

# **PROFESSIONAL COMPUTER**

**Model: PC 280**

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**Customer Engineering  
Product Maintenance Manual**

**741-1771**

**COMPANY CONFIDENTIAL**

## **PREFACE**

This document is the Illustrated Product Maintenance Manual for the Wang PC 280 computer. The manual's purpose is to provide the Customer Engineer with information to install, operate, troubleshoot, and repair the PC 280 computer in the field.

### **First Edition (February, 1987)**

This is the first edition of the PC 280 Product Maintenance Manual. The material in this document may only be used for the purpose stated in the preface. Updates and/or changes to this document will be published as Publication Update Bulletins (PUBs) or subsequent revised editions.

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**SECTION**

**1**

**INTRODUCTION**

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## SECTION 1 INTRODUCTION

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## **1.1 Scope and Purpose**

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This manual contains installation, operation, troubleshooting, and repair information for the Wang PC 280 IBM-compatible computer.

The manual's purpose is to provide Customer Engineering personnel with the information necessary to install and repair the PC 280 computer in the field.

## 1.2 Organization and Layout

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Each section of this manual describes a separate maintenance subject. Every section is preceded by the section number and a section table of contents. Within each section, information pertaining to a specific task is contained in a frame or frames. Each frame comprises illustrations, numbered steps, and/or text to describe the actions required to accomplish each task. References to other frames are indicated by an arrow (▶), followed by the section number(s) being referenced. The manual's sections and frames are arranged in numerical sequence from left-to-right and from top-to-bottom on the microfiche cards.

**SECTION**

**2**

**IDENTIFICATION**



# SECTION 2 CONTENTS

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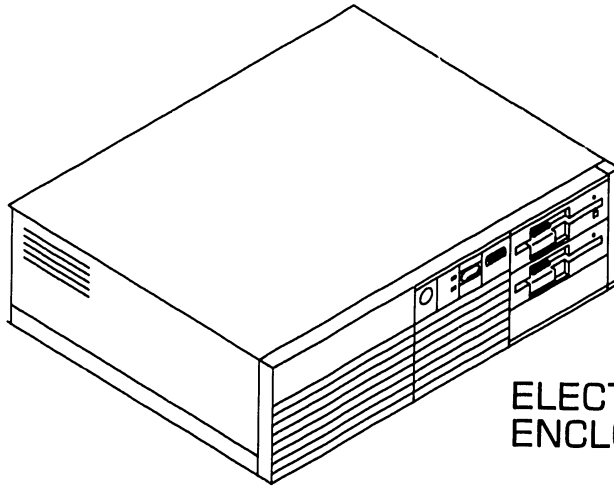
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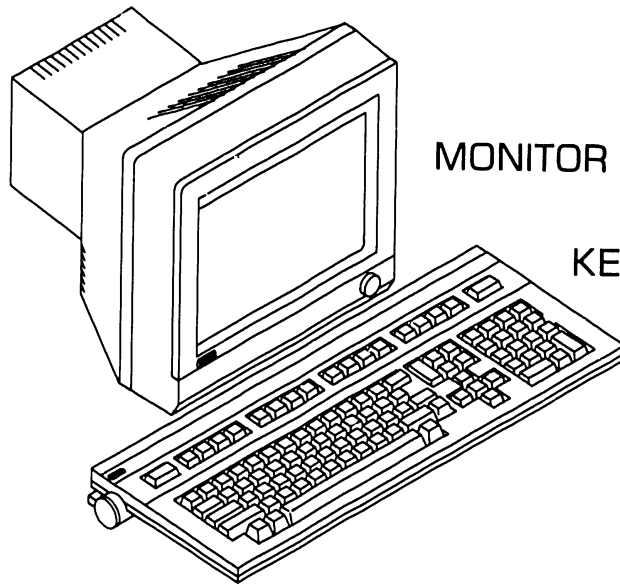
# 2.1 Major Assemblies

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# IDENTIFICATION



ELECTRONICS  
ENCLOSURE



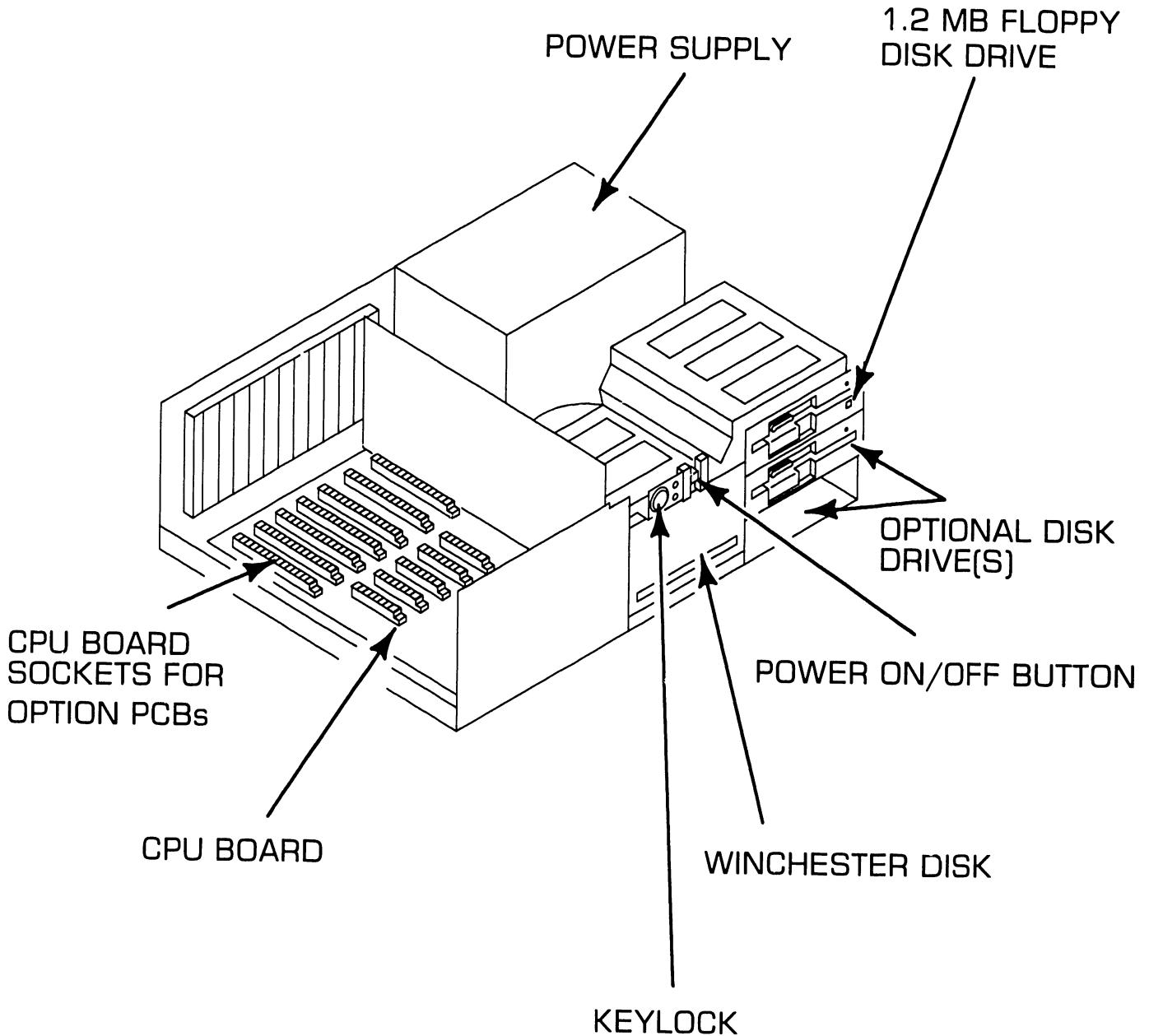
MONITOR

KEYBOARD

# 2.2

## Electronics Enclosure Major Parts

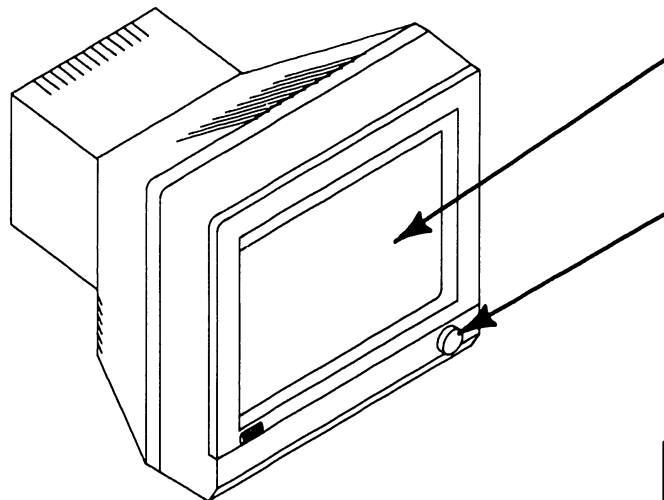
# IDENTIFICATION



# 2.3

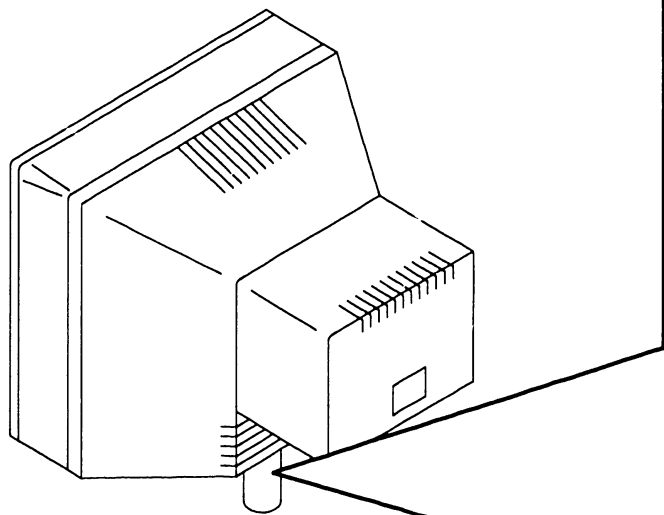
## Workstation Monitor Major Parts

# IDENTIFICATION



CRT MONITOR SCREEN

MONITOR POWER AND BRIGHTNESS CONTROL KNOB (POWER ON= PRESS SO BUTTON PROTRUDES-GREEN RING ENCIRCLING INSIDE OF BUTTON WILL SHOW)



PHILLIPS SCREW (CONTROLS TENSION OF TILT CONTROL STICK)

CONTRAST CONTROL KNOB

TILT CONTROL STICK

**SECTION**

**3**

**CONTROLS**

**AND**

**INDICATORS**

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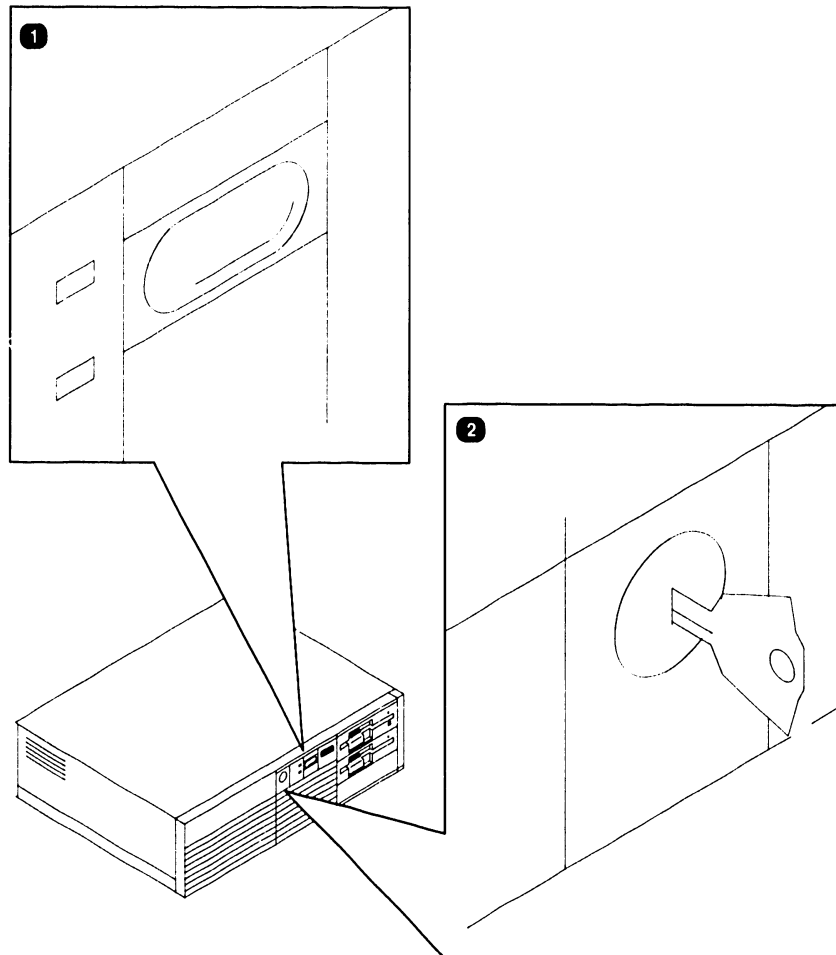
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# 3.1 CONTROLS AND INDICATORS

## 3.1.1 Operator Controls

### 3.1.1 Electronics Enclosure Front Panel Controls



<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Power On/Off Button	Push button; applies or removes power from system, initiates B.I.T. power-up diagnostics and Initial Program Load.
2	Keylock	Locked position -- prevents removal of top/front cover and locks keyboard. Unlocked position -- permits removal of top/front cover and allows keyboard communication with system.

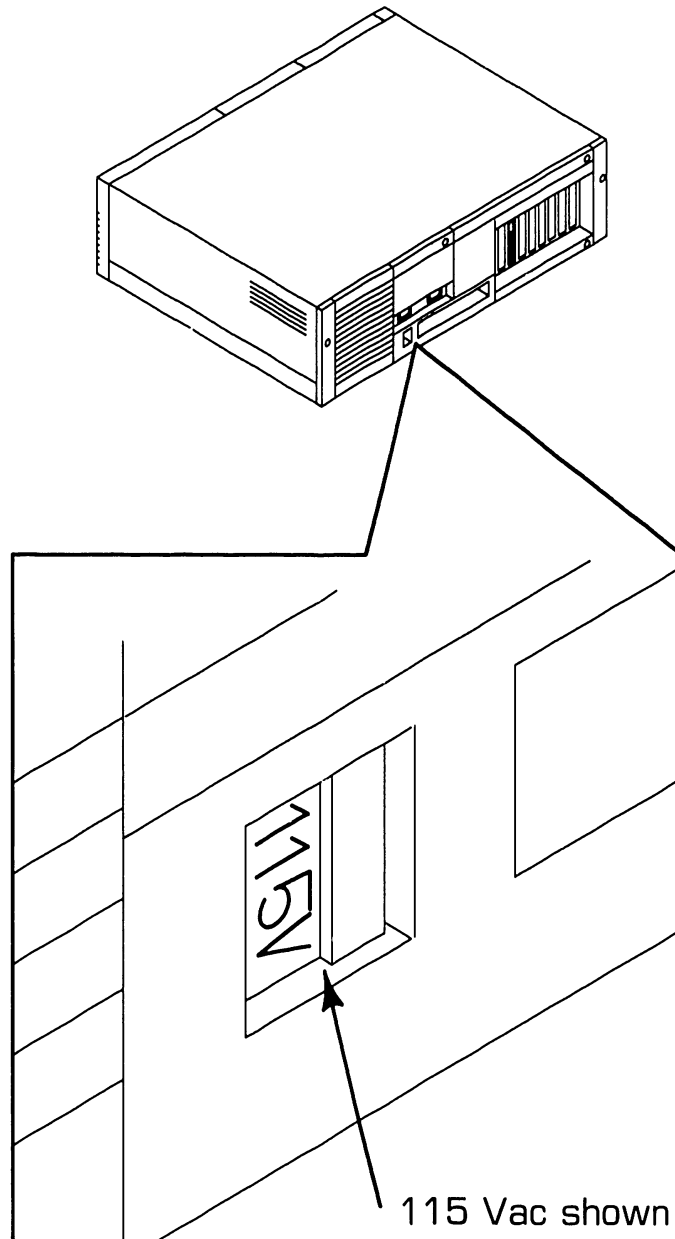


# 3.1 CONTROLS AND INDICATORS

## 3.1.1 Operator Controls

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### 3.1.2 Electronics Enclosure Rear Panel Controls



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<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Voltage Select Switch	Slider-type switch; selects ac operating voltage of 115V or 220V (determined by available line voltage).

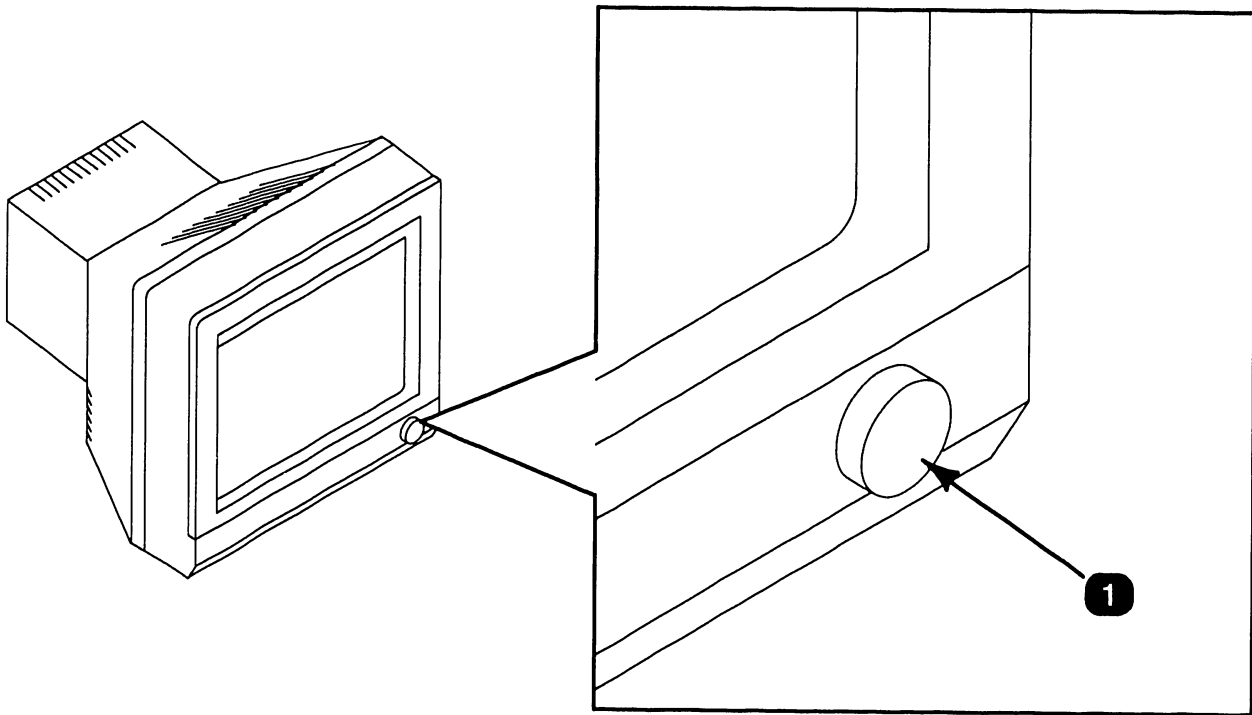
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# 3.1 CONTROLS AND INDICATORS

## 3.1.1 Operator Controls

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### 3.1.3 Workstation Monitor Controls: Front

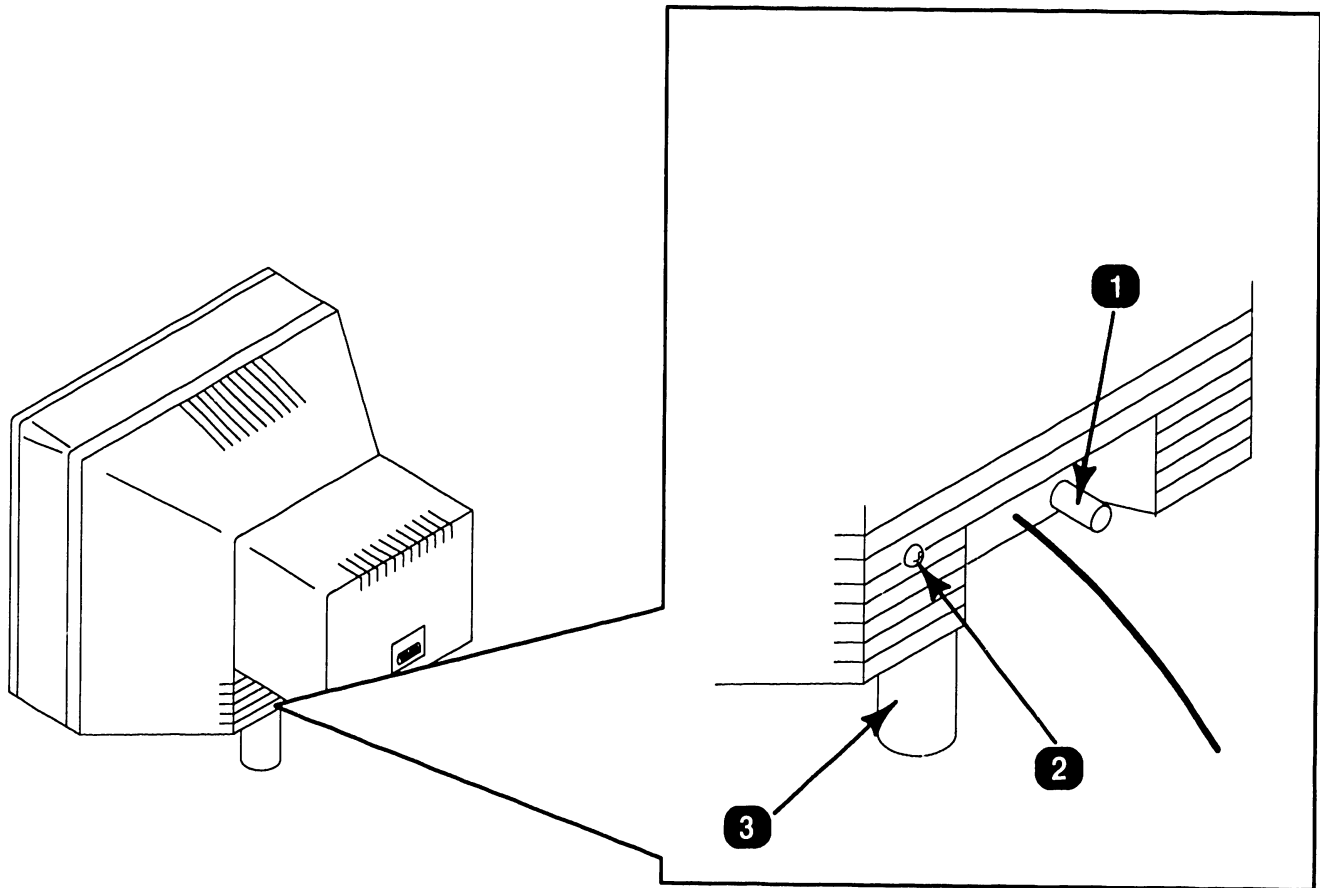


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Power Button and Brightness Control	Push-button, potentiometer-type control; applies and removes power from monitor and adjusts display brightness.

# 3.1 CONTROLS AND INDICATORS

## 3.1.1 Operator Controls

### 3.1.4 Workstation Monitor Controls: Rear



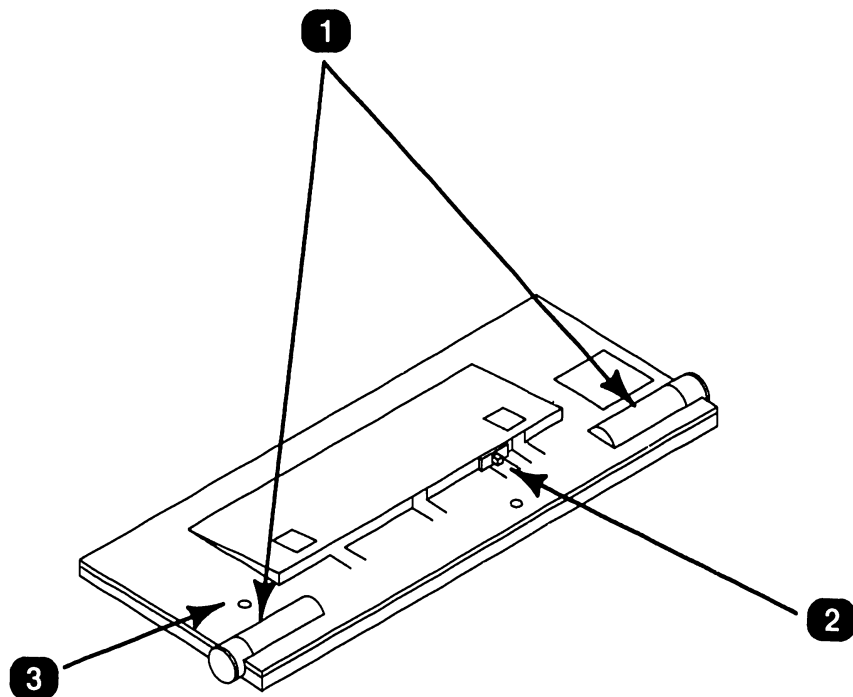
<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Contrast Control	Potentiometer-type control; adjusts contrast of monitor display.
2	Tilt Control Screw	Phillips-head screw; adjusts spring-loaded tension of monitor tilt control stick.
3	Tilt Control Stick	Variable-length stick; may be adjusted to alter angle of monitor screen.

