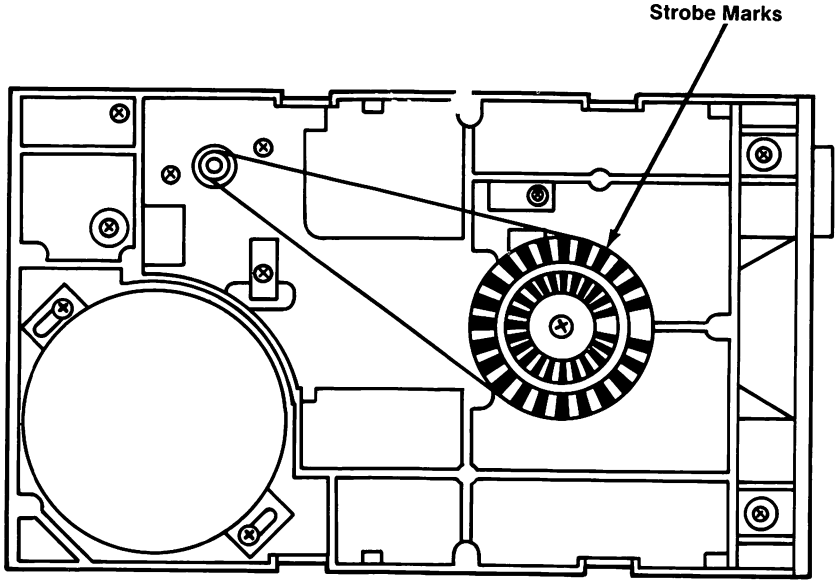
7. Set the system unit's Power switch to On.

   Note: The diskette-drive motor will run as long as the system unit's Power switch is On and the test points are jumpered.

8. Observe the black strobe marks on the outer ring of the drive pulley under florescent light.

9. Adjust the variable resistor until the strobe marks on the outer ring appear to stand still.

   Note: A florescent light must be used to observe the marks standing still.



10. Set the system unit's Power switch to Off.

11. Remove the jumper from test point 9 and position 11 of the resistor block RN1.

12. Remove the diskette-drive power cable from the diskette drive.

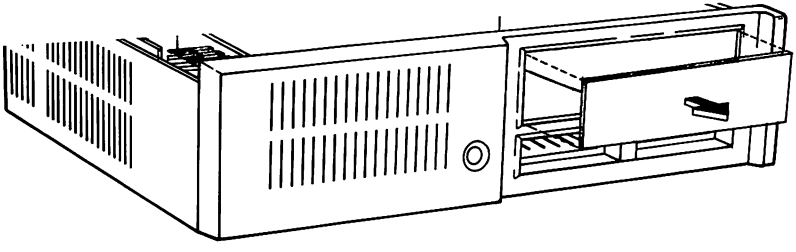
13. Replace the diskette-drive mounting bracket (625).

14. Adjust the diskette-drive mounting bracket (630).

15. Replace the diskette drive (610).

Diskette-Drive Face Plate Removal 660

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Remove the diskette-drive face plate by pushing on it from the inside of the system unit. It will snap out.

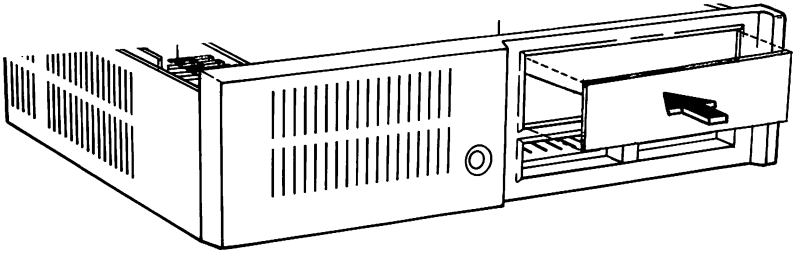


Diskette-Drive Face Plate Replacement 665

1. Place the diskette-drive face plate into the system unit's front cover opening.

2. Snap the diskette-drive face plate into place by pushing on it from the outside of the system unit.

3. Replace the system unit top cover (105).

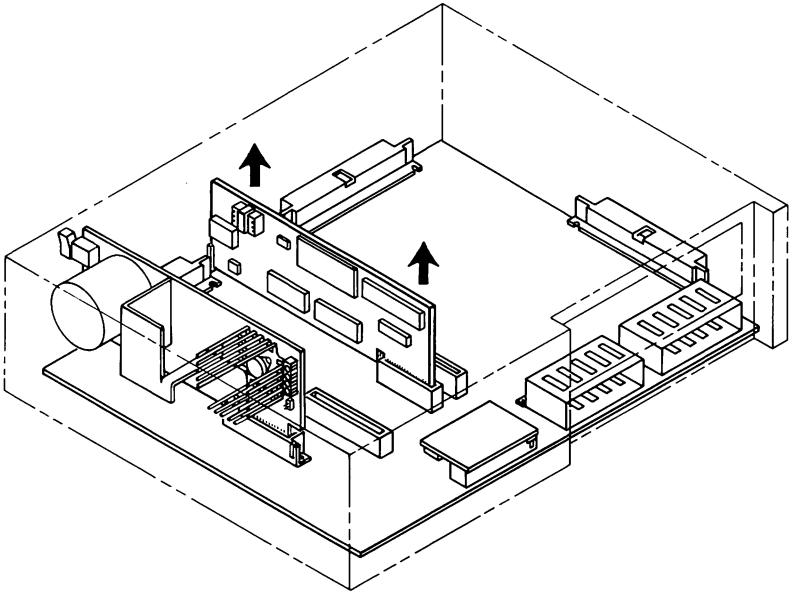


Internal Modem

Internal Modem Removal 830

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Set the system unit's Power switch to Off.
2. Remove the system unit top cover (100).
3. Unplug the modem cable from the system unit connector M.
4. Gently pull the internal modem straight up from its system board connector.



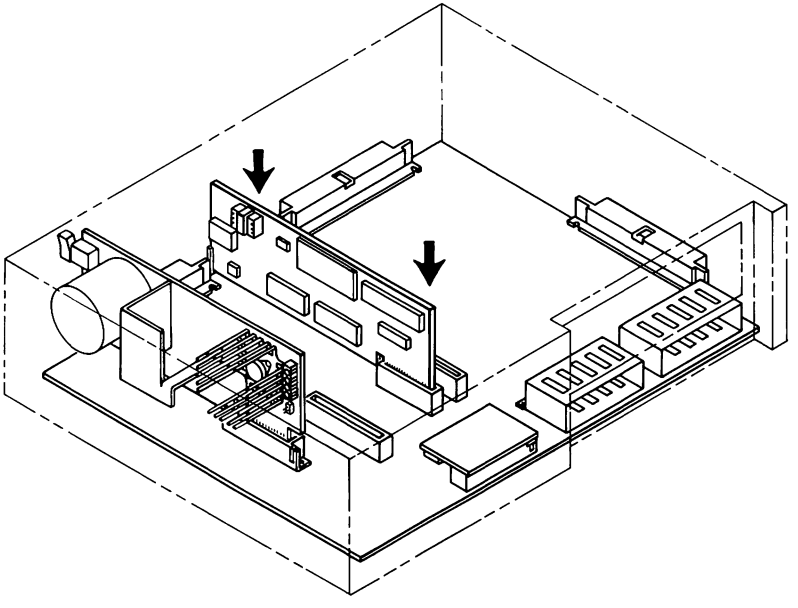
Internal Modem Replacement 835

Warning: Be careful when the top cover is off the system unit. The components on the power board can become hot with the system unit On.

1. Plug the internal modem in by gently pushing it straight down into both of its system board connector, making sure that the internal modem rests in the notch at the rear of the case.

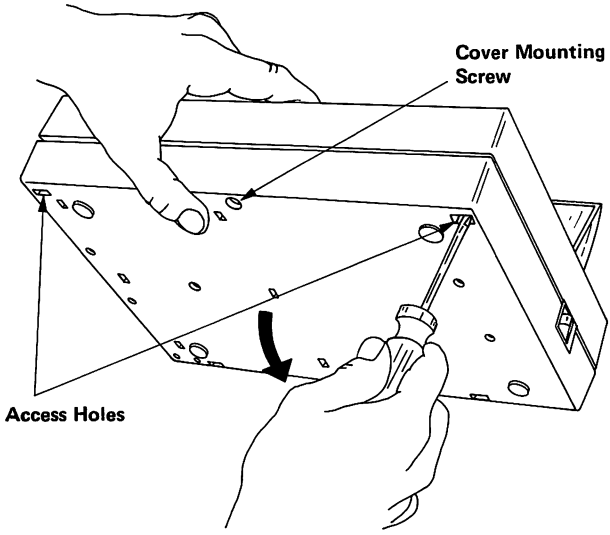
2. Connect the modem cable.

3. Replace the system unit top cover (105).



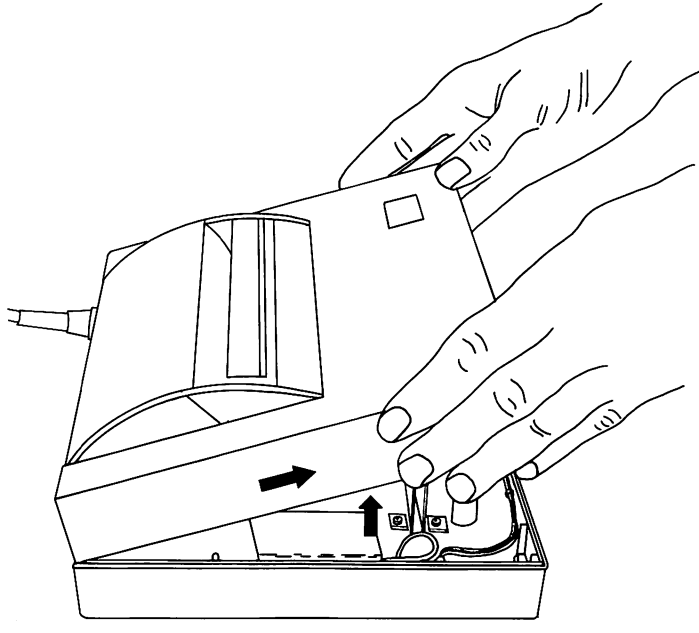
Top Cover Removal 851

1. Set the printer's Power switch to Off.
2. Unplug the power cord from the wall outlet and the rear of the printer.
3. Remove any paper.
4. Tilt the printer up, and remove the cover mounting screw.
5. Insert a flat bladed screwdriver through one of the two access holes in the bottom cover.
6. Gently pry down on the screwdriver, and begin to separate the covers. Then repeat on the other side.
7. Return the printer to its operating position.

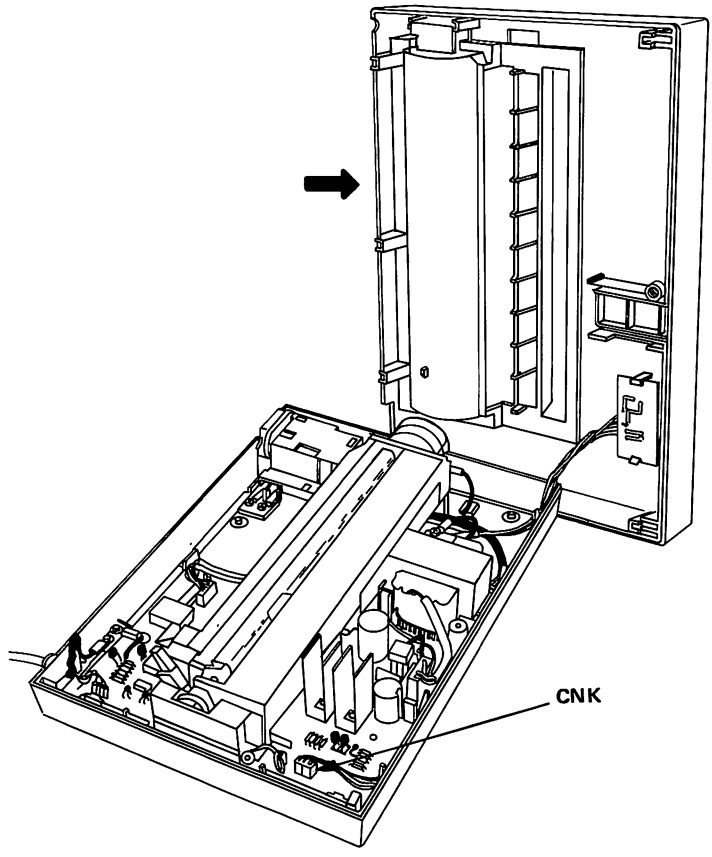


8. Lift the front of the top cover up, and slide it towards the front of the printer to separate it from the bottom cover.

   Note: The control panel is attached by a cable inside the printer. Note how the cable is routed so that it can be routed correctly during reassembly.

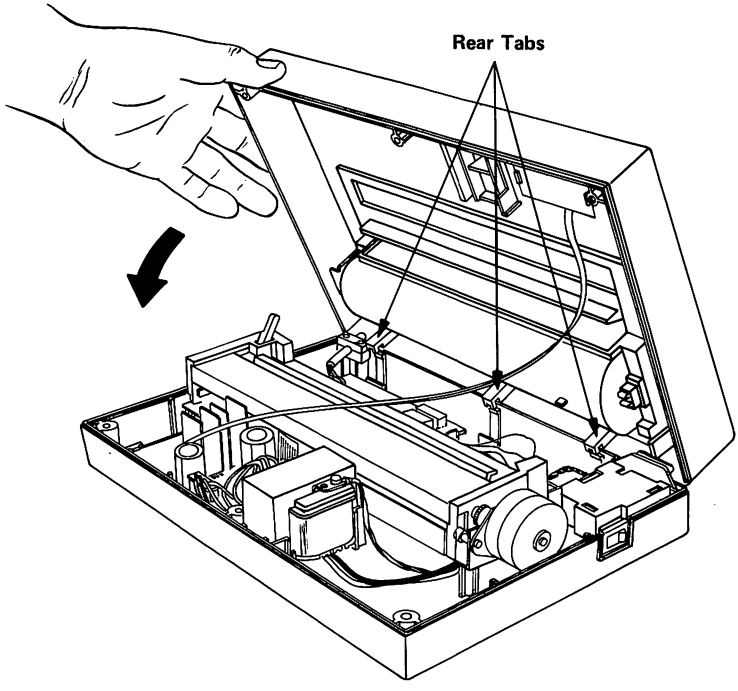


9. When the covers are separated, set the top cover off to the side and disconnect CNK (control panel cable) from the logic card.



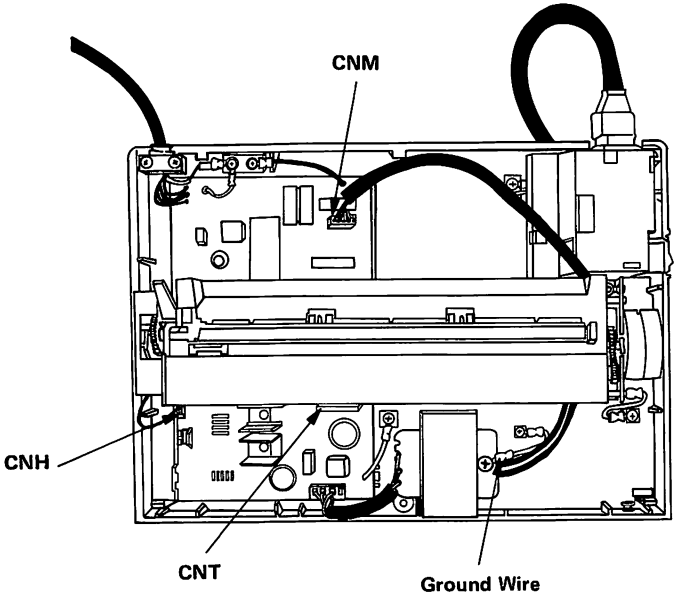
Top Cover Replacement 852

1. Connect CNK (control panel cable).
2. Set the rear of the top cover onto the bottom cover with the three rear tabs under their latches.
3. Pivot the the top cover down until it closes securely.
4. Tilt the printer up, and install the cover mounting screw.
5. Connect the power cord to the printer.



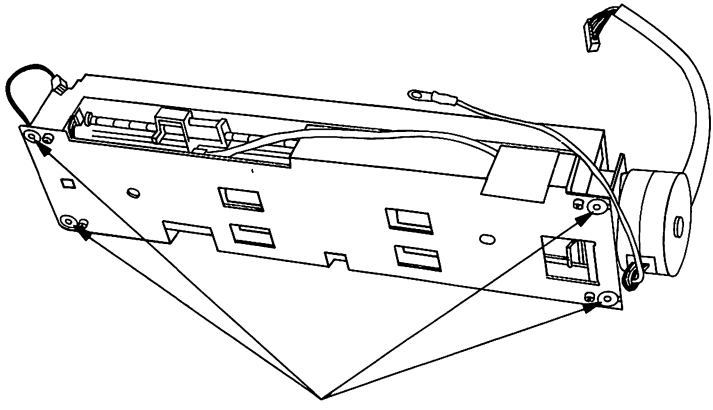
Print Mechanism Removal 853

1. Set the printer's Power switch to Off.
2. Unplug the power cable from the wall outlet.
3. Remove the printer top cover. (851)
4. Disconnect CNH, CNM, and CNT from the logic card.
5. Remove the ground wire from the transformer and lift the print mechanism from the bottom cover.



Print Mechanism Replacement 854

1. Ensure that the rubber mounting grommets are in place, as shown.



Rubber Mounting Grommets

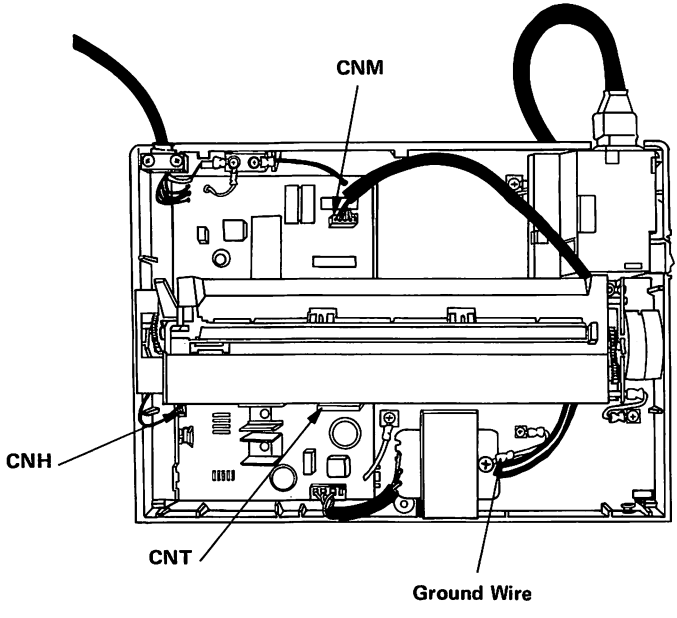
2. Position the print mechanism onto the four mounting studs.

3. Connect CNH, CNM, and CNT to the logic card.

4. Install the ground wire to the transformer.

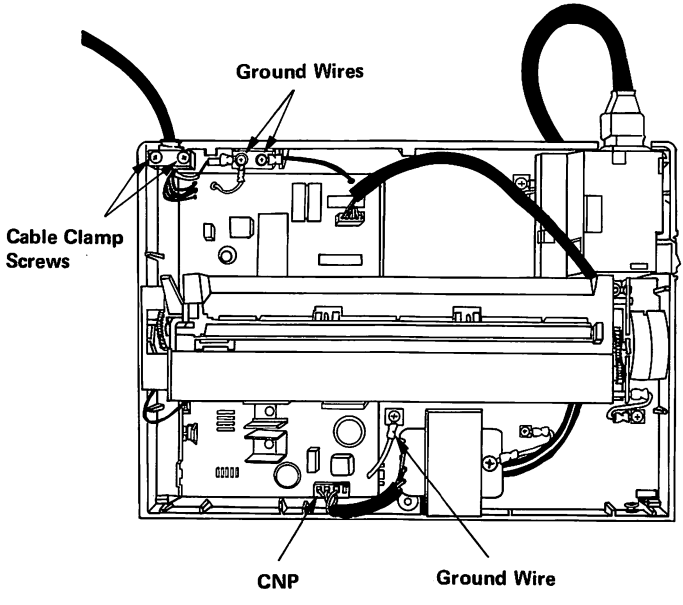
5. Install the top cover. (852)

6. Connect the power cord to the printer.

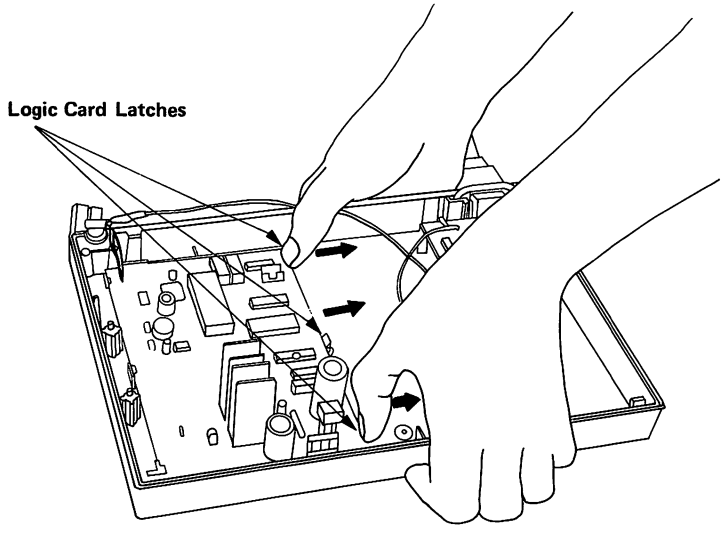


Logic Card Removal 855

1. Set the printer's Power switch Off.
2. Unplug the power cord from the wall outlet.
3. Remove the printer top cover. (851)
4. Remove the print mechanism. (854)
5. Disconnect CNP.
6. Remove the two screws from the signal cable clamp.
7. Remove the logic card ground wire screws.



8. Press the three logic card latches away from the logic card, and lift the card out of the bottom cover.



Logic Card Replacement 856

1. Slide the logic card into its three left hand mounting tabs.

2. Gently push down on the right side of the logic card until the three logic card latches snap into place.

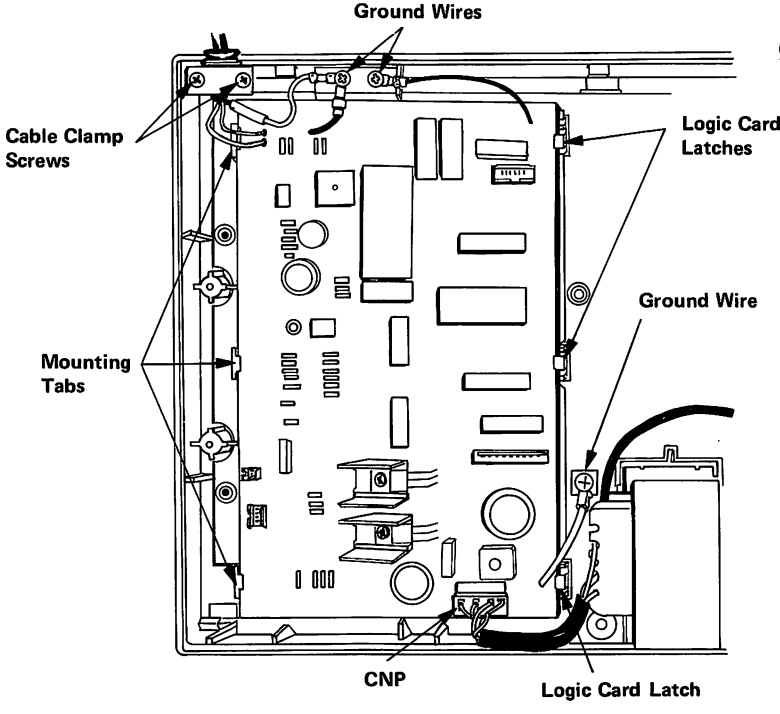
3. Install the two screws through the signal cable clamp, and tighten into the bottom cover.

4. Install the logic card ground wires and their screws.

5. Connect CNP.

6. Install the print mechanism. (853)

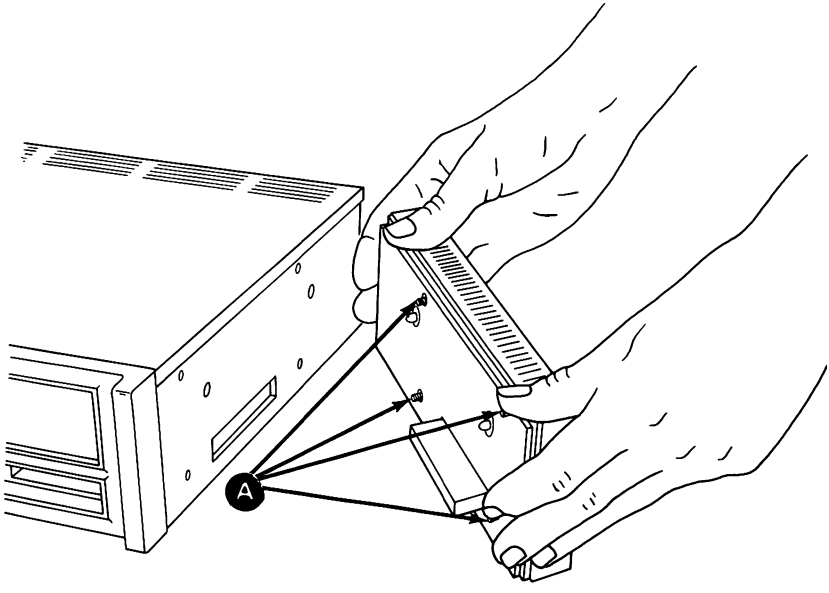
7. Install the top cover. (851)



Parallel Printer Attachment

Parallel Printer Attachment Removal 900

1. Set the system unit's Power switch to Off.
2. Unplug the printer cable, if present.
3. Remove the side cover, if present (110).
4. Loosen the four captive screws (A).
5. Pull the parallel printer attachment from the system unit.



Parallel Printer Attachment Replacement 905

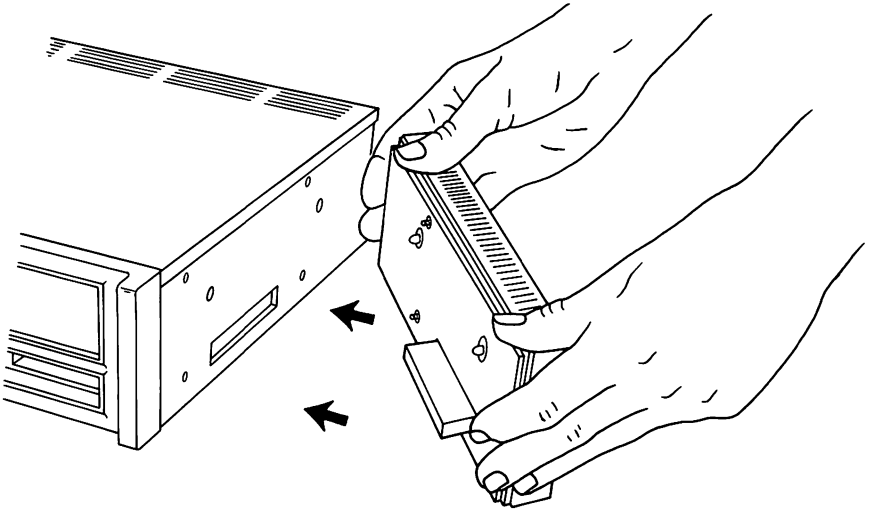
1. If the side cover is on the system unit, remove it (110).

2. Align the studs on the parallel printer attachment with the holes in the right side of the system unit.

3. Press the parallel printer attachment and the system unit together.

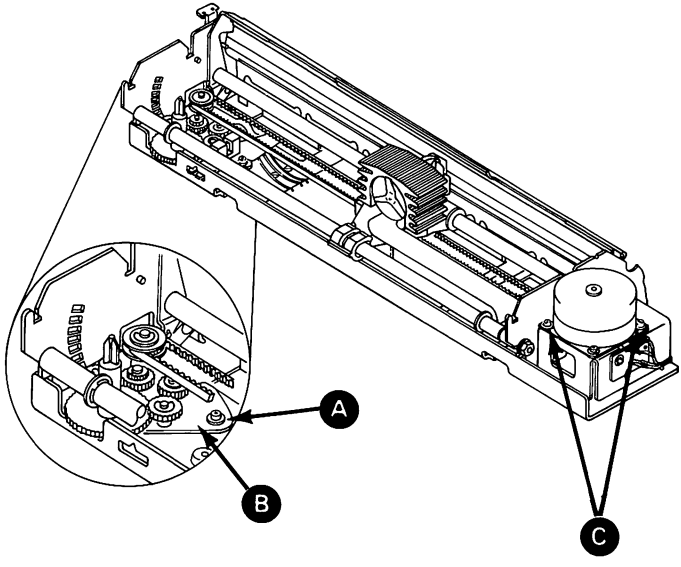
4. Tighten the four captive screws.

5. Attach the side cover to the parallel printer attachment (115).

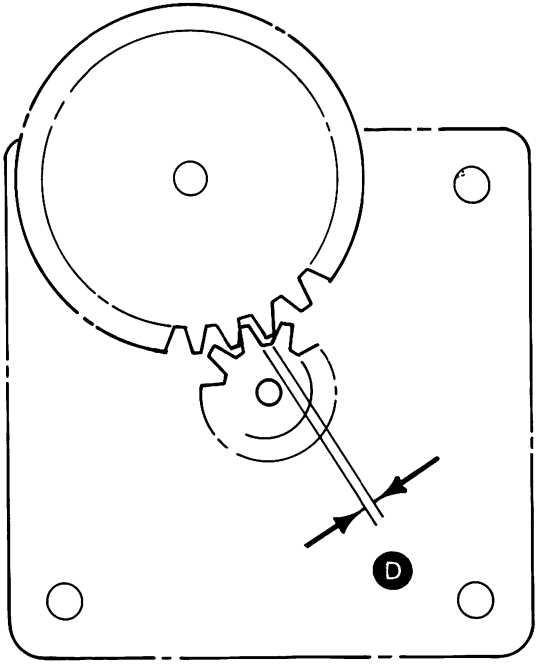


Carriage Belt Adjustment 1400

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Loosen holddown screw (A) in carriage drive assembly.
8. Pivot carriage drive assembly (B) to the left to tighten belt.
9. Tighten holddown screw.
10. Loosen screws (C) in carriage motor mounts.



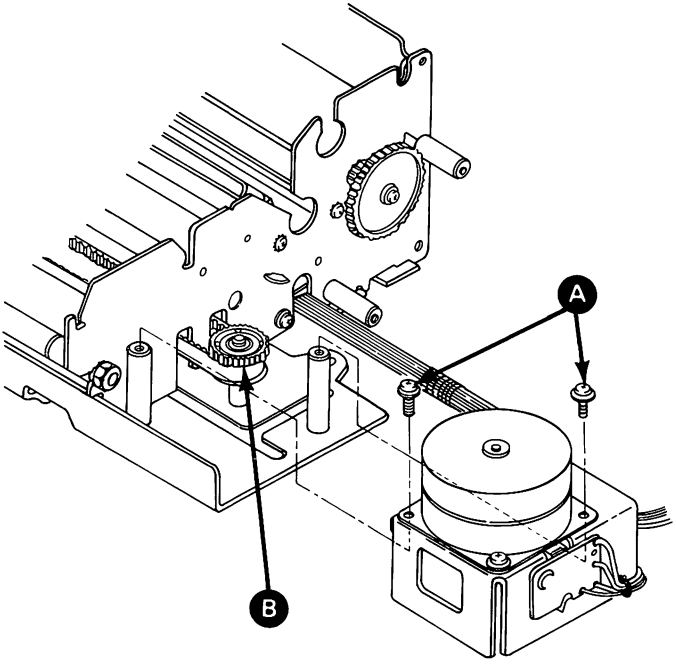
11. Position carriage motor so that motor and drive gears mesh.
12. Adjust gear backlash (D) for minimum.



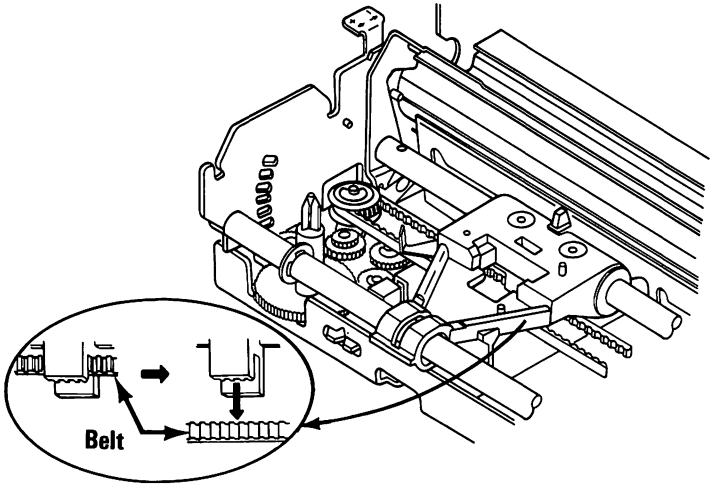
13. Tighten motor mounts screws.
14. Move print head back and forth to check for smooth gear operation with no binding.

Carriage Belt Removal 1402

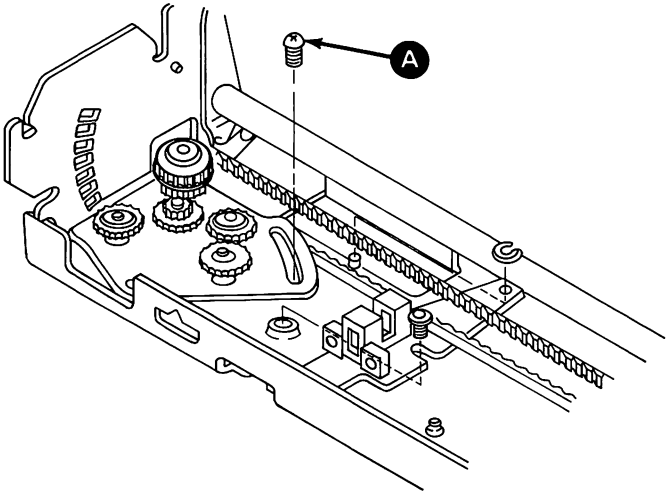
1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover(1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Remove left front and right rear screws from carriage motor mounts Ⓐ.
8. Lift motor away from mounts to expose belt pulley Ⓑ.



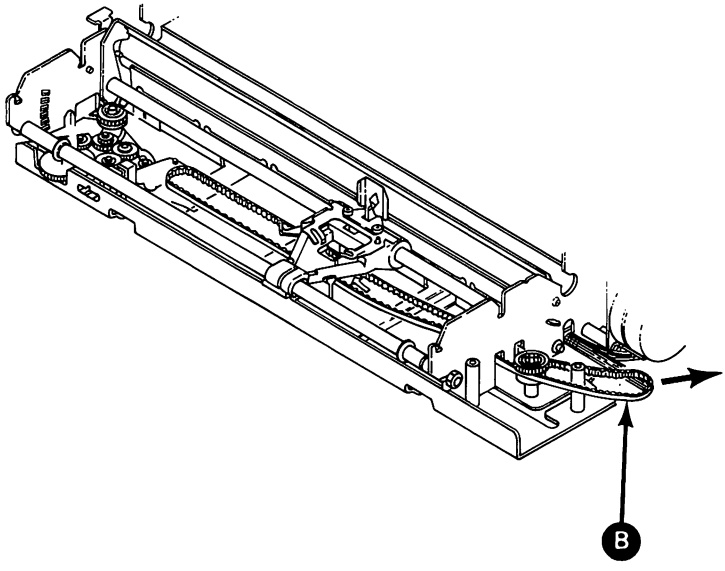
9. Pull belt from clip underneath print head carriage by pulling down on belt.



10. Loosen screw in slot in carriage drive assembly (A).
11. Pivot carriage drive assembly to right.

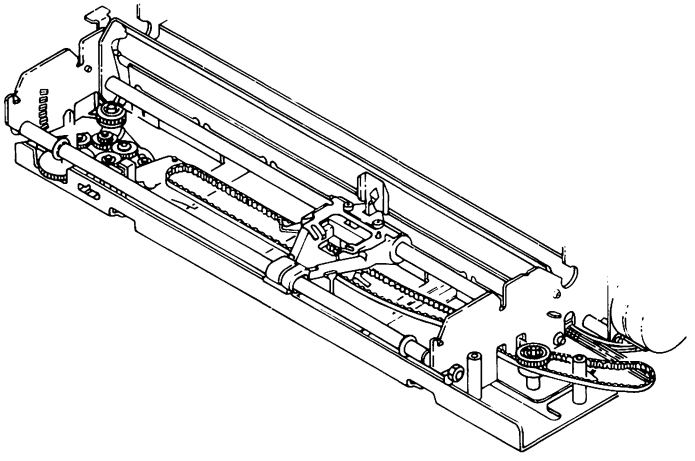


12. Lift belt off pulley at each end.
13. Guide belt (B) through opening in right side of print mechanism assembly frame.

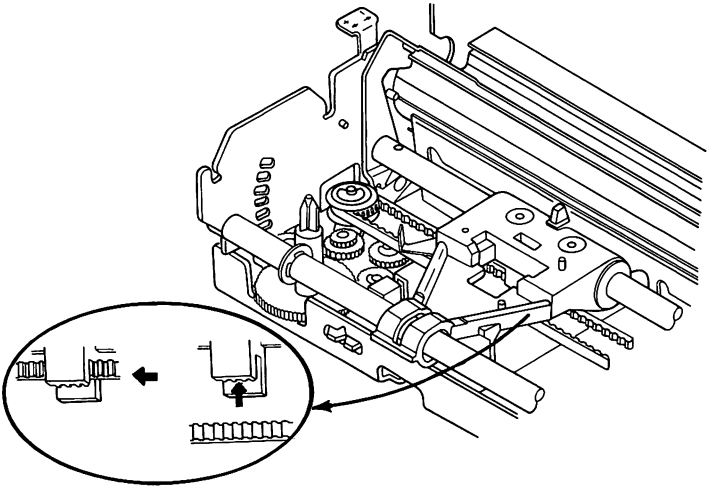


Carriage Belt Replacement 1404

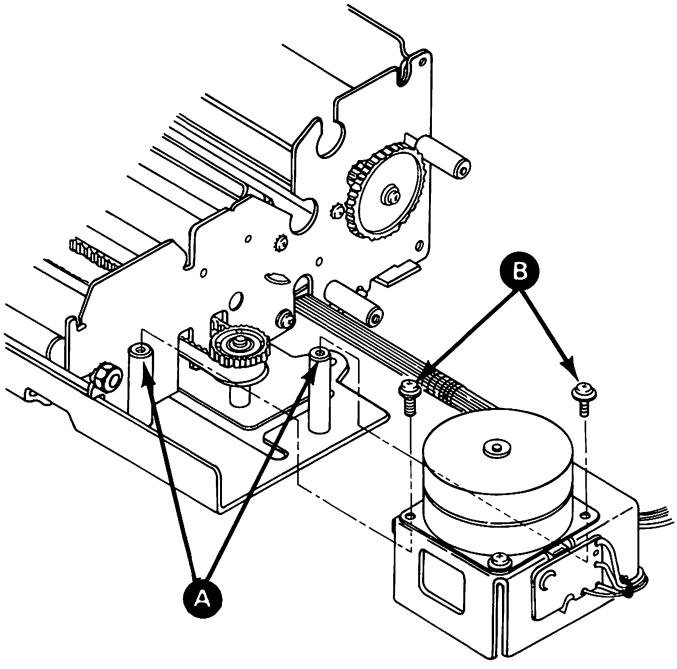
1. Insert belt through opening in right side of frame of print mechanism assembly.
2. Guide belt along base toward carriage drive assembly.



3. Place belt onto pulleys at both ends.
4. Insert belt into retaining clip under the print head carriage.

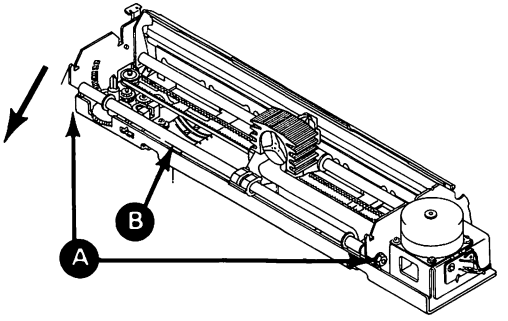


5. Place carriage motor onto motor mounts (A).
6. Install screws (B) into motor base (do not tighten)
7. Perform carriage belt adjustment (1400).
8. Replace top cover (1434).
9. Replace ribbon cartridge.
10. Replace access cover (1430).
11. Replace forms rack (1440).

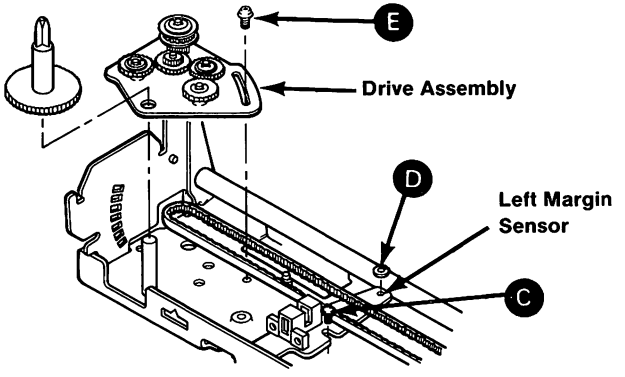


Carriage Drive Assembly Removal 1405

1. Set printer POWER switch to OFF; unplug printer power cord from outlet and disconnect printer cable.
2. Remove forms
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Move carriage to right side of frame.
8. Loosen nuts Ⓐ on carriage shaft Ⓑ and pivot left end of shaft to front.

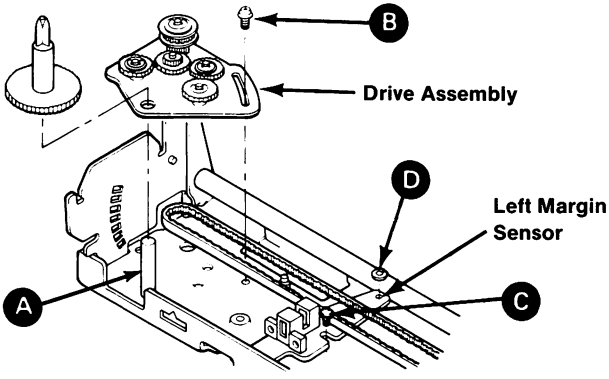


9. Remove screw Ⓒ and clamp Ⓓ from left margin sensor.
10. Remove carriage drive assembly retaining screw Ⓔ.
11. Pivot carriage drive assembly clockwise, lift belt off drive pulley, lift left margin sensor off post, and lift carriage drive assembly from machine.

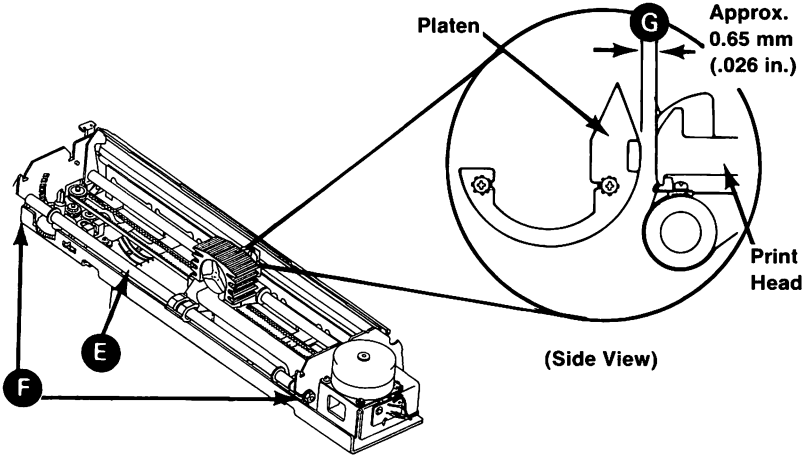


Carriage Drive Assembly Replacement 1407

1. Position carriage drive assembly by inserting post (A) through pivot hole.
2. Replace carriage drive assembly retaining screw (B).
3. Replace left margin sensor, screw (C), and clip (D).
4. Place belt over drive pulley and perform carriage belt adjustment (1400).



5. Pivot carrier shaft (E) into the slots on frame. Tighten nuts (F).
6. Check print head gap (G). Adjust if necessary (1486).



7. Perform left margin sensor adjustment (1470).
8. Replace top cover (1434).
9. Replace ribbon cartridge.
10. Replace access cover (1430).
11. Replace forms rack (1440).

Control Circuit Card Removal 1415

Before replacing the control circuit card, check the printer DIP switch settings. Be sure the problem 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. and English speaking countries.

Graphics Printer

Switch No.	Function	On	Off	Factory Set
1-1	Not Applicable	—	—	On
1-2	CR	Print Only	Print and Line Feed	On
1-3	Buffer Full	Print Only	Print and 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

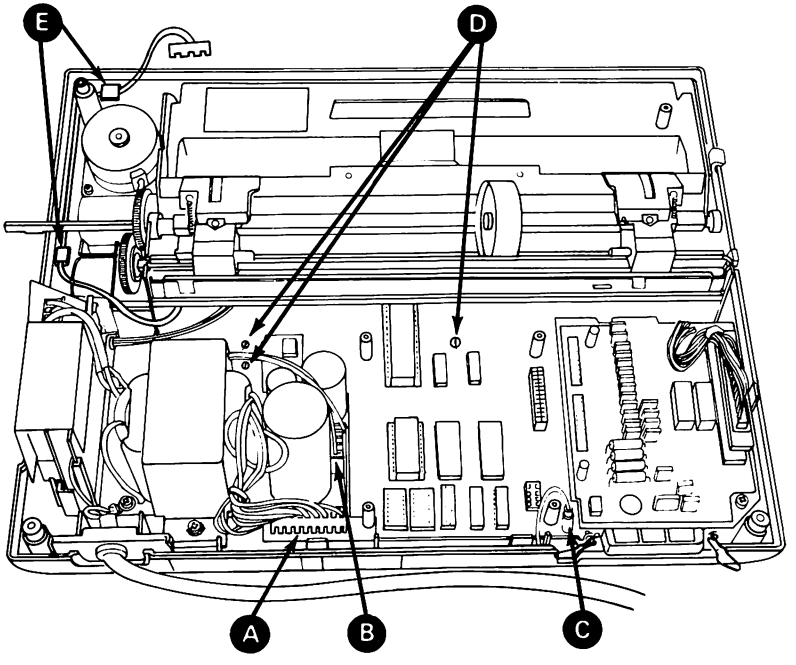
Functions and Conditions of Dip Switch No. 1

Graphics Printer

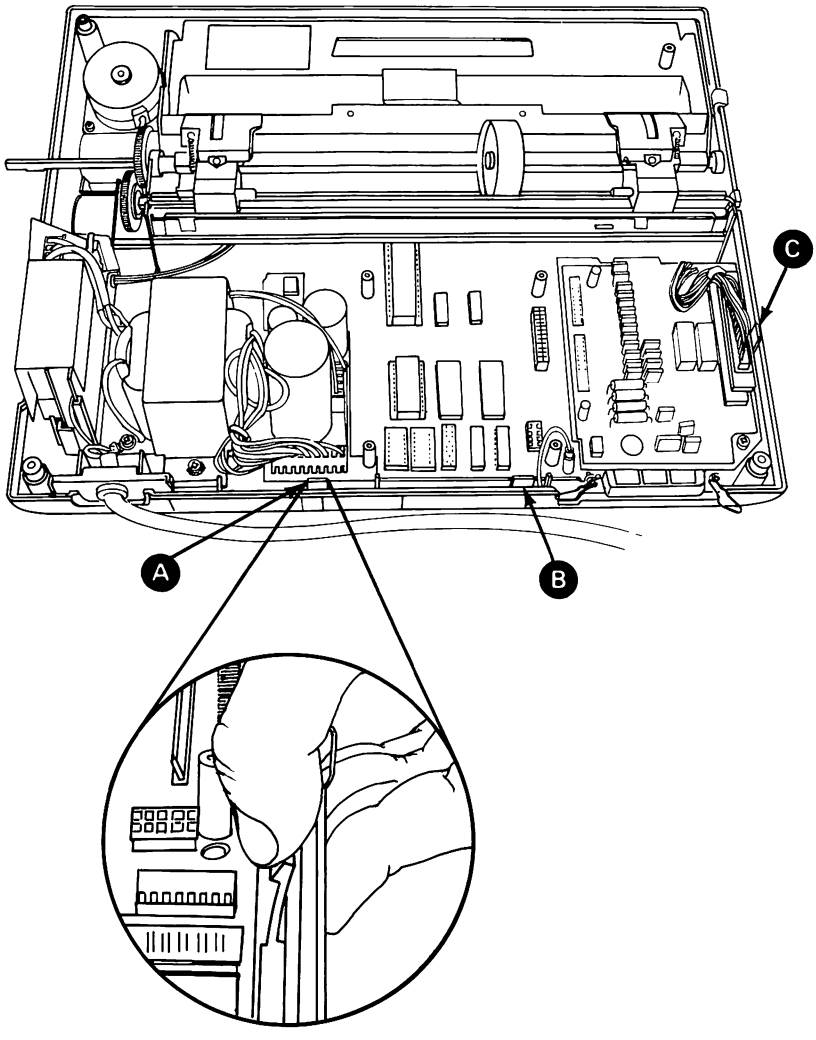
2-1	Form Length	12″	11″	Off
2-2	Line Spacing	1/8″	1/8″	Off
2-3	Auto Feed XT Signal	Fixed Internally	Not Fixed Internally	Off
2-4	1-in. Skip Over Perforation	Valid	Not Valid	Off

Functions and Conditions of Dip Switch No. 2

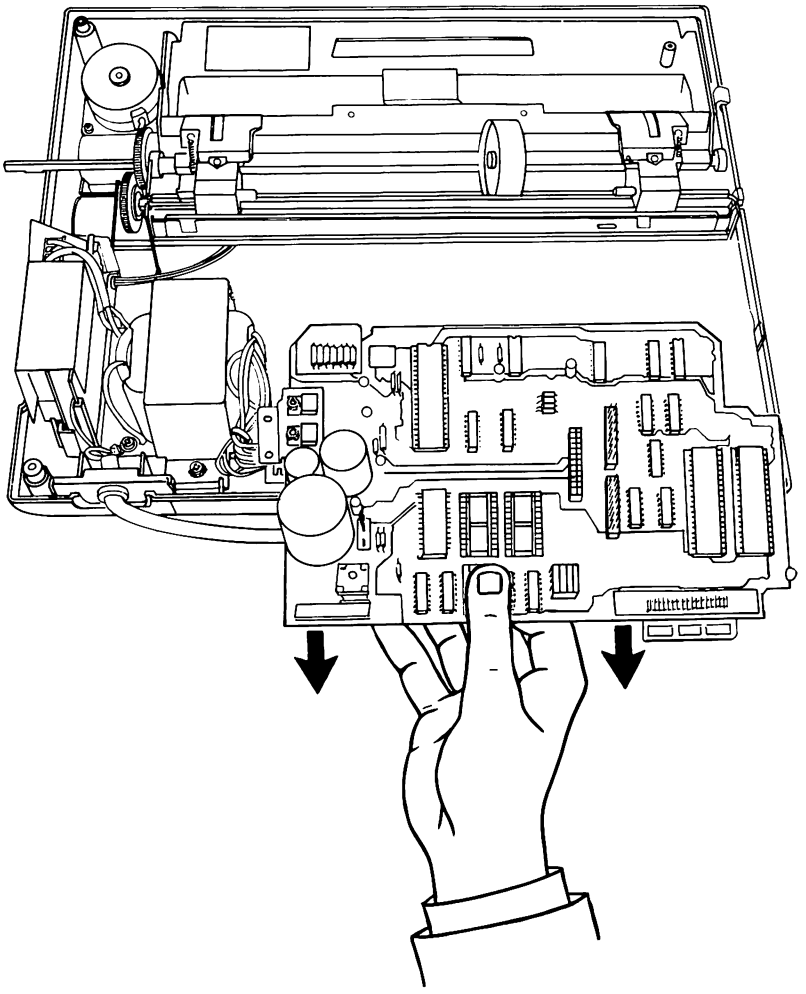
1. Set printer POWER switch to OFF; unplug printer power cord from outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove Top cover (1432).
6. Remove driver circuit card (1420).
7. Unplug connector CN2 (A).
8. Unplug Connector CN6 (B).
9. Unplug ground wire (C).
10. Remove three screws (D).
11. Pull control panel cable from under retaining clips (E).