# 3.1 CONTROLS AND INDICATORS

## 3.1.1 Operator Controls

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### 3.1.5 Workstation Keyboard Controls

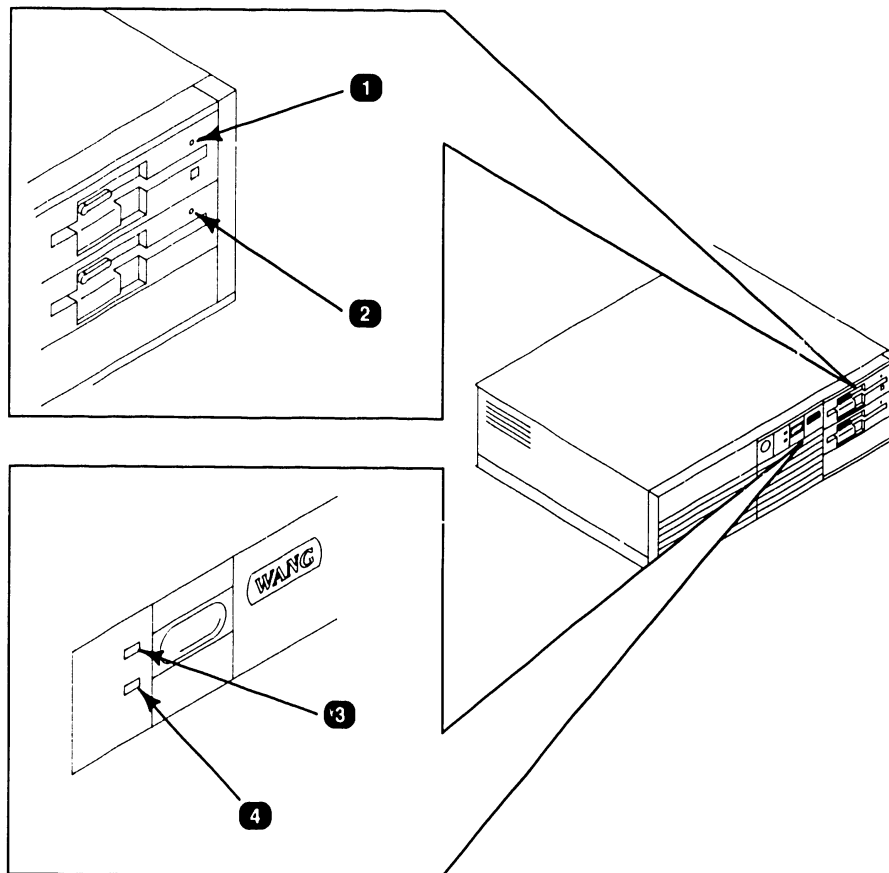


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Keyboard Tilt Controls	Potentiometer-type controls; adjusts keyboard tilt and height.
2	Keyboard Mode Control	Slider-type switch; sets keyboard compatibility mode (AT or PC XT).
3	Keyboard Clicker Control	Potentiometer-type control; adjusts volume of keystroke clicking when keys are pressed.

# 3.2 CONTROLS AND INDICATORS

## 3.2 Operator Indicators

### 3.2.1 Electronics Enclosure Front Panel Indicators

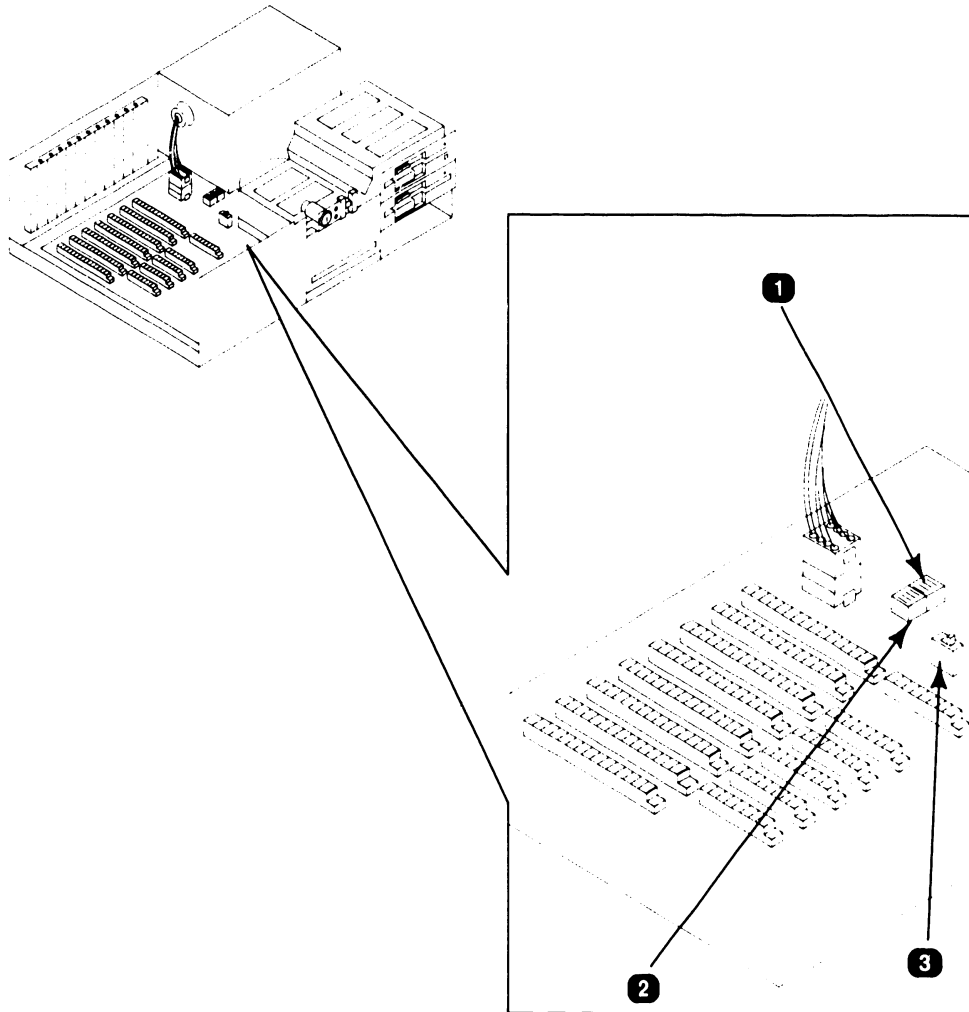


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	1.2MB Floppy Diskette Drive Activity LED	LED (amber); illuminates to indicate activity on floppy diskette drive.
2	360KB Floppy Diskette Drive Activity LED	LED (red); illuminates to indicate activity on floppy diskette drive.
3	Winchester Disk Drive Activity LED	LED (red); illuminates to indicate activity on Winchester drive.
4	System Power LED	LED (green); illuminates when power is applied to system.

# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.1 Electronics Enclosure: CPU Board Controls

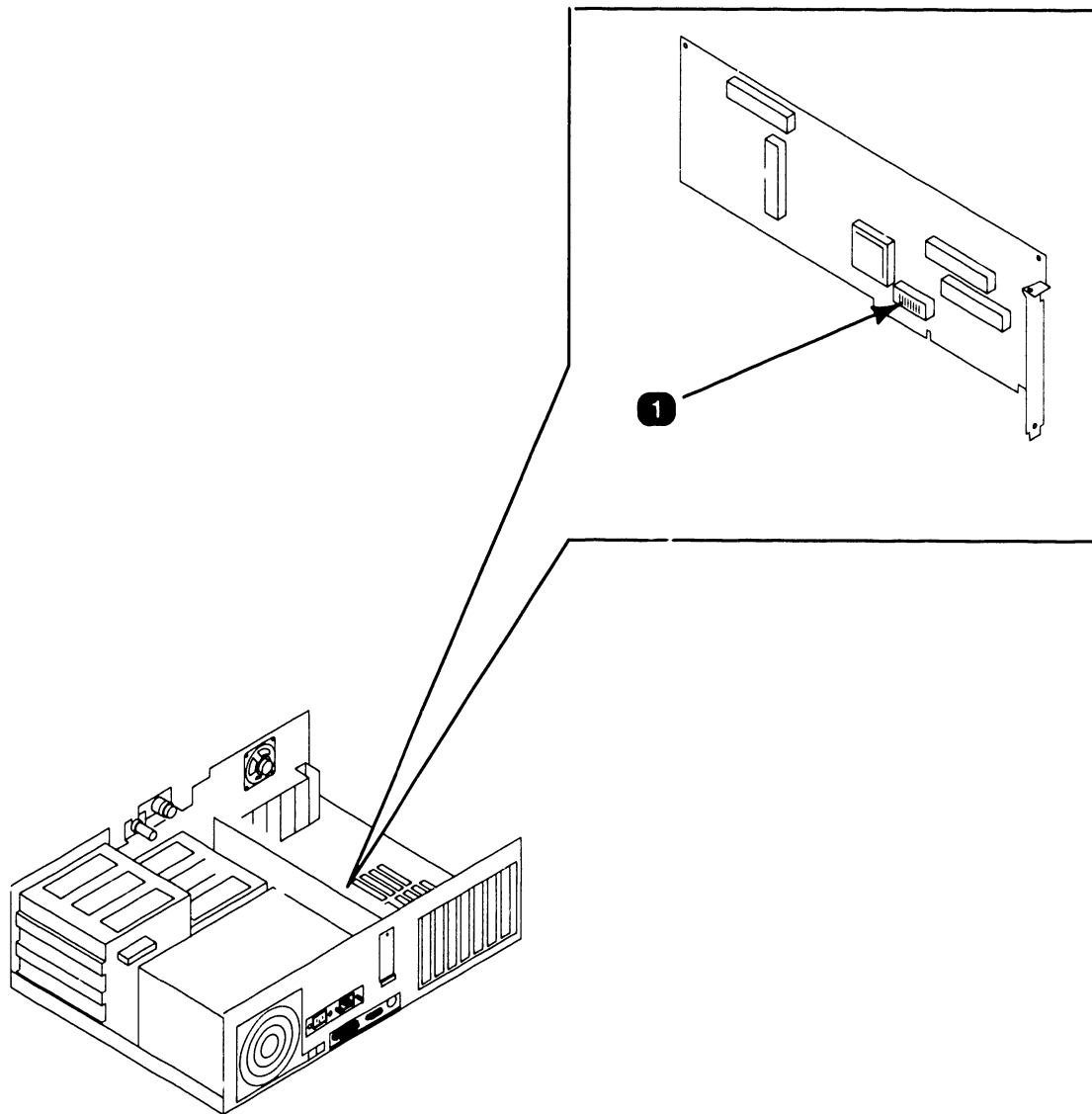


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Serial Port Switch (L17)	Rocker-type, 4-bit switch bank; used to designate/disable serial port.
2	Parallel Port Switch (L18)	Rocker-type, 4-bit switch bank; used to designate/disable parallel port.
3	Monitor Adapter Switch	Two-position slide switch; specifies monochrome or color monitor operation (not used when monochrome/color video board configured with system).

# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.2 Electronics Enclosure: Winchester/ Floppy Disk Controller Board Controls

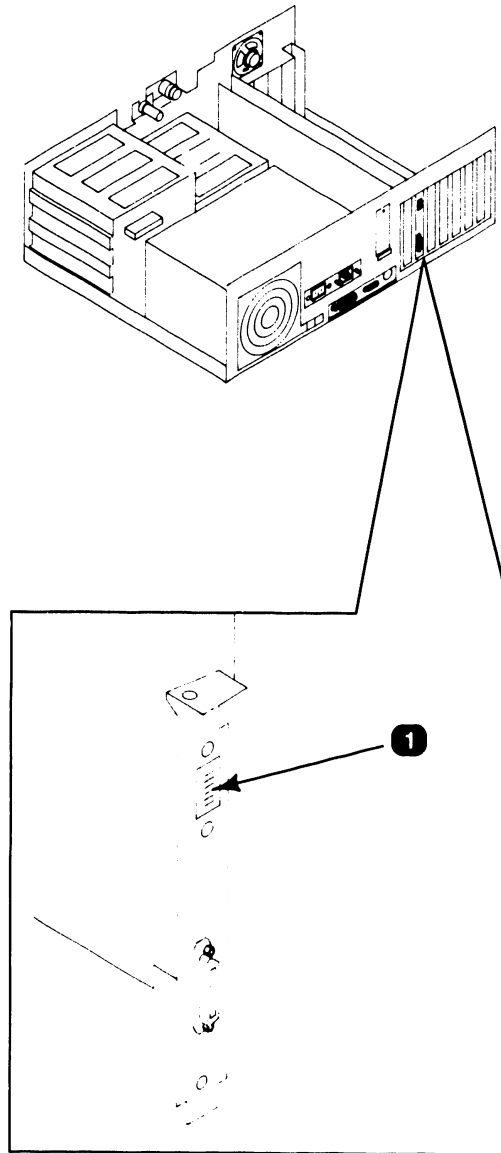


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Drive Control Switch (SW1)	Slider-type, 8-bit switch bank; may be set so board controls Winchester and floppy drives, or Winchester only (switch not present on controllers in early PC280 units).

# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.3 Electronics Enclosure: Monochrome/ Color Video Board



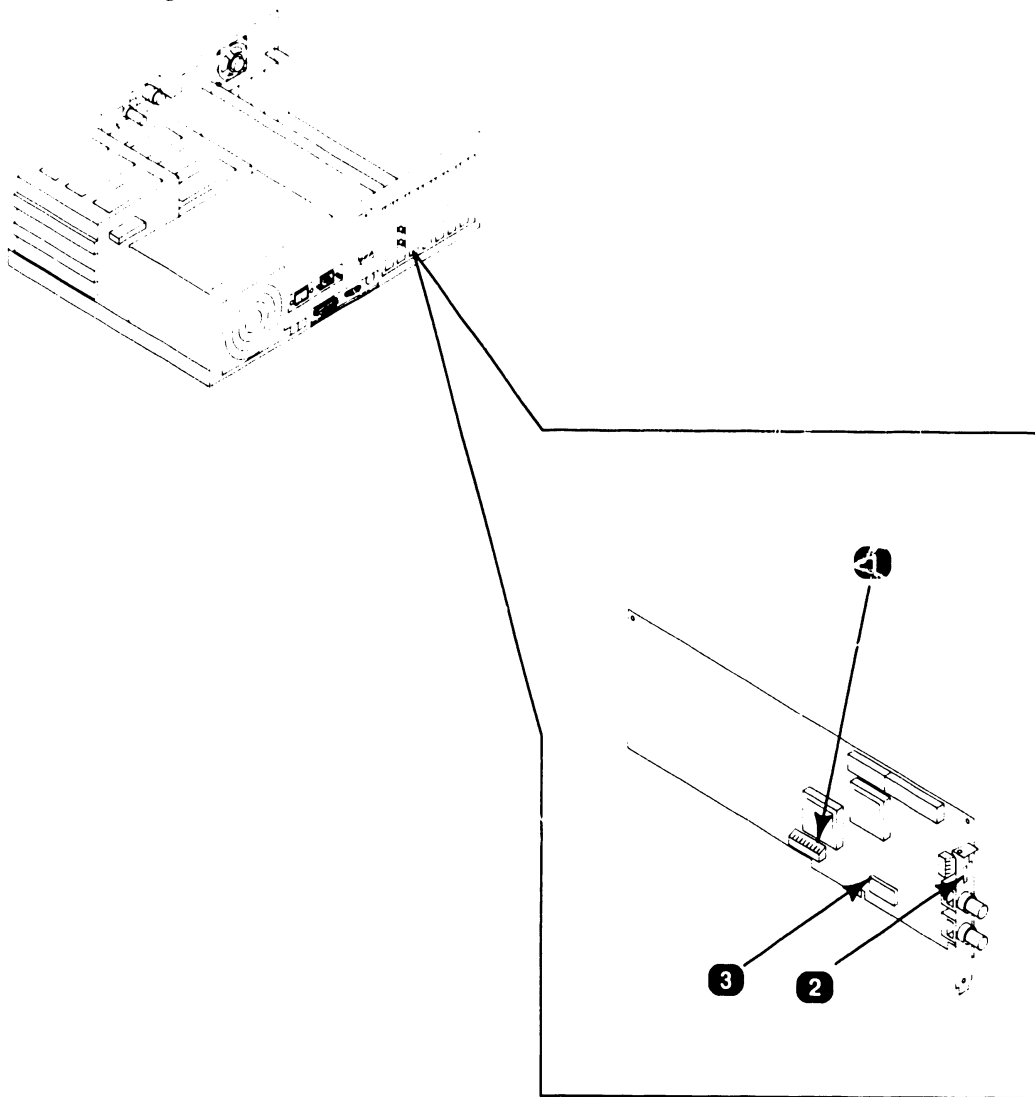
<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Monitor Identification Switch	6-bit, rocker-type switch bank; designates type of workstation monitor used (monochrome, standard color, enhanced color).



# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.4 Electronics Enclosure: Wang Local Office Connection (WLOC) Board Controls

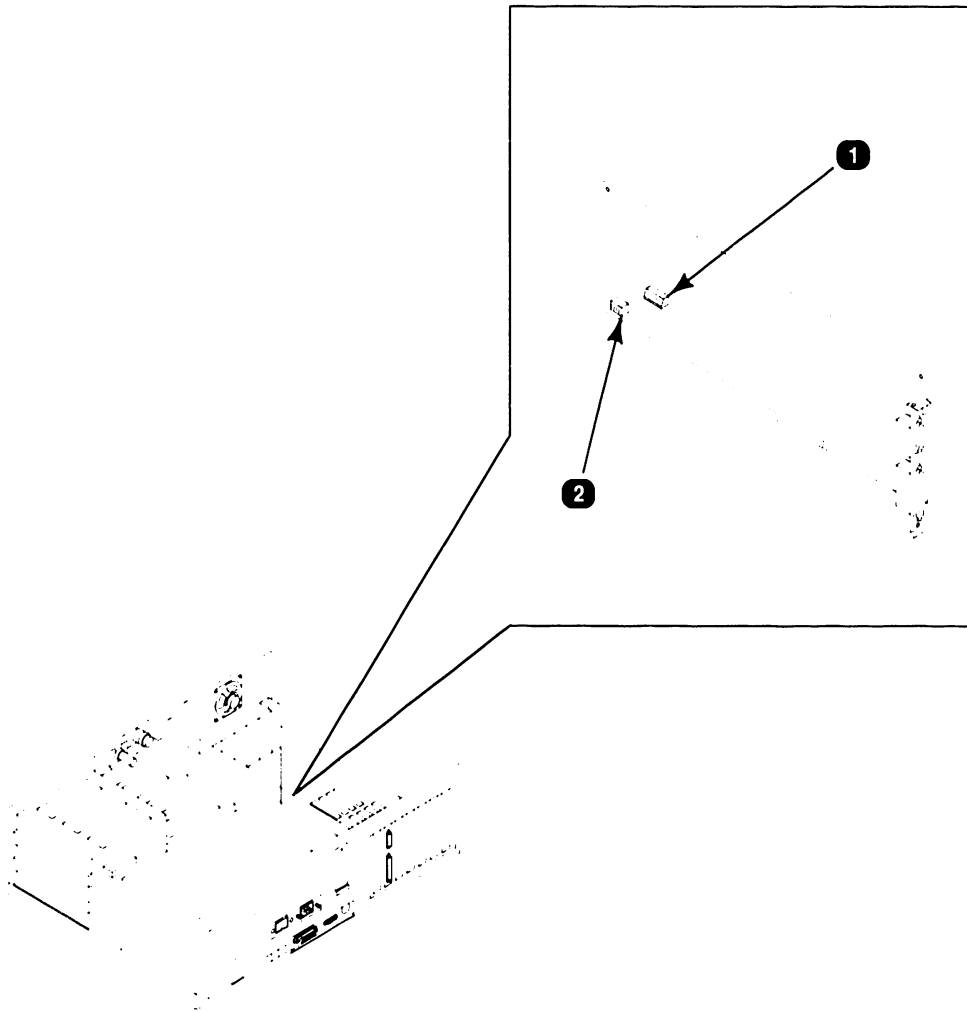


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	PCB Address Switch (SW1)	10-bit, rocker-type switch; sets board address.
2	PROM Enable Switch (SW2)	5-bit, rocker-type switch; enables/disables PROM, and sets PROM address.
3	Interrupt Jumper	11-position jumper; sets interrupt level.

# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.5 Electronics Enclosure: Synchronous/Asynchronous Board Controls

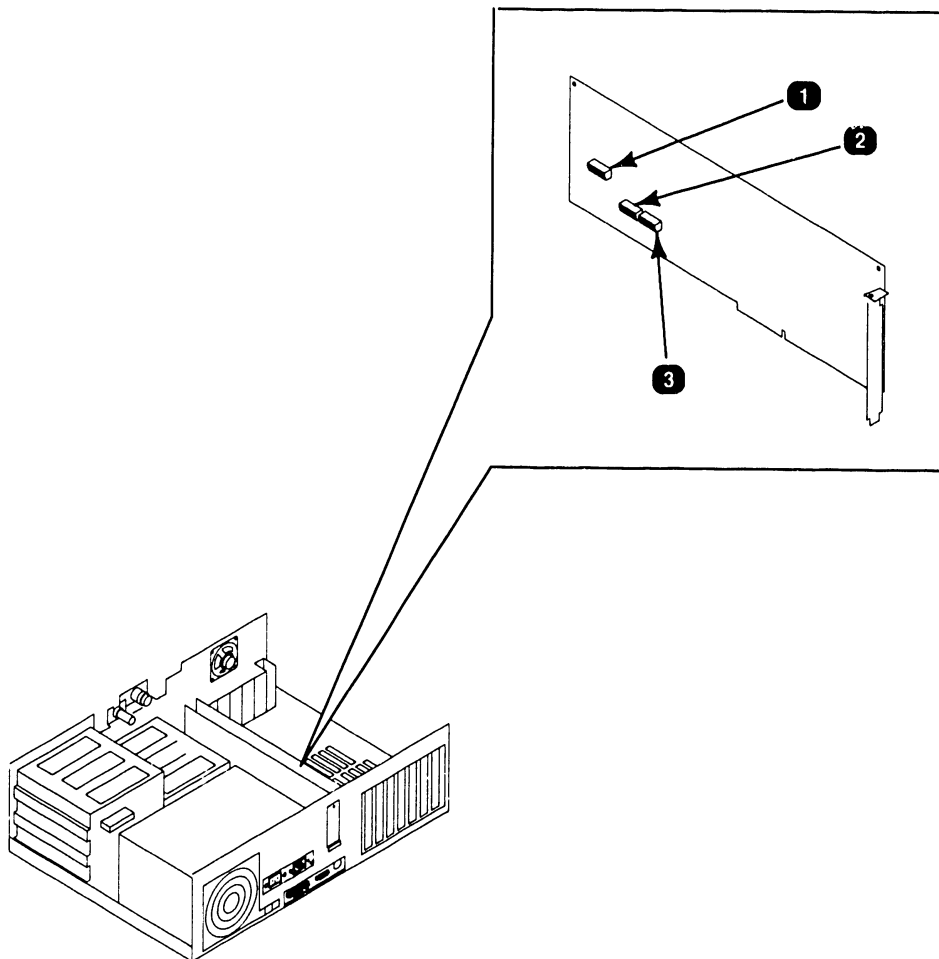


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Serial Port Address Switch (SW1)	10-bit, rocker-type switch; sets synchronous/asynchronous serial port bus I/O address.
2	Asynchronous Serial Port and Interrupt Level Switch (SW1A)	4-bit, rocker-type switch; sets bus I/O address and interrupt level for asynchronous serial port.

# 3.3 CONTROLS AND INDICATORS

## 3.3 Service Controls

### 3.3.6 Electronics Enclosure: Expanded Memory Board Controls

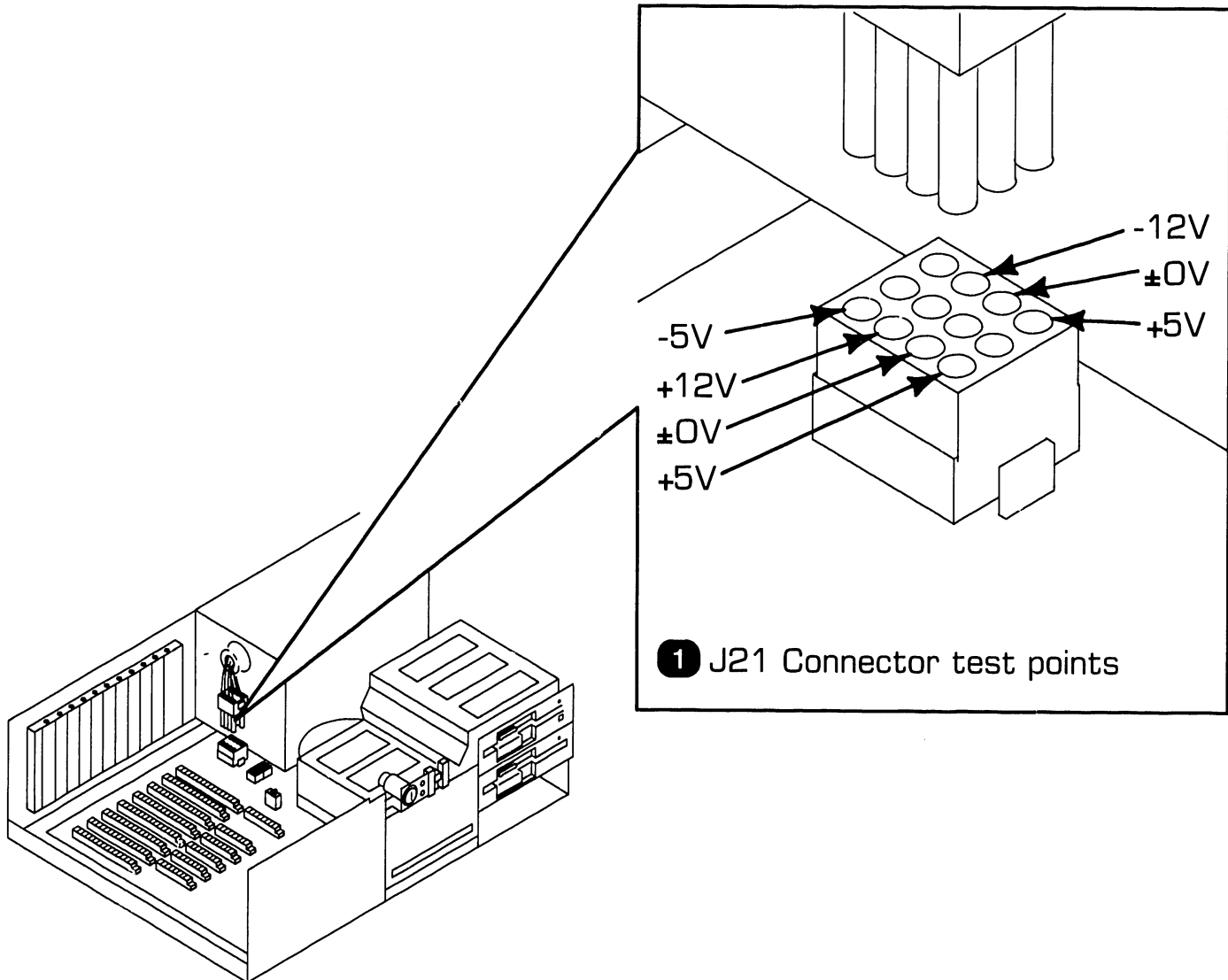


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Hex. Address Switch (SW1)	10-bit, rocker-type switch; sets board hex. address.
2	Existing Memory Switch (SW2)	8-bit, rocker-type switch; set to correspond to amount of memory present in system prior to installing expanded memory board.
3	Memory Allocation Switch (SW3)	8-bit, rocker-type switch; used to allocate expanded memory as non-paged and paged memory.

# 3.4 CONTROLS AND INDICATORS

## 3.4 Service Indicators

### 3.4.1 CPU Board: Power Supply DC Voltage Test Points

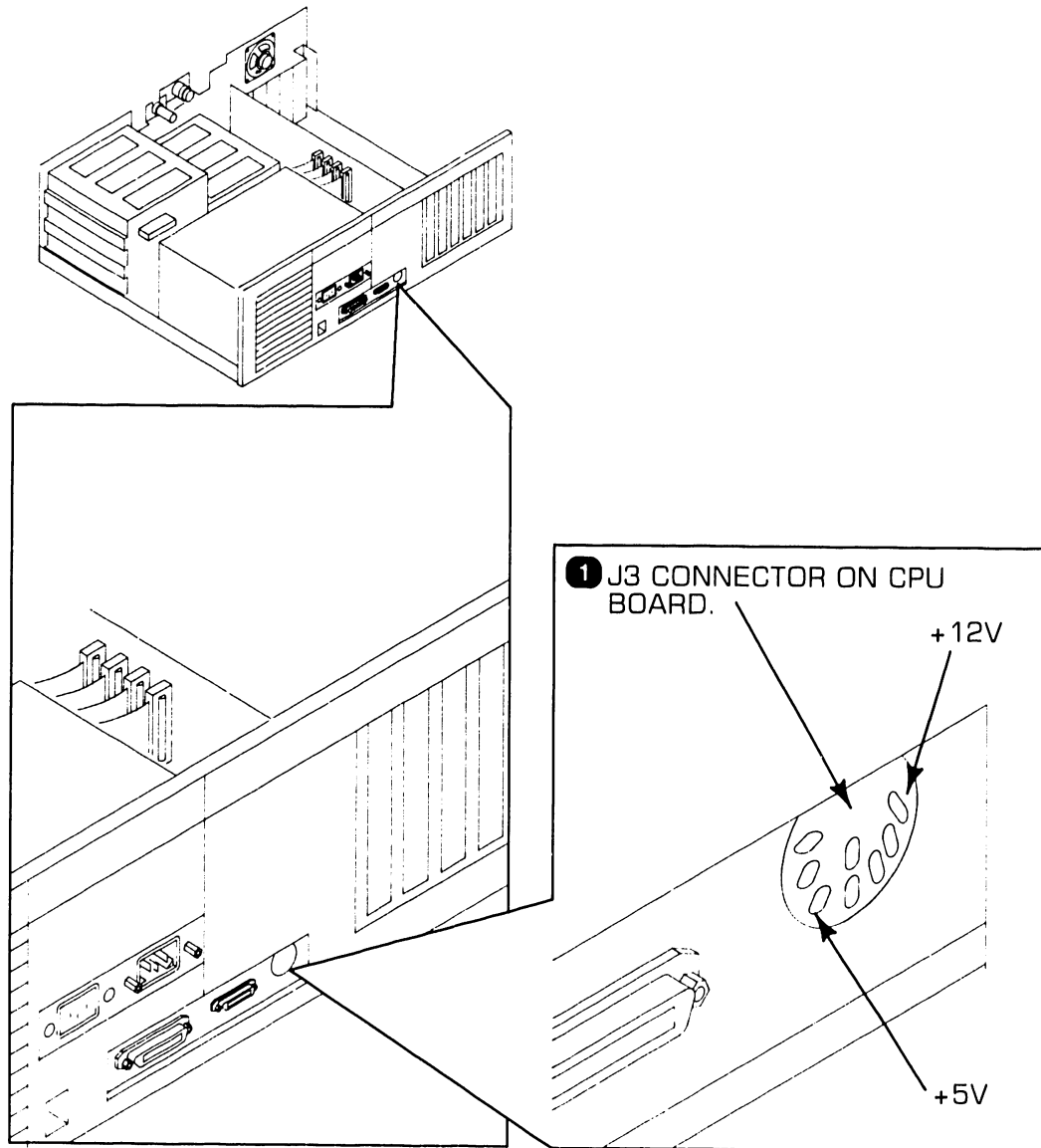


Item	Name	Type and Function
1	Power Supply DC Voltage Test Points (J21)	Connector on CPU board; voltage test points for checking power supply voltages.

# 3.4 CONTROLS AND INDICATORS

## 3.4.1 Service Indicators

### 3.4.2 CPU Board: Monitor and Keyboard Voltage Test Points

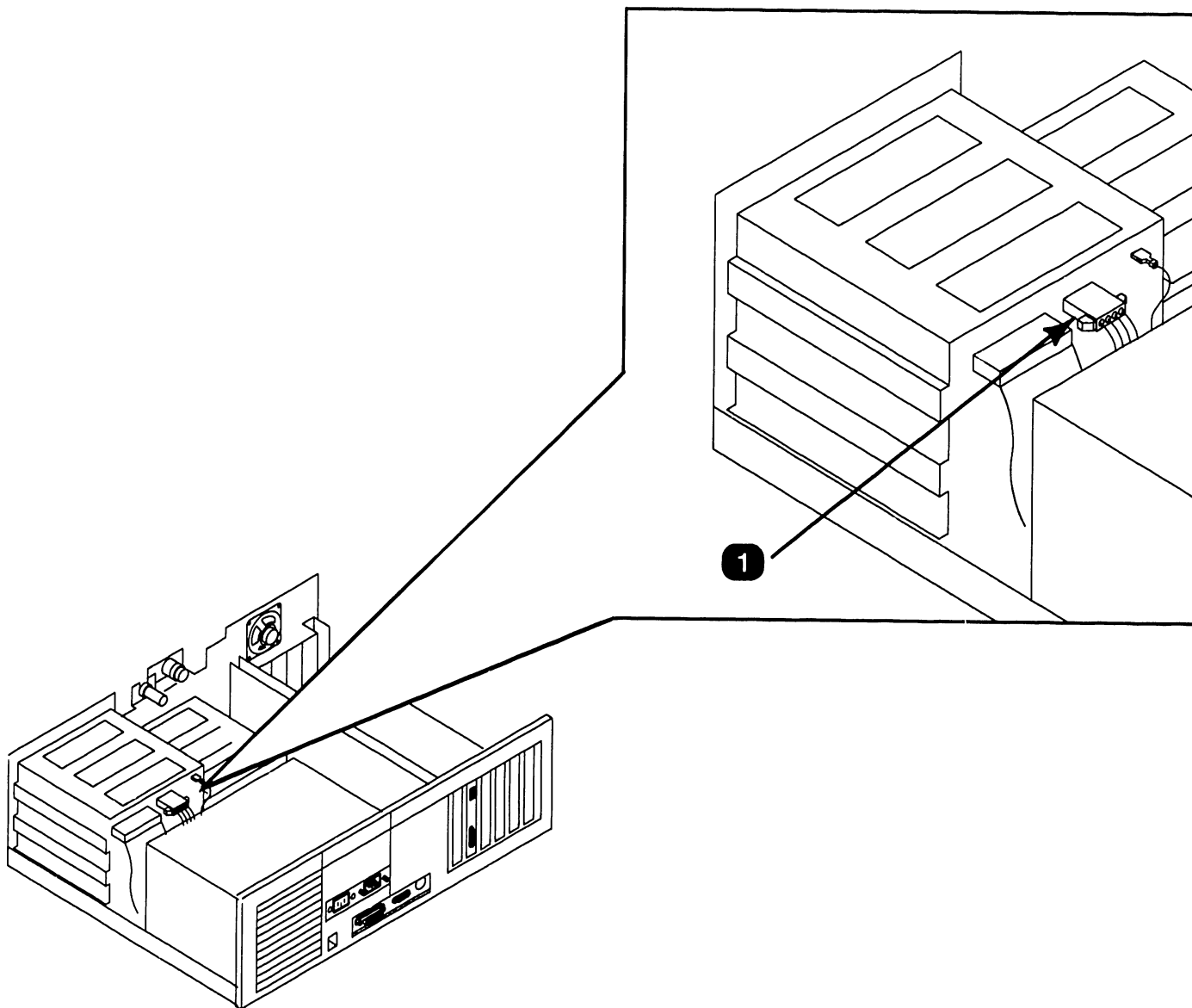


Item	Name	Type and Function
1	Monitor and Keyboard Voltage Test Points (J3)	Connector on CPU board; voltage test points for checking keyboard voltage (+5V) and monitor voltage (+12V).

# 3.4 CONTROLS AND INDICATORS

## 3.4 Service Indicators

### 3.4.3 Floppy Drive Voltage Test Points

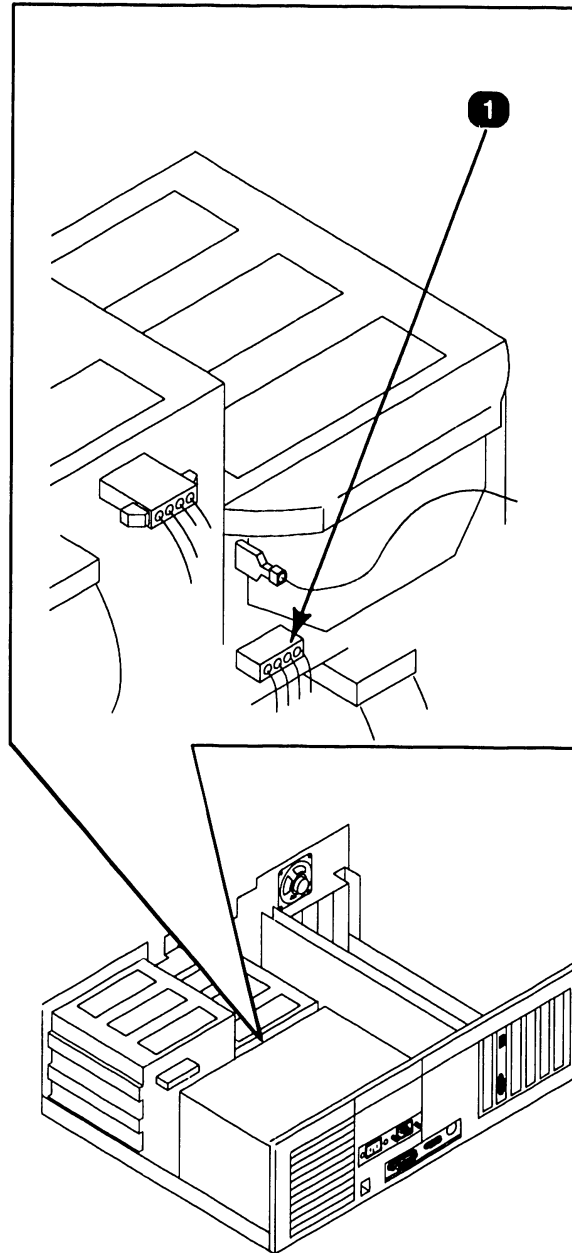


<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Floppy Drive Voltage Test Points	Power cable connector on floppy drive; voltage test points for checking floppy drive voltages (+5V, +12V).

# 3.4 CONTROLS AND INDICATORS

## 3.4 Service Indicators

### 3.4.4 Winchester Drive Voltage Test Points



<i>Item</i>	<i>Name</i>	<i>Type and Function</i>
1	Winchester Drive Voltage Test Points	Power cable connector; voltage test points for checking Winchester drive voltages (+5V, +12V).

**SECTION**

**4**

**OPERATION**



# SECTION 4 CONTENTS

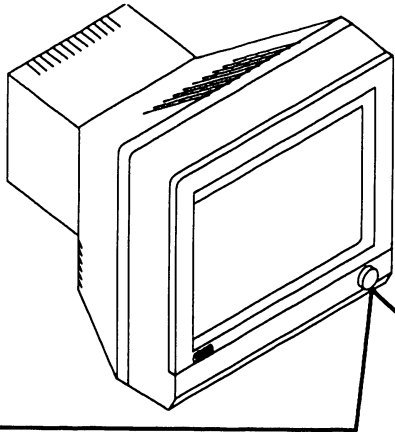
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## SECTION 4 OPERATION

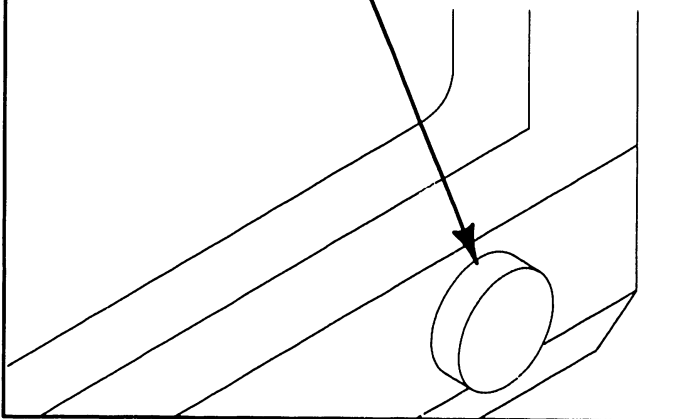
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# OPERATION

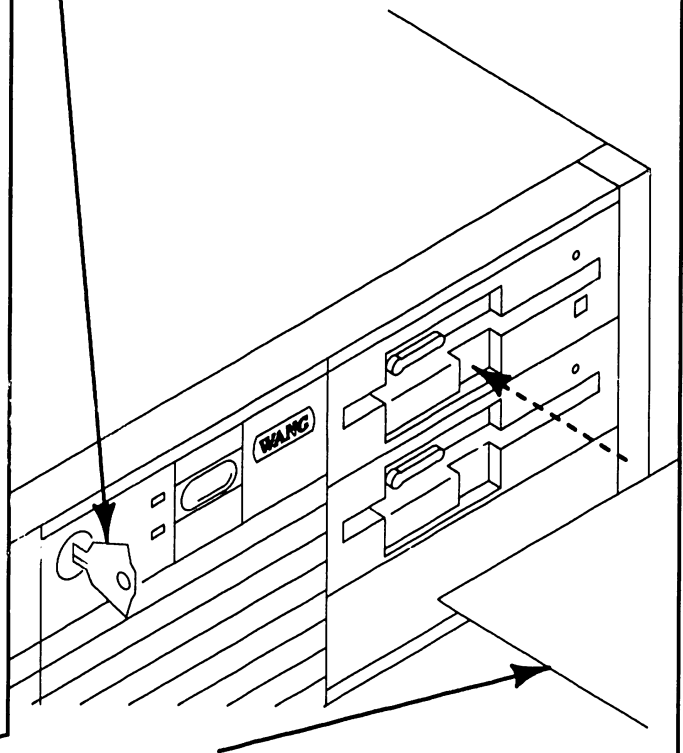
## 4.1 Power-Up and B.I.T. Diagnostic Procedure (Sheet 1 of 2)



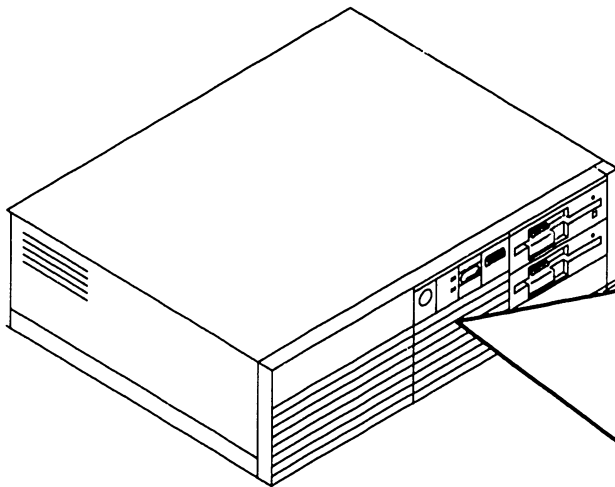
- 1 Set power and monitor brightness control to "out" setting (green ring around power and brightness control shows).



- 2 Turn key clockwise to unlocked position.



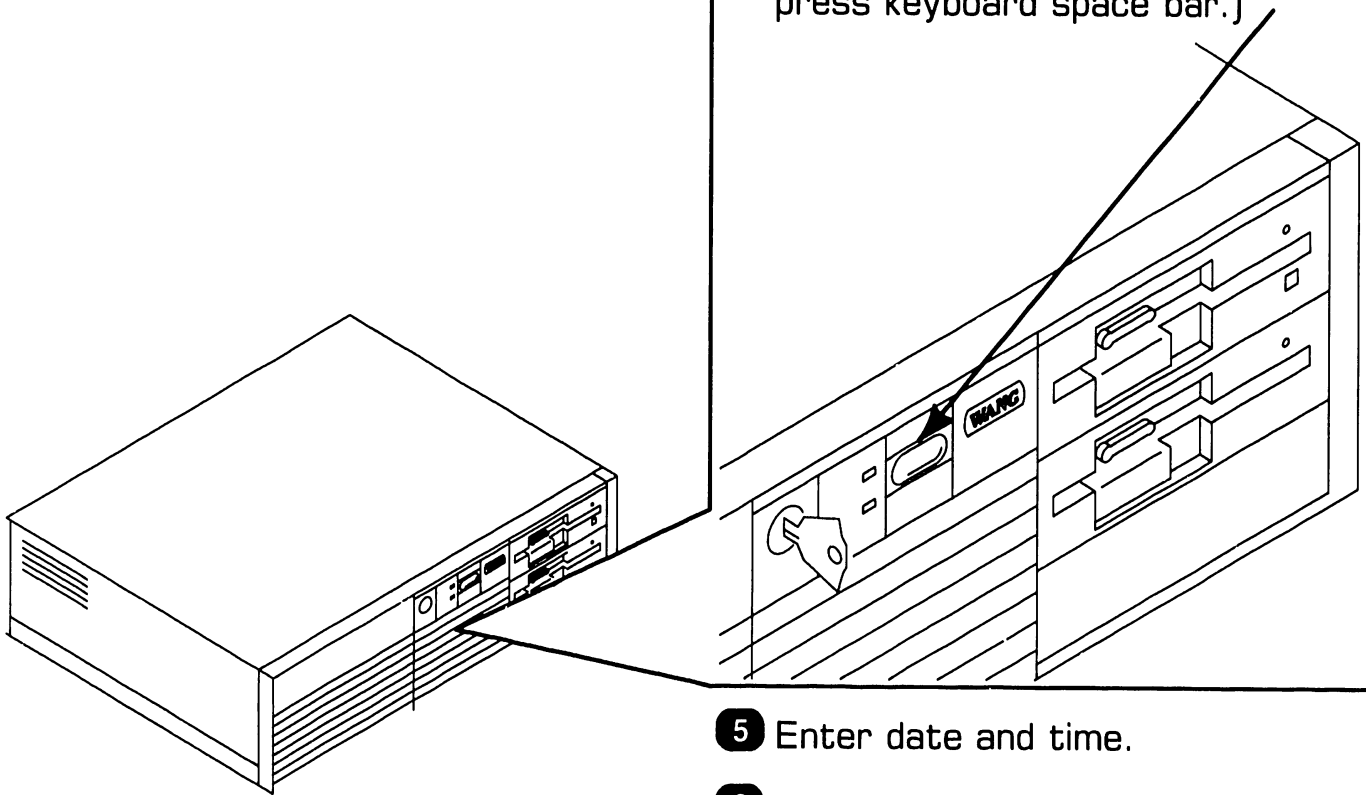
- 3 Insert diskette into floppy drive "A" if starting from floppy drive; leave floppy drive door(s) open if starting system from Winchester drive.



# OPERATION

## 4.1 Power-Up and B.I.T. Diagnostic Procedure (Sheet 2 of 2)

- 4 Press electronics enclosure power-on/off button; green power-on LED illuminates next to power-on/off button and workstation automatically cycles through diagnostic built-in tests. (To bypass memory diagnostics, press keyboard space bar.)



- 5 Enter date and time.
- 6 Power-on peripherals.

### **NOTE**

Upon successful B.I.T. completion, system generates one beep and start-up screen appears on monitor, followed by date and time display. If an error occurs during power-up, a message shows on monitor screen and/or speaker emits a beep code (refer to section 6).



**SECTION**

**5**

**PREVENTIVE  
MAINTENANCE**

# SECTION 5 CONTENTS

---

## SECTION 5 PREVENTIVE MAINTENANCE

	Page
5.1 PM SCHEDULE .....	5-1

# **5.1 PREVENTIVE MAINTENANCE**

## **PM Schedule**

---

Replace the lithium battery every two years (▶7.2.8).

**SECTION**

**6**

**TROUBLESHOOTING**



# SECTION 6 CONTENTS

---

## SECTION 6 TROUBLESHOOTING

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# TROUBLESHOOTING

## 6.1 Tools and Equipment

---

Equipment and tools required to troubleshoot the PC 280 computer include: a standard CE tool kit, a DVM, and diagnostic test routines. The diagnostic routines are contained on diskettes and should be used when troubleshooting at the customer's site as an aid in isolating system problems.

## **6.2 Power-Up Diagnostic (Built-In Test)**

---

### **6.2.1 Built-In Test (B.I.T.) Description**

The built-in test (B.I.T.) checks basic system hardware and provides fatal and non-fatal error indications that allow isolation of subassembly failures. The B.I.T. executes automatically when the PC 280 is powered-on. Invalid configuration data or hardware malfunctions are displayed on the monitor screen (▶6.2.2) or as audible codes generated by the system speaker (▶6.2.3).

# 6.2 Power-Up Diagnostic (Built-In Test)

## 6.2.2 B.I.T. Error Messages (Sheet 1 of 2)

<i>B.I.T. Error Message</i>	<i>Suspected Failure</i>
Diskette drive 0 seek to track 0 failed	Floppy drive
Diskette drive reset failed	Floppy drive
Diskette read failure -- strike F1 to retry boot	Floppy drive, drive cable
Display adapter failed; using alternate	Video board
Gate A20 failure	CPU board
Hard disk controller failure	Winchester/floppy controller board
Hard disk failure	Winchester drive cables, Winchester drive
Hard disk read failure -- strike F1 to retry boot	Winchester cables, Winchester drive
Invalid configuration information -- please run SETUP program	Lithium battery
Keyboard clock line failure	Keyboard
Keyboard controller failure	CPU board
Keyboard data line failure	Keyboard
Keyboard stuck key failure	Keyboard
Memory address line failure at XXXXX, read XXXXX expecting XXXXX	CPU board, expanded memory board
Memory data line failure at XXXXX, read XXXXX expecting XXXXX	CPU board, expanded memory board
Memory high address line failure at XXXXX	CPU board, expanded memory board

# 6.2

# TROUBLESHOOTING

## Power-Up Diagnostic (Built-In Test)

### 6.2.2 B.I.T. Error Messages (Sheet 2 of 2)

<i>B.I.T. Error Message</i>	<i>Suspected Failure</i>
Memory odd/even logic failure at XXXXX, read XXXXX expecting XXXXX	CPU board, expanded memory board
Memory parity failure at XXXXX	CPU board, expanded memory board
Memory write/read failure at XXXXX, read XXXXX expecting XXXXX	CPU board, expanded memory board
No boot device available -- strike F1 to retry boot	Winchester/floppy drive cables
No boot sector on hard disk -- strike F1 to retry boot	Winchester drive (format), drive cables
No timer tick	CPU board
Not a boot diskette -- strike F1 to retry boot	Diskette
XXXXX optional ROM bad checksum = XXXXX	BIOS PROM on CPU board
Shutdown failure	CPU board
Time-of-day clock stopped	CPU board
Timer chip counter 2 failed	CPU board
Timer of interrupt controller bad	CPU board
Unexpected interrupt in protected mode	CPU board

# 6.2 Power-Up Diagnostic (Built-In Test)

---

## 6.2.3 B.I.T. Error Beep Codes (Sheet 1 of 2)

---

<i>B.I.T. Error Beep Code Sequence</i>	<i>Suspected Failure</i>
1-1-3	CPU board
1-1-4	BIOS PROM on CPU board
1-2-1	CPU board
1-2-2	CPU board
1-2-3	CPU board
1-3-1	CPU board
1-3-3	CPU board
1-3-4	CPU board
1-4-1	CPU board
1-4-2	CPU board
2-1-1	CPU board
2-1-2	CPU board
2-1-3	CPU board
2-1-4	CPU board
2-2-1	CPU board
2-2-2	CPU board
2-2-3	CPU board
2-2-4	CPU board
2-3-1	CPU board
2-3-2	CPU board

---

# 6.2 Power-Up Diagnostic (Built-In Test)

## 6.2.3 B.I.T. Error Beep Codes (Sheet 2 of 2)

<i>B.I.T. Error Beep Code Sequence</i>	<i>Suspected Failure</i>
2-3-3	CPU board
2-4-1	CPU board
2-4-2	CPU board
2-4-3	CPU board
2-4-4	CPU board
3-1-1	CPU board
3-1-2	CPU board
3-1-3	CPU board
3-1-4	CPU board
3-2-4	CPU board
3-3-4	Video board
3-4-1	Video board
3-4-2	Video board
4-2-1	CPU board
4-2-2	CPU board
4-2-3	CPU board
4-2-4	CPU board
4-3-1	Expanded memory board
4-3-3	CPU board
4-3-4	CPU board

## **6.3 Diagnostic Utility**

---

### **6.3.1 Diagnostic Utility Description**

The diagnostic utility is a diskette-based troubleshooting aid designed to run with minimal user intervention.