12. Press three tabs Ⓐ, Ⓑ, and Ⓒ. Lift card clear of tabs.

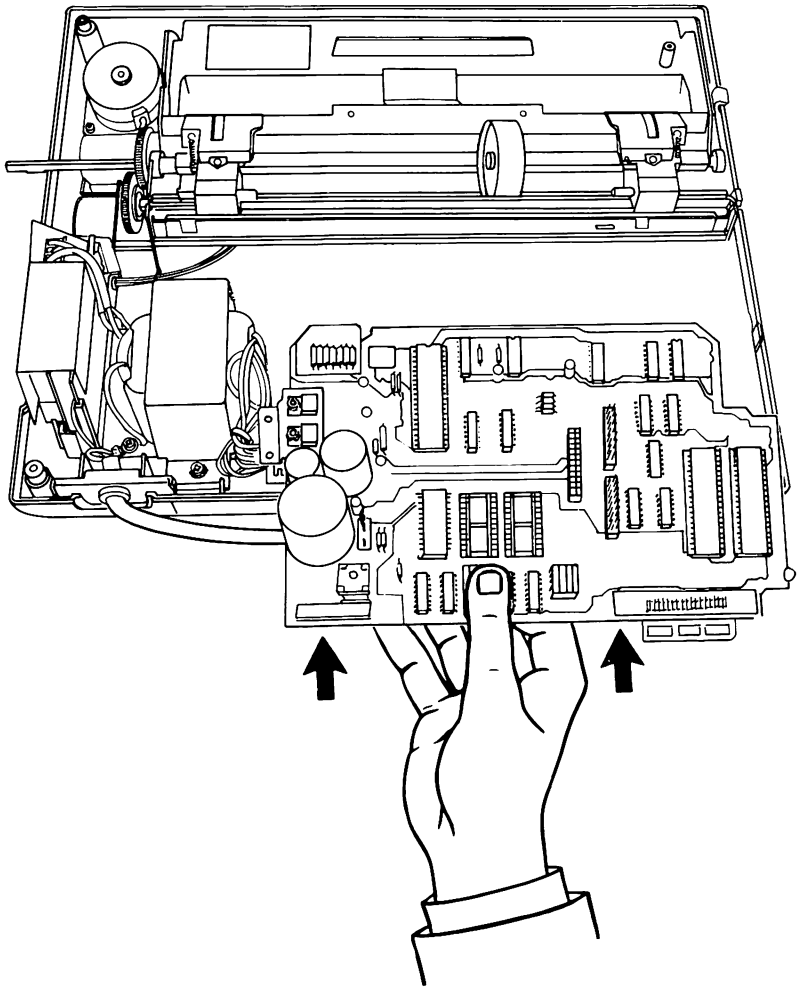


13. Lift control circuit card to clear the six posts. Carefully pull control circuit card away from print mechanism assembly.

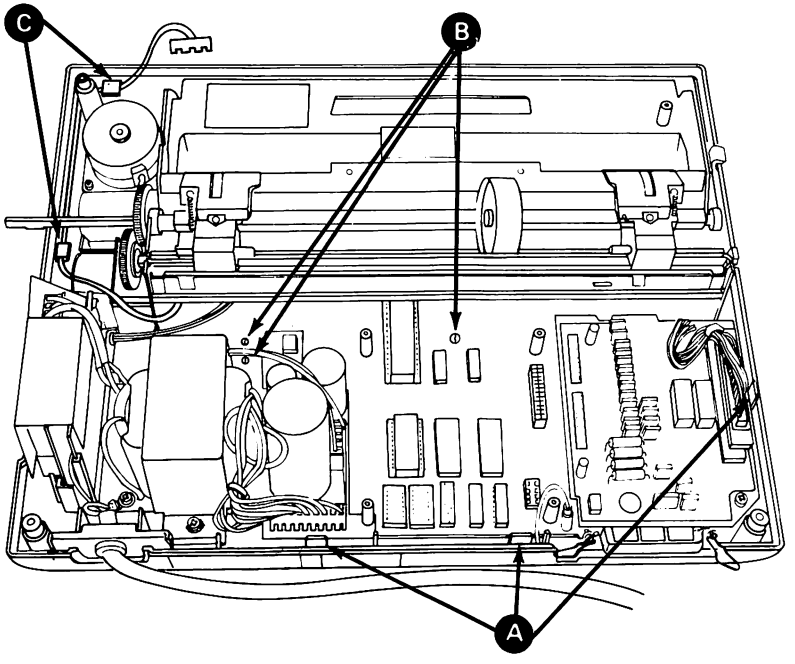


Control Circuit Card Replacement 1417

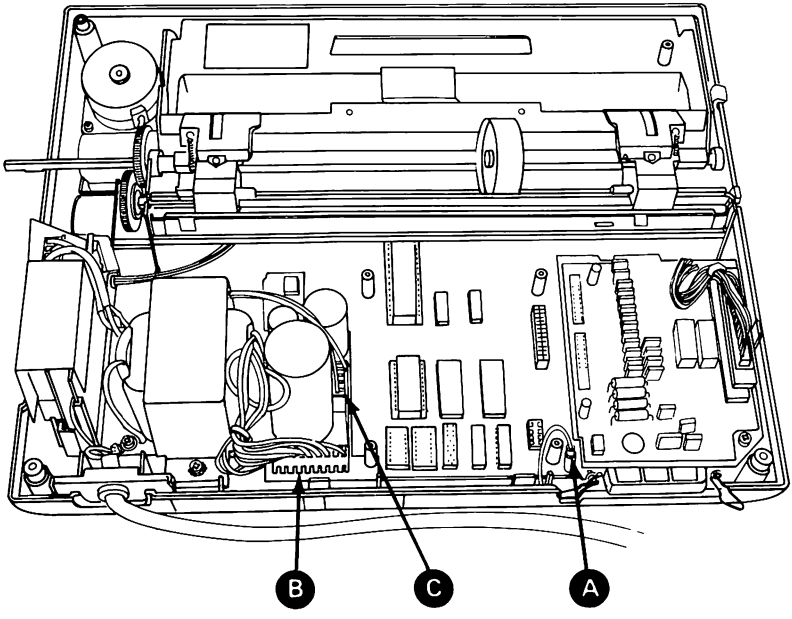
1. Guide control circuit card into open area behind print mechanism assembly.



2. Align six holes in control circuit card with six posts in base cover.
3. Lower control circuit card onto base cover and snap the three retaining tabs (A) into place.
4. Install 3 hold down screws (B).
5. Guide control panel cable along right side of base cover and around to front.
6. Place control panel cable under two retaining clips (C).



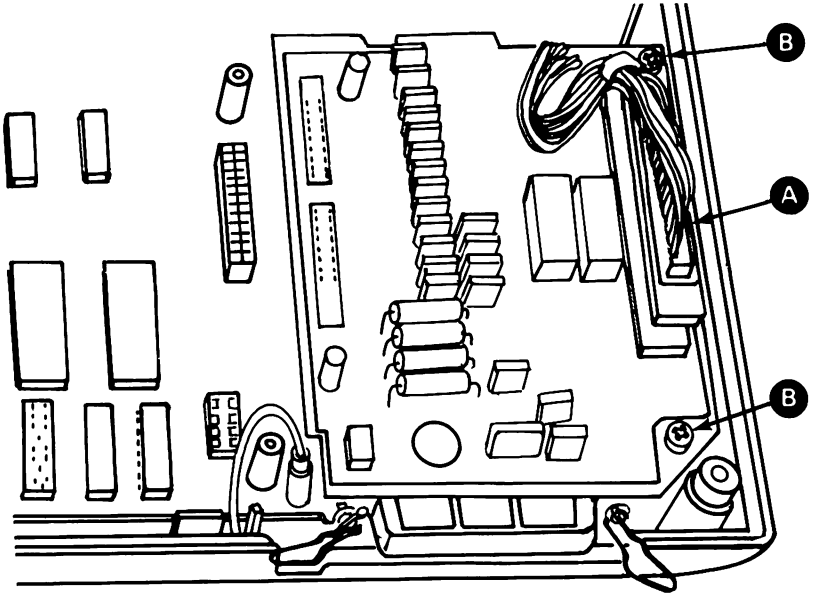
7. Connect ground wire (A).
8. Install connector CN2 (B).
9. Install connector CN6 (C).



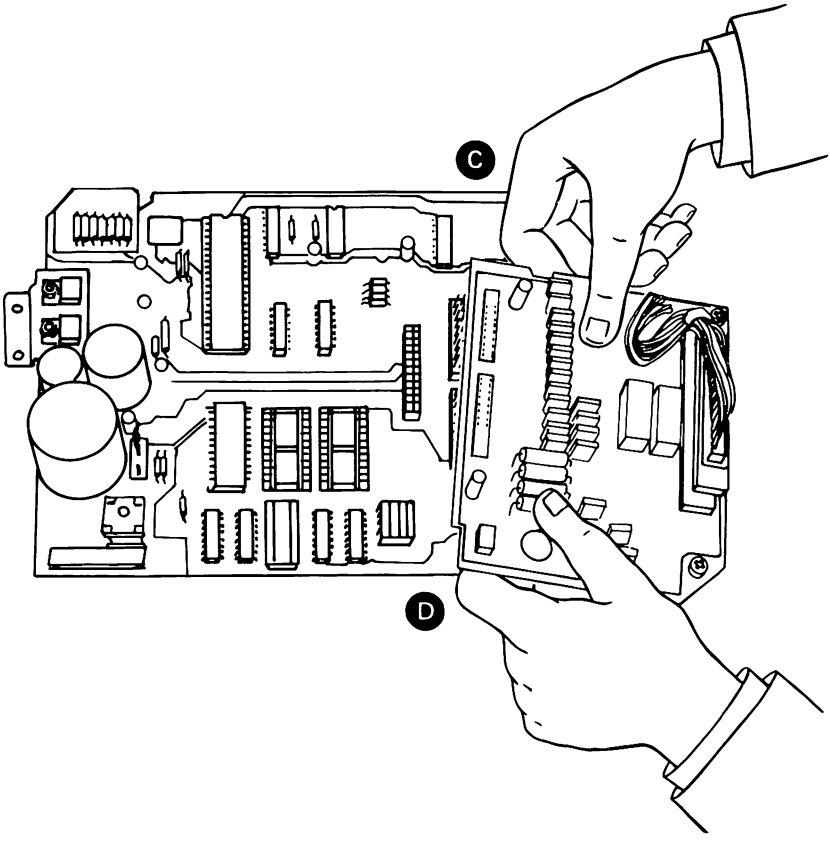
10. Replace driver circuit card (1422).
11. Replace top cover (1434).
12. Replace access cover (1430).
13. Replace forms rack (1440).

Driver Circuit Card Removal 1420

1. Set printer POWER switch to OFF; unplug printer power cord form wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Unplug connector CN6 (A).
7. Remove two screws (B).



8. Disconnect driver circuit card from control card at CN4 and CN5. Lift at Ⓒ, then at Ⓓ.

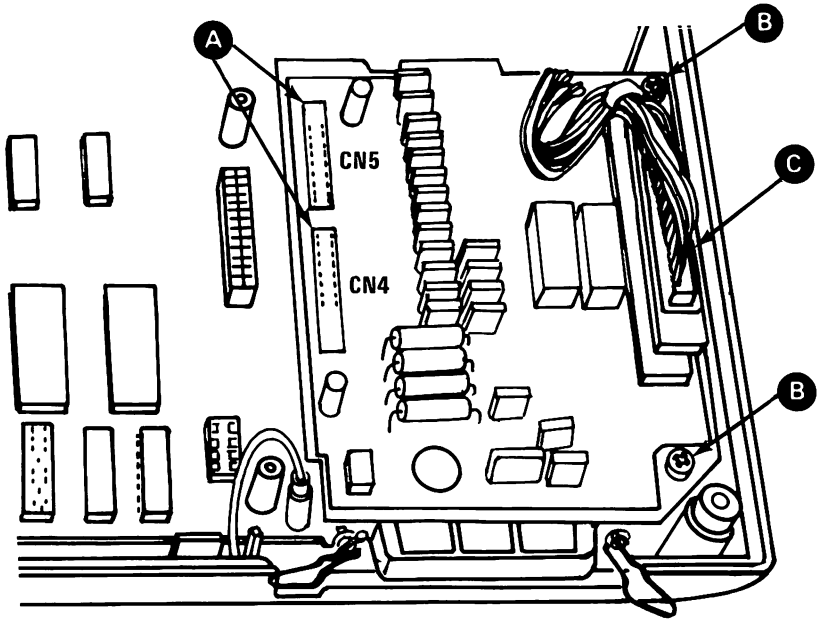


Driver Circuit Card Replacement 1422

1. Align two connectors CN4 and CN5 (A) on bottom of driver circuit card with connectors CN4 and CN5 on control circuit card.

   CAUTION
   CN4 and CN5 are not keyed. Verify proper alignment before powering on to prevent circuit card damage.

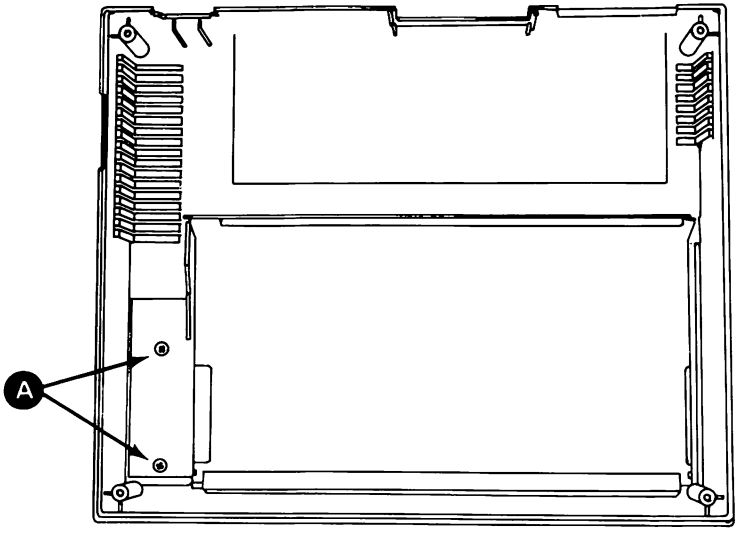
2. Connect driver circuit card to control circuit card by pressing down firmly on connectors. Be sure to guide connector CN6 cable into slot on left front edge of driver circuit.
3. Install two screws (B).
4. Install connector CN6 (C).



5. Replace top cover (1434).
6. Replace access cover (1430).
7. Replace forms rack (1440).

Control Panel Removal 1425

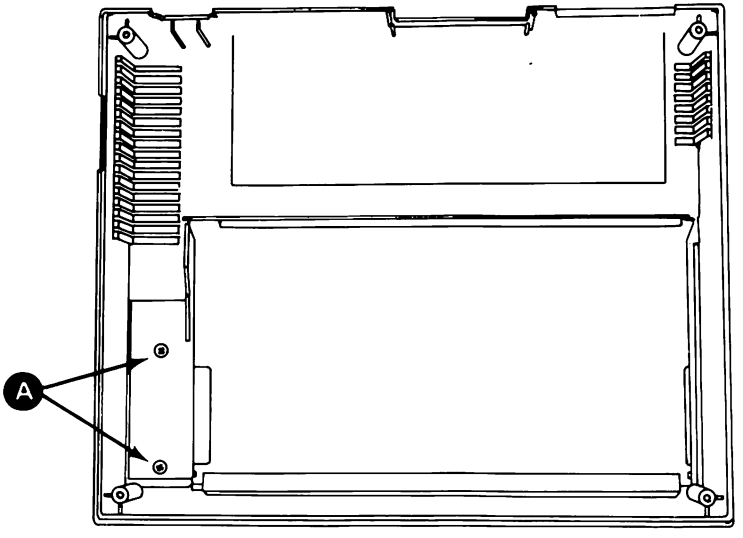
1. Set printer POWER switch OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Invert top cover.
7. Remove two screws (A) from underside of top cover.



8. Lift control panel from top cover.

Control Panel Replacement 1427

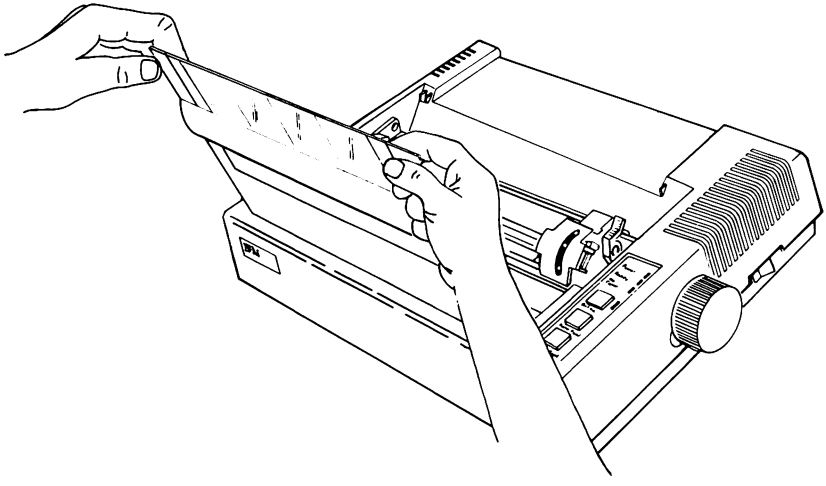
1. Insert control panel into top cover.
2. Install two screws (A).
3. Replace top cover (1434).
4. Replace access cover (1430).
5. Replace forms rack (1440).



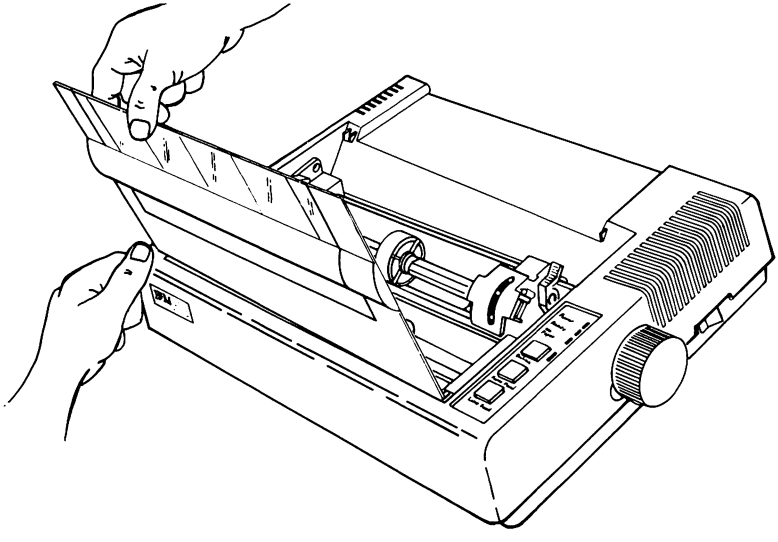
Covers

Access Cover 1430

1. Raise access cover.

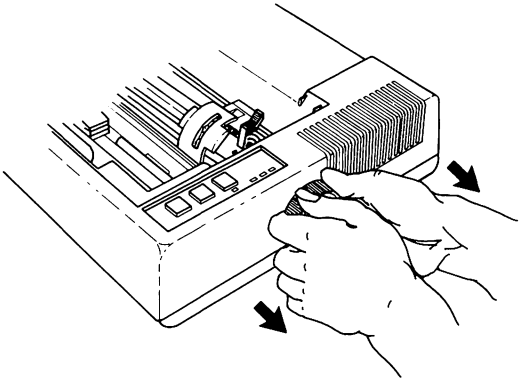


2. Lift cover from base as shown.

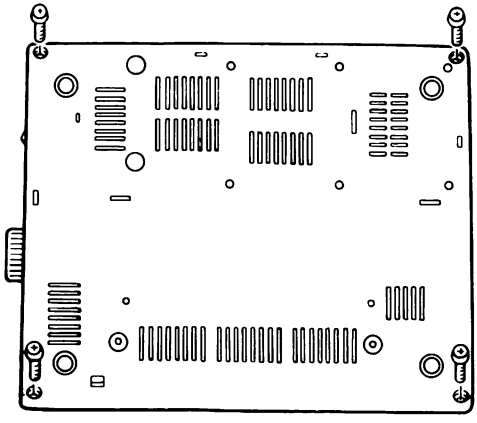


Top Cover Removal 1432

1. Set printer POWER switch to OFF; unplug power cord from wall outlet.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Pull forms feed knob from shaft using a steady firm pull.



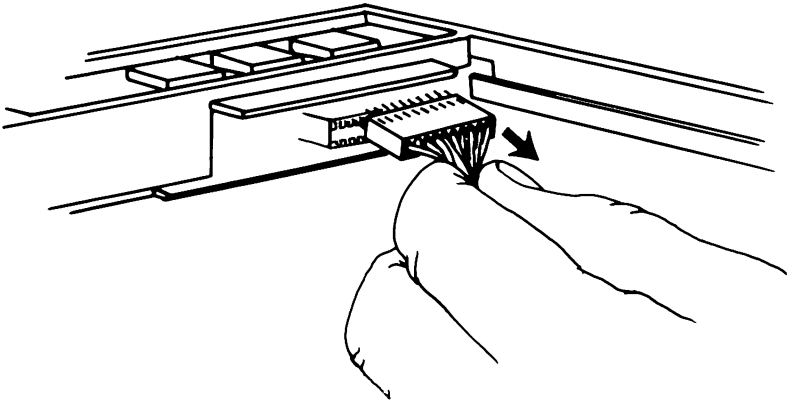
6. Turn printer upside down and place on smooth surface.
7. Loosen completely (using a Phillips screwdriver) the four corner screws in the base.



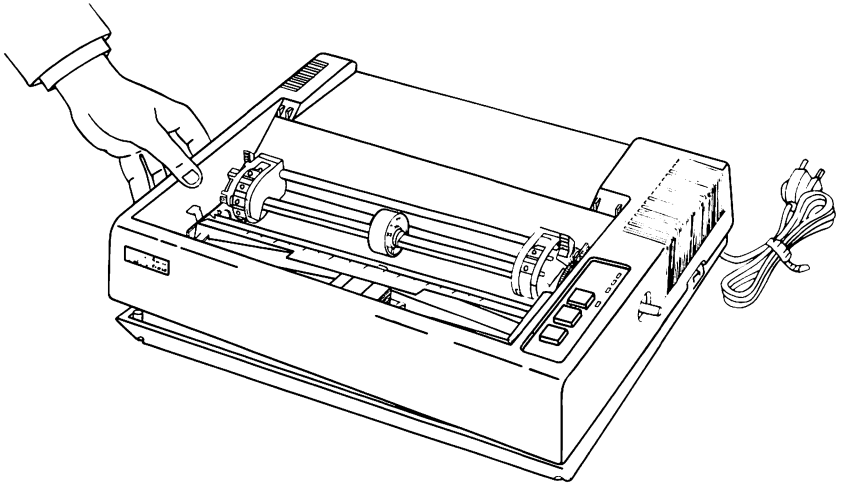
8. Turn printer rightside up.

CAUTION
Be sure to grasp both printer and base cover.

9. Pull control panel cable connector from control panel in top cover.

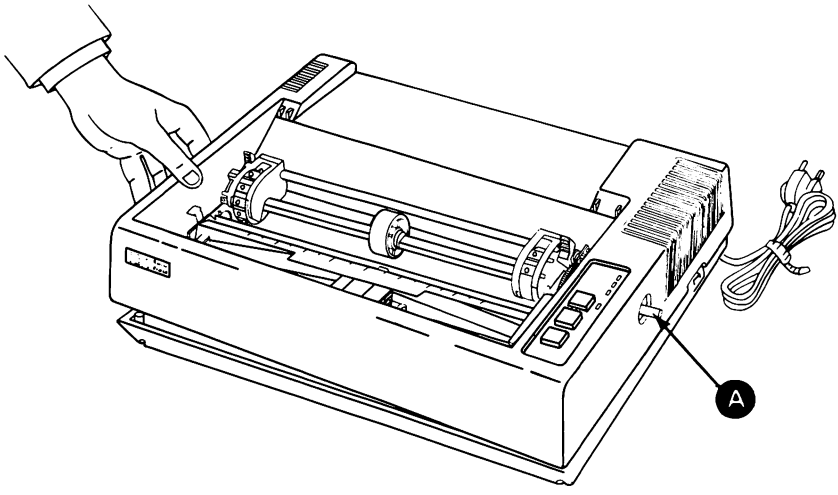


10. Lift top cover away from base cover. Lift left side first. Then, slide top cover to right to clear forms feed shaft.

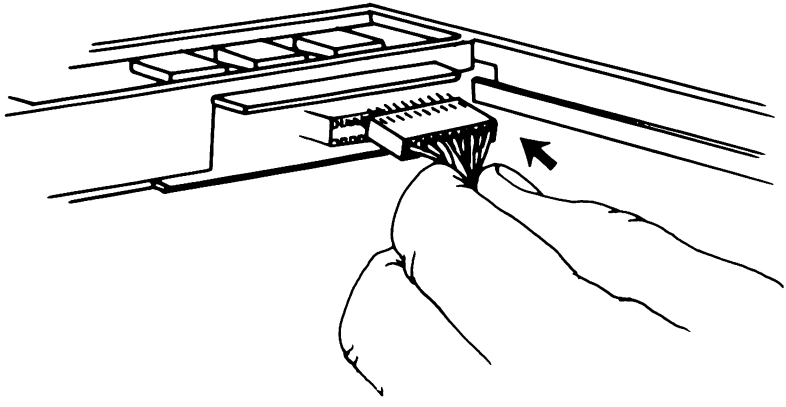


Top Cover Replacement 1434

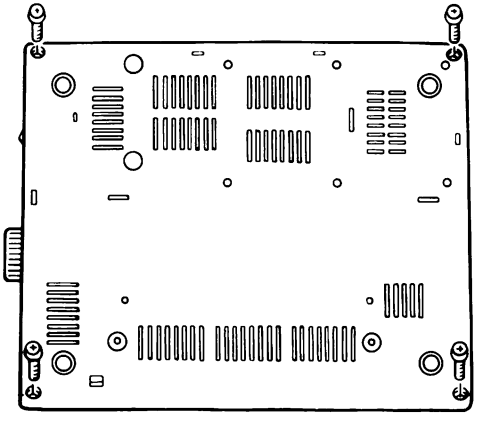
1. Position forms feed shaft through opening Ⓐ in top cover and lower top cover onto base cover.