Two versions of the diagnostic utility are offered: a bootable 1.2MB diskette containing all available diagnostic files; and a non-bootable 360KB diskette containing diagnostic files for one specific option only.



## 6.3 Diagnostic Utility

---

### 6.3.2 Running 1.2MB Diskette Diagnostic Utility

---

#### **NOTE**

Single options ship with a 360KB diskette that contains diagnostics for that option only. The diagnostic can be loaded into the 1.2MB diskette.

---

1. Load diagnostic utility into 1.2MB diskette drive and boot system from diagnostic diskette (►4.1).
  2. Press keyboard "y" key after disclaimer screen appears. Pressing "y" key causes test selection screen to appear.
  3. Use keyboard INSERT and DELETE keys to deselect unwanted tests. (INSERT key positions arrow in front of test to be deselected; DELETE key deselects test.)
  4. Press keyboard EXEC key. (While test executes, test status information shows on screen.)
- 

#### **NOTE**

If an error is detected, a message specifying failed hardware appears on screen. To continue running diagnostic program, press EXEC key.

---

5. After system executes all selected tests, comprehensive test results appear on screen. Press SHIFT and CANCEL keys to exit diagnostic utility.
-

# 6.4 Troubleshooting Strategy (Sheet 1 of 3)

## TROUBLESHOOTING

<i>Fault Condition</i>	<i>Troubleshooting Action</i>
Fan does not run after system power-up and proper ac voltage not present at input to power supply.	<ul style="list-style-type: none"><li>• Check voltage at electrical outlet.</li><li>• Source voltage O.K.: Check continuity of ac power cord; replace if bad</li><li>• Source voltage incorrect: Try another outlet; if voltage still bad inform customer.</li></ul>
Fan does not run after system power-up and proper ac voltage is present at input to power supply.	<ul style="list-style-type: none"><li>• Unplug monitor cable from CPU board; if fan runs replace monitor.</li><li>• If fan still does not run: Check for bad power button on electronics enclosure.</li><li>• Replace power supply if power button operational.</li></ul>
B.I.T. fails after system powered-on and error message or beep code present.	<ul style="list-style-type: none"><li>• Refer to section 6.2.2 (error messages) or section 6.2.3 (error beep codes).</li></ul>
B.I.T. fails after system powered-on and no error messages or beep codes present.	<ul style="list-style-type: none"><li>• Check all cable connections.</li><li>• Secure or replace cable(s).</li></ul>
B.I.T. fails after system powered-on, no error messages or beep codes present, but all cable connections O.K.	<ul style="list-style-type: none"><li>• Check voltages (►9.5).</li><li>• Voltages wrong: Replace power supply.</li><li>• Voltages correct: Check hardware for visible physical damage (e.g., bent pins, broken components). Replace damaged hardware.</li></ul>
B.I.T. fails after system powered-on, no error messages or beep codes present, and no visible damage to hardware.	<ul style="list-style-type: none"><li>• Remove all non-Wang option boards; replace boards one-at-a-time until faulty board isolated.</li></ul>

# 6.4 Troubleshooting Strategy (Sheet 2 of 3)

---

<i>Fault Condition</i>	<i>Troubleshooting Action</i>
B.I.T. fails after system powered-on, no error messages or beep codes present, no visible damage to hardware, and removal of all non-Wang boards fails to correct problem.	<ul style="list-style-type: none"><li>• Remove all Wang boards except CPU board.</li><li>• Replace CPU board if system does not emit error beep codes.</li><li>• If system emits beep codes after all Wang boards (except CPU board) have been removed, replace Wang boards one-at-a-time until faulty board isolated.</li></ul>
Diagnostic utility detects faulty FRU.	<ul style="list-style-type: none"><li>• Check configuration of FRU (►9.3).</li><li>• Replace FRU if configuration correct.</li></ul>
Problem with system, and diagnostic utility fails to detect faulty FRU.	<ul style="list-style-type: none"><li>• If diagnostic menu contains tests for all FRUs present, suspect software.</li><li>• If menu does not contain required test(s): Are files for desired test(s) on utility? Yes -- check FRU I/O addresses; no -- replace diskette with diagnostic that contains necessary file(s).</li></ul>
System powered-on, B.I.T. completes successfully, but diagnostic menu does not appear on monitor.	<ul style="list-style-type: none"><li>• Remove all option boards except Winchester/floppy controller and video board.</li><li>• If diagnostic menu appears, replace option boards one-at-a-time until faulty board isolated.</li><li>• Check configuration of faulty board; replace if necessary.</li></ul>
System powered-on, B.I.T. completes successfully, but diagnostic menu still does not appear, even after all option boards (except Winchester/floppy controller and video board) are removed.	<ul style="list-style-type: none"><li>• Replace diskette in drive "A" with system diskette 1. If MS-DOS loads properly, diagnostic diskette was faulty.</li></ul>

# 6.4 Troubleshooting Strategy (Sheet 3 of 3)

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---

## *Fault Condition*

Diagnostic menu does not appear after power-up and MS-DOS does not load properly even after drive "A" diskette is replaced by system diskette 1.

## *Troubleshooting Action*

If system contains Winchester drive:

- Unplug drive "A" and boot from hard disk.
- Replace diskette drive "A" if MS-DOS loads properly.
- Replace Winchester/floppy controller if MS-DOS does not load.
- Replace CPU board.

If system not configured with Winchester drive:

- Swap diskette drive "A" and "B" cables, insert system diskette 1 into drive "B" and boot system.
  - Replace diskette drive "A" if MS-DOS loads properly.
  - Replace Winchester/floppy controller if MS-DOS does not load properly.
  - Replace CPU board.
-

**SECTION**

**7**

**REPAIR**

# SECTION 7 CONTENTS

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## SECTION 7 REPAIR

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## **7.1 Tools and Test Equipment**

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- Wang CE tool kit, P/N 726-9401
- Diagnostic disk, P/N 732-8098  
(package number 195-5537-9)

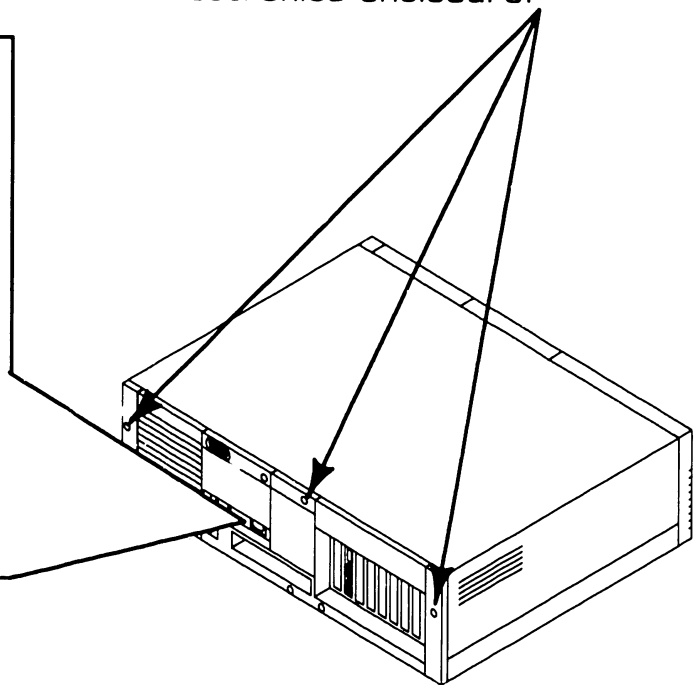
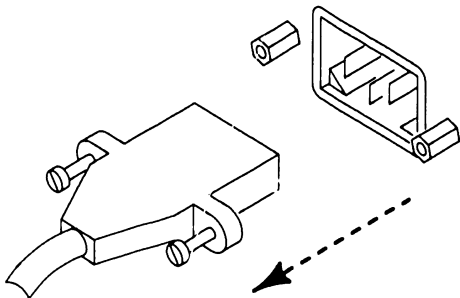
## 7.2 Removal Procedures

### 7.2.1 Unfastening Electronics Enclosure Top Cover Screws

1 Power-down workstation ( ➔ 4.2).

3 Unscrew Phillips-head screws that secure top cover to electronics enclosure.

2 Disconnect workstation ac power cord (420-2040) from inlet.





## 7.2 Removal Procedures

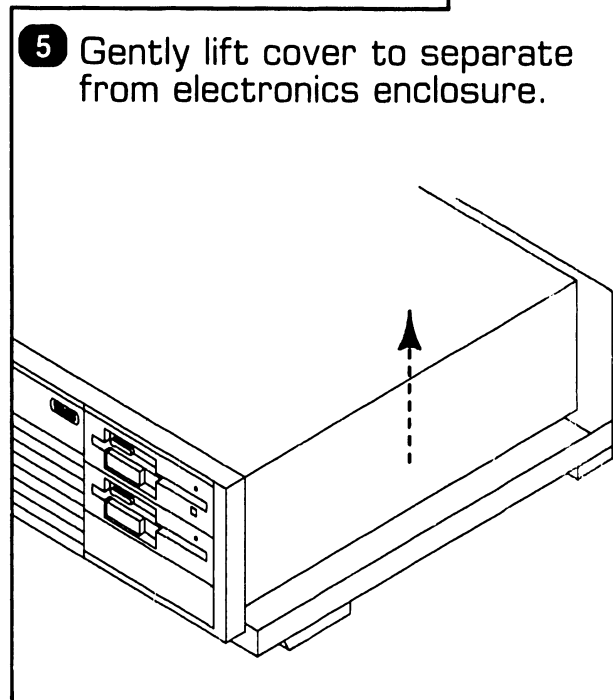
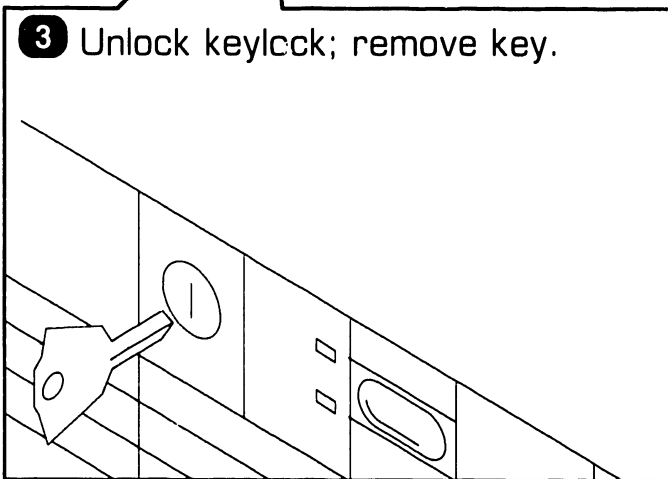
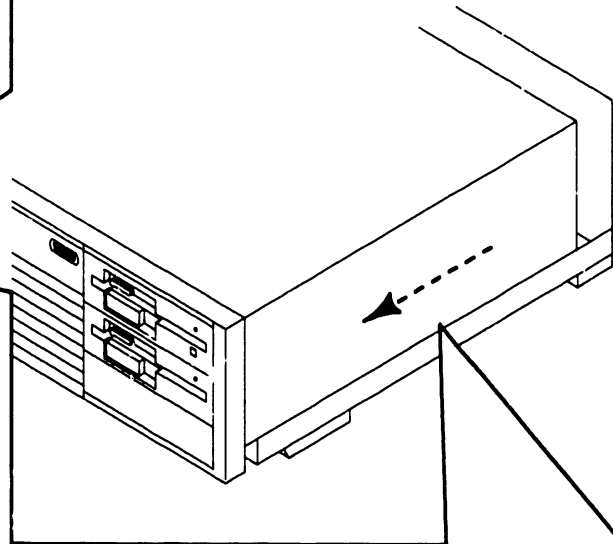
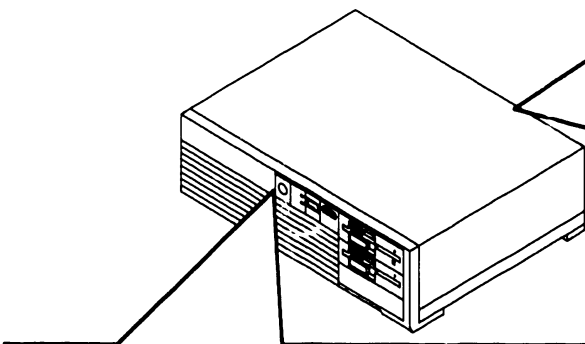
### 7.2.2 Electronics Enclosure Top/Front Cover Removal

- 1 Power-down workstation (▶4.2).
- 2 Unscrew top cover screws (▶7.2.1).

- 4 Slide cover approximately 1 inch toward front of electronics enclosure.

- 3 Unlock keylock; remove key.

- 5 Gently lift cover to separate from electronics enclosure.

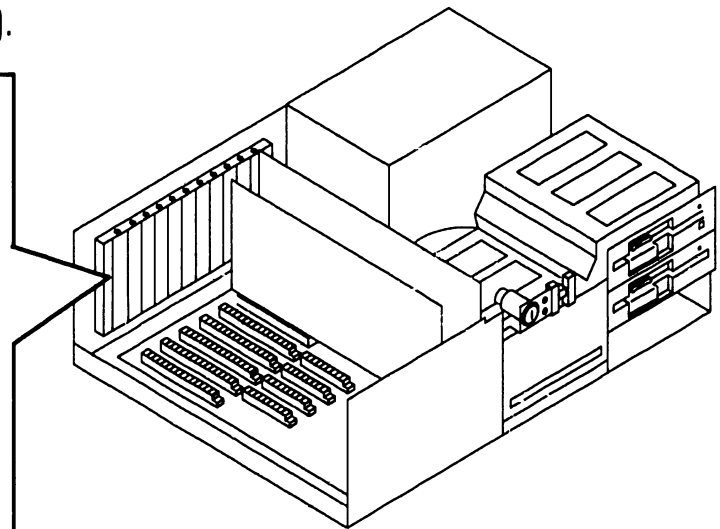
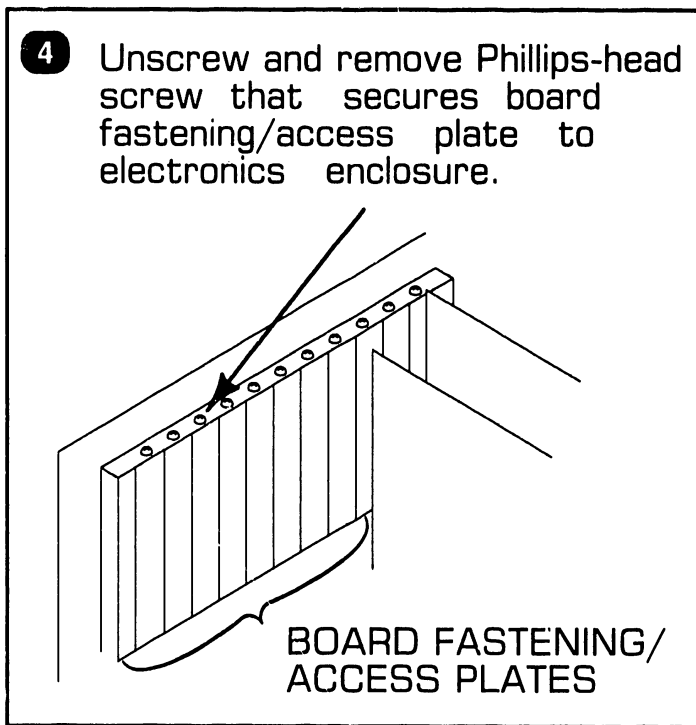


## 7.2 Removal Procedures

### 7.2.3 General Board Removal (Sheet 1 of 2)

- 1 Power-down workstation( ➡ 4.2).
- 2 Unscrew top cover screws ( ➡ 7.2.1).
- 3 Remove top/front cover( ➡ 7.2.2).

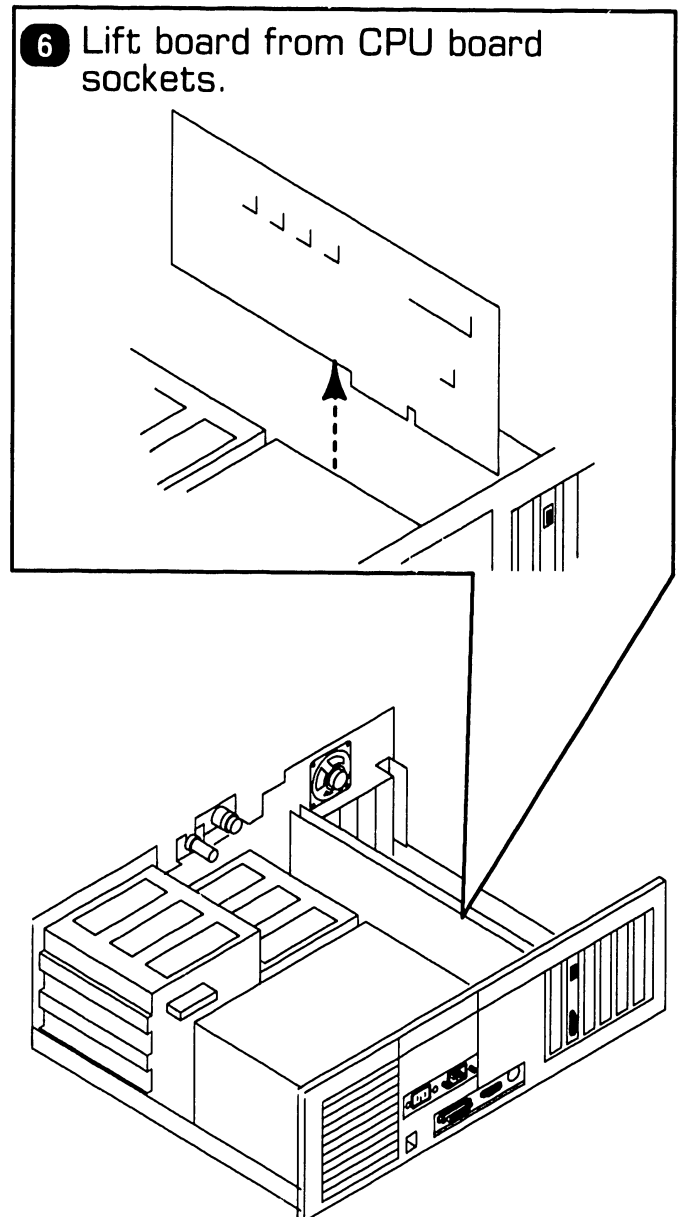
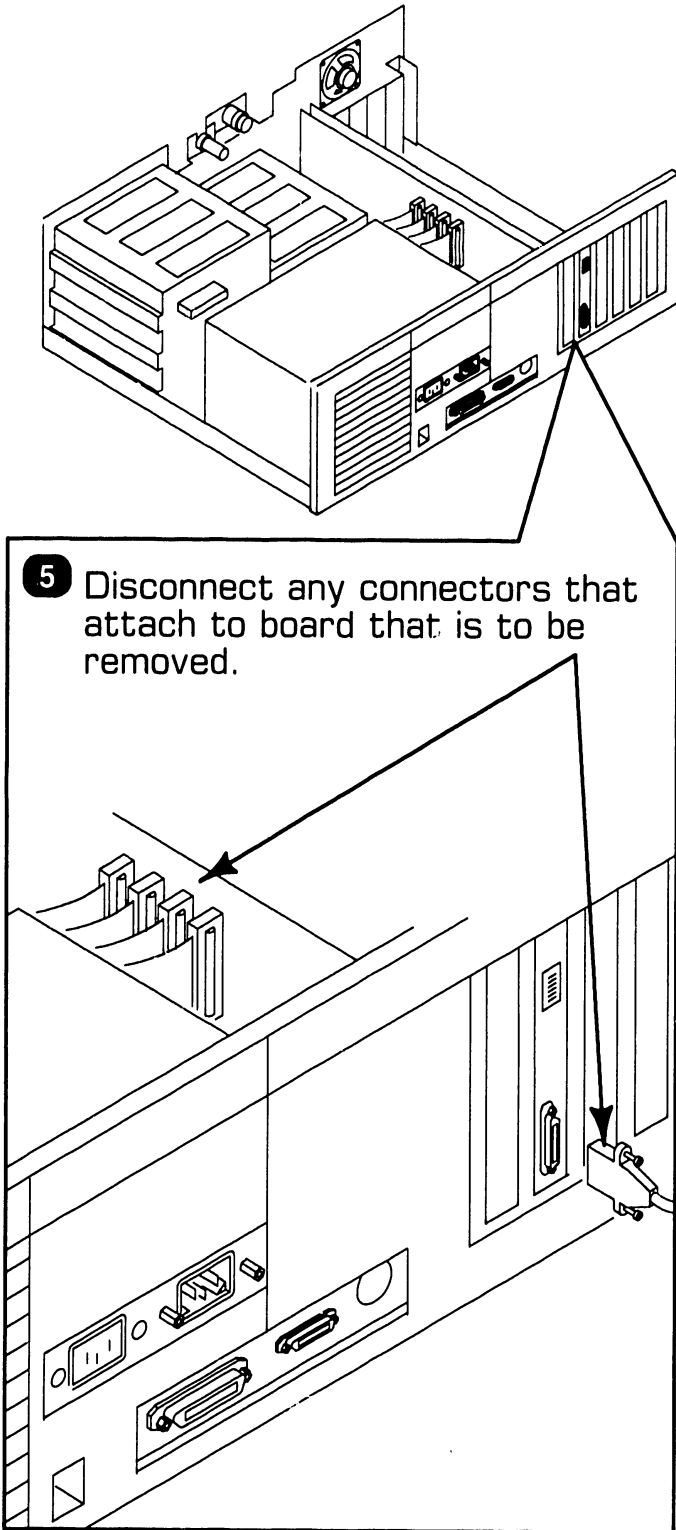
- 4 Unscrew and remove Phillips-head screw that secures board fastening/access plate to electronics enclosure.



# 7.2 Removal Procedures

# REPAIR

## 7.2.3 General Board Removal (Sheet 2 of 2)



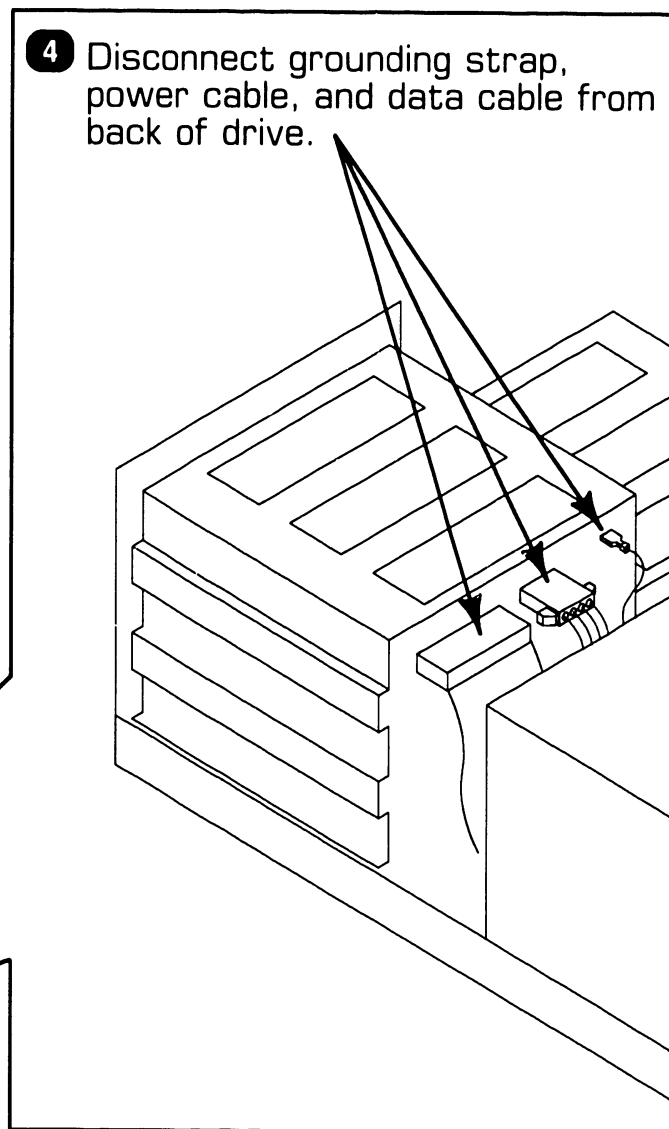
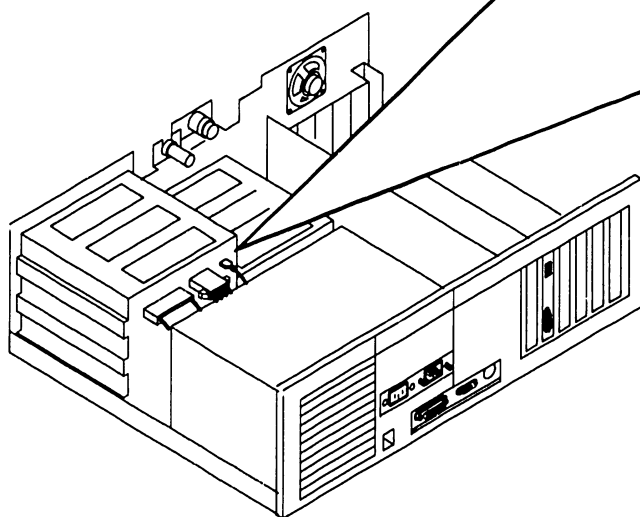
# 7.2 Removal Procedures

# REPAIR

## 7.2.4 Floppy Diskette Drive Removal (Sheet 1 of 2)

- 1 Power-down workstation (► 4.2).
- 2 Unscrew top cover screws (► 7.2.1).
- 3 Remove top/front cover (► 7.2.2).