2. Connect control panel cable to control panel.



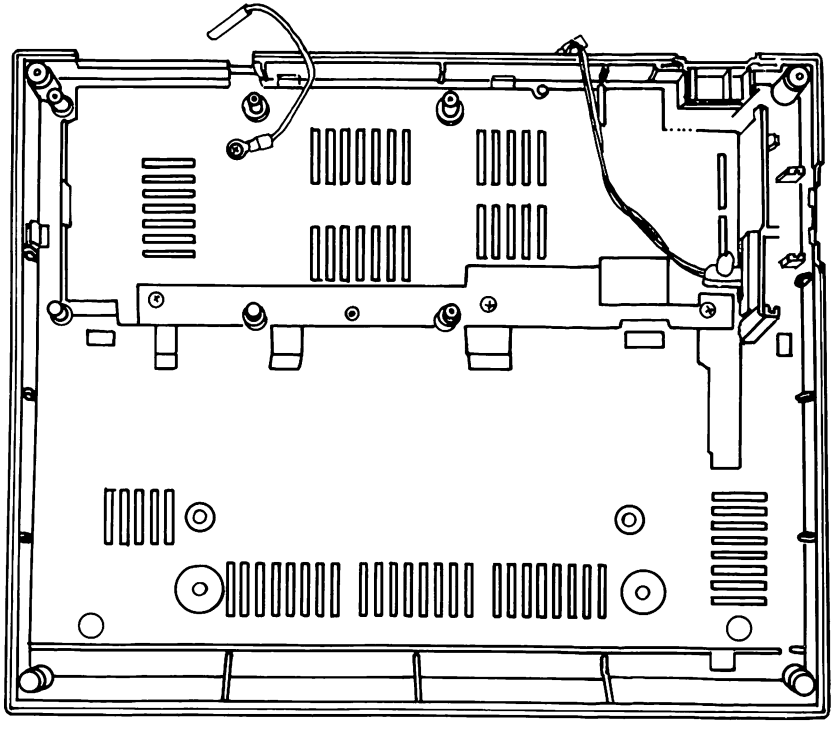
3. Turn printer upside down.
4. Install four screws.



5. Turn printer rightside up.
6. Replace forms feed knob (1439).
7. Replace access cover (1430).
8. Replace forms rack (1440).

Base Cover Removal 1436

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Remove power transformer (1475).
7. Remove fuse-filter card/power cord (1452).
8. Remove driver circuit card (1420).
9. Remove control circuit card (1415).
10. Remove print mechanism assembly (1488).
11. Remove heat sink/power transistor assembly (1460).
12. Base cover is now completely detached from other FRUs.

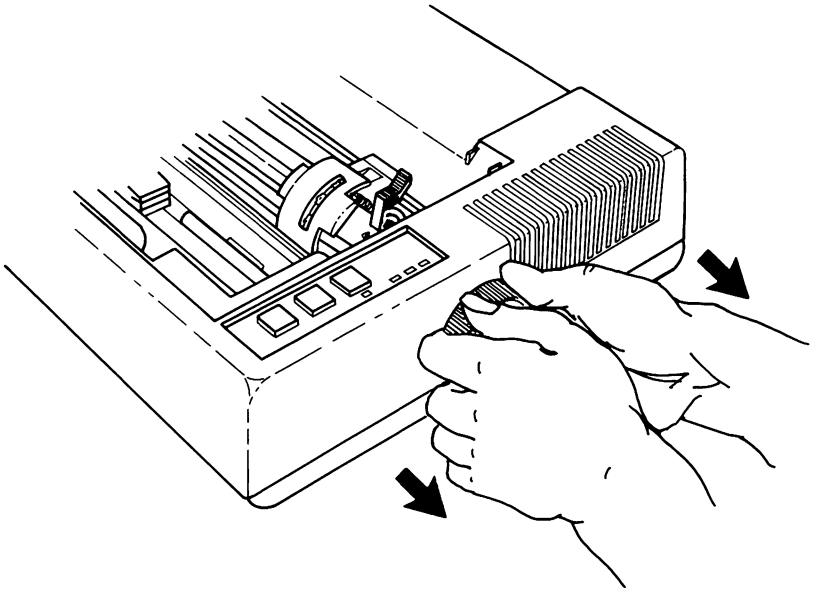


Base Cover Replacement 1438

1. Set base cover on work surface.
2. Replace heat sink/power transistor assembly (1462).
3. Replace print mechanism assembly (1490).
4. Replace control circuit card (1417).
5. Replace driver circuit card (1422).
6. Replace fuse-filter card/power cord (1454).
7. Replace power transformer (1477).
8. Replace top cover (1434).
9. Replace access cover (1430).
10. Replace forms rack (1440).

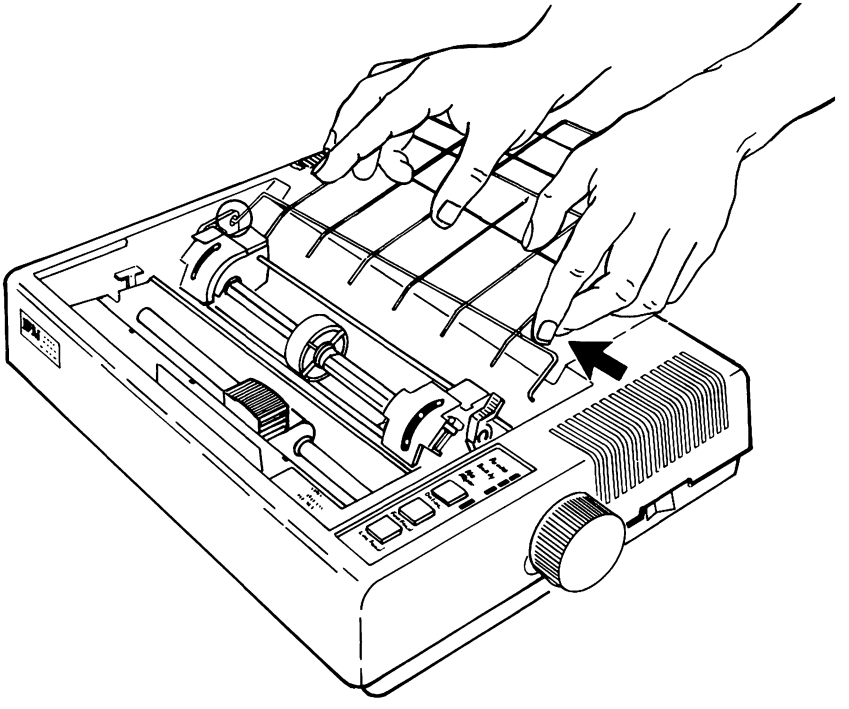
Forms Feed Knob 1439

1. Pull forms feed knob from shaft using steady, firm pull.



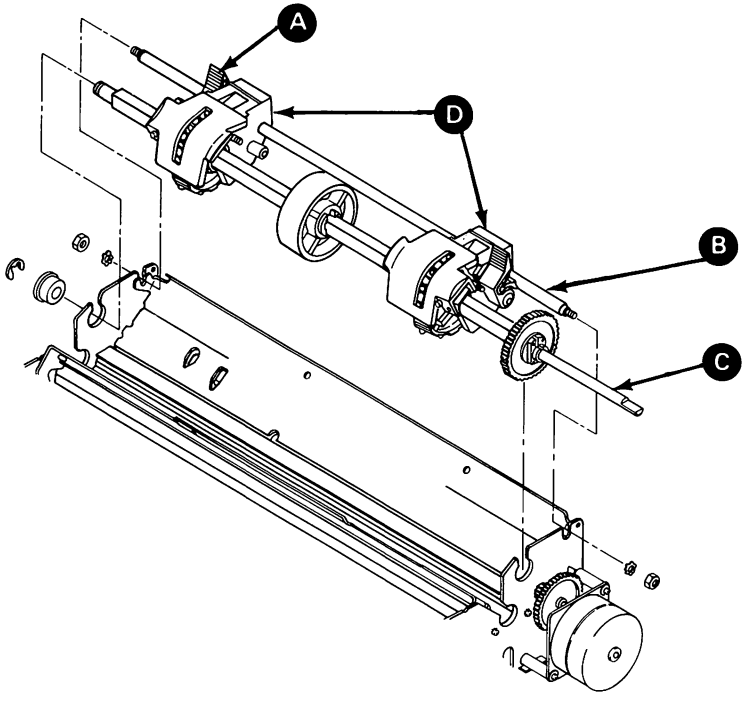
Forms Rack 1440

1. Remove forms.
2. Compress rack on one side to unhook rack from printer frame.
3. Lift rack away from frame.



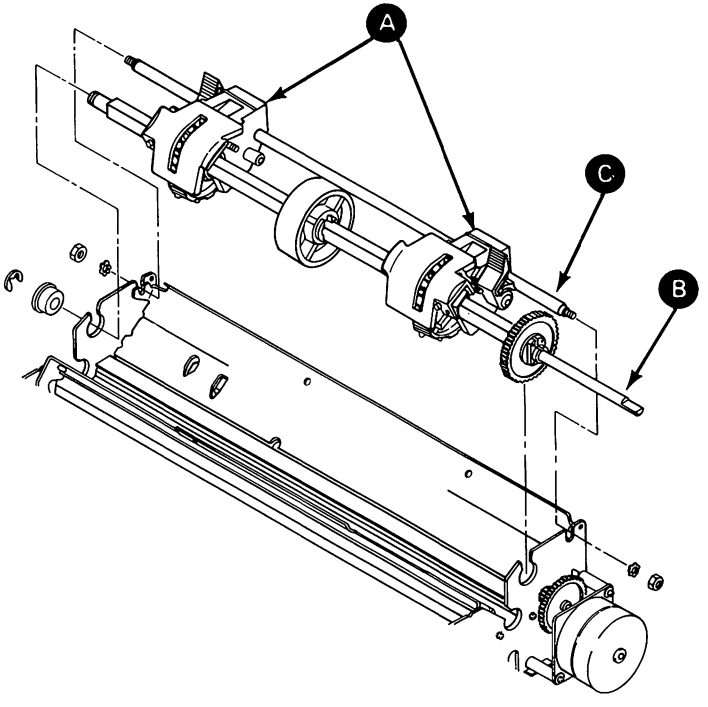
Forms Tractor Removal 1445

1. Set printer POWER switch to OFF; unplug power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430)
5. Remove top cover (1432).
6. Rotate lock levers (A) to forward (released) position.
7. Loosen nuts on ends of tractor support shaft (B).
8. Remove retaining clip on left end of guide shaft (C) and slide bushings to outside of frame.
9. Lift guide shaft, support shaft and forms tractors form machine.
10. Slide forms tractors (D) off shafts.



Forms Tractor Replacement 1447

1. Slide forms tractors (A) onto guide shaft (B) and support shaft (C).
2. Place guide shaft and support shaft into slots on frame.
3. Slide bushings on guide shaft into frame and replace retaining nuts on ends of support shaft.
4. Replace top cover (1434).
5. Replace access cover (1430).
6. Replace forms rack (1440).

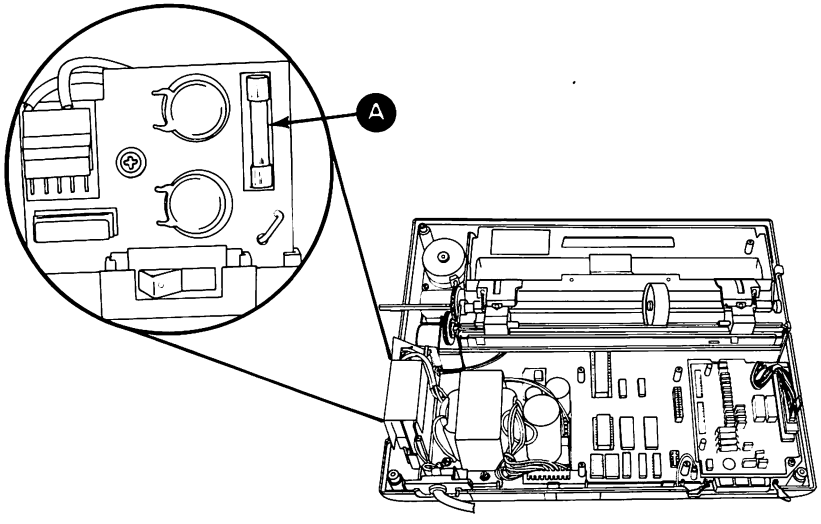


Fuse 1450

1. Set printer POWER switch to OFF: unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE FUSE-FILTER CARD. USE CAUTION IN THIS AREA.

6. Remove safety shield on fuse-filter card (1496).
7. Pull fuse (A) from holder.

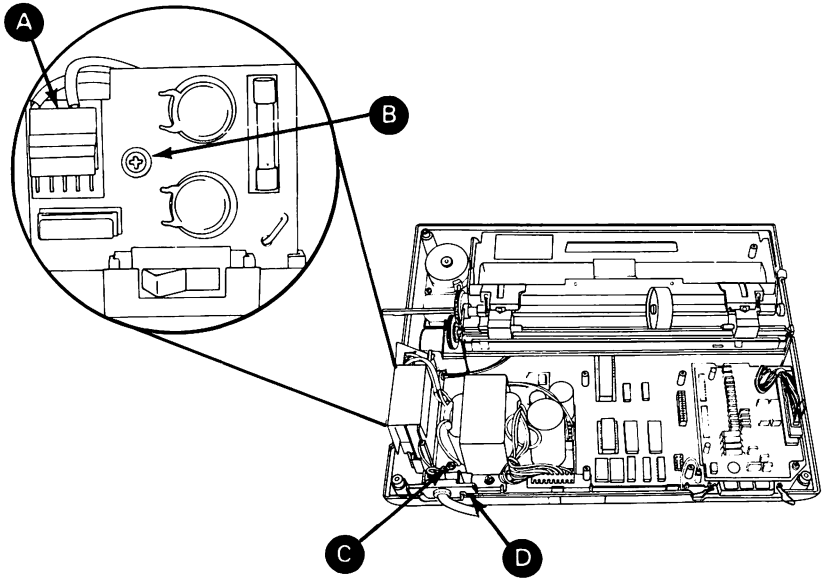


Fuse-Filter Card/Power Cord Removal 1452

1. Set printer POWER switch to OFF; unplug power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).

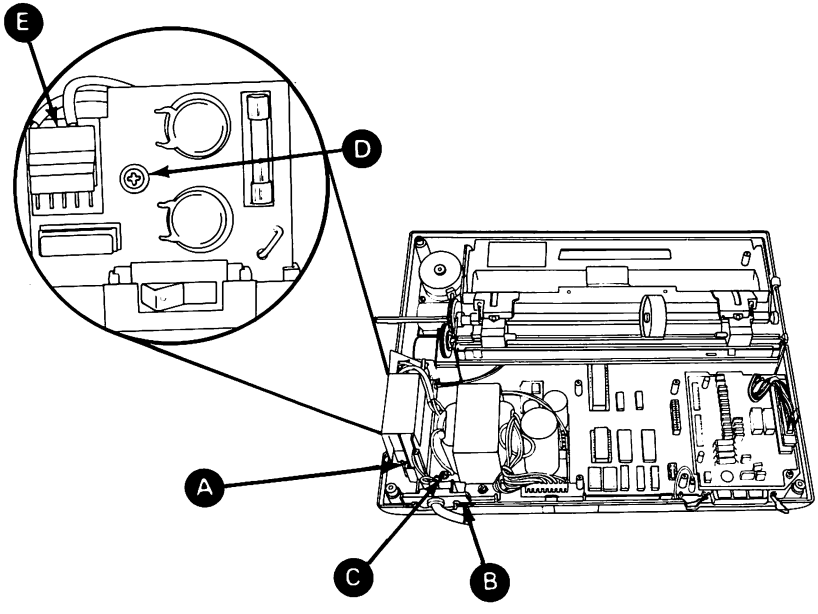
DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE FUSE-FILTER CARD. USE CAUTION IN THIS AREA.

6. Remove safety shield from fuse-filter card assembly (1496).
7. Remove transformer primary connector Ⓐ from fuse- filter card.
8. Remove screw Ⓑ from center of fuse-filter card.
9. Remove screw Ⓒ from ground terminal of printer power cord.
10. Lift strain relief Ⓓ from slot in base cover.
11. Lift fuse-filter card from slot in base cover.



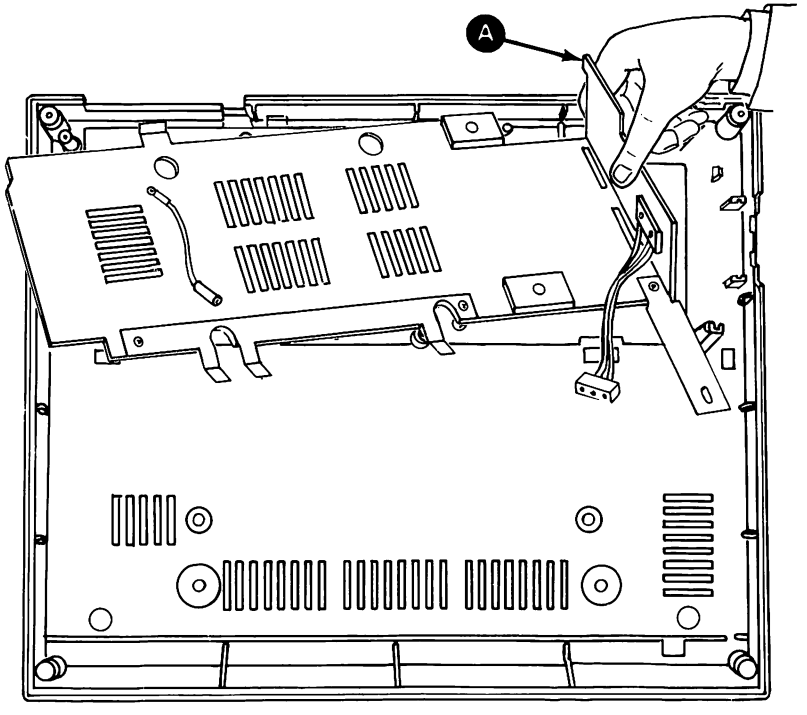
Fuse-Filter Card/Power Cord Replacement 1454

1. Insert fuse-filter card into slot (A) in base cover.
2. Insert strain relief into slot (B) in base cover.
3. Install screw (C) into ground terminal of power cord.
4. Install screw (D) in center of fuse-filter card.
5. Connect transformer primary (E) to fuse-filter card.
6. Replace safety shield onto fuse-filter card (1498).
7. Replace top cover (1434).
8. Replace access cover (1430).
9. Replace forms rack (1440).



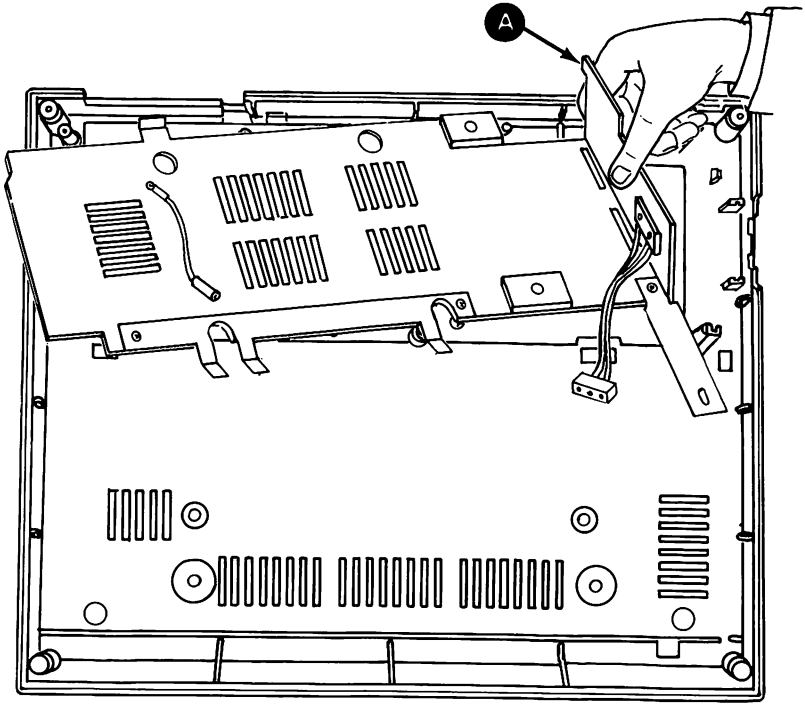
Heat Sink/Power Transistor Assembly Removal 1460

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Remove power transformer (1475).
7. Remove fuse-filter card/power cord (1452).
8. Remove control circuit card (1415).
9. Remove print mechanism assembly (1488).
10. Lift heat sink assembly (A) from base cover.



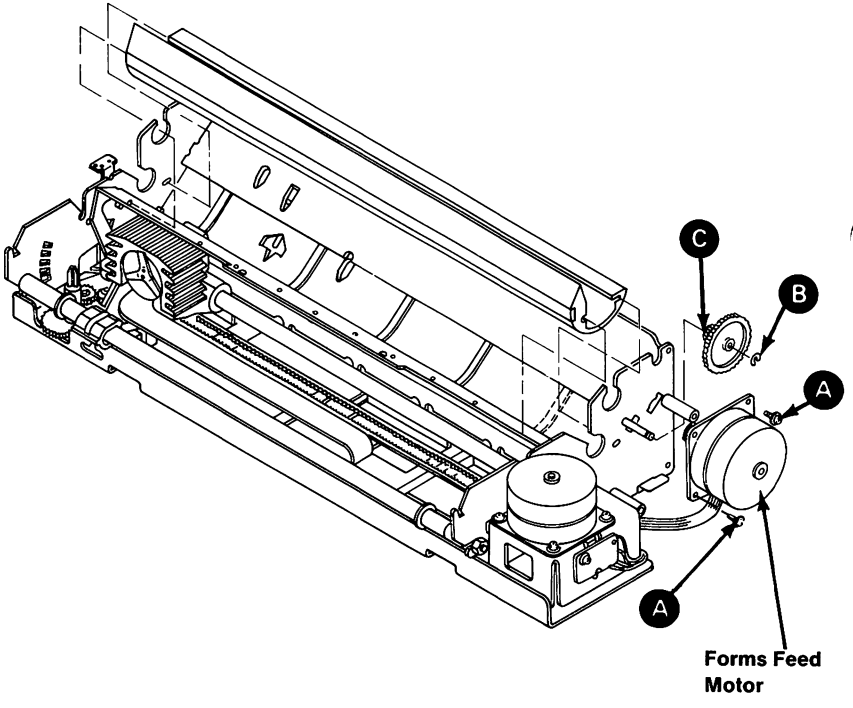
Heat Sink/Power Transistor Assembly Replacement 1462

1. Position heat sink/power transistor assembly (A) onto base cover.
2. Replace print mechanism assembly (1490).
3. Replace control circuit card (1417).
4. Replace driver circuit card (1422).
5. Replace fuse-filter card/power cord (1454).
6. Replace power transformer (1477).
7. Replace top cover (1434).
8. Replace access cover (1430).
9. Replace forms rack (1440).



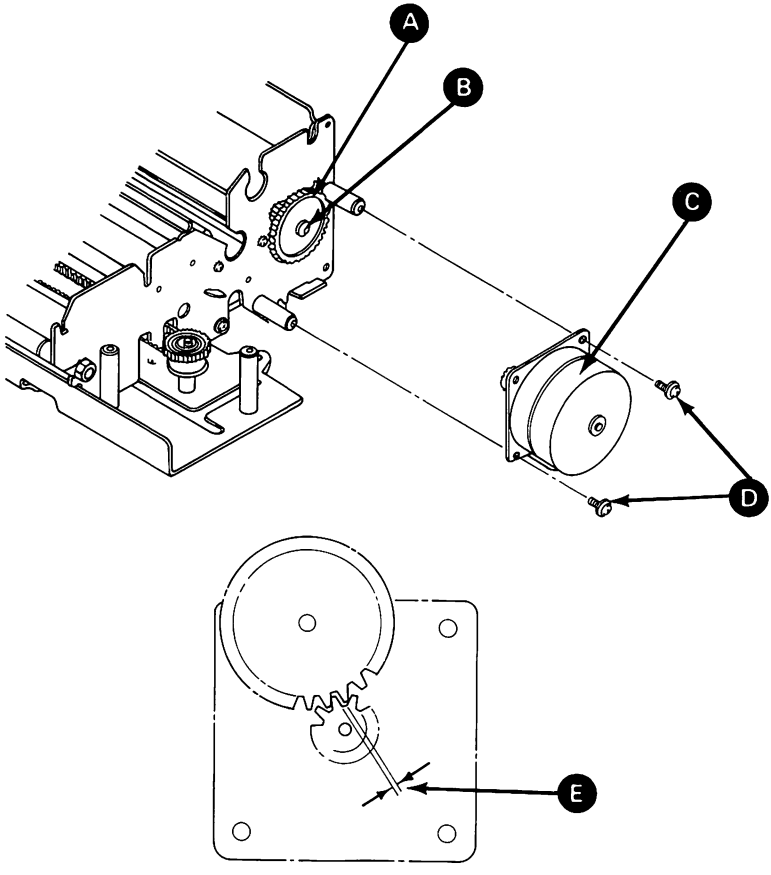
Intermediate Gear Removal 1465

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Remove two screws (A) from forms feed motor mounts.
7. Remove intermediate gear retaining clip (B).
8. Slide intermediate gear (C) off shaft.



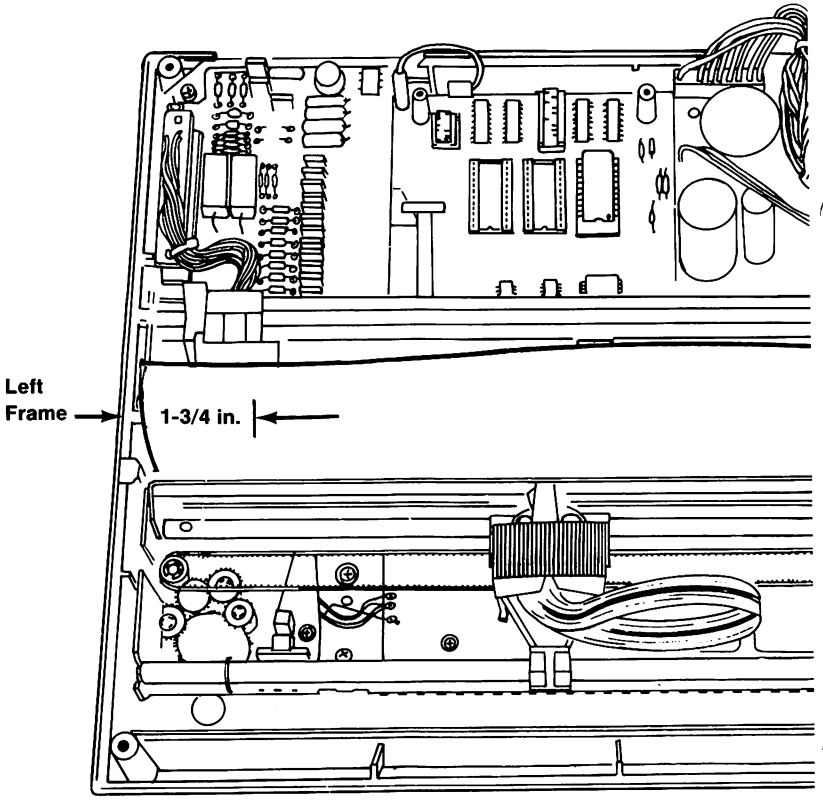
Intermediate Gear Replacement 1467

1. Slide intermediate gear (A) onto shaft.
2. Replace retaining clip (B).
3. Place forms feed motor (C) onto mounts.
4. Install two screws (D) but do not tighten.
5. Position forms feed motor to mesh gears with minimum backlash (E) and no binding.
6. Tighten two screws.
7. Replace top cover (1434).
8. Replace access cover (1430).
9. Replace forms rack (1440).

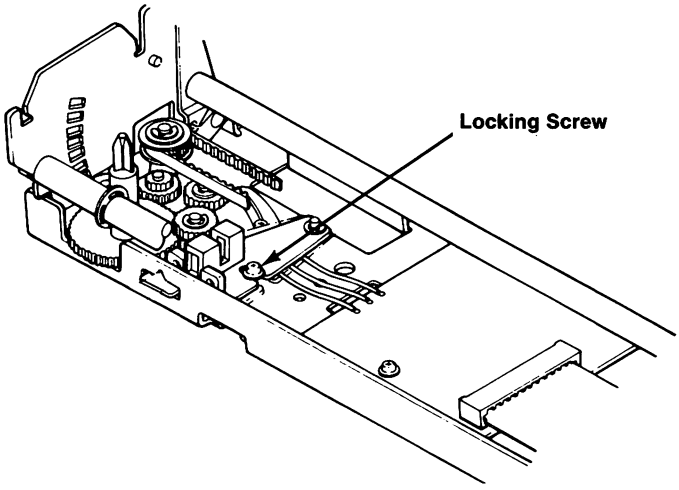


Left Margin Sensor Adjustment 1470

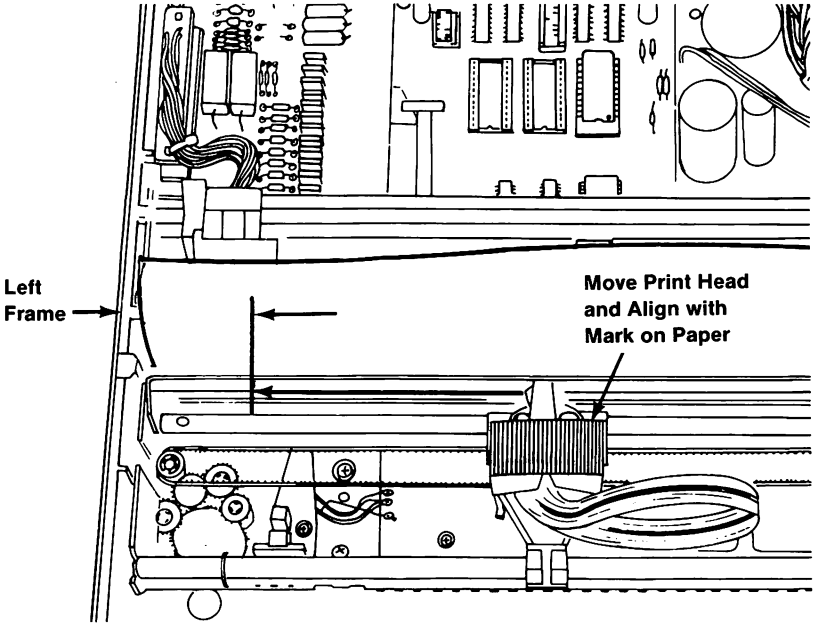
1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).
6. Remove ribbon cartridge.
7. Insert a sheet of paper into the printer. Position paper to the left frame.
8. Measure 1-3/4 inches from the left frame and mark the position on the paper.



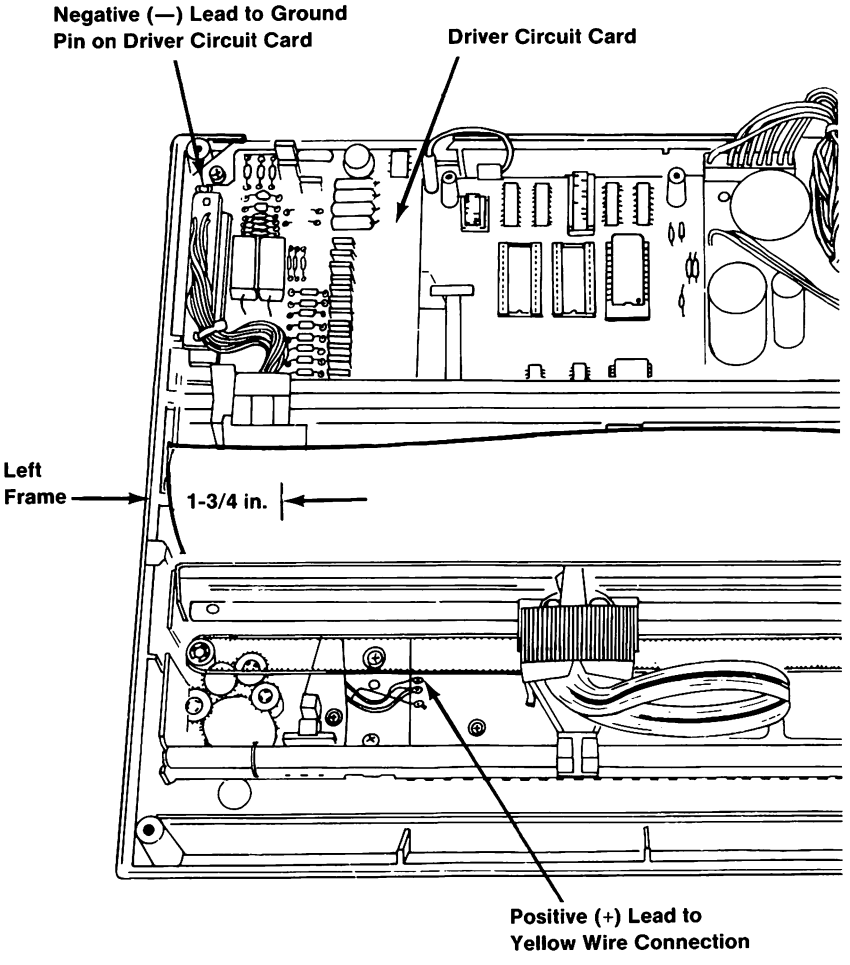
9. Loosen the left margin sensor locking screw.



10. Plug in the printer power cord. Position the printer POWER switch to ON.
11. Move the print head manually and align it with the 1-3/4 inch mark on the paper.



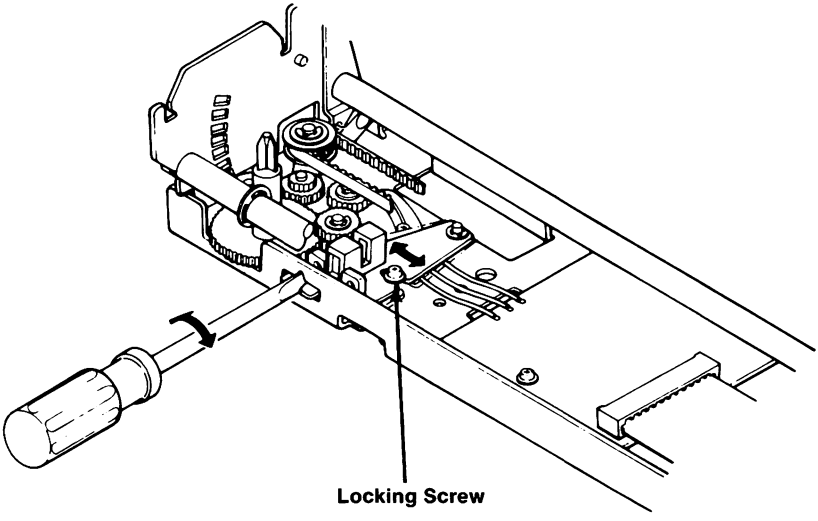
12. Set your multimeter to the 12 Vdc scale.
13. Place the negative (-) lead of the meter on the ground pin of the driver circuit card.
14. Place the positive (+) lead of the meter on the yellow wire solder connection on the left margin sensor.



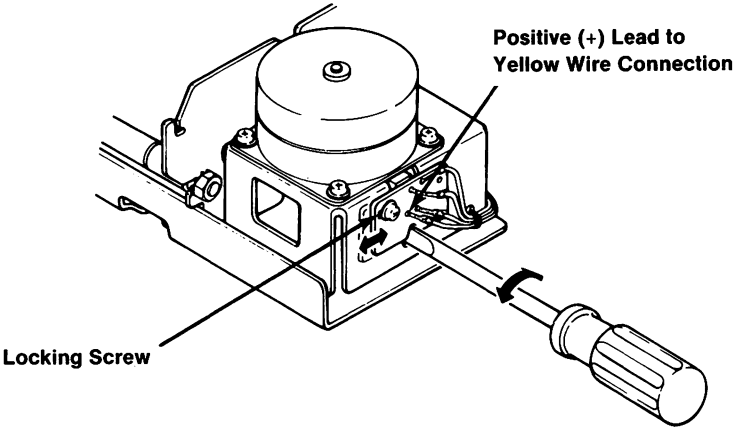
15. Move the left margin sensor to the left until the voltage reading on the meter is a down level (approximately 0 Vdc).
16. Move the left margin sensor to the right until the voltage on the meter is an up lever (approximately 5 Vdc).

    Note: If the voltage reading on the meter stays at a down level, move the print head one position to the left and repeat steps 15 and 16.

17. Tighten the left margin locking screw.



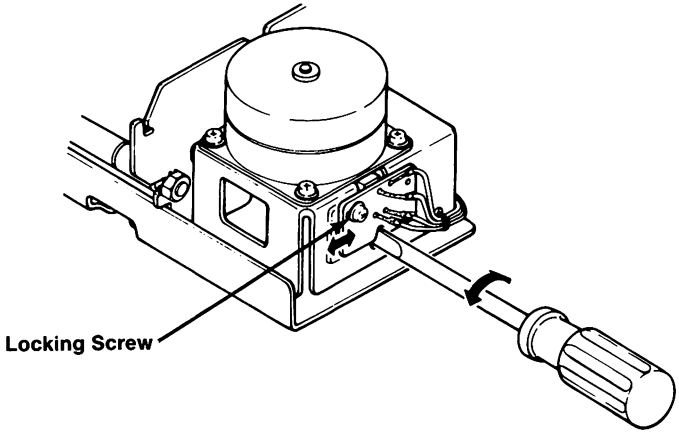
18. Place the positive (+) lead of the meter on the yellow wire solder connection on the printer timing sensor (PTS) board.
19. Loosen the printer timing sensor board locking screw.
20. Move the printer timing sensor board either way until the voltage reading is an up level (approximately 5 Vdc).



21. Move the print head slightly to the left. The voltage reading should drop to a down level (approximately 0 Vdc). Do not allow the print head to step to the next detented position.
22. Move the print head slightly to the right. The voltage reading should drop to a down level (approximately 0 Vdc).

Note: It is very important that the amount of pressure exerted on the print head be equal in either direction when the meter reading drops to the down level, without causing the print head to jump to the next detented position.

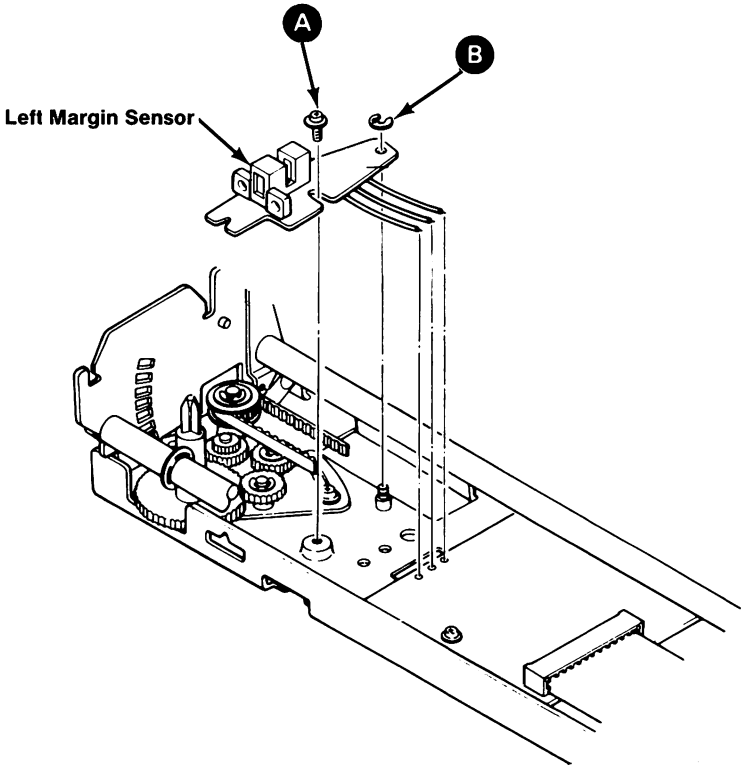
23. Tighten the printer timing sensor locking screw and recheck step 14. Realign if necessary.



24. Run the "Printer Offline Diagnostic Test" and observe the speed in both directions.
25. If the buzzer sounds the printer timing sensor board is set incorrectly. Repeat the procedure starting at step 18.
26. If the speed is different between forward and reverse printing, perform the following steps.
    a. Place positive (+) lead of the voltage meter on the yellow wire solder connection on the printer timing sensor board.
    b. Loosen the printer timing sensor board locking screw.
    c. Move the printer timing sensor board until another up level location is observed and repeat the procedure from step 14.
27. If it is the same speed in both directions, the adjustment is complete.

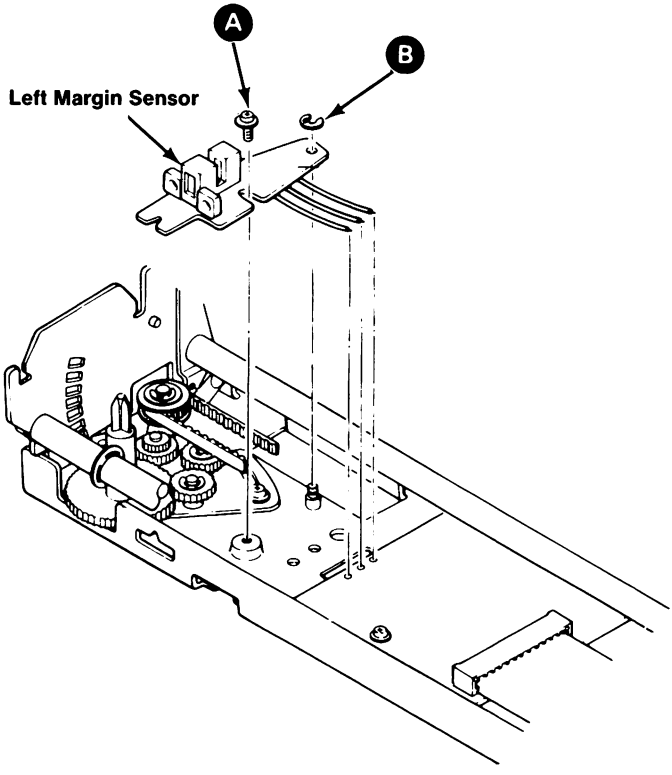
Left Margin Sensor Removal 1472

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Move carriage to right frame.
8. Remove retaining screw (A) and retaining clip (B).
9. Unsolder three wires from left margin sensor.
10. Lift left margin sensor from printer.



Left Margin Sensor Replacement 1474

1. Solder three wires from terminal board to left margin sensor.
2. Position left margin sensor pivot hole over post.
3. Replace retaining screw (A) and retaining clip (B).
4. Readjust left margin sensor (1470).
5. Replace top cover (1434).
6. Replace ribbon cartridge.
7. Replace access cover (1430).
8. Replace forms rack (1440).

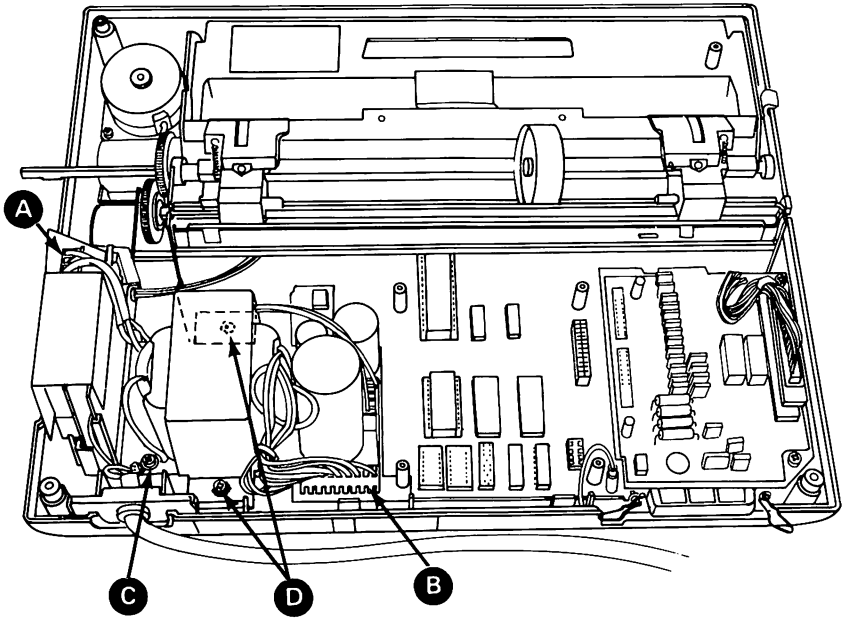


Power Transformer Removal 1475

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).

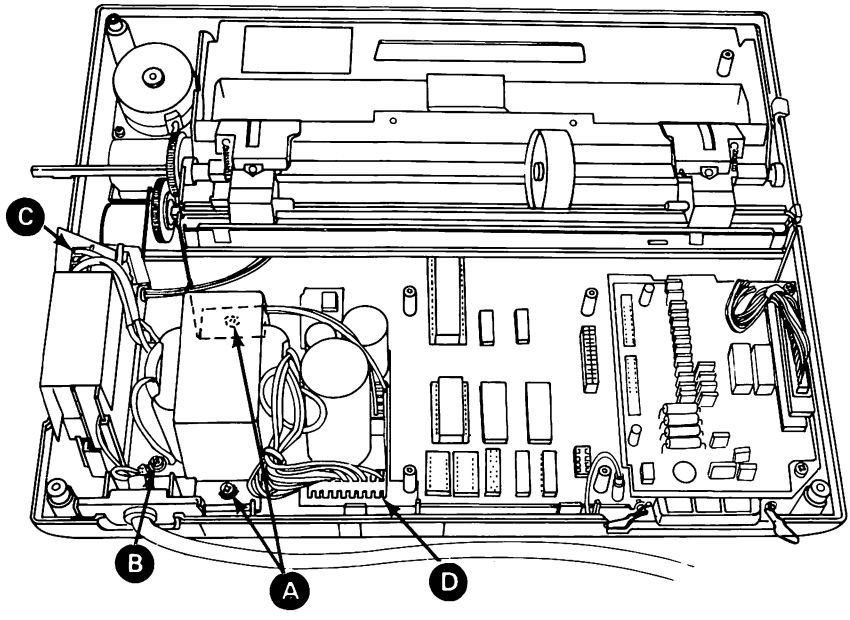
DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE FUSE-FILTER CARD. USE CAUTION IN THIS AREA.

6. Unplug connector (A) from fuse-filter card.
7. Unplug connector (B) from control circuit card.
8. Remove screw (C) from transformer ground wire, if present.
9. Remove two screws (D) from base of transformer.
10. Lift transformer from base.



Power Transformer Replacement 1477

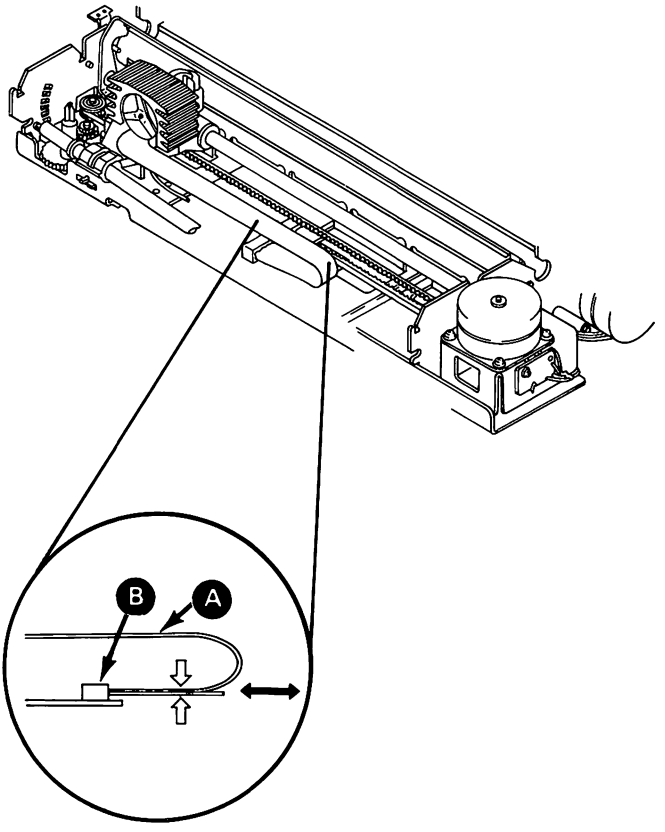
1. Place transformer on base in area next to fuse-filter card (note positioning of two connectors).
2. Install two base mounting screws (A).
3. Install screw in ground wire (B), if present.
4. Plug connector (C) into fuse-filter card.
5. Plug connector (D) into control circuit card.



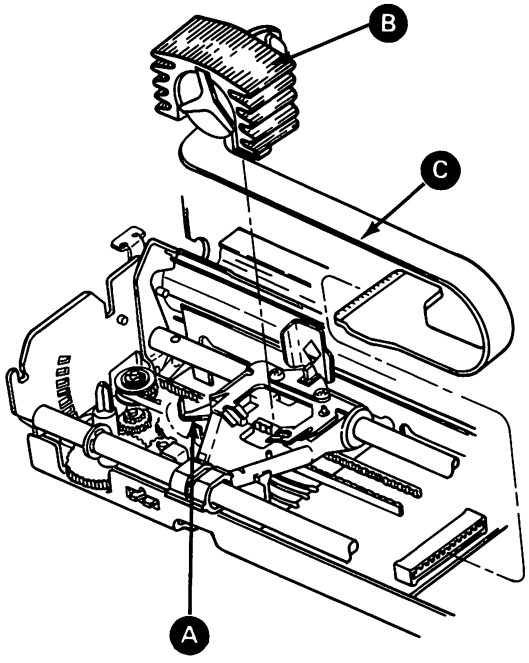
6. Replace top cover (1434).
7. Replace access cover (1430).
8. Replace forms rack (1440).

Print Head Removal 1482

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Pull print head cable (A) from connector (B).

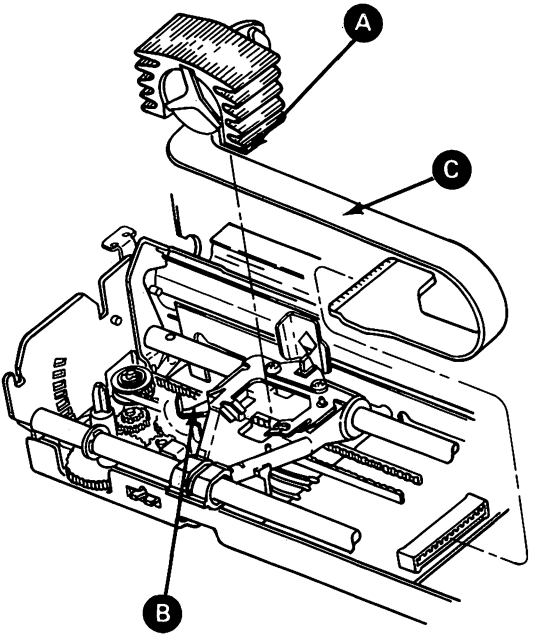


8. Pivot print head lock lever (A) clockwise.
9. Lift print head (B) and cable (C) from carriage.



Print Head Replacement 1484

1. Insert feet (A) on print head into opening on carriage.
2. Pivot lock lever (B) counterclockwise while pressing down on print head.
3. Connect print head cable (C) at connector.
4. Replace top cover (1434).
5. Replace ribbon cartridge.
6. Replace access cover (1430).
7. Replace forms rack (1440).

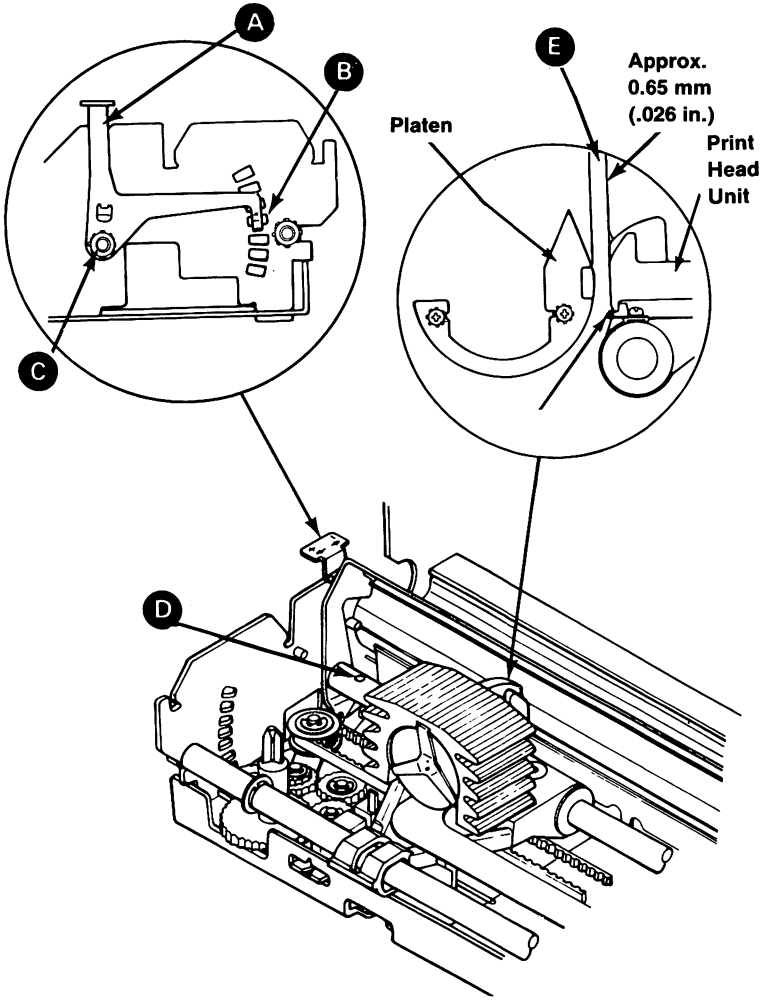


Note: Broken wires may be the result of other problems. If a print head has been replaced because of a broken wire, perform the following steps to prevent damaging the newly installed print head.