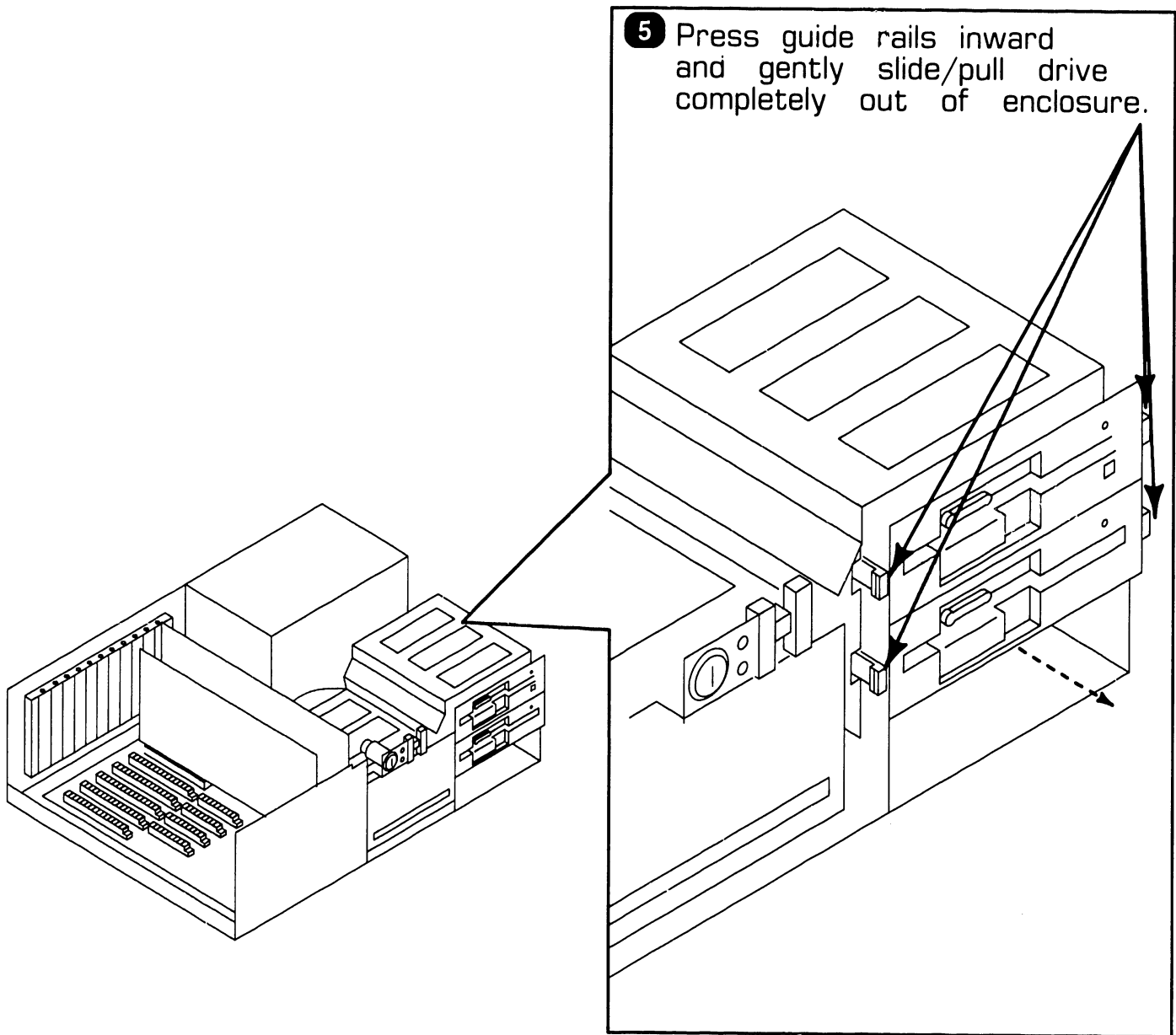
- 4 Disconnect grounding strap, power cable, and data cable from back of drive.



# 7.2 Removal Procedures

# REPAIR

## 7.2.4 Floppy Diskette Drive Removal (Sheet 2 of 2)

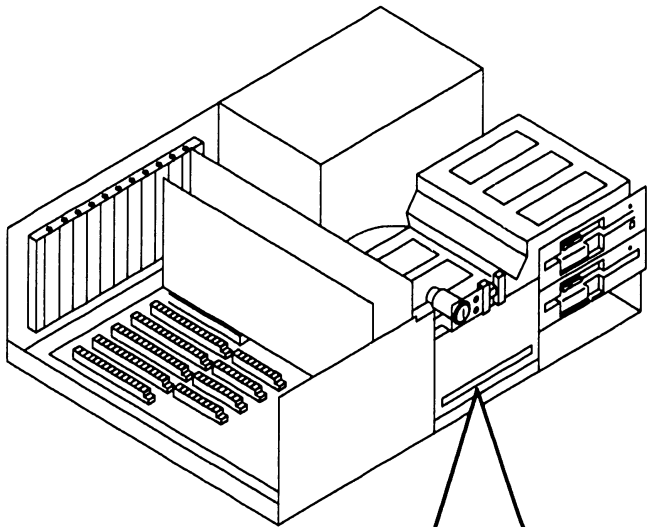


# 7.2 Removal Procedures

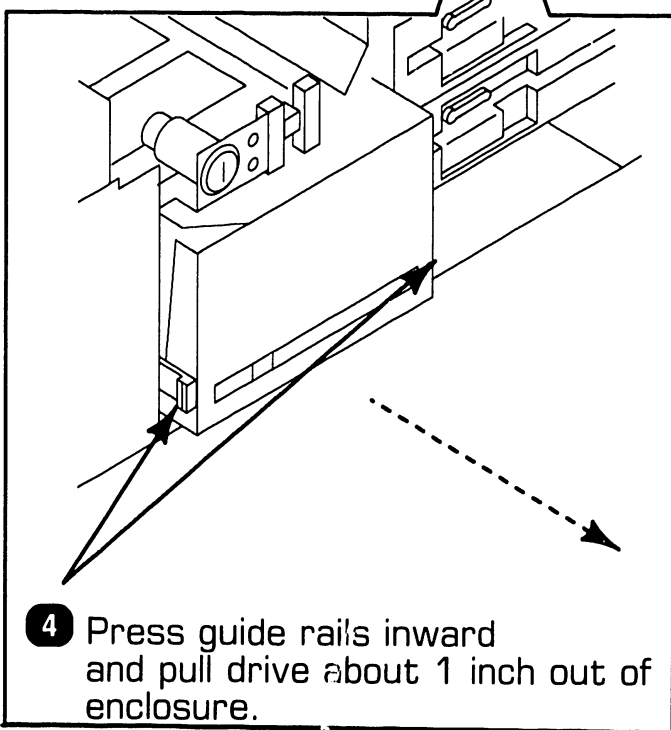
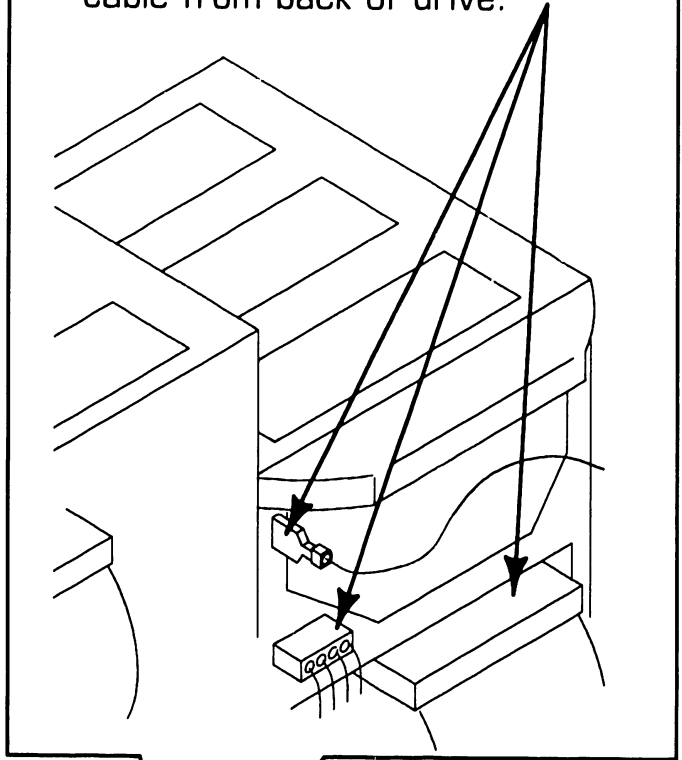
# REPAIR

## 7.2.5 Winchester Disk Removal

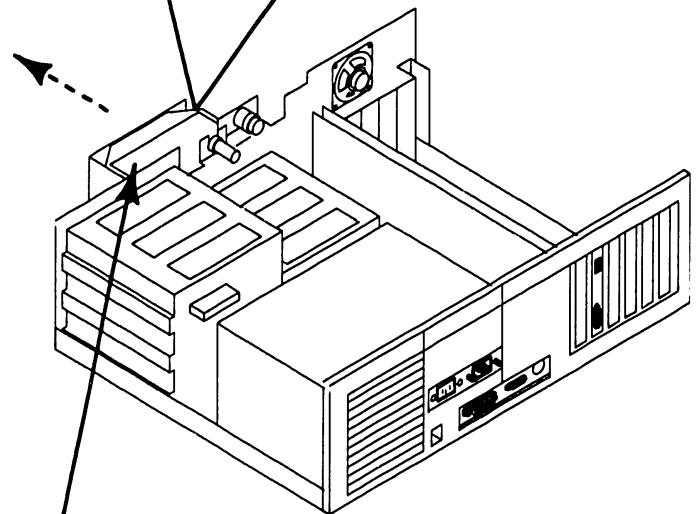
- 1 Power-down workstation (▶ 4.2).
- 2 Unscrew top cover screws (▶ 7.2.1).
- 3 Remove top/front cover (▶ 7.2.2).



- 5 Disconnect grounding strap, power cable, and data/control cable from back of drive.



- 4 Press guide rails inward and pull drive about 1 inch out of enclosure.

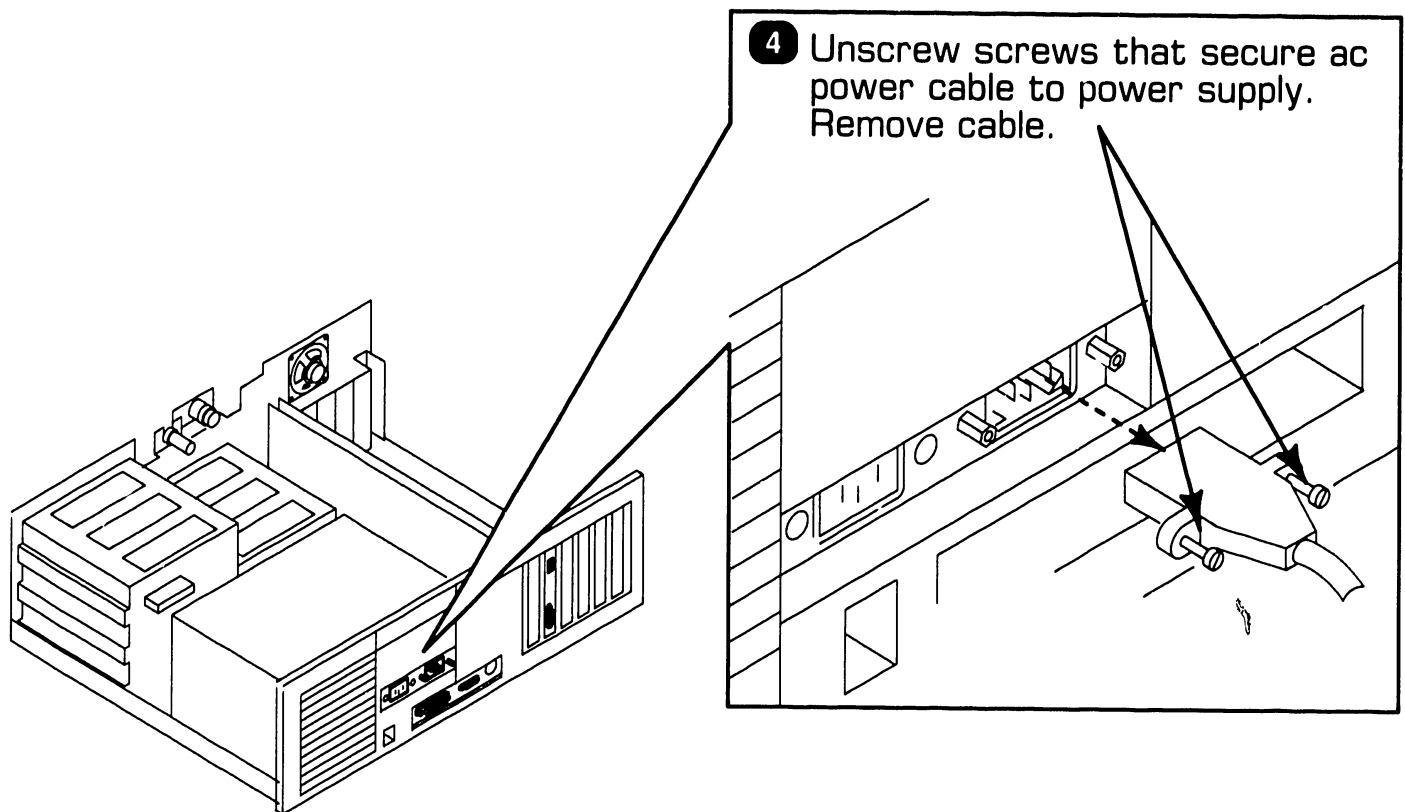


- 6 Gently slide/pull drive completely out of enclosure.

## 7.2 Removal Procedures

### 7.2.6 Power Supply Removal (Sheet 1 of 3)

- 1 Power-down workstation (➡ 4.2).
- 2 Unscrew top cover screws (➡ 7.2.1).
- 3 Remove enclosure top/front cover (➡ 7.2.2).

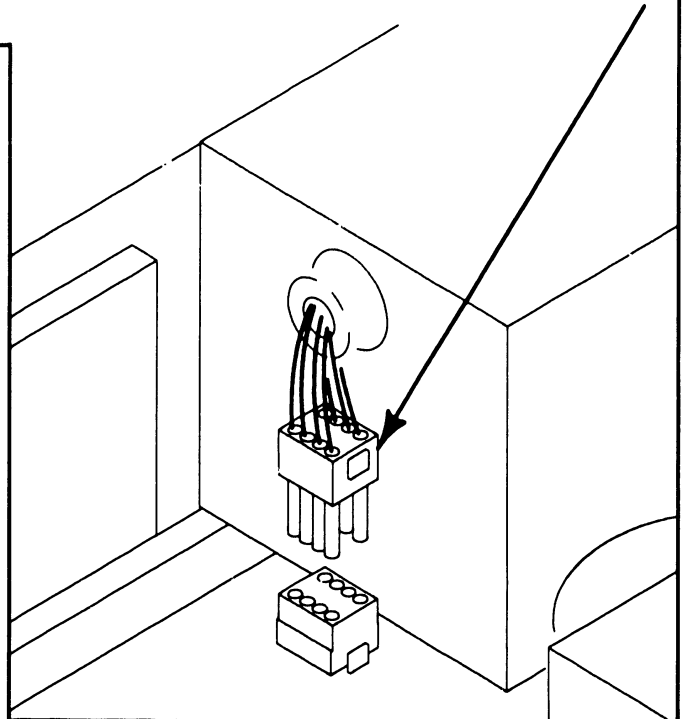
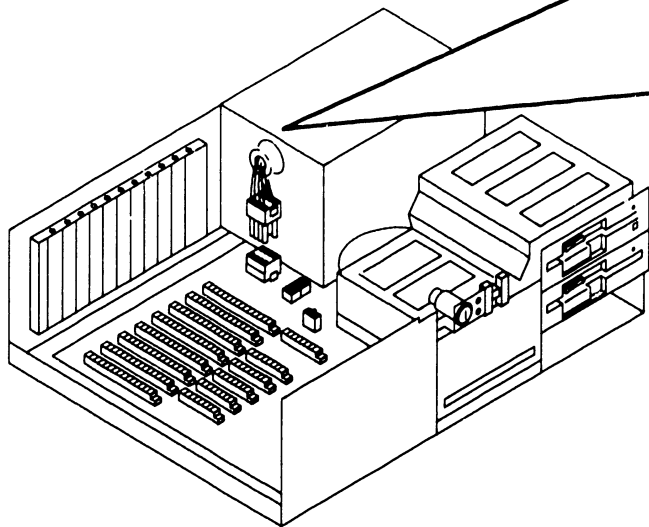


# 7.2 Removal Procedures

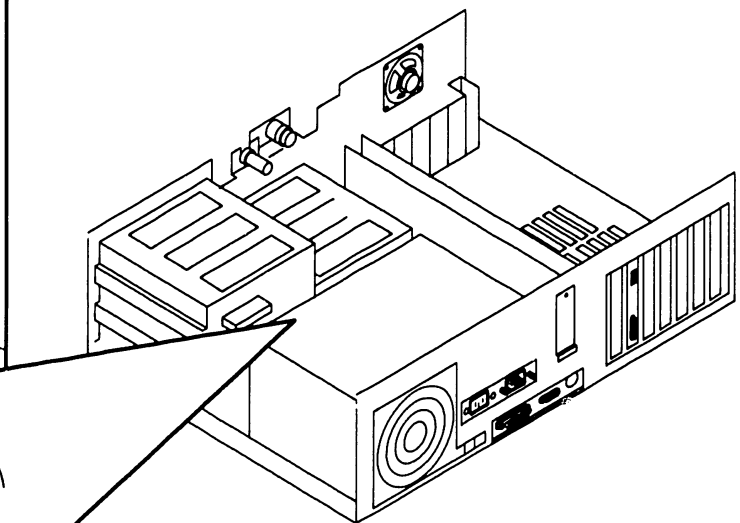
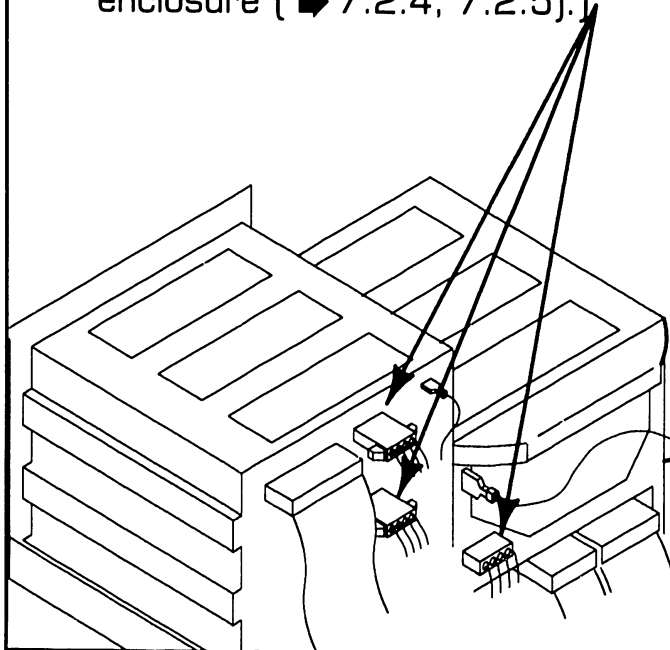
# REPAIR

## 7.2.6 Power Supply Removal (Sheet 2 of 3)

**6** Disconnect power supply cable from CPU board connector J21.



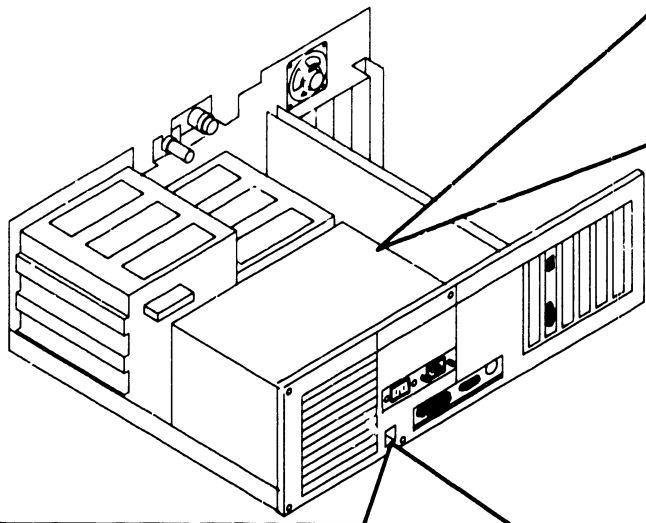
**5** Disconnect power supply cable from connectors on rear of floppy drives and Winchester disk unit. (Disconnecting cable from these drives might require partial removal of drives from enclosure (► 7.2.4, 7.2.5).)



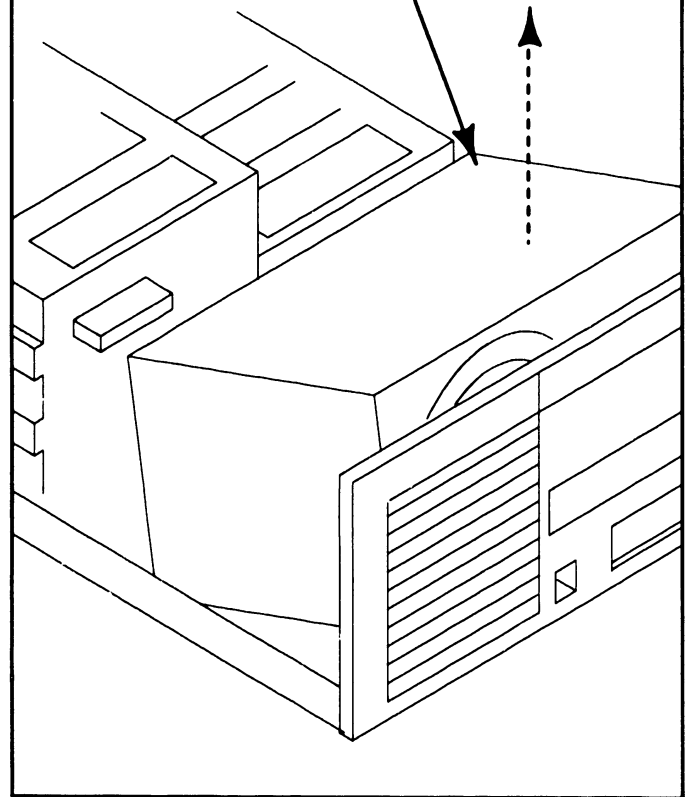


## 7.2 Removal Procedures

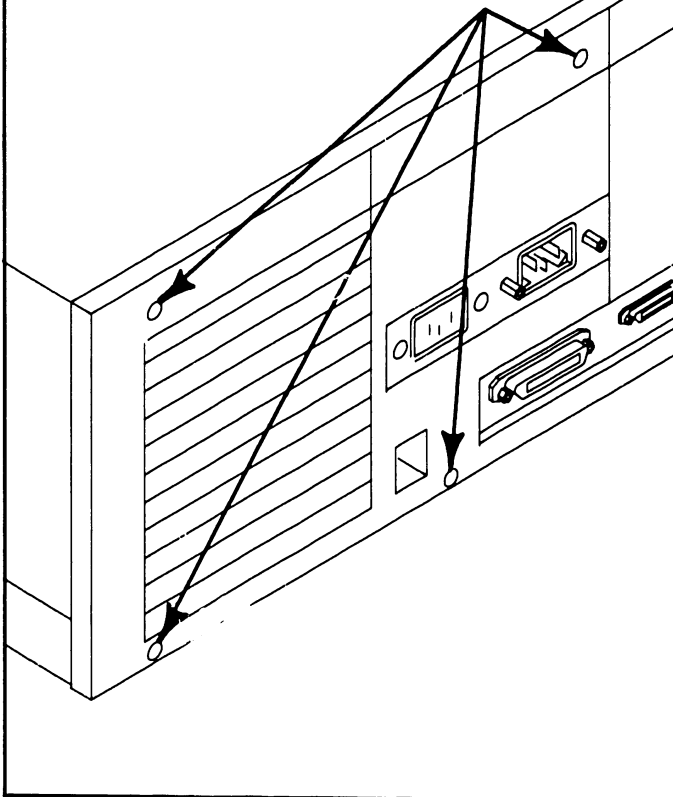
### 7.2.6 Power Supply Removal (Sheet 3 of 3)



**8** Gently tilt power supply toward front of enclosure and lift out of unit. (Tilting power supply ensures that it does not catch on enclosure rear plate as power supply is lifted.)



**7** Unscrew and remove Phillips-head screws in rear of chassis that secure power supply to electronics enclosure.



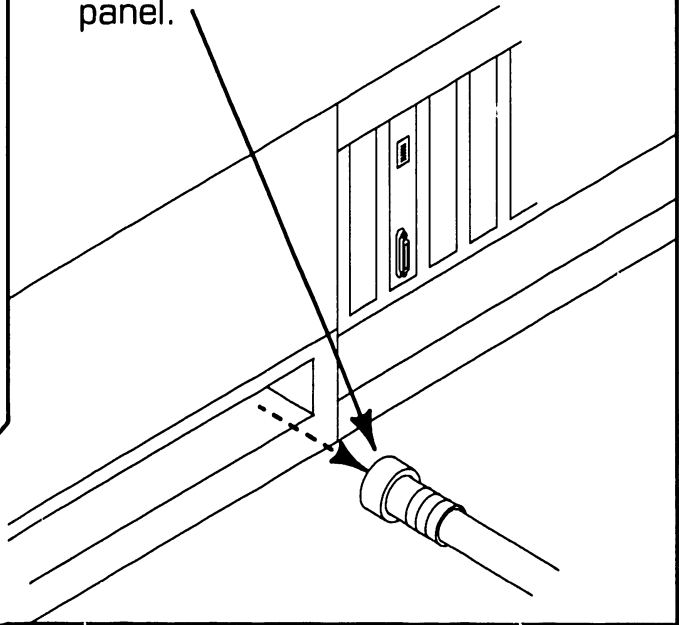
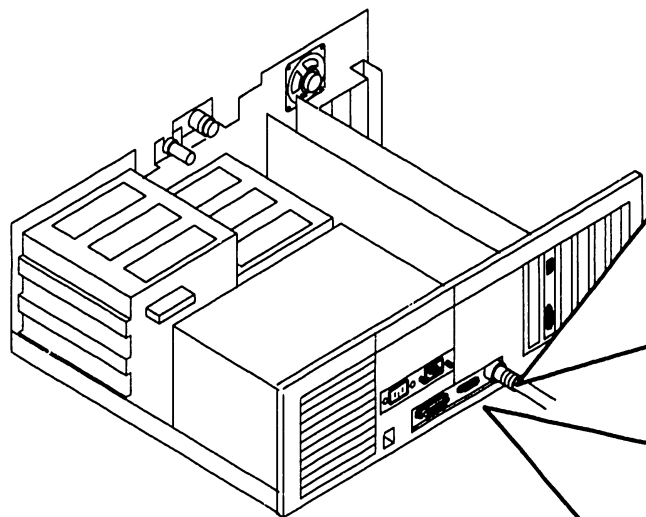
# 7.2 Removal Procedures

# REPAIR

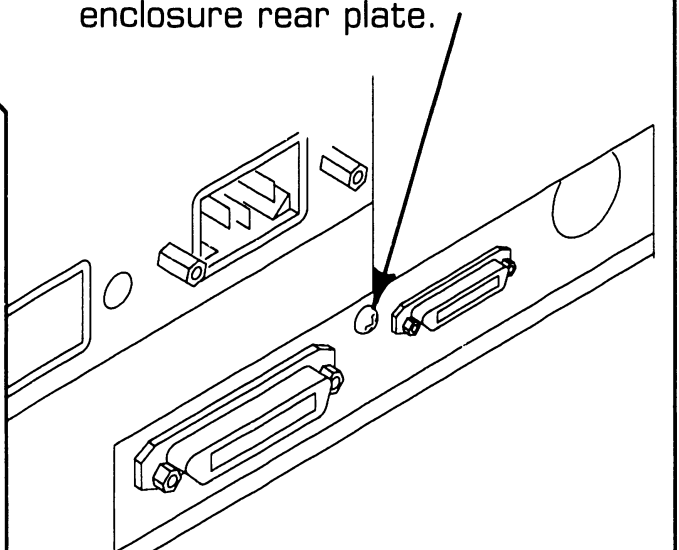
## 7.2.7 CPU Board Removal (Sheet 1 of 3)

- 1 Power-down workstation ( ➤ 4.2).
- 2 Unscrew top cover screws ( ➤ 7.2.1).
- 3 Remove top/front cover ( ➤ 7.2.2).
- 4 Remove option boards from CPU board sockets ( ➤ 7.2.3).

- 5 Disconnect monitor cable from CPU board connector on rear panel.



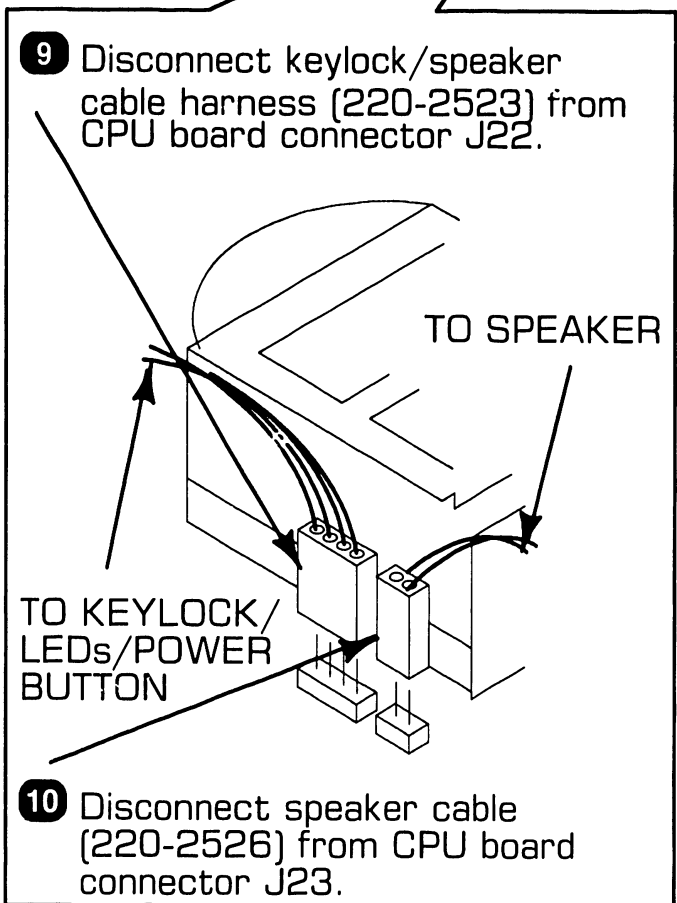
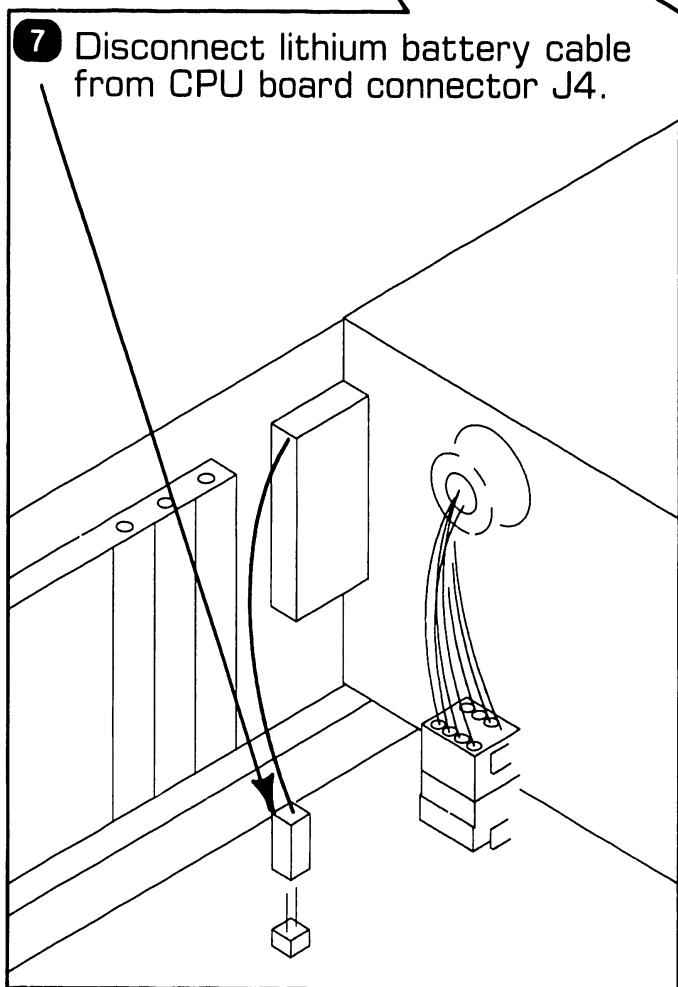
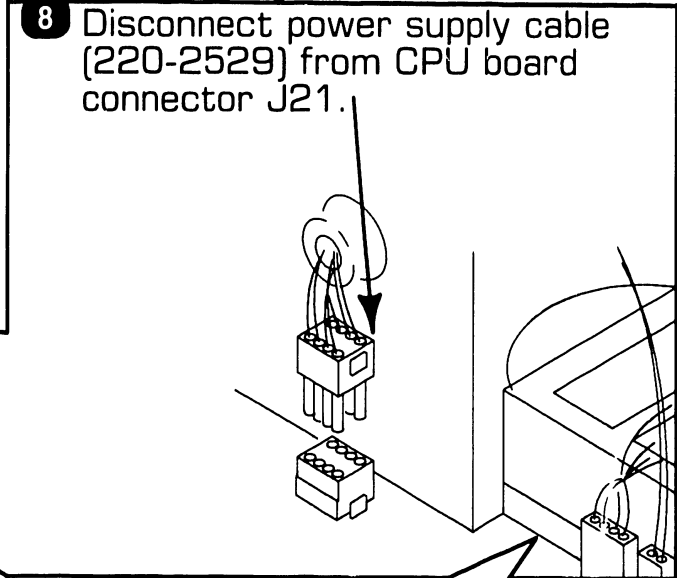
- 6 Remove Phillips-head screw that secures side of CPU board to enclosure rear plate.



# 7.2 Removal Procedures

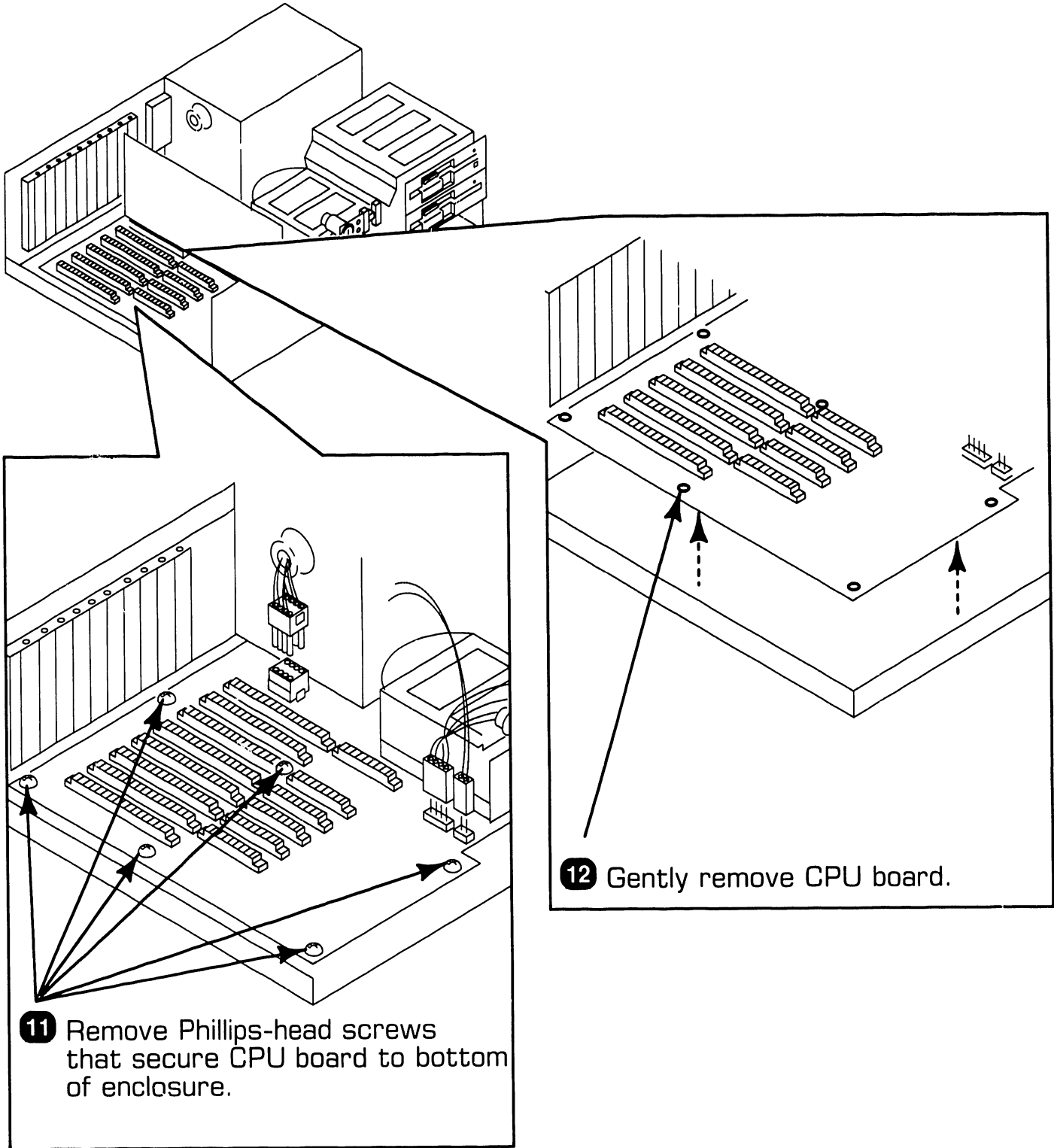
# REPAIR

## 7.2.7 CPU Board Removal (Sheet 2 of 3)



## 7.2 Removal Procedures

### 7.2.7 CPU Board Removal (Sheet 3 of 3)



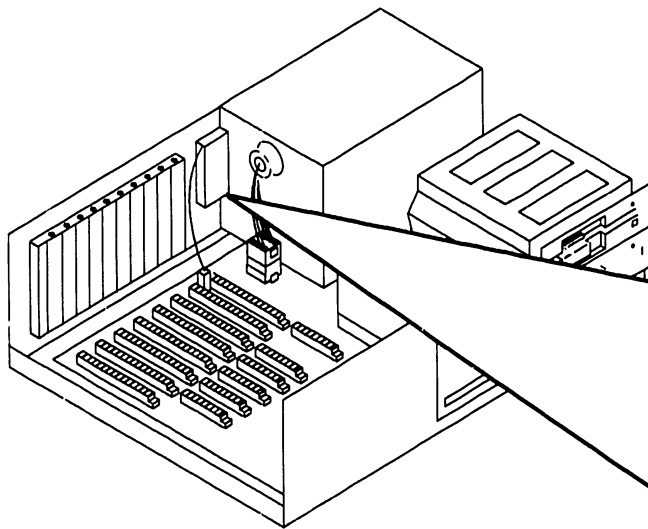
# 7.2 Removal Procedures

## 7.2.8 Lithium Battery Removal

- 1 Power-down workstation ( ➤ 4.2).
- 2 Unscrew top cover ( ➤ 7.2.1).
- 3 Remove top/front cover ( ➤ 7.2.2).

### **CAUTION**

Disconnecting lithium battery cable will result in erasure of CPU CMOS RAM. Run SETUP program.



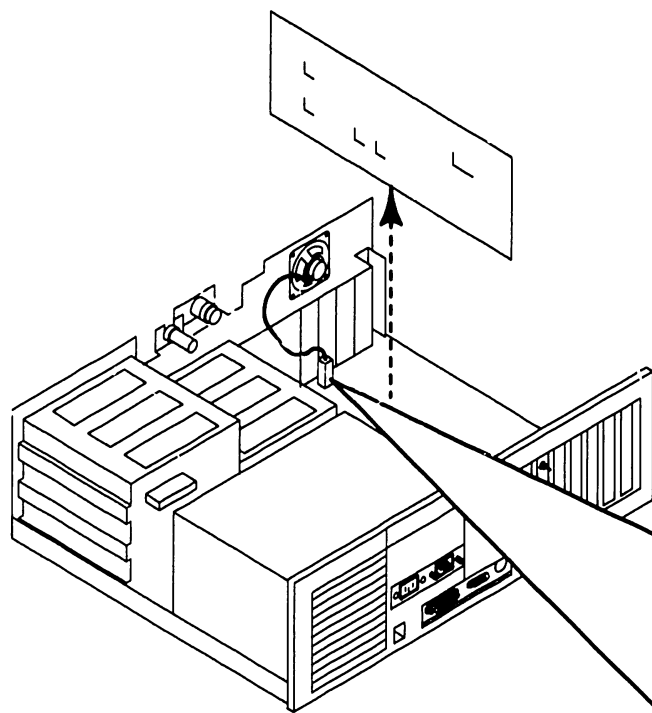
- 4 Disconnect lithium battery cable from CPU board connector J4.

- 5 Pull battery away from velcro pad on inside rear wall of electronics enclosure.

## 7.2 Removal Procedures

### 7.2.9 Speaker Removal

- 1 Power-down workstation (▶4.2).
- 2 Unscrew top cover screws (▶7.2.1).
- 3 Remove top/front cover (▶7.2.2).
- 4 Remove board closest to Winchester disk to access speaker cable connector (▶7.2.3).



- 5 Disconnect speaker cable (220-2526) from CPU board connector J23.

- 6 Unscrew and remove Phillips-head screws (2) that secure speaker assembly to enclosure front plate.

**SECTION**

**8**

**ADJUSTMENTS**

# SECTION 8 CONTENTS

---

## SECTION 8 ADJUSTMENTS

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8.1.1 Special Tools .....	8-1
8.2 MECHANICAL ADJUSTMENTS .....	8-2
8.2.1 Mating Arm Adapter Plate to Monitor Arm .....	8-2



## 8.1 Tools and Equipment

---

### 8.1.1 Special Tools

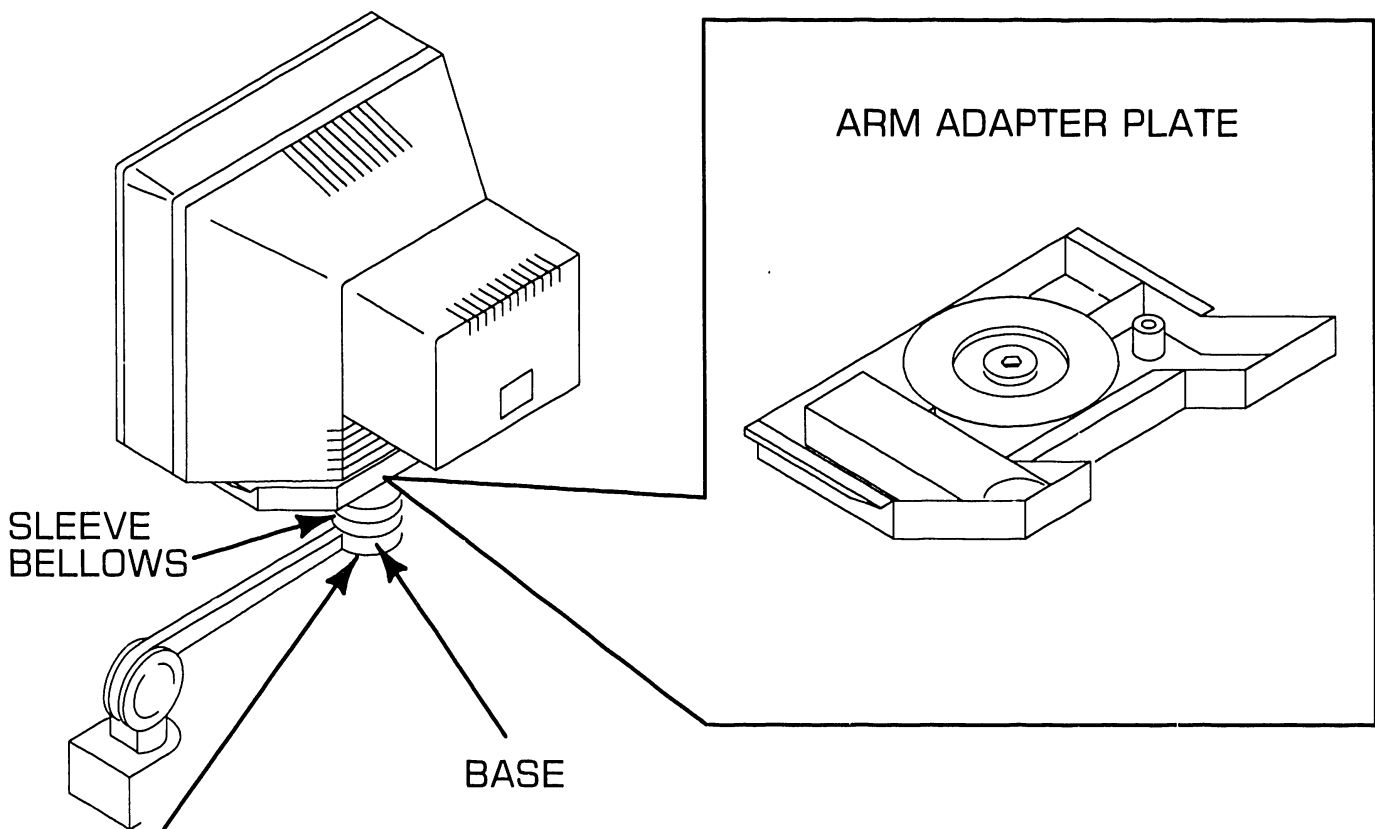
Special equipment or tools are not required to perform adjustments on the PC 280 computer.

# ADJUSTMENTS

## 8.2 Mechanical Adjustments

### 8.2.1 Mating Arm Adapter Plate To Monitor Arm

A simple mechanical adjustment secures the arm adapter plate to the monitor arm. (The arm adapter plate connects the workstation monitor to the monitor arm.)



- 1 Sufficiently tighten locknut on base underneath sleeve bellows.

**SECTION**

**9**

**UNPACKING**

**AND**

**SETUP**

# SECTION 9 CONTENTS

---

## SECTION 9 UNPACKING AND SETUP

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# **9.1 UNPACKING AND SETUP**

## **Tools and Equipment**

---

- Standard CE tool kit, P/N 726-9401
- Digital multimeter
- Customer-runnable diagnostic

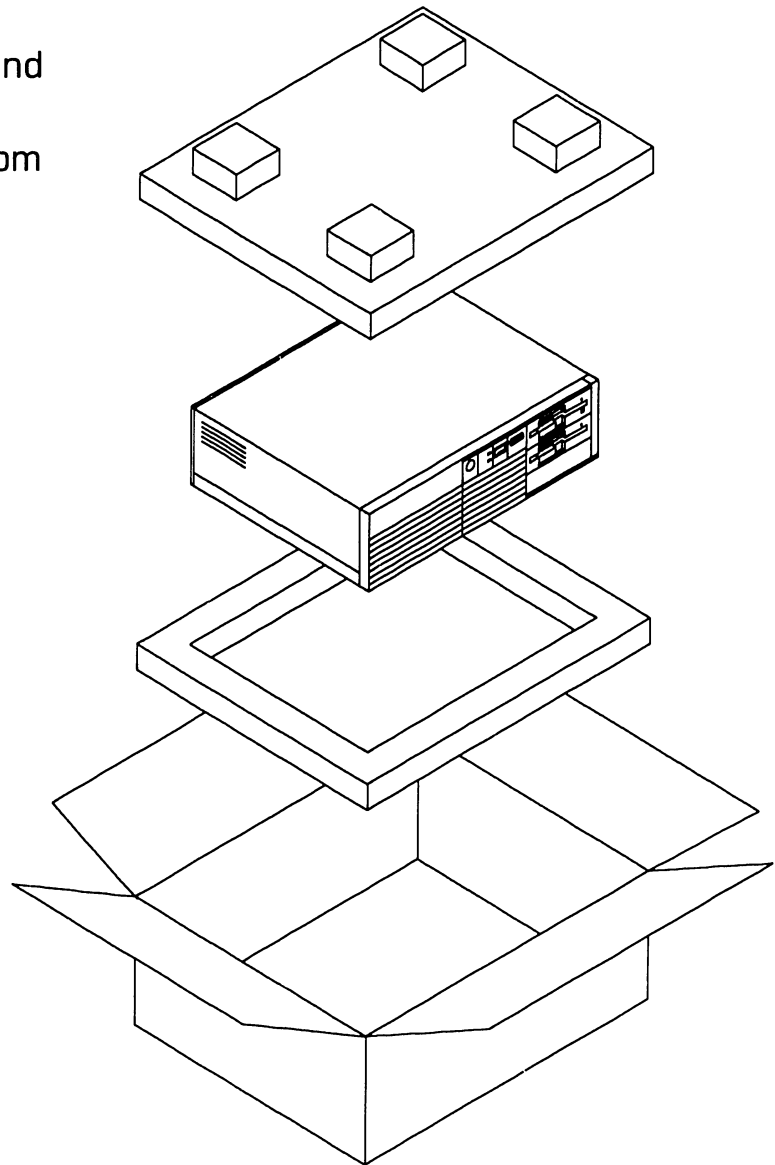
# 9.2 UNPACKING AND SETUP

## 9.2 Unpacking Procedures

---

### 9.2.1 Unpacking and Inspecting Electronics Enclosure

1. Remove electronics enclosure from shipping carton.
2. Inspect unit for external damage.
3. Remove electronics enclosure top/front cover.
4. Inspect for internal damage and loose parts.
5. Remove shipping protector from diskette drives.





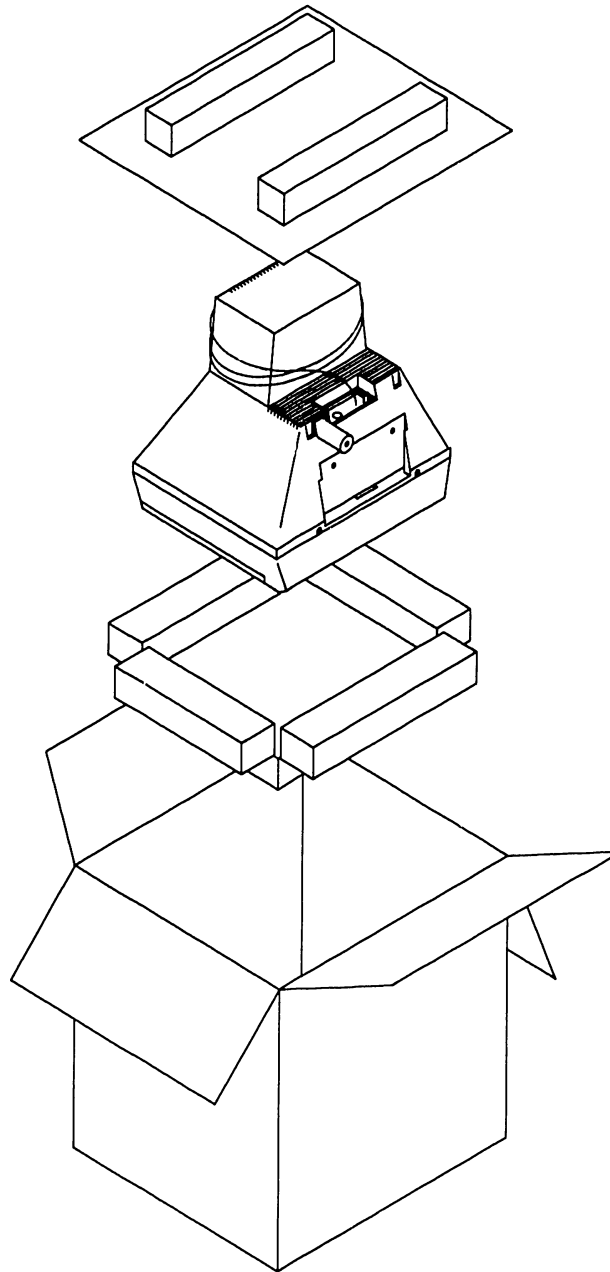
# 9.2 UNPACKING AND SETUP

## 9.2 Unpacking Procedures

---

### 9.2.2 Unpacking Workstation Monitor

1. Remove monitor from shipping carton.
2. Inspect unit for external damage.



# **UNPACKING AND SETUP**

## **9.2 Unpacking Procedures**

---

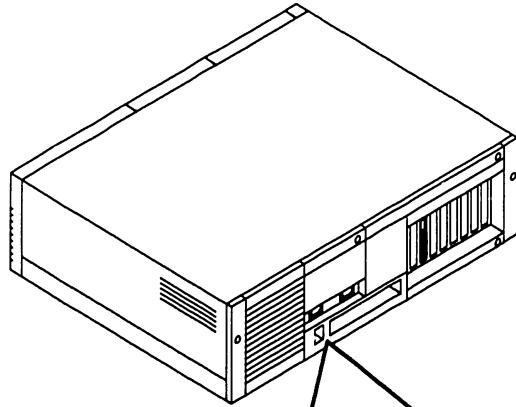
### **9.2.3 Options Overpack Box**

The Options Overpack box can include: Winchester disk and floppy diskette drives, option boards, cabling, and keyboard country kit. (Keyboard country kit contains keyboard, set-up utilities, diagnostics, and literature.)