1. Remove the top cover. Disconnect CN6 on the driver control card. Check for 22 ohms resistance between pin CN6-10 (male end) and pins CN6-1 through 9. Replace the print mechanism assembly if there are any shorts or opens.
2. Power on. Check for +24 Vdc at pins CN6-1 through 9 on driver card (use ground pin for common lead). If any pin has +24 Vdc, replace the control cards. If all pins read 0 Vdc, Power off and reconnect CN6. The print head circuitry is functional.

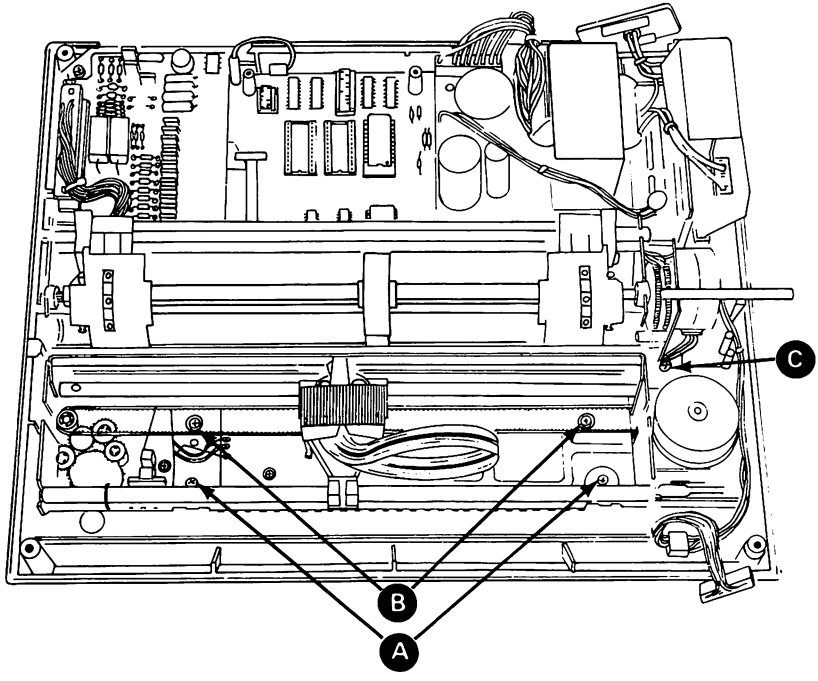
Print Head Gap Adjustment 1486

1. Remove print mechanism assembly (1488).
2. Set print head gap adjusting lever (A) to the fourth position (B).
3. Loosen nut (C).
4. Rotate carriage shaft (D) to obtain .65mm gap (.026") between print head and platen (E).
5. Tighten nut (C).
6. Replace print mechanism assembly (1490).



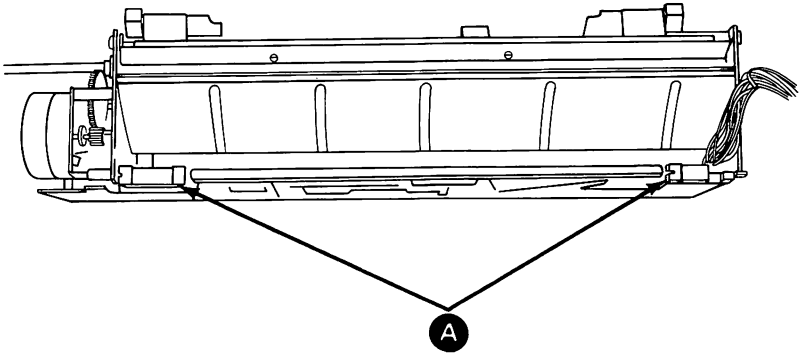
Print Mechanism Assembly Removal 1488

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove rack (1440).
4. Remove access cover (1430).
5. Remove ribbon cartridge.
6. Remove top cover (1432).
7. Remove driver circuit card (1420).
8. Remove control circuit card (1415).
9. Remove two screws (A) from base unit of print mechanism assembly.
10. Remove shipping screws (B) if still installed.
11. Remove screw (C) from ground strap.
12. Lift print mechanism assembly from base cover.



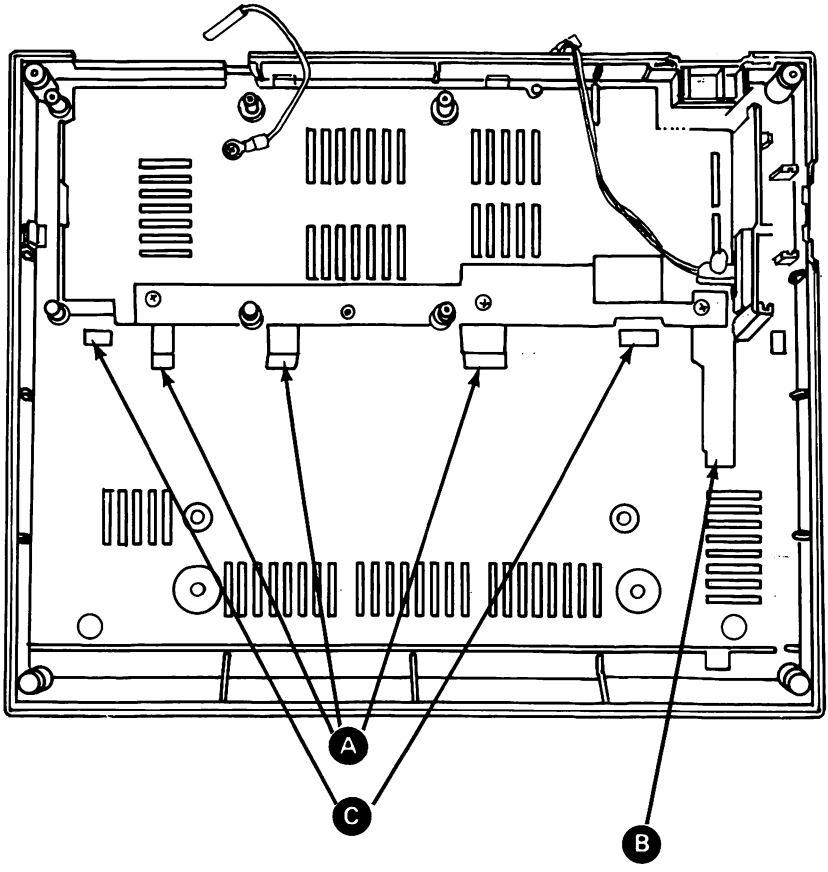
Print Mechanism Assembly Replacement 1490

1. Verify that the rubber grommets (A) are in position shown.

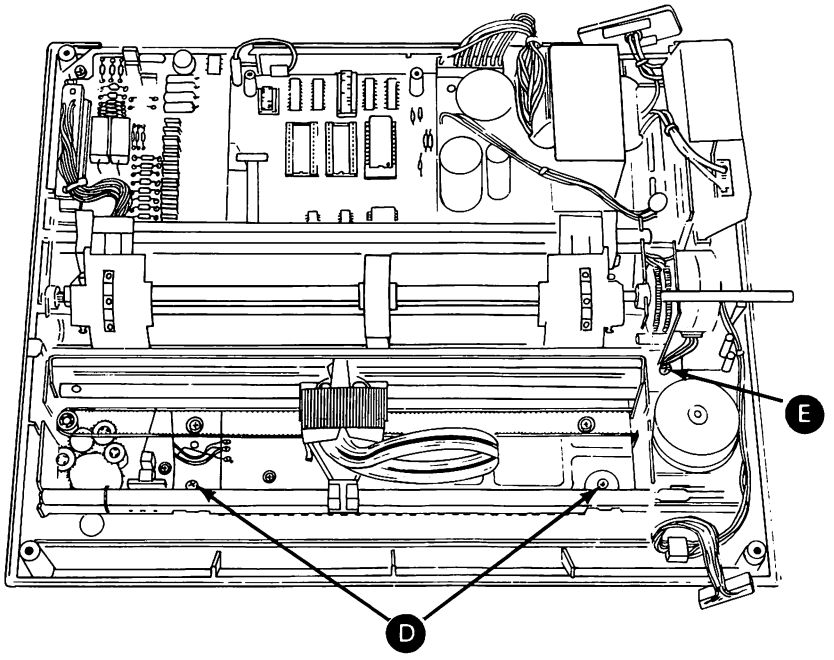


Rear View

2. Place print mechanism assembly on base cover.
3. Slide print mechanism assembly toward the rear over three grounding tabs (A) and under ground strap (B).
4. Position rubber grommets around plastic stops (C).



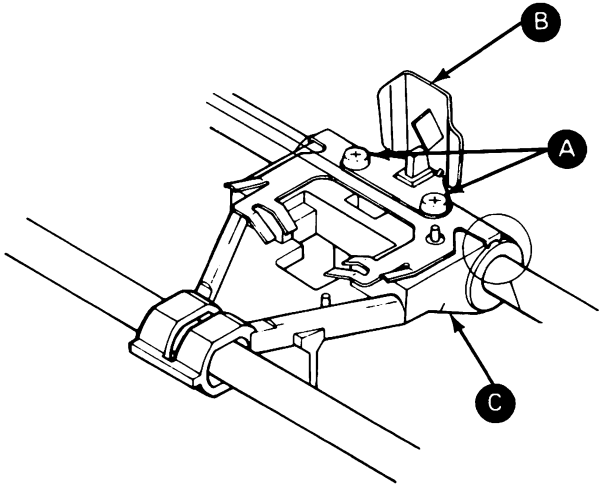
5. Install two screws (D).



6. Install screw (E) in ground strap.
7. Replace control circuit card (1417).
8. Replace driver circuit card (1422).
9. Replace top cover (1434).
10. Replace ribbon cartridge.
11. Replace access cover (1430).
12. Replace forms rack (1440).

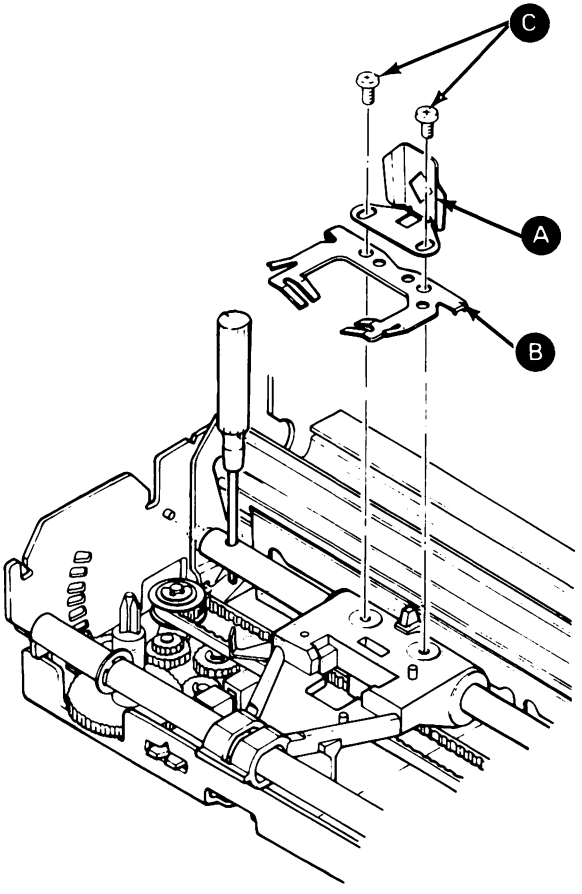
Ribbon Shield Removal 1492

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove ribbon cartridge.
5. Remove access cover (1430).
6. Remove top cover (1432).
7. Remove print head (1482).
8. Remove two screws (A) at base of ribbon shield (B).
9. Lift shield straight up from carriage (C).

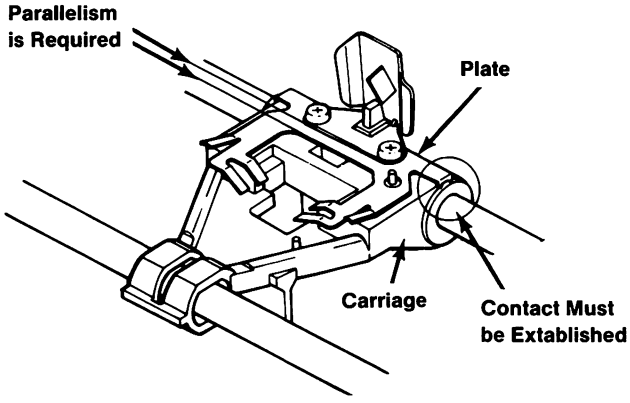


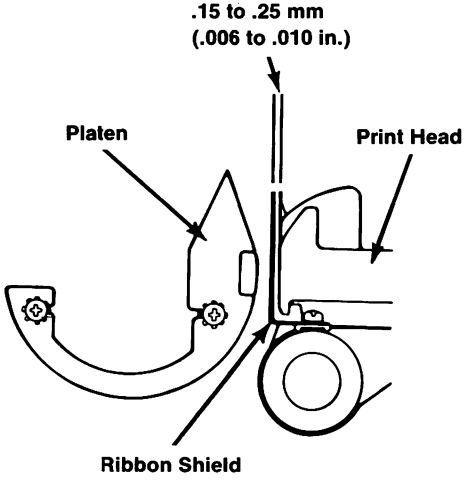
Ribbon Shield Replacement 1494

1. Position shield (A) and plate (B) on head carriage.
2. Insert screws (C) (do not tighten).



3. Position shield and plate as shown. Tighten screws.





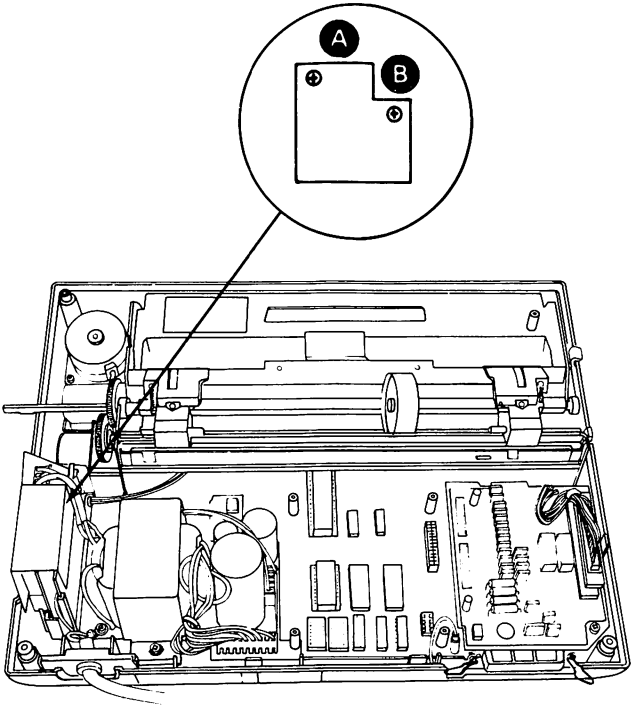
4. Replace print head (1484).
5. Replace top cover (1434).
6. Replace ribbon cartridge.
7. Replace access cover (1430)
8. Replace forms rack (1440).

Safety Shield Removal 1496

1. Set printer POWER switch to OFF; unplug printer power cord from wall outlet and disconnect printer cable.
2. Remove forms.
3. Remove forms rack (1440).
4. Remove access cover (1430).
5. Remove top cover (1432).

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE FUSE-FILTER CARD. USE CAUTION IN THIS AREA.

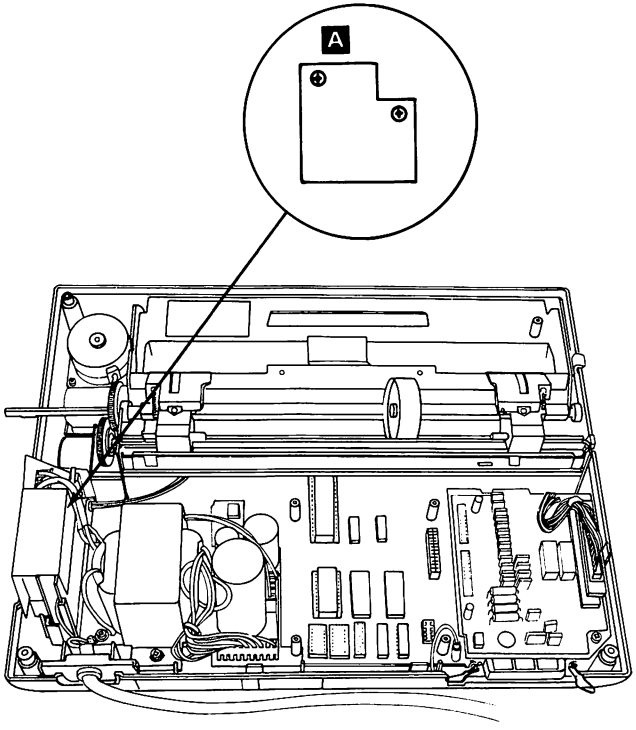
6. Loosen screw Ⓐ and screw Ⓑ.
7. Lift safety shield from fuse-filter card.



Safety Shield Replacement 1498

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE FUSE-FILTER CARD. USE CAUTION IN THIS AREA.

1. Position safety shield on fuse-filter card.
2. Install screws (A).



3. Replace top cover (1432).
4. Replace access cover (1430).
5. Replace forms rack (1440).

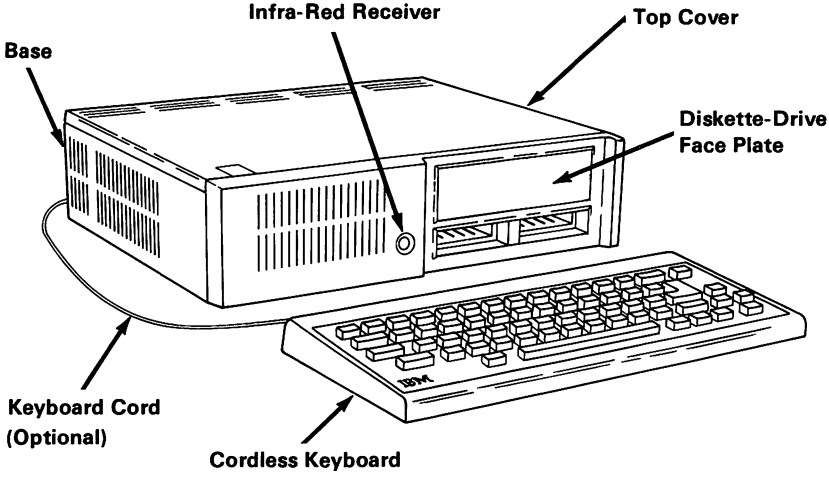
Notes:

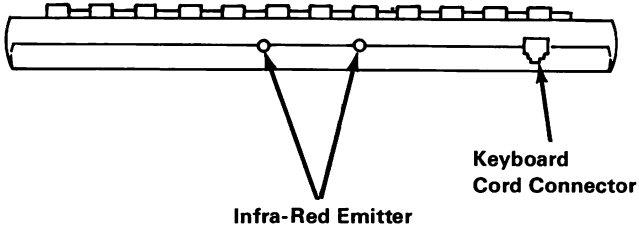
Section 5. Locations

Contents

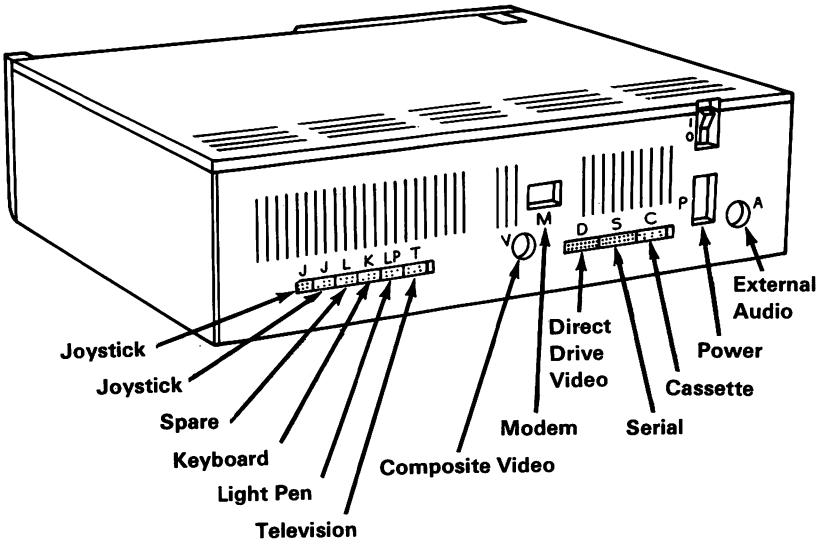
Notes:

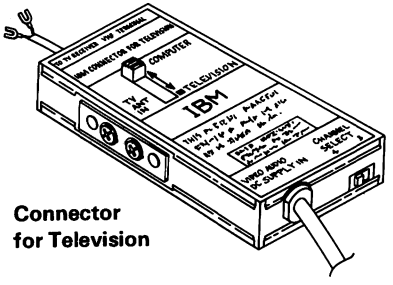
System Unit, Front



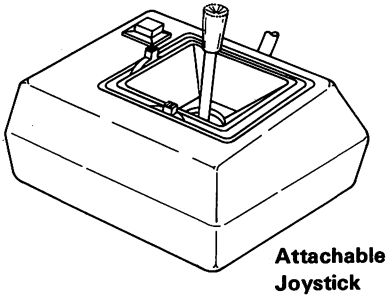


System Unit, Rear

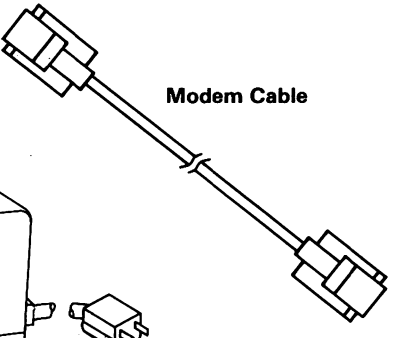




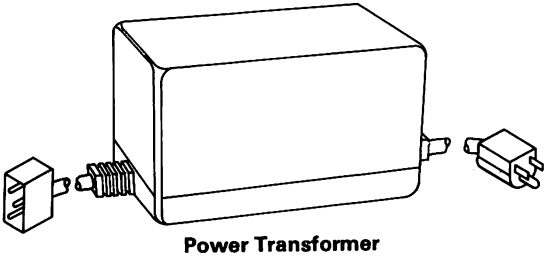
Connector for Television



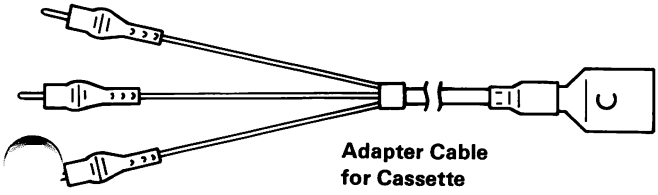
Attachable Joystick



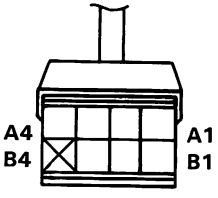
Modem Cable



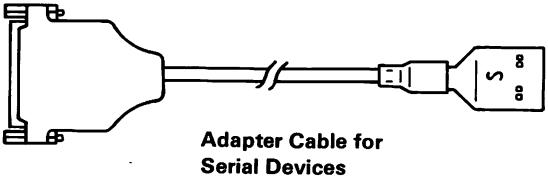
Power Transformer



Adapter Cable
for Cassette



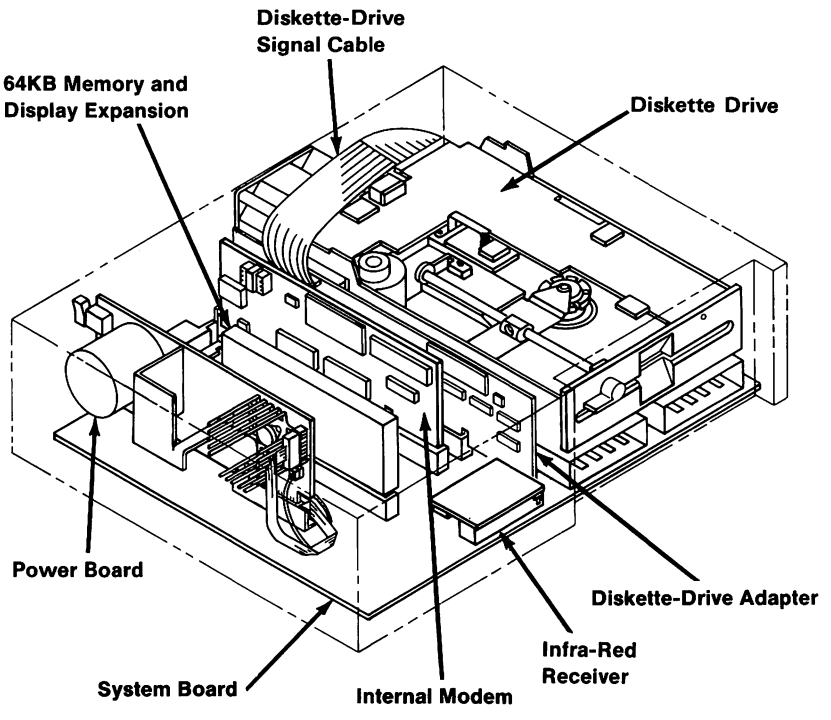
Cassette Connector		System Connector
Red	1	B2
	2	A1
Black	1	A2
	2	A1
Gray	1	A4
	2	B3



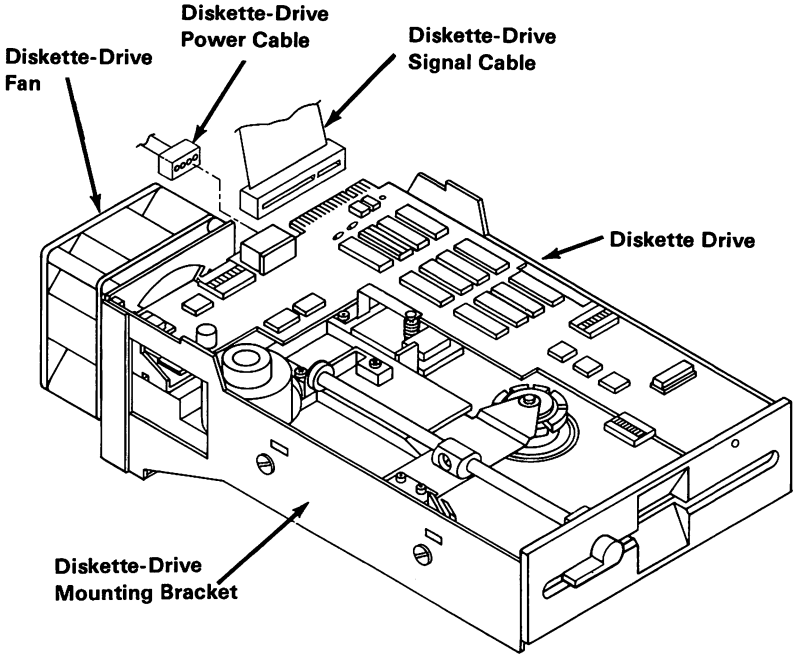
Adapter Cable for
Serial Devices

Adapter Cable for
IBM Color Display

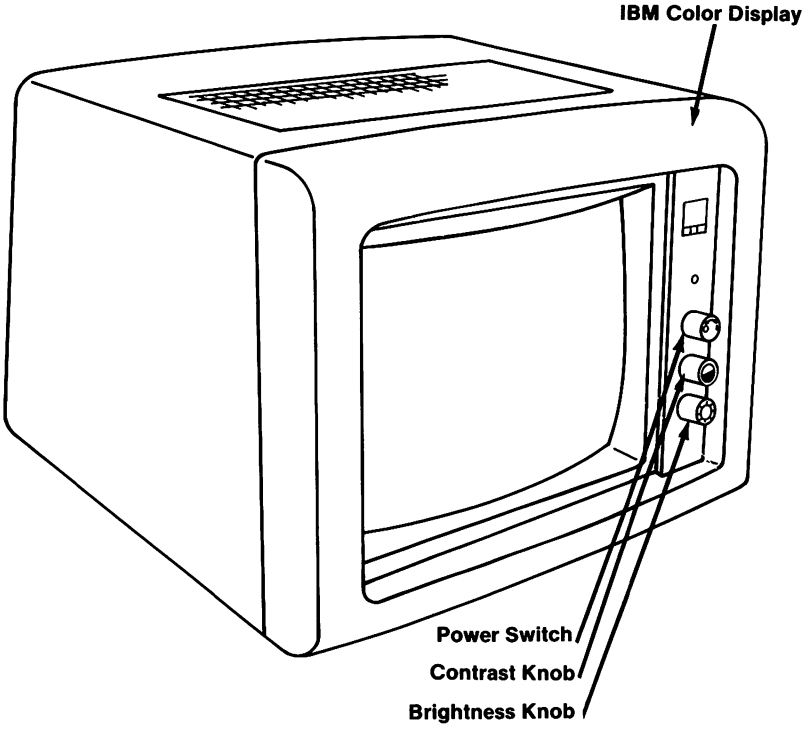
System Unit, Internal



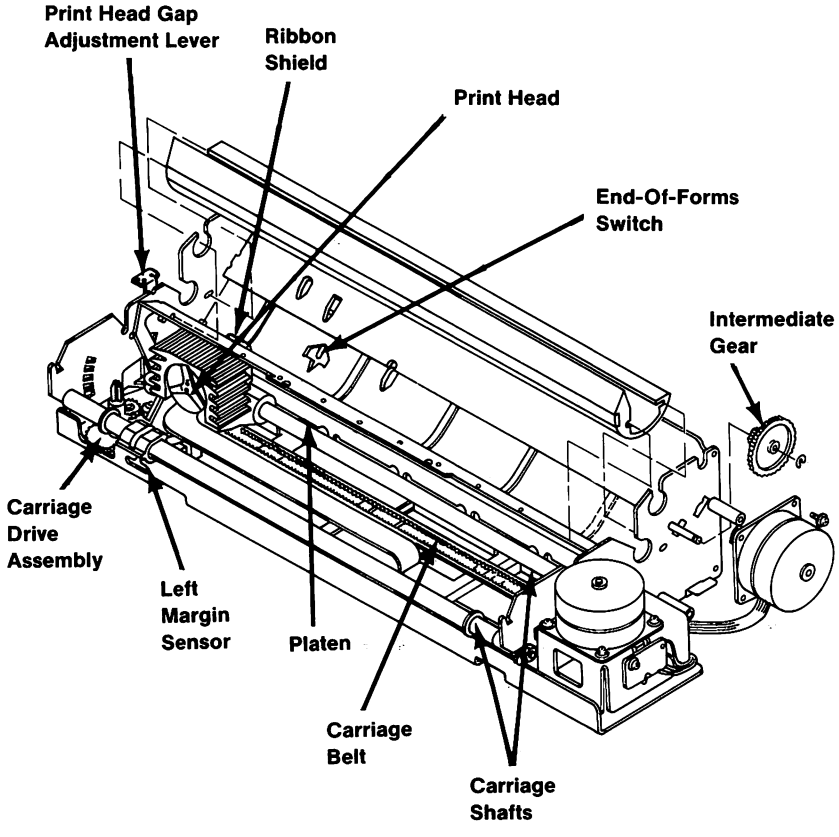
Diskette Drive



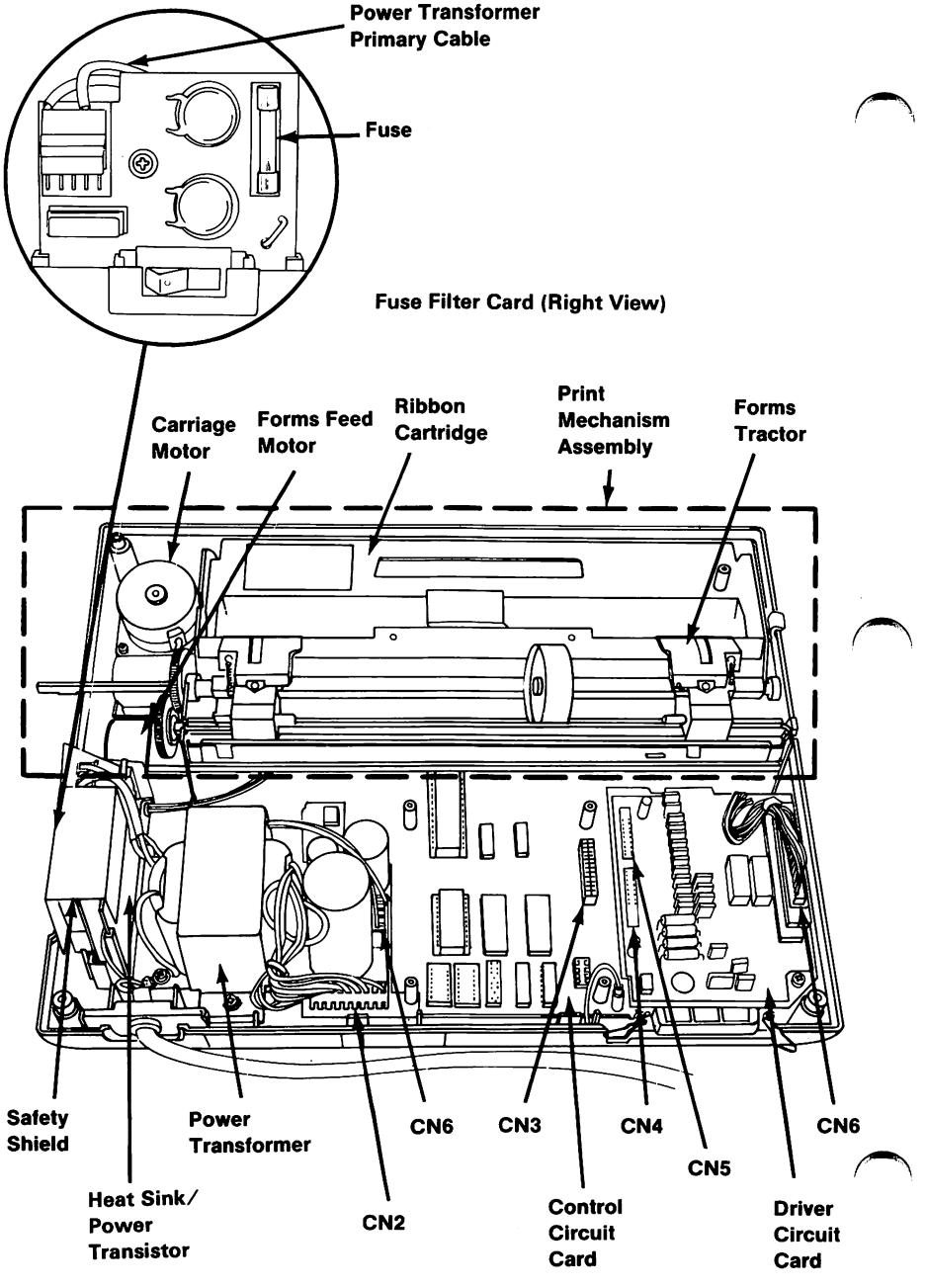
IBM Color Display



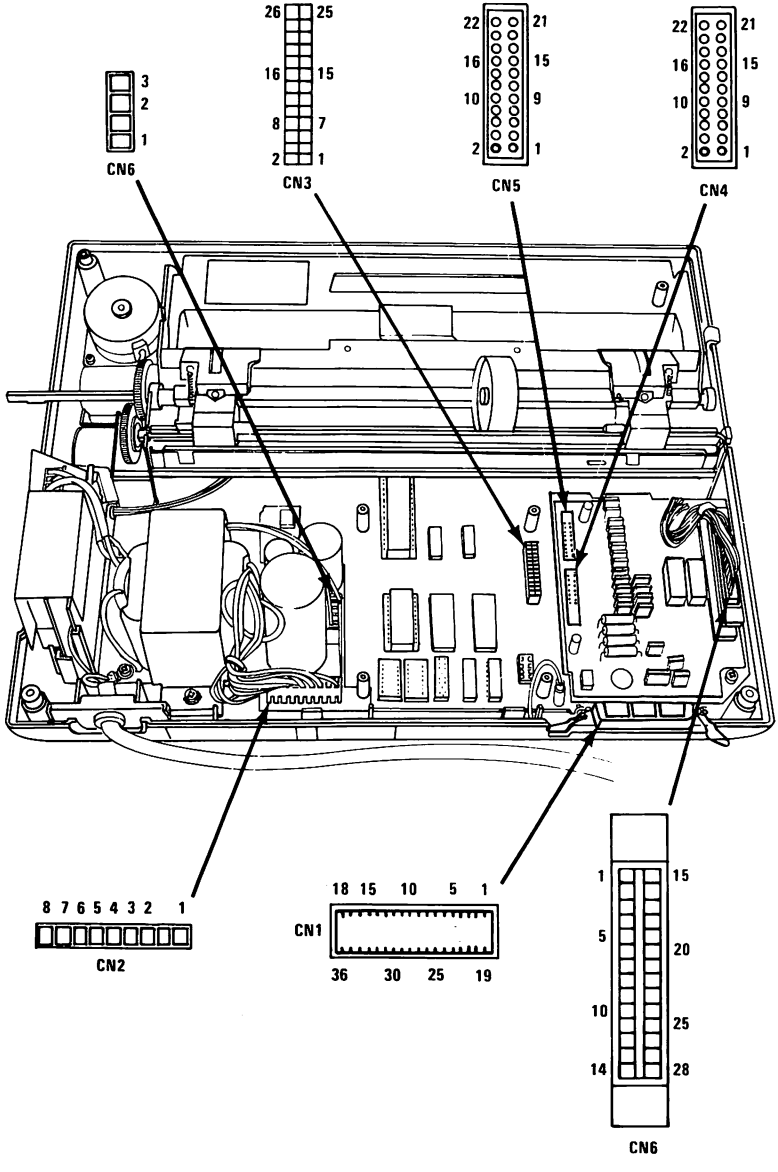
IBM Graphics Printer, Front



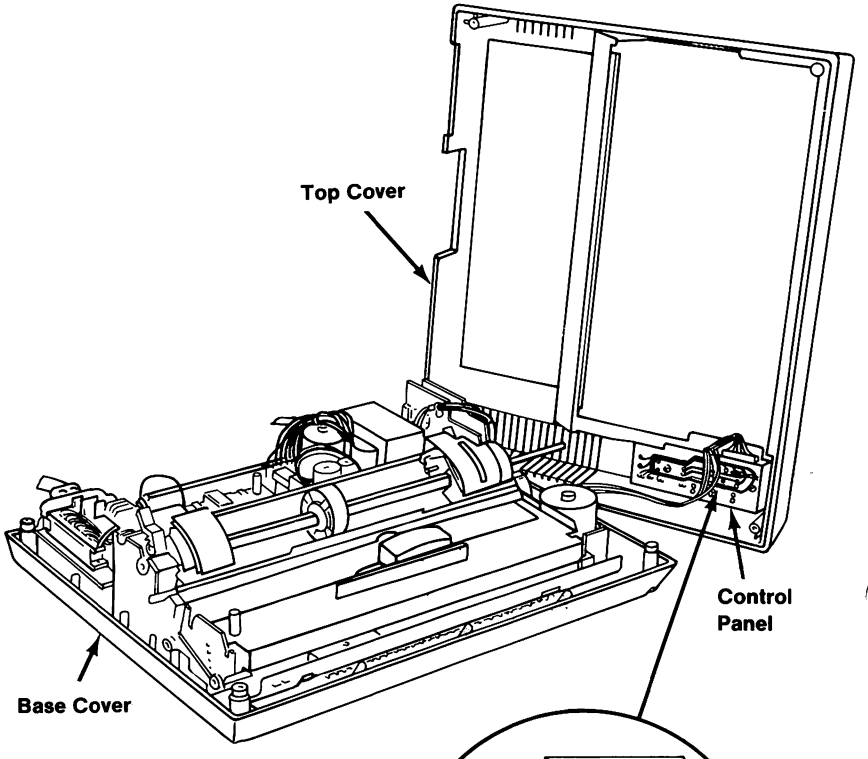
IBM Graphics Printer, Rear



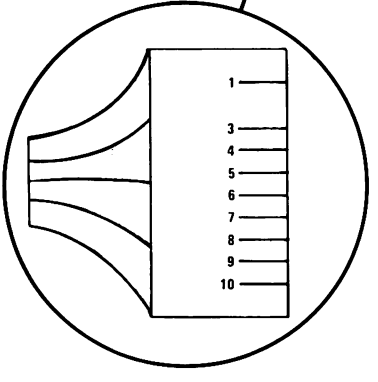
IBM Graphics Printer, Rear



IBM Graphics Printer, Top

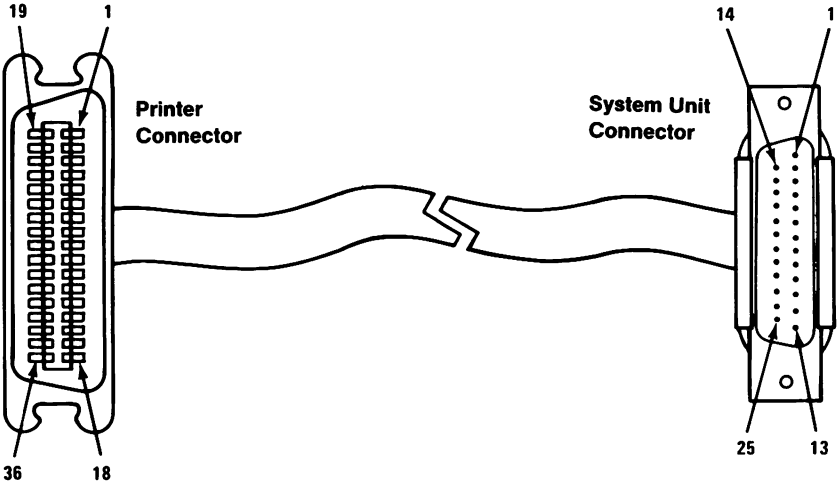


Pin	Name
1	Online Light
2	Key
3	No Paper Light
4	Ready Light
5	Online Switch
6	Forms Feed
7	Line Feed
8	Ground
9	+ 12 Vdc
10	Alarm



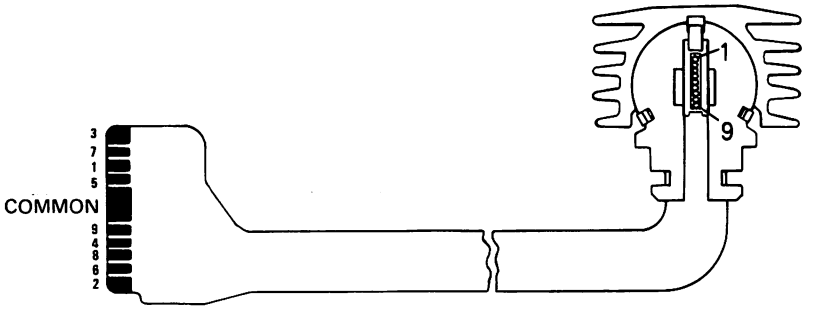
Control Panel Connector

Printer Cable

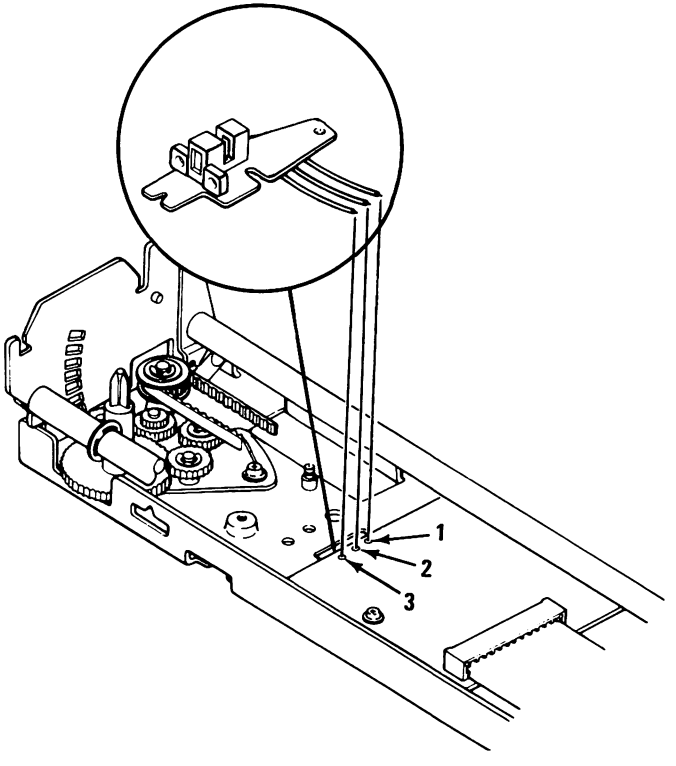


Printer Connector Pin Number	System Unit Connector Pin Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
33	18
19	19
21	20
23	21
25	22
27	23
29	24
30	25

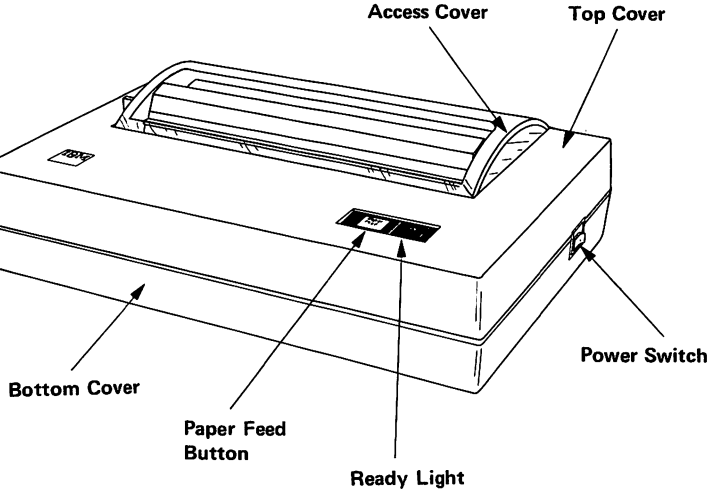
Print Head and Cable, Rear



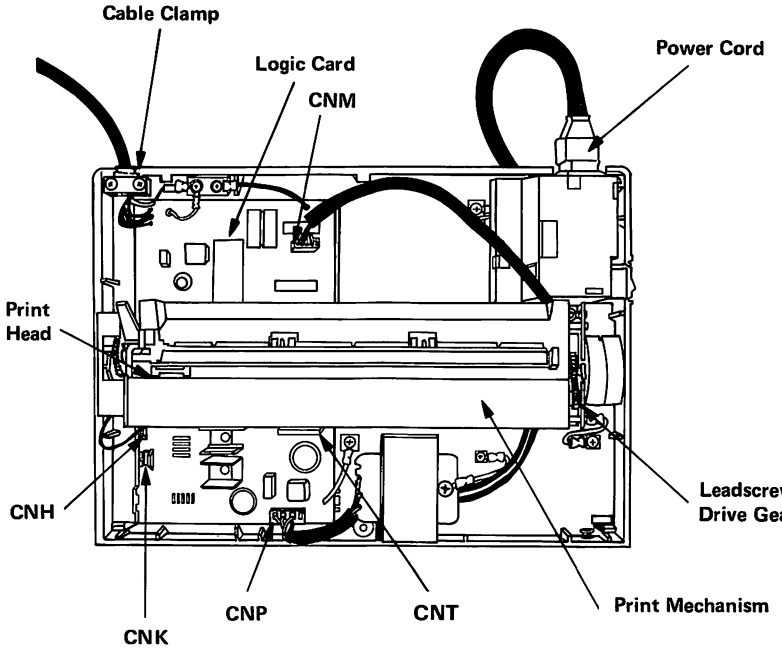
Left Margin Sensor, Front



IBM PC Compact Printer, External



IBM PC Compact Printer, Internal



Section 6. Parts Catalog

Contents

Notes:

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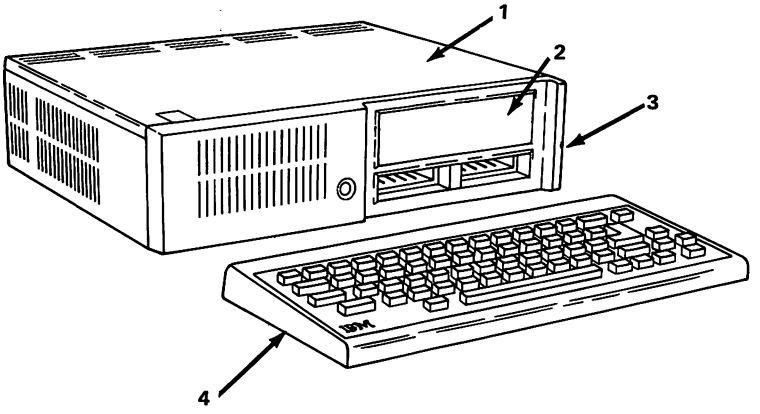
Notes:

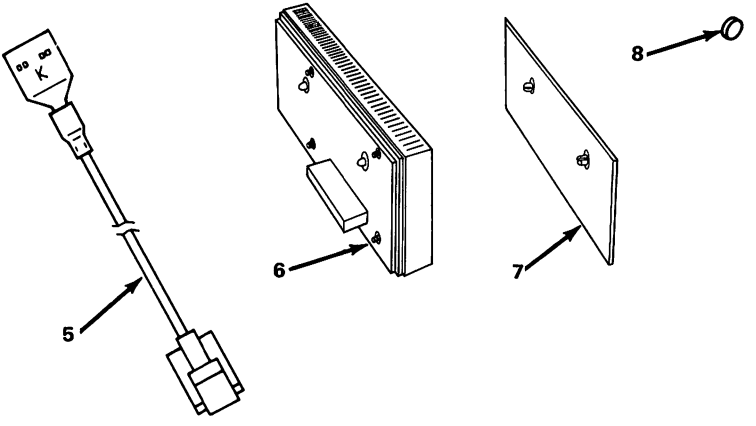
How To Use This Parts Catalog

This parts catalog is split into units. Each unit consists of a list of part names, part numbers, major unit codes, and an indexed drawing.

To find a part number, go to the Contents page at the beginning of the parts catalog and choose the unit that contains the part. Then go to the indicated page number.