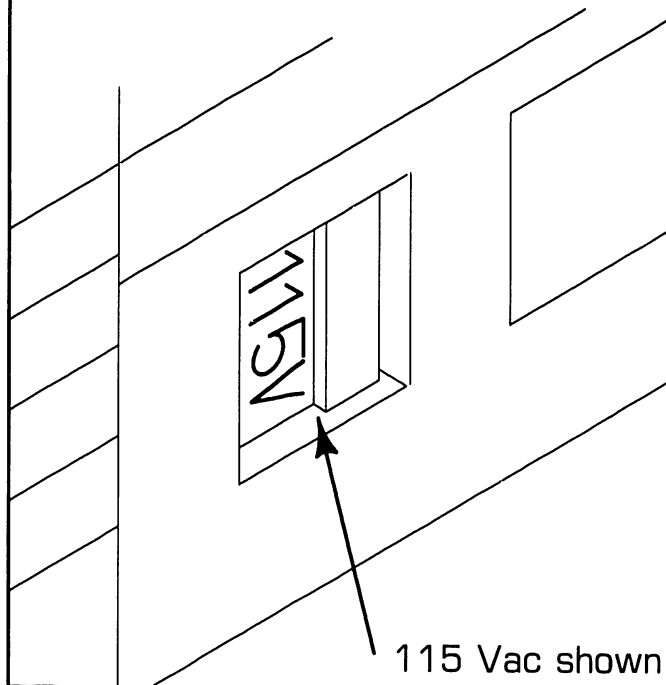
# 9.3 UNPACKING AND SETUP

## 9.3 Switch Settings and Jumpers

### 9.3.1 Electronics Enclosure Line Voltage Select Switch



- 1 Set electronics enclosure voltage selection switch to correct line voltage setting. (115/220 Vac).

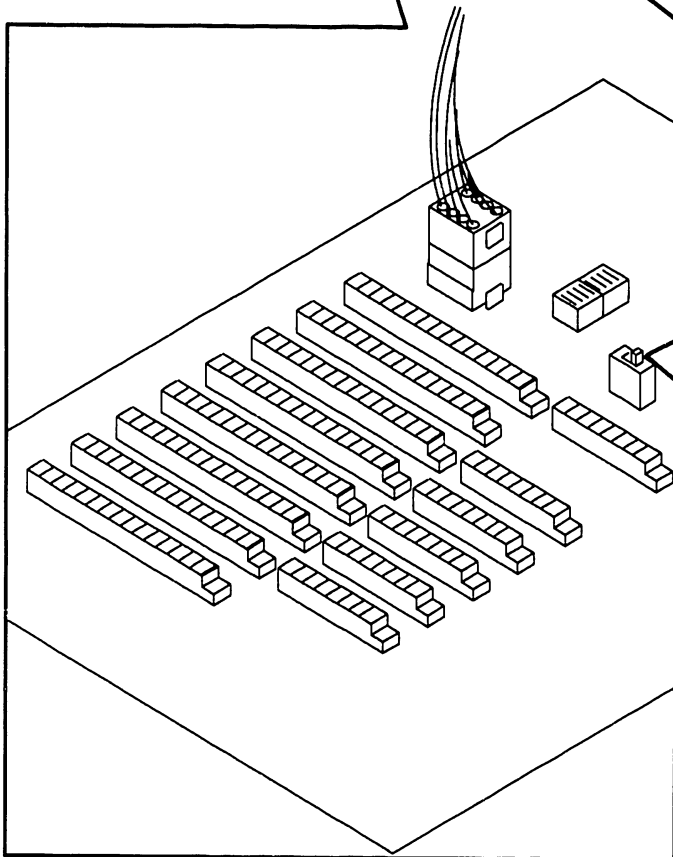
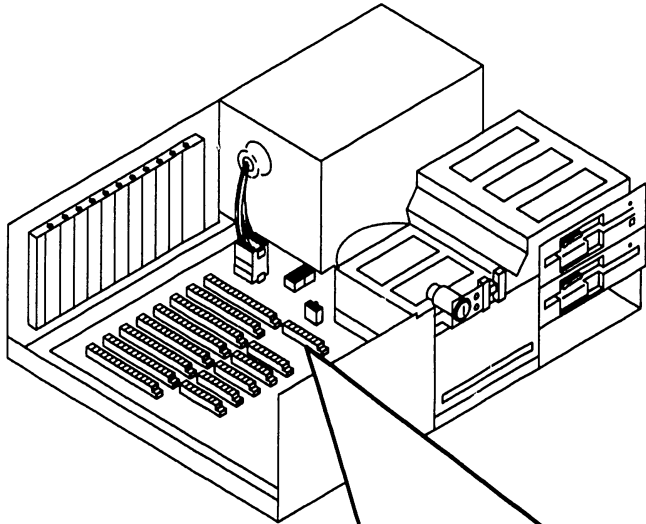


# 9.3 UNPACKING AND SETUP

## 9.3.2 Switch Settings and Jumpers

### 9.3.2 CPU Board: Monitor Adapter Switch



1 Remove top/front cover (► 7.2.2).



#### NOTE

Monitor adapter switch is not used when system is configured with monochrome/color video board.

2 Slide two-position monitor adapter switch to appropriate setting (monochrome or color video operation).

COLOR  MONOCHROME 

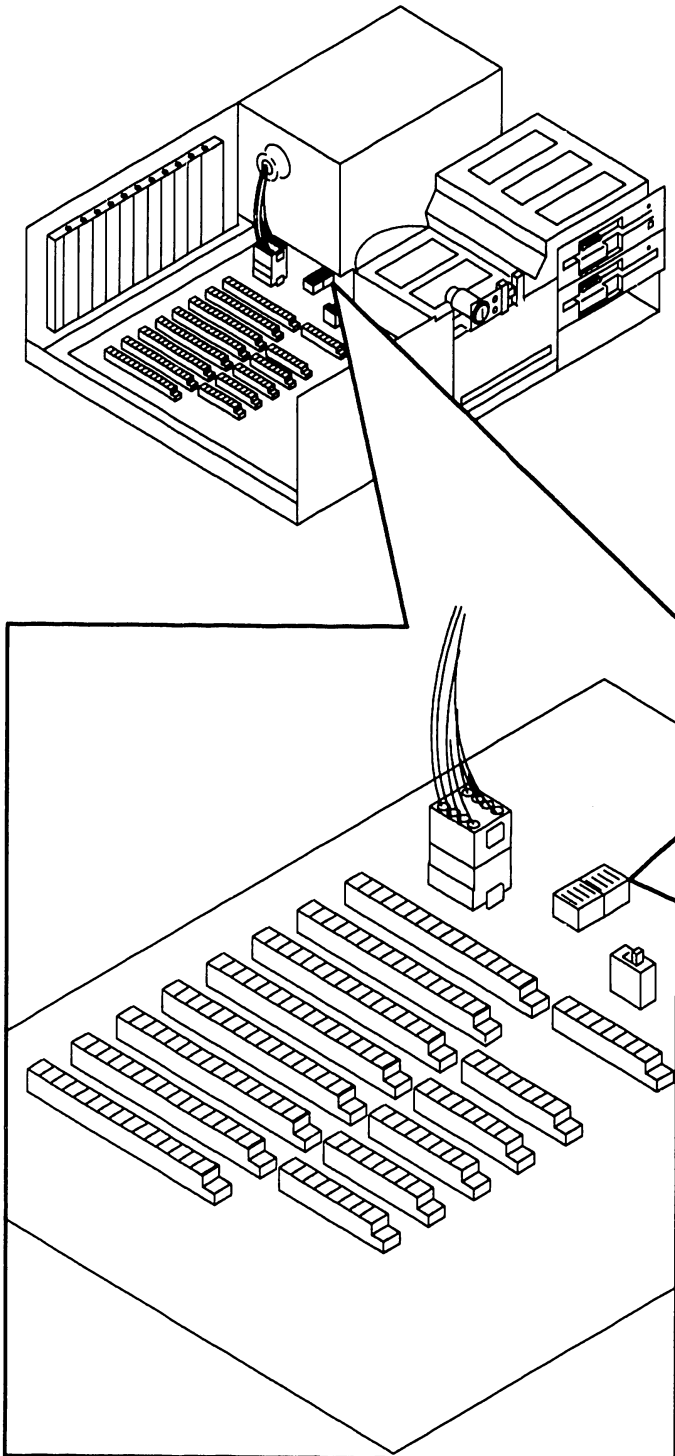
 = SWITCH POSITION

# 9.3 UNPACKING AND SETUP

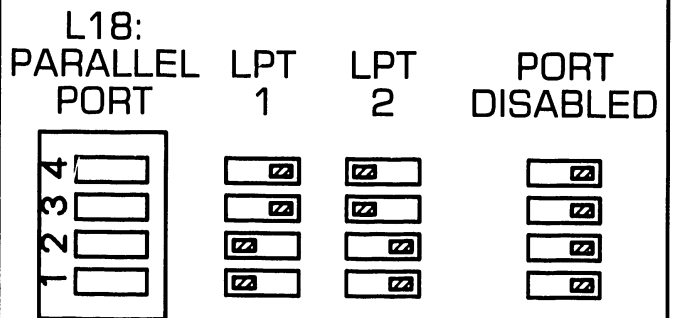
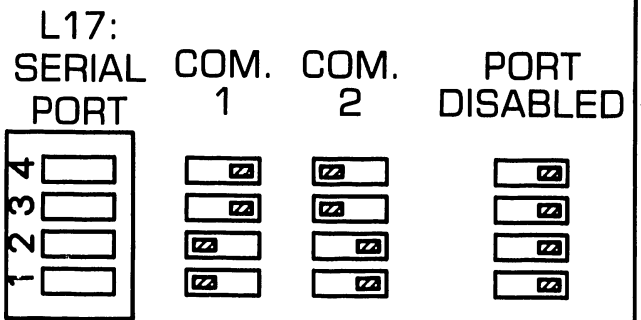
## 9.3.3 Switch Settings and Jumpers

### 9.3.3 CPU Board: Serial and Parallel Port Switch Settings

1 Remove top/front cover (▶ 7.2.2).



2 Verify proper switch settings of L17 and L18 switch banks.



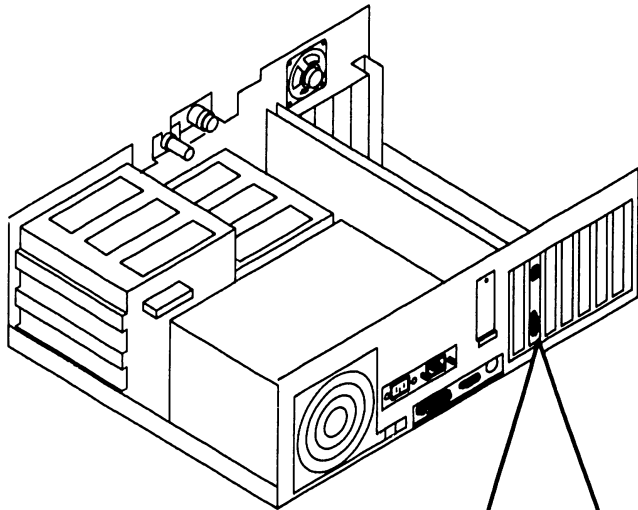
= SWITCH POSITION

# 9.3 UNPACKING AND SETUP

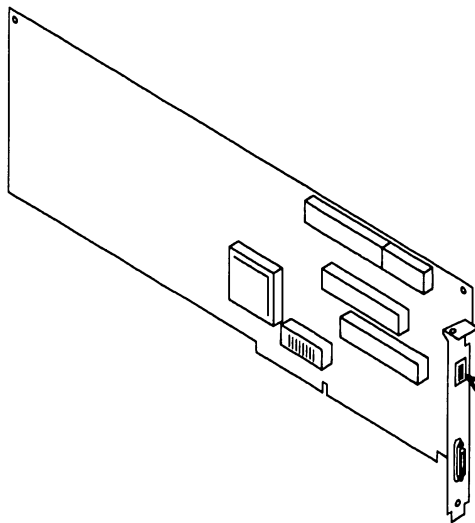
## 9.3 Switch Settings and Jumpers

### 9.3.4 Monochrome/Color Video Board: Switch Settings (Sheet 1 of 2)

1 Remove top/front cover ( ➔ 7.2.2).



2 Remove monochrome/color video board ( ➔ 7.2.3).



3 Verify proper switch settings.

	WANG MONO- CHROME	NON-WANG MONO- CHROME
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	COLOR GRAPHICS ADAPTER (40-COLUMN)	COLOR GRAPHICS ADAPTER (80-COLUMN)
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\* Switch 5 enables/disables Auto-switch feature;

= automatic mode switching feature enabled,

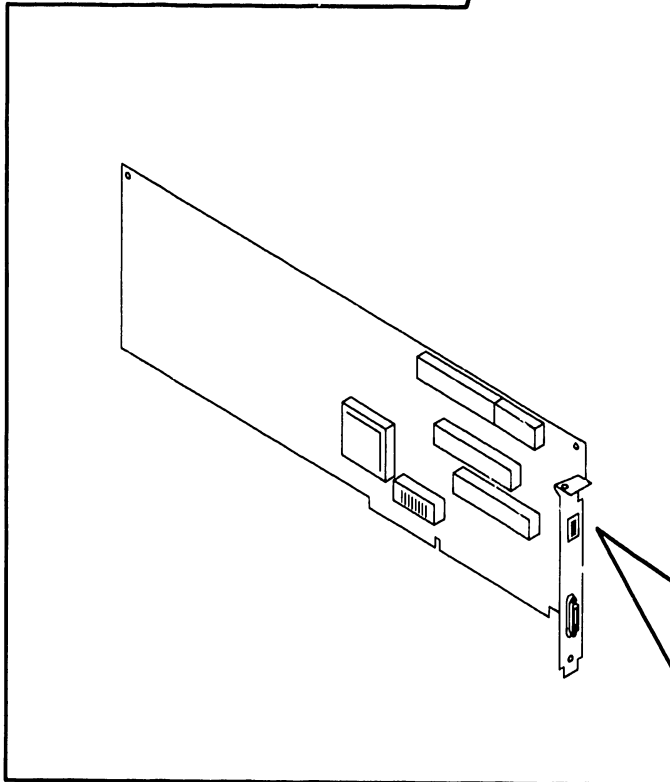
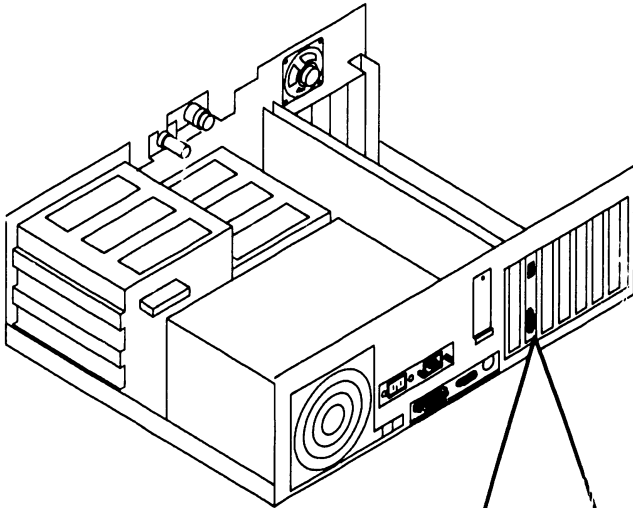
= automatic mode switching feature disabled.

= SWITCH POSITION

# 9.3 UNPACKING AND SETUP

## 9.3 Switch Settings and Jumpers

### 9.3.4 Monochrome/Color Video Board: Switch Settings (Sheet 2 of 2)



	ENHANCED GRAPHICS ADAPTER (200-LINE)	ENHANCED GRAPHICS ADAPTER (350-LINE)
<input type="checkbox"/> 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> 5 *	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> 3	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> 2	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> 1	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>

\* Switch 5 enables/disables Auto-switch feature;

= automatic mode switching feature enabled,

= automatic mode switching feature disabled.

= SWITCH POSITION

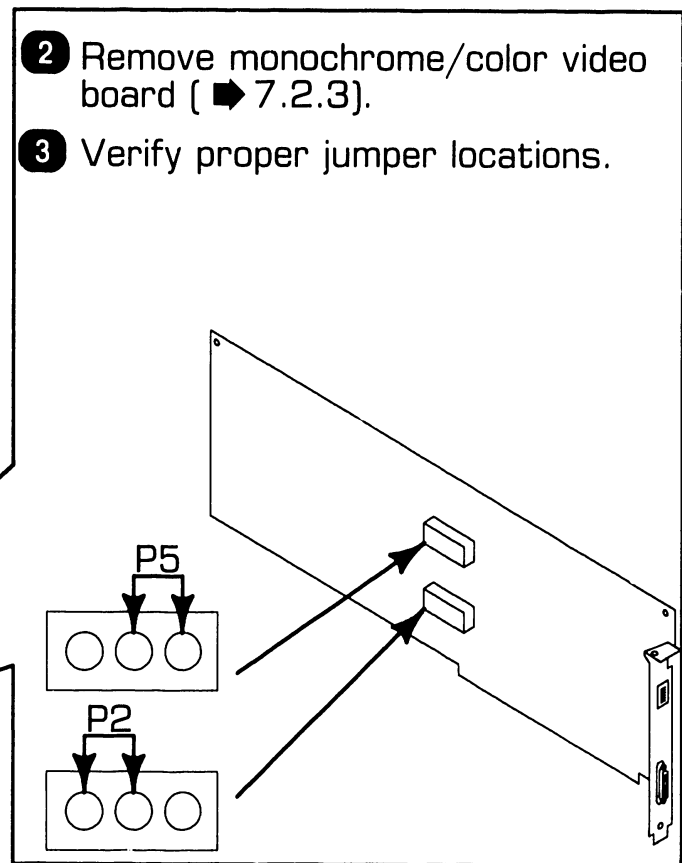
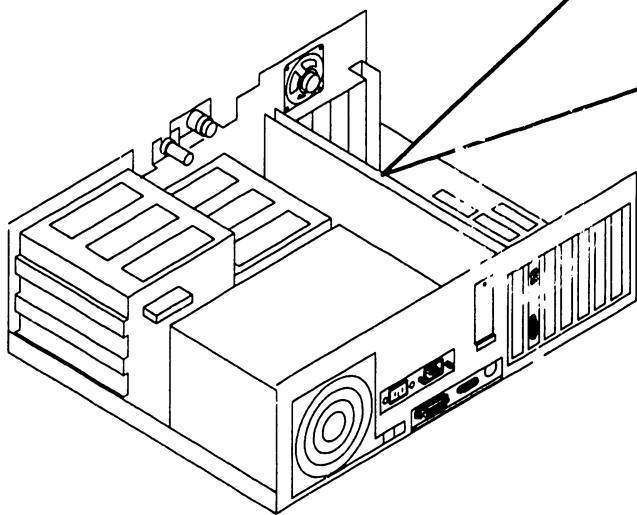
# 9.3 UNPACKING AND SETUP

## 9.3.3 Switch Settings and Jumpers

### 9.3.5 Monochrome/Color Video Board: Jumper Locations

**1** Remove top/front cover ( ➡ 7.2.2).

- 2** Remove monochrome/color video board ( ➡ 7.2.3).
- 3** Verify proper jumper locations.



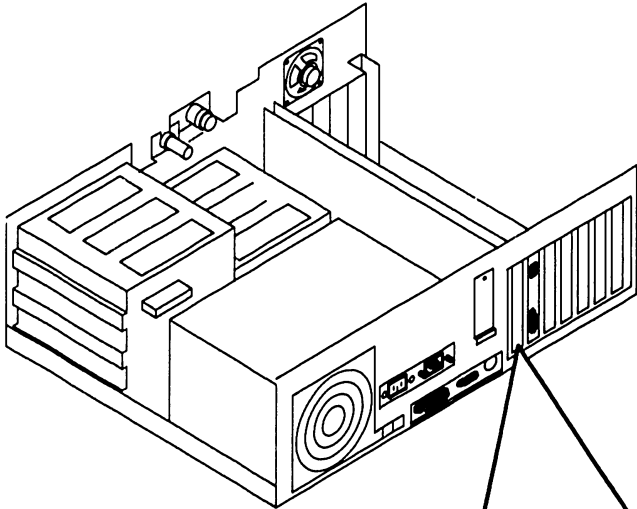


# 9.3 UNPACKING AND SETUP

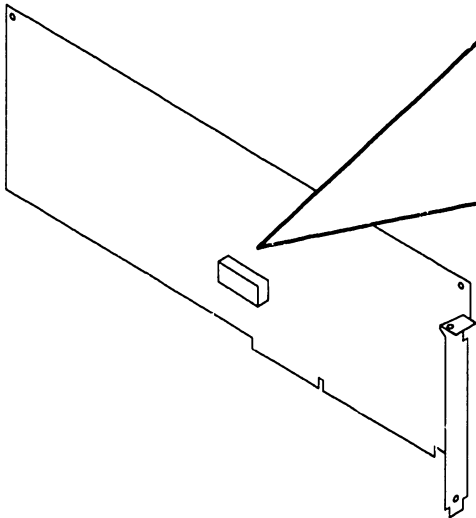
## 9.3 Switch Settings and Jumpers

### 9.3.6 Winchester Disk/Floppy Diskette Controller Board: Switch Settings

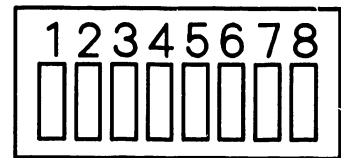
1 Remove top/front cover (▶ 7.2.2).



2 Remove Winchester disk/floppy disk controller board (▶ 7.2.3).



3 Verify proper switch settings.



WINCHESTER  
OR  
FLOPPY



WINCHESTER  
ONLY



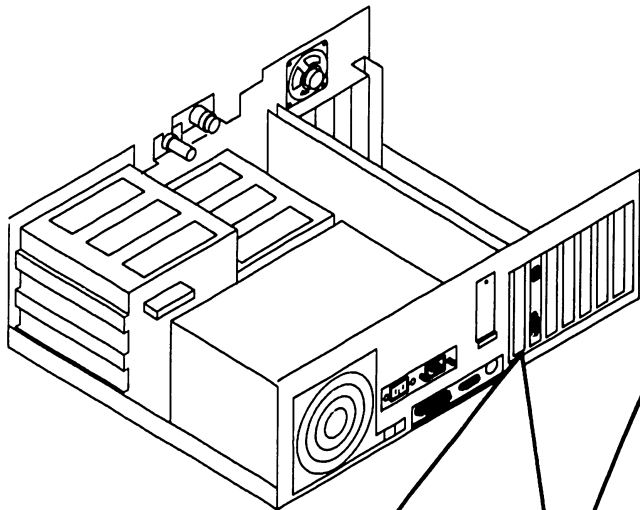
☐ = SWITCH POSITION

# 9.3 UNPACKING AND SETUP

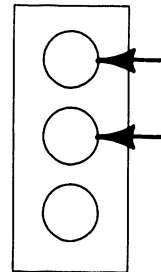
## 9.3 Switch Settings and Jumpers

### 9.3.7 Winchester Disk/Floppy Diskette Controller Board: Jumper Locations

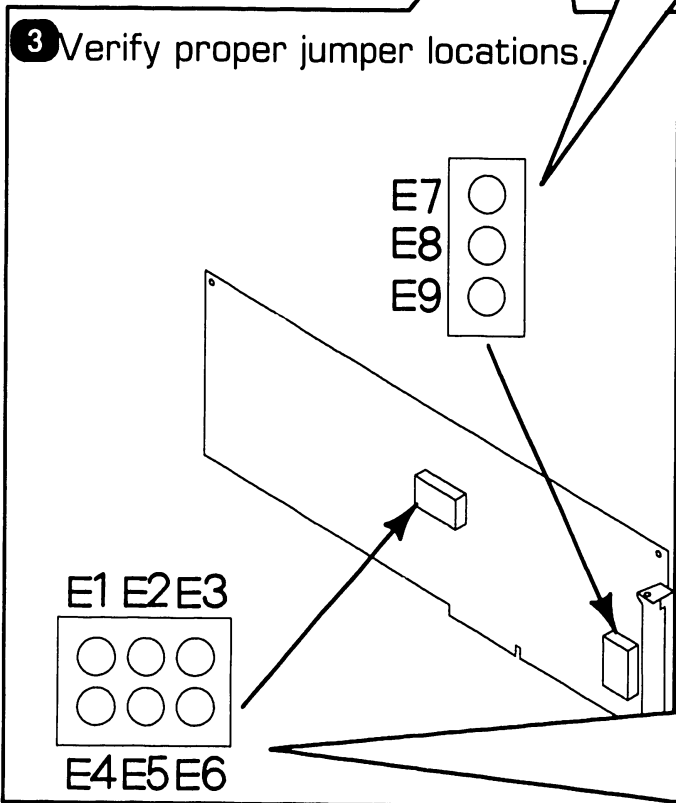
- 1 Remove top/front cover ( ➡ 7.2.2).
- 2 Remove Winchester disk/  
floppy diskette controller board  
( ➡ 7.2.3).



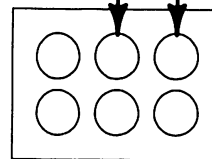
DRIVE-TYPE JUMPER;  
WANG AND IBM COMPATIBLE  
FLOPPY DRIVES (E7-E8)



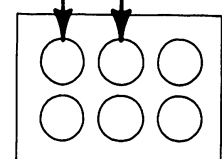
- 3 Verify proper jumper locations.