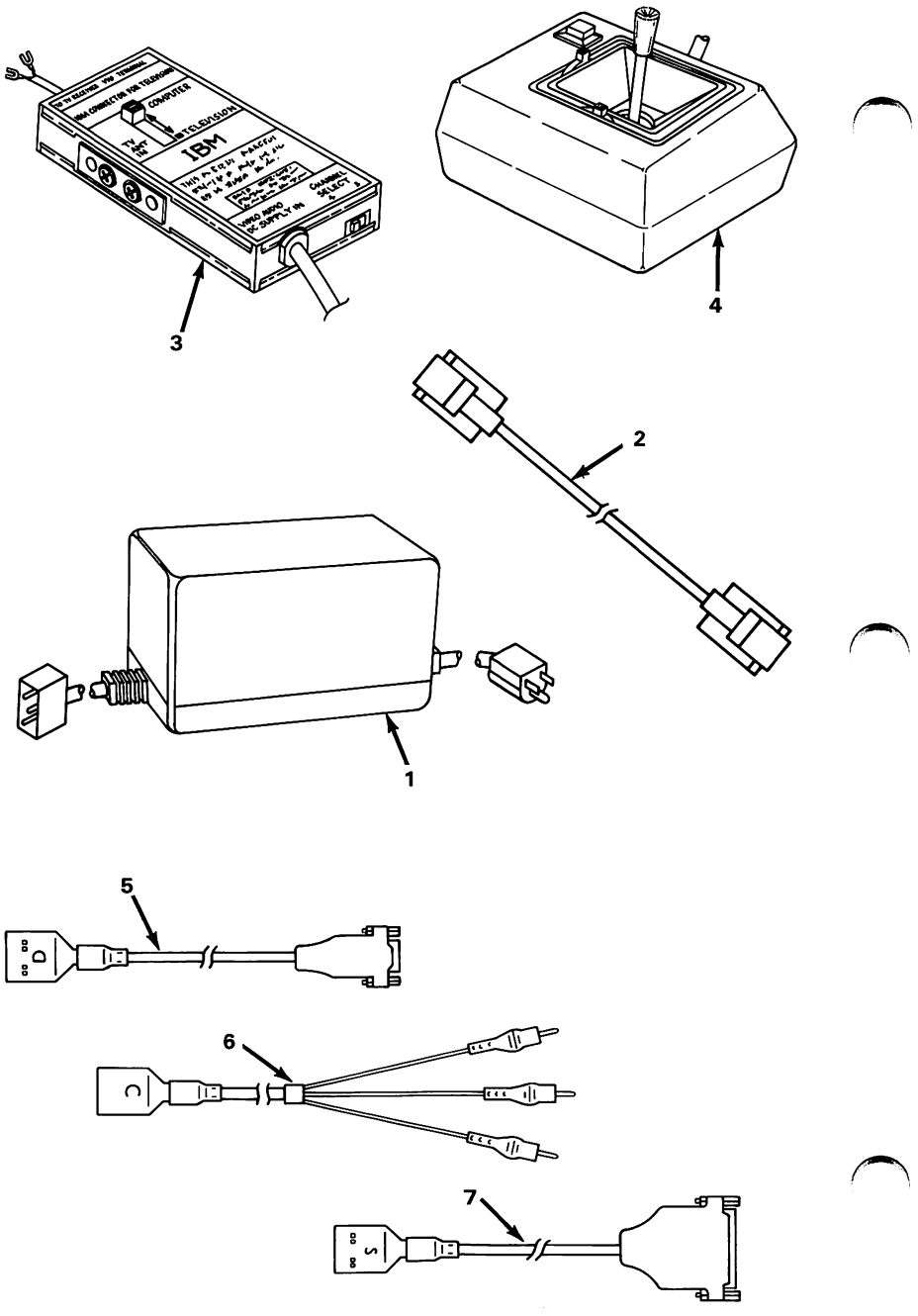
System Unit, Front





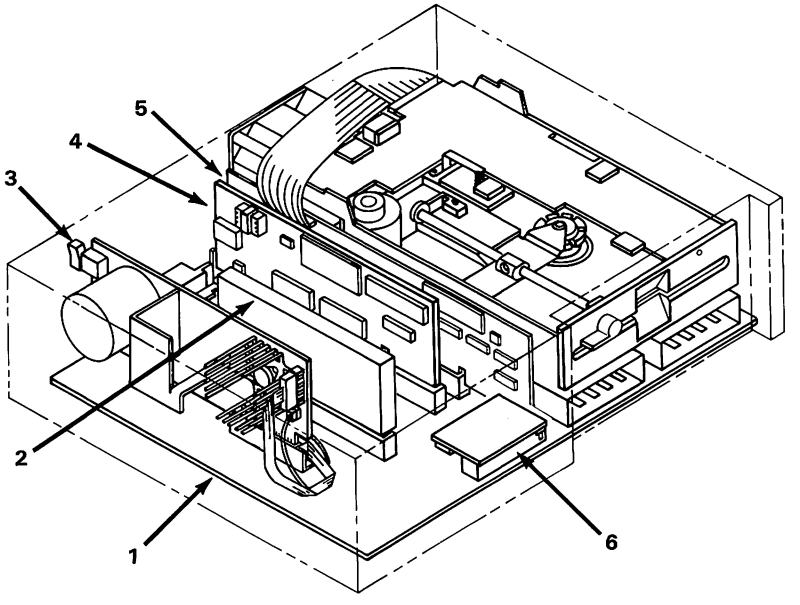
MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
001	1	8286006	SYSTEM UNIT TOP COVER
001	2	8285995	DISKETTE-DRIVE FACE PLATE
001	3	8286007	SYSTEM UNIT BASE
040	4	8286004	CORDLESS KEYBOARD
041	5	8285983	KEYBOARD CORD
307	6	8285987	PARALLEL PRINTER ATTACHMENT
001	7	8285994	RIGHT SIDE COVER
001	8	8286010	SYSTEM UNIT FOOTPAD (PACK OF 56)

System Unit, Rear



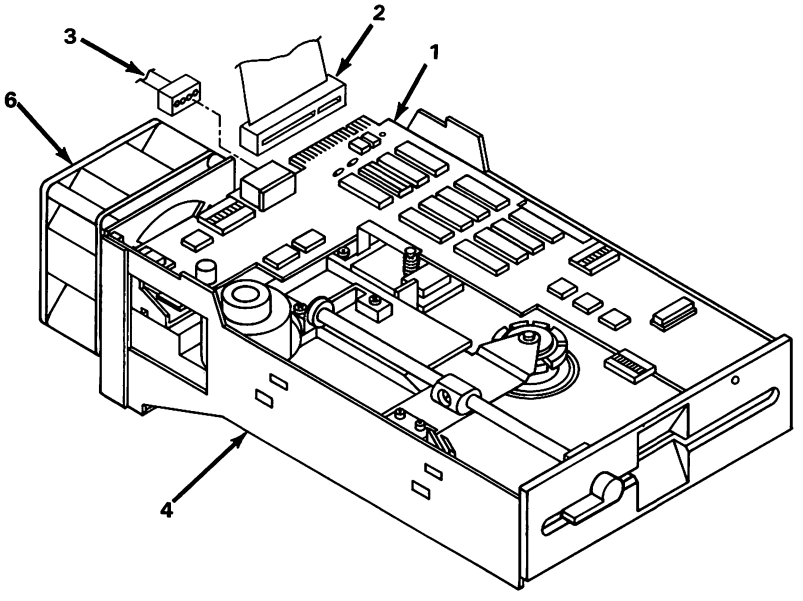
MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
600	1	8286003	POWER TRANSFORMER
101	2	8285985	MODEM CABLE
070	3	8285989	CONNECTOR FOR TELEVISION
050	4	8286002	ATTACHABLE JOYSTICK
072	5	8285991	ADAPTER CABLE FOR IBM COLOR DISPLAY
079	6	8285992	ADAPTER CABLE FOR CASSETTE
071	7	8285993	ADAPTER CABLE FOR SERIAL DEVICES
	8	1503441	SERVICE PLUG
	9	1503442	POST-LOOP PLUG
	10	1503443	SERIAL WRAP PLUG
	11	8529228	PARALLEL PRINTER ATTACHMENT WRAP PLUG

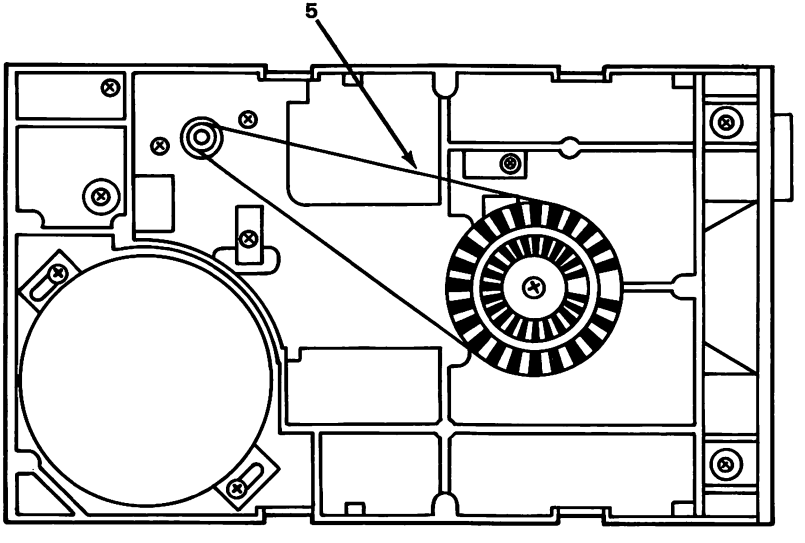
System Unit, Internal



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
301	1	8654225	SYSTEM BOARD
305	2	8654227	64KB MEMORY AND DISPLAY EXPANSION
601	3	8654339	POWER BOARD
100	4	8654400	INTERNAL MODEM
303	5	8654228	DISKETTE-DRIVE ADAPTER
302	6	8654226	INFRA-RED RECEIVER

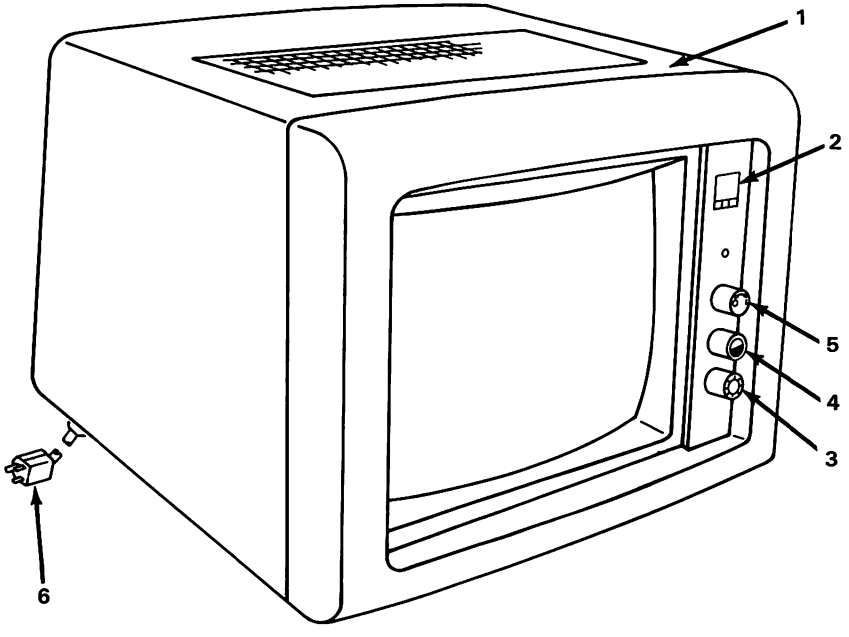
Diskette Drive





MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
828	1	8285997	DISKETTE DRIVE
828	2	8285986	DISKETTE-DRIVE SIGNAL CABLE
828	3	8285984	DISKETTE-DRIVE POWER CABLE
828	4	8286005	DISKETTE-DRIVE MOUNTING BRACKET
828	5	8285998	DISKETTE-DRIVE DRIVE BELT
080	6	8285982	DISKETTE-DRIVE FAN ASSEMBLY

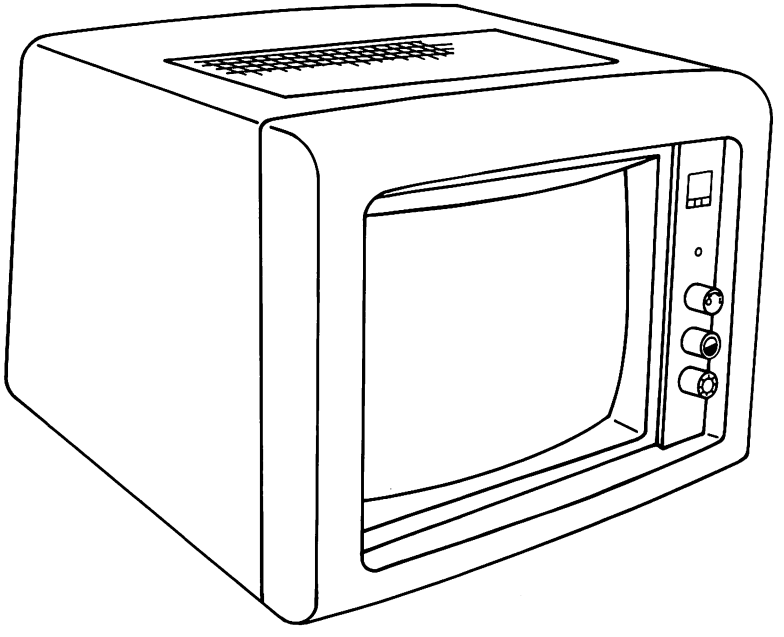
IBM Color Display



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
202	1	8529227	DISPLAY ASSEMBLY
202	2	8929339	LOGO/LABEL KIT
202	3	8529287	BRIGHTNESS KNOB
202	4	8529288	CONTRAST KNOB
202	5	8529289	POWER ON/OFF KNOB
202	6	8529158	POWER CORD
		8529285*	FRONT COVER WITH TOP, BOTTOM, AND POWER SUPPLY BRACKETS
		8529286*	REAR COVER
		8929323*	P.C. BOARD/FLYBACK TRANSFORMER FOCUS PACK/ HORIZONTAL DRIVE TRANSISTOR/ CHASSIS
		8654275*	DEGAUSSING COIL
		8929338*	CONTROL ASSEMBLY
		8654276*	POWER ON INDICATOR
		8529291*	POWER SUPPLY ASSEMBLY
		8529290*	CRT AND YOKE
		8929324*	CRT DRIVE BOARD AND SHIELD CABLE
		8929334*	SIGNAL CABLE

*RESTRICTED AVAILABILITY

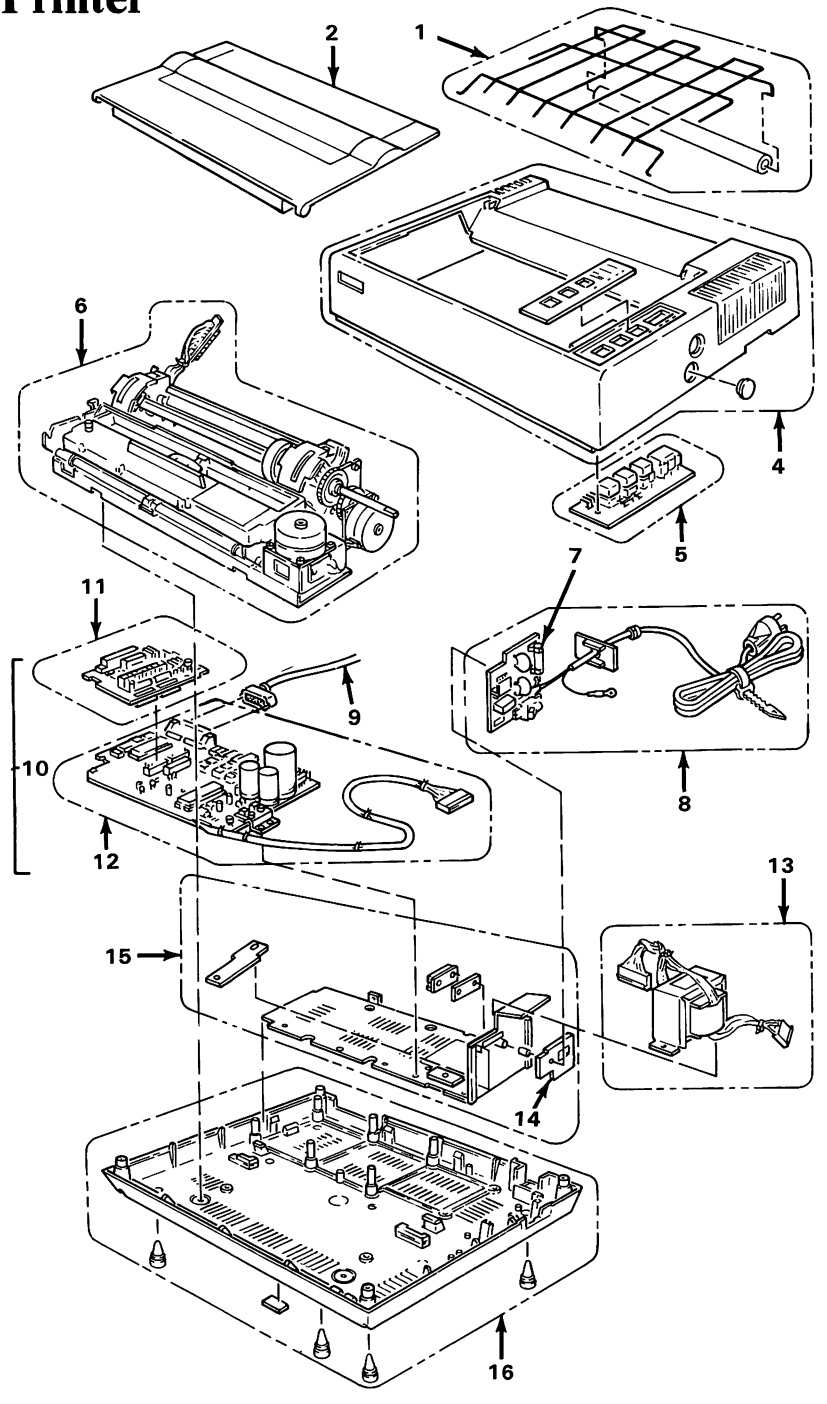
IBM Color Display, continued



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
		8929336*	POWER RECEPTACLE/LINE FILTER ASSEMBLY
		8929335*	VERTICAL SIZE POT SHAFT EXTENSION
		8929337*	VERTICAL HOLD POT SHAFT EXTENSION
		8929340*	PACKING MATERIAL KIT
		8929327*	MISC. HARDWARE KIT
			----CONSISTING OF----
			DRIVER BOARD SHIELD
			DRIVER BOARD SHIELD RETAINERS
			SIGNAL CORD STRAIN RELIEF
			POWER SUPPLY SCREWS
			CRT MOUNTING SCREWS
			CRT MOUNTING WASHERS
			CONTROL ASSEMBLY SCREWS
			P.C. BOARD CHASSIS MOUNTING SCREWS
			REAR COVER SCREWS AND WASHERS
			COVER SCREW PLUGS
			DEGAUSSING COIL WIRE TIES
			----****----
		8929340*	PACKING MATERIAL KIT

*RESTRICTED AVAILABILITY

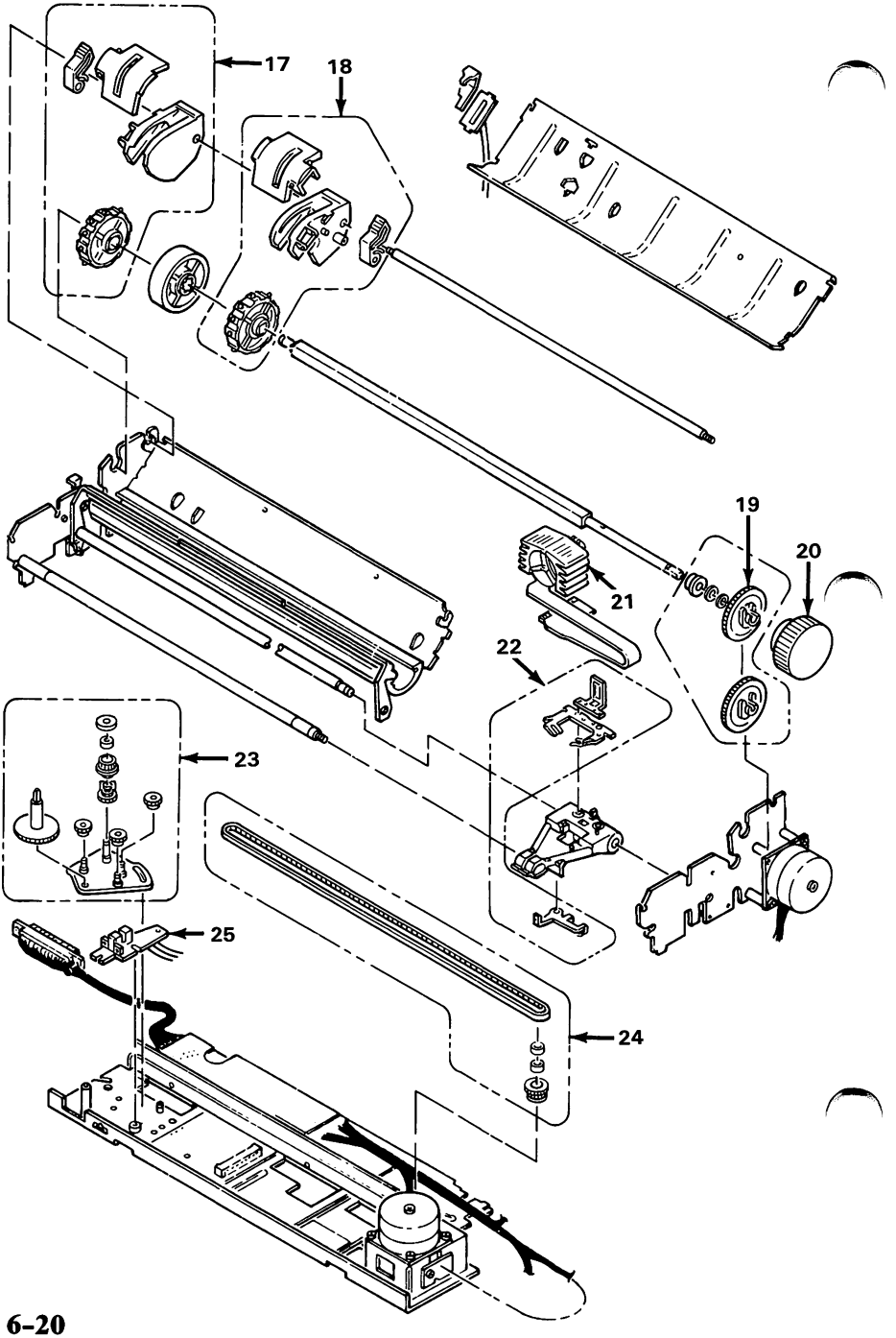
IBM Personal Computer Graphics Printer



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
554	1	8529191	FORMS RACK
000	2	8529185	ACCESS COVER
000	3	8529186	LOGO/LABEL KIT
			----CONSISTING OF----
			CONTROL PANEL LABEL
			NAMEPLATE LOGO-FRONT
			NAMEPLATE LOGO-REAR
			WARNING LABEL-BOTTOM
			LABEL F.C.C.
			WARNING LABEL-SAFETY SHIELD
			1 EACH - 120, 220, 240
000	4		LABEL-REAR
000	5		----****----
551	6	8529182	TOP COVER
600	7	8529184	CONTROL PANEL
600	8	8529198	PRINT MECHANISM ASSEMBLY
		8529220	FUSE-2A FOR 120 VOLT
551	9	8529187	FUSE-FILTER CARD/POWER CORD
318	10		ASSEMBLY FOR 120 VOLT
		8529214	PRINTER CABLE
318	11	8529268*	CONTROL CARDS
318	12		----CONSISTING OF----
		8529221*	DRIVER CARD
600	13	8529276*	LOGIC CARD
600	14		----****----
600	15	8529196	POWER TRANSFORMER 120 VOLT
000	16	8529215	SAFETY SHIELD
		8529217	HEAT SINK/POWER TRANSISTOR
		8529181	BASE ASSEMBLY

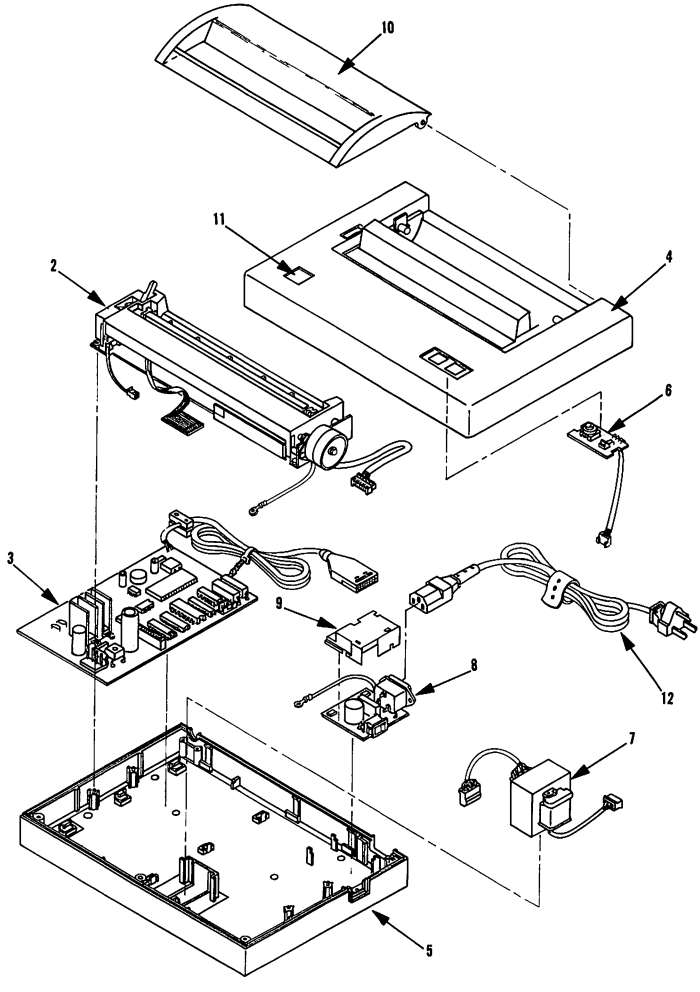
*RESTRICTED AVAILABILITY

IBM Personal Computer Graphics Printer, continued



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
550	17	8529188	FORMS TRACTOR ASSEMBLY, LEFT
550	18	8529216	FORMS TRACTOR ASSEMBLY, RIGHT
550	19	8529194	INTERMEDIATE GEAR
550	20	8529193	FORMS FEED KNOB
551	21	8529183	PRINT HEAD
551	22	8529192	RIBBON SHIELD
551	23	8529195	CARRIAGE DRIVE ASSEMBLY
551	24	8529190	CARRIAGE BELT
551	24	8529189	LEFT MARGIN ASSEMBLY
000		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 SCREWS (BINDING HEAD)
			HEXAGON NUTS
			CB SCREWS
			----****----
000		8529218	PRINTER MISC. SPRINGS
			----CONSISTING OF----
			SPRING PIN
			LEAF SPRING
			PE LEVER SPRING
			HEADLOCK LEVER SPRING
			SCALE SPRING, LEFT
			SCALE SPRING, RIGHT
			PAPER HOLDING COVER SPRING
			----****----
000		8529219	PRINTER MISC. PARTS
			----CONSISTING OF----
			BOARD SPACING
			PAPER GUIDE ROLLER
			GROMMET
			RUBBER BUMPER A
			RUBBER BUMPER B
			WIRE BAND
			----****----

IBM PC Compact Printer



MAJOR UNIT CODE	FIGURE-INDEX NUMBER	PART NUMBER	DESCRIPTIONS
555	1	8654411	PRINTER ASSEMBLY
551	2	8654409	PRINT MECHANISM
318	3	8654407	LOGIC CARD
000	4	8654403*	TOP COVER
000	5	8654404*	BOTTOM COVER
552	6	8654405*	CONTROL CARD
600	7	8654406*	TRANSFORMER
600	8	8654408*	POWER SUPPLY CARD
600	9	6323447*	SAFETY COVER
553	10	8654410*	ACCESS COVER
---	11	6323446*	LABEL KIT
			—CONSISTING OF—
			NAMEPLATE LOGO FRONT
			WARNING LABEL INTERIOR
			FCC LABEL
600	12	8286095*	POWER CORD

*RESTRICTED AVAILABILITY

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