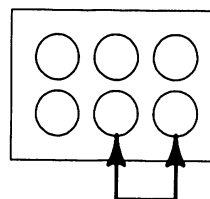
FLOPPY  
DRIVE  
PRIMARY  
ADDRESS  
(E2-E3)



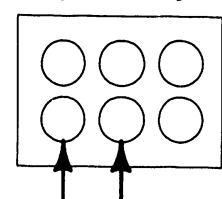
FLOPPY  
DRIVE  
SECONDARY  
ADDRESS  
(E1-E2)



WINCHESTER  
DRIVE  
PRIMARY  
ADDRESS  
(E5-E6)



WINCHESTER  
DRIVE  
SECONDARY  
ADDRESS  
(E4-E5)

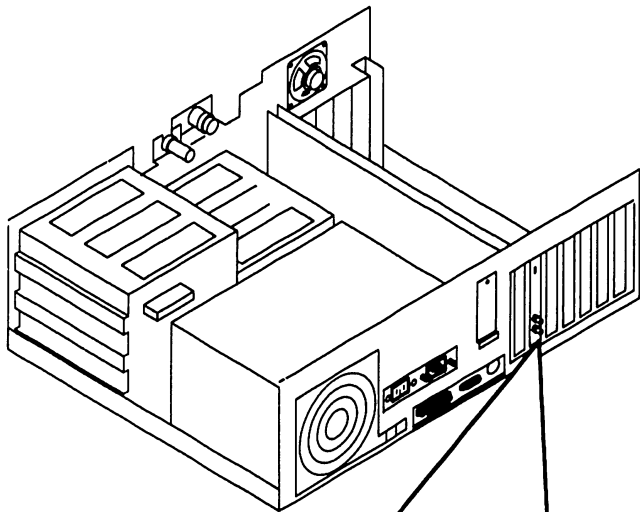


# 9.3 UNPACKING AND SETUP

## 9.3 Switch Settings and Jumpers

### 9.3.8 Wang Local Office Connection (WLOC) Board: Switch Settings

1 Remove top/front cover (➔ 7.2.2).



3 Verify SW1 (address) settings.

SW1  
(ADDRESS)

10	9	8	7	6	5	4	3	2	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

342 (HEX.)-  
DEFAULT

322 (HEX.)

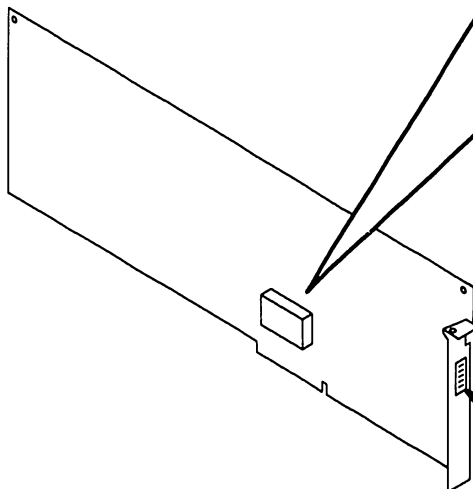
2A2 (HEX.)

282 (HEX.)

242 (HEX.)

222 (HEX.)

2 Remove WLOC board (➔ 7.2.3).



4 Verify SW2 (Prom Enable) settings.

SW2  
(PROM ENABLE)

<input checked="" type="checkbox"/>	5
<input checked="" type="checkbox"/>	4
<input checked="" type="checkbox"/>	3
<input checked="" type="checkbox"/>	2
<input checked="" type="checkbox"/>	1

= SWITCH POSITION

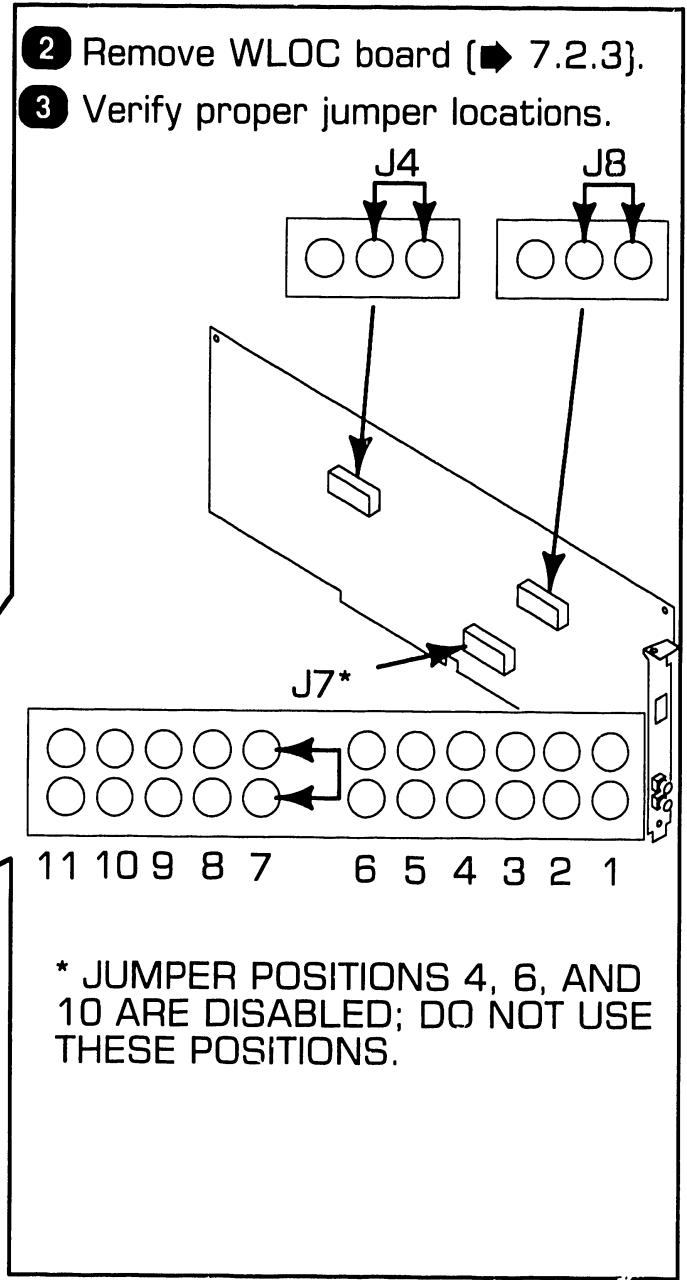
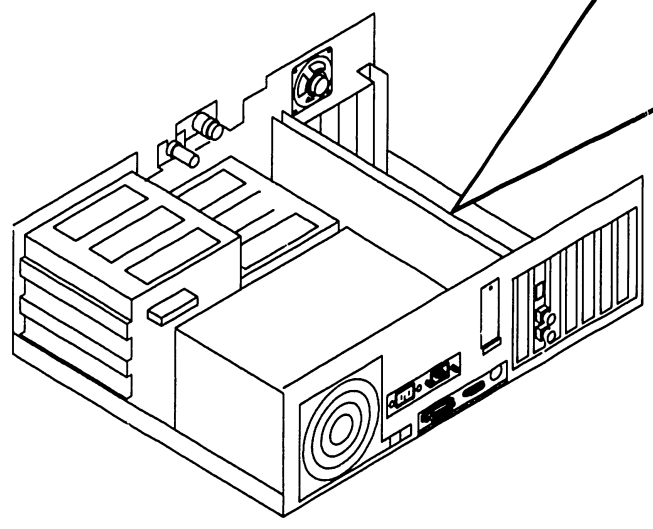
# 9.3 UNPACKING AND SETUP

## 9.3.3 Switch Settings and Jumpers

### 9.3.9 Wang Local Office Connection Board: Jumper Locations

1 Remove top/front cover (➡ 7.2.2).

2 Remove WLOC board (➡ 7.2.3).  
3 Verify proper jumper locations.



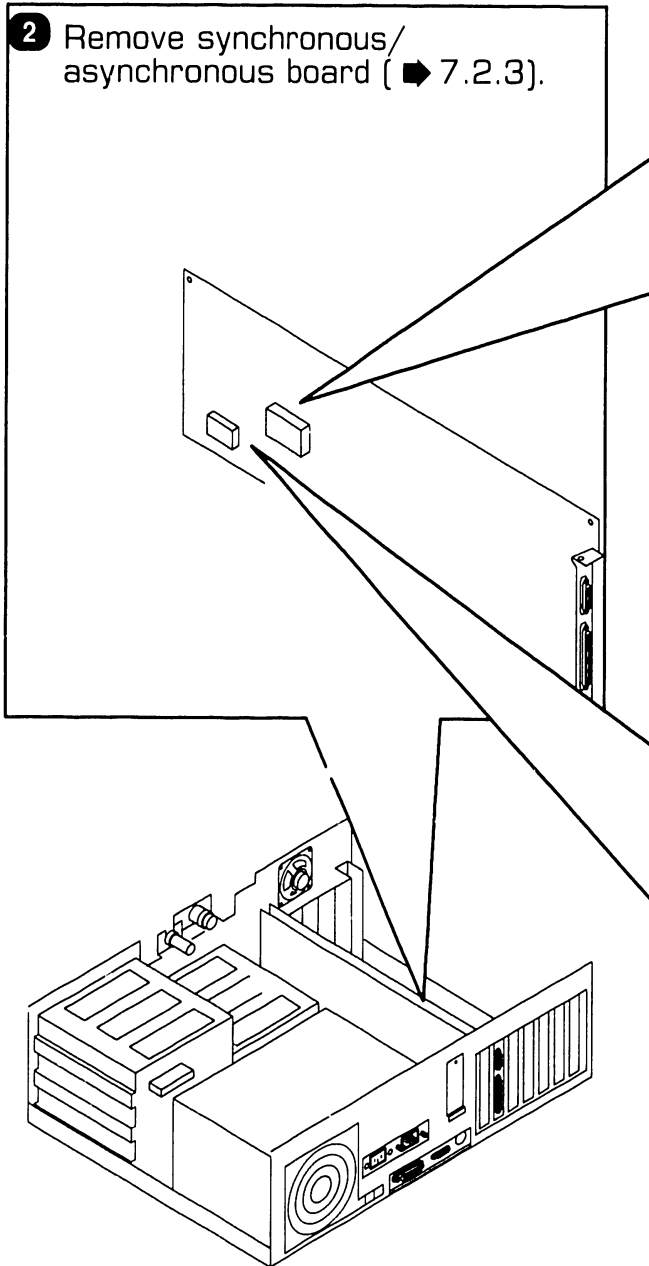
# 9.3 UNPACKING AND SETUP

## 9.3 Switch Settings and Jumpers

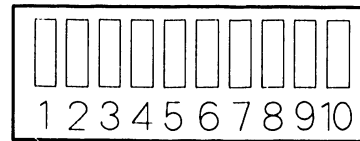
### 9.3.10 Synchronous/Asynchronous Communications Board: Switch Settings

1 Remove top/front cover ( ➡ 7.2.2).

2 Remove synchronous/asynchronous board ( ➡ 7.2.3).



3 Verify SW1 settings.  
SW1 (SYNC/ASYNC SERIAL PORT ADDRESS)

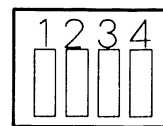


<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	340 (HEX.)- DEFAULT
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	320 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2A0 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	280 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	240 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	220 (HEX.)

= SWITCH POSITION

4 Verify SW1A settings.

SW1A(SERIAL PORT, ADDRESS/  
INTERRUPT LEVEL)



<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	COM. PORT 1*
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	COM. PORT 2*

\*PORT CAN BE DISABLED BY  
SETTING SWITCH 10 ON BANK  
SW1 TO  POSITION.



# 9.3 UNPACKING AND SETUP

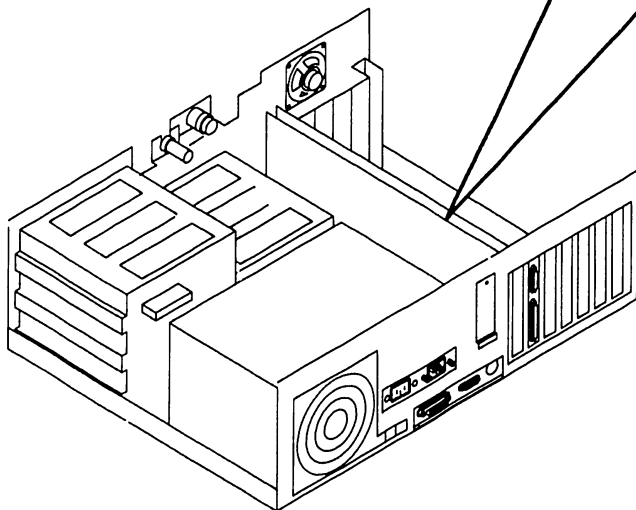
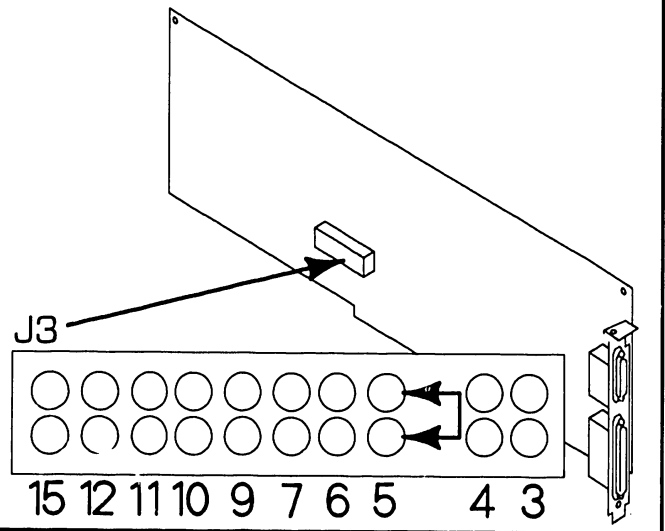
## 9.3 Switch Settings and Jumpers

### 9.3.11 Synchronous/Asynchronous Communications Board: Jumper Locations

1 Remove top/front cover ( ▶ 7.2.2).

2 Remove synchronous/asynchronous board. ( ▶ 7.2.3).

3 Verify proper jumper location.



# 9.3 UNPACKING AND SETUP

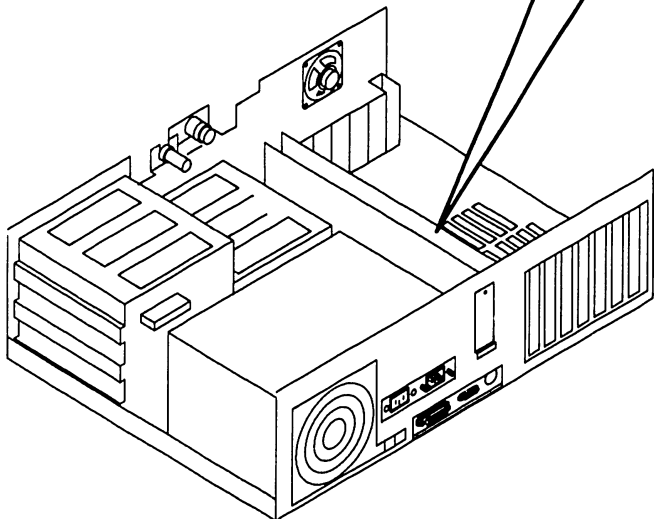
## 9.3.12 Switch Settings and Jumpers

### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 1 of 7)

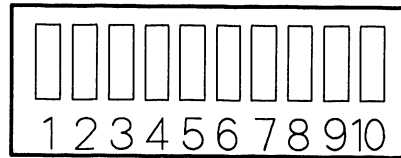
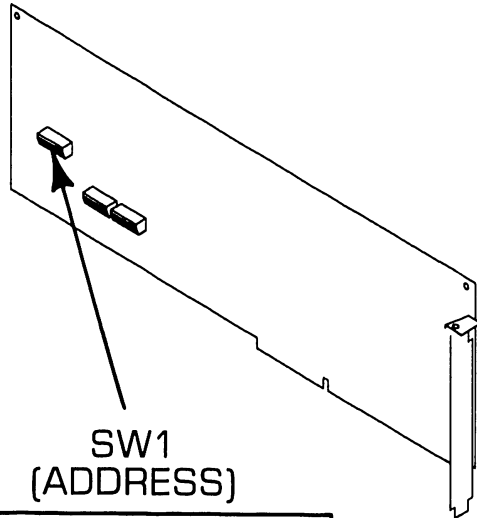
*NOTE*

An Expanded Memory Card Installation Assistant program is available to help set switches on expanded memory board(s). Insert diskette into floppy drive "A" and type "ASSIST" after "A >" appears on screen. Press "RETURN" and follow prompts.

- 1 Remove top/front cover (➔ 7.2.2).



- 2 Remove expanded memory board (➔ 7.2.3).
- 3 Verify proper switch settings.



<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	344 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	324 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2A4 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	284 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	244 (HEX.)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	224 (HEX.)

☒ = SWITCH POSITION

# 9.3 UNPACKING AND SETUP

## 9.3.12 Switch Settings and Jumpers

### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 2 of 7)

1 Remove top/front cover (➡ 7.2.2).

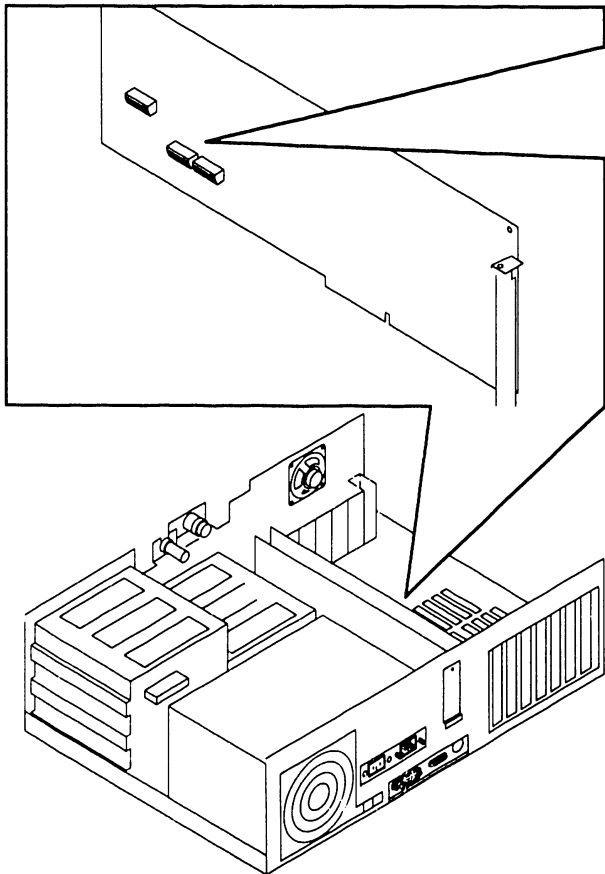
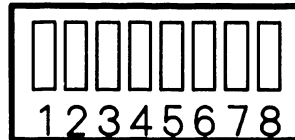
#### NOTE

SW2 specifies amount of direct (non-paged) memory already residing in system before expanded memory board is installed. Setting switch specifies that a certain amount of memory has already been installed. These values are: SW1 = 8192KB, SW2 = 4096KB, SW3 = 2048KB, SW4 = 1024KB, SW5 = 512KB, SW6 = 256KB, SW7 = 128KB, SW8 = parity enable/disable.

2 Remove expanded memory board (➡ 7.2.3).

3 Verify proper switch settings (➡ 9.3.12 sheets 3, 4 & 5).

SW2 (EXISTING MEMORY)



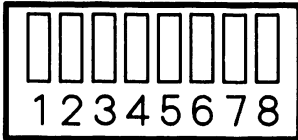


# 9.3 UNPACKING AND SETUP

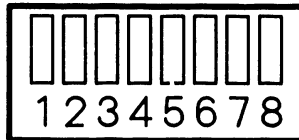
## 9.3.12 Switch Settings and Jumpers

### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 3 of 7)

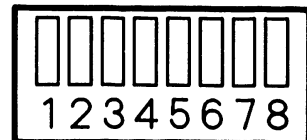
SW2 (EXISTING MEMORY)



SW2 (EXISTING MEMORY)



SW2 (EXISTING MEMORY)



0KB		2048KB		3968KB	
128KB		2176KB		4096KB	
256KB		2304KB		4224KB	
384KB		2432KB		4352KB	
512KB		2560KB		4480KB	
640KB		2688KB		4608KB	
768KB		2816KB		4736KB	
896KB		2994KB		4864KB	
1024KB		3072KB		4992KB	
1152KB		3200KB		5120KB	
1280KB		3328KB		5248KB	
1408KB		3456KB		5376KB	
1536KB		3584KB		5504KB	
1664KB		3712KB		5632KB	
1792KB		3840KB		5760KB	
1920KB					

= switch position

# 9.3 UNPACKING AND SETUP

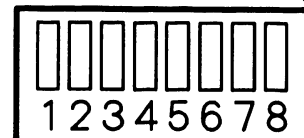
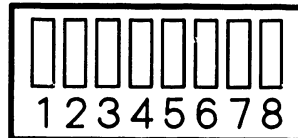
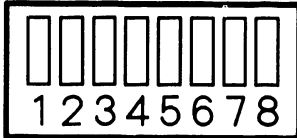
## 9.3 Switch Settings and Jumpers

### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 4 of 7)

SW2 (EXISTING MEMORY)

SW2 (EXISTING MEMORY)

SW2 (EXISTING MEMORY)



5888KB		7808KB		9728KB	
6016KB		7936KB		9856KB	
6144KB		8064KB		9984KB	
6272KB		8192KB		10112KB	
6400KB		8320KB		10240KB	
6528KB		8448KB		10368KB	
6656KB		8576KB		10496KB	
6784KB		8704KB		10624KB	
6912KB		8832KB		10752KB	
7040KB		8960KB		10880KB	
7168KB		9088KB		11008KB	
7296KB		9216KB		11136KB	
7424KB		9344KB		11264KB	
7552KB		9472KB		11392KB	
7680KB		9600KB		11520KB	

= switch position

# 9.3 UNPACKING AND SETUP

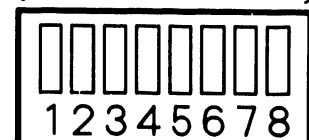
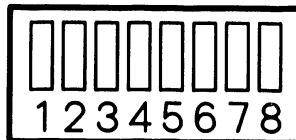
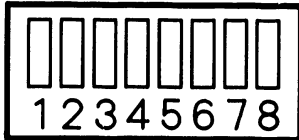
## 9.3 Switch Settings and Jumpers

### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 5 of 7)

SW2 (EXISTING MEMORY)

SW2 (EXISTING MEMORY)

SW2 (EXISTING MEMORY)



11648KB		13568KB		15488KB	
11776KB		13696KB		15616KB	
11904KB		13824KB		15744KB	
12032KB		13952KB		15872KB	
12160KB		14080KB			
12288KB		14208KB			
12416KB		14366KB			
12544KB		14464KB			
12672KB		14592KB			
12800KB		14720KB			
12928KB		14848KB			
13056KB		14976KB			
13184KB		15104KB			
13312KB		15232KB			
13340KB		15360KB			

☐ = switch position

# 9.3 UNPACKING AND SETUP

## 9.3.12 Switch Settings and Jumpers

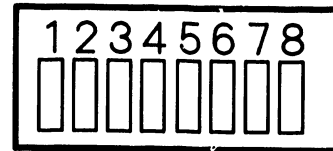
### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 6 of 7)

1 Remove top/front cover (▶ 7.2.2).

2 Remove expanded memory board (▶ 7.2.3).

3 Verify proper switch settings (▶ 9.3.12 sheet 7).

SW3 (MEMORY ALLOCATION)



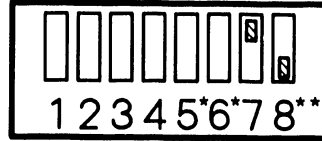
□ = switch position

# 9.3 UNPACKING AND SETUP

## 9.3.12 Switch Settings and Jumpers

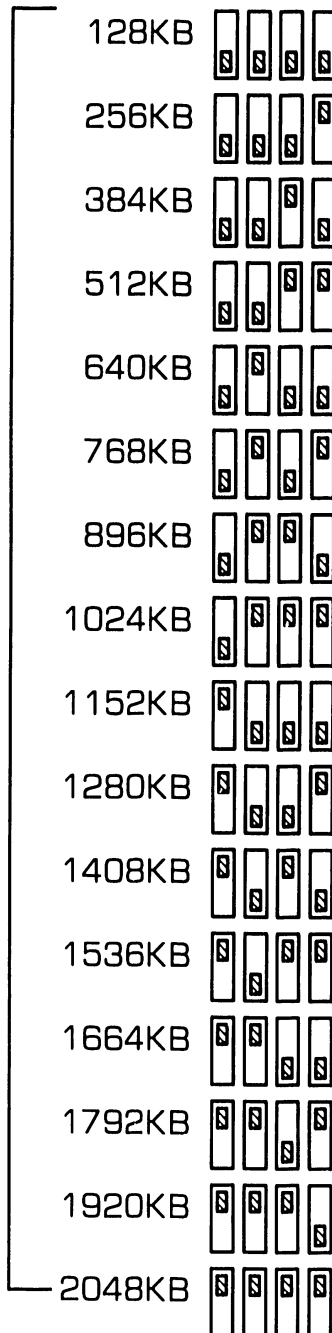
### 9.3.12 Expanded Memory Board: Switch Settings (Sheet 7 of 7)

SW3(MEMORY ALLOCATION)



DIRECT  
MEMORY  
(NON-  
PAGED)  
ALLOCATION  
(SW3-1  
THROUGH  
SW3-4)\*\*\*

\*\*\*SW3-1 through SW3-4 define amount of memory allocated as direct(non-paged) memory.



\*SWITCHES 5 AND 6 NOT USED; SET TO

\*\*SW3-8 ENABLES/DISABLES CPU DIRECT MODE ADDRESSING OF MEMORY ON EXPANDED MEMORY BOARD. DEFAULT SETTING IS ; TO OVERRIDE

SW3-1 THROUGH SW3-4, SW3-8 IS SET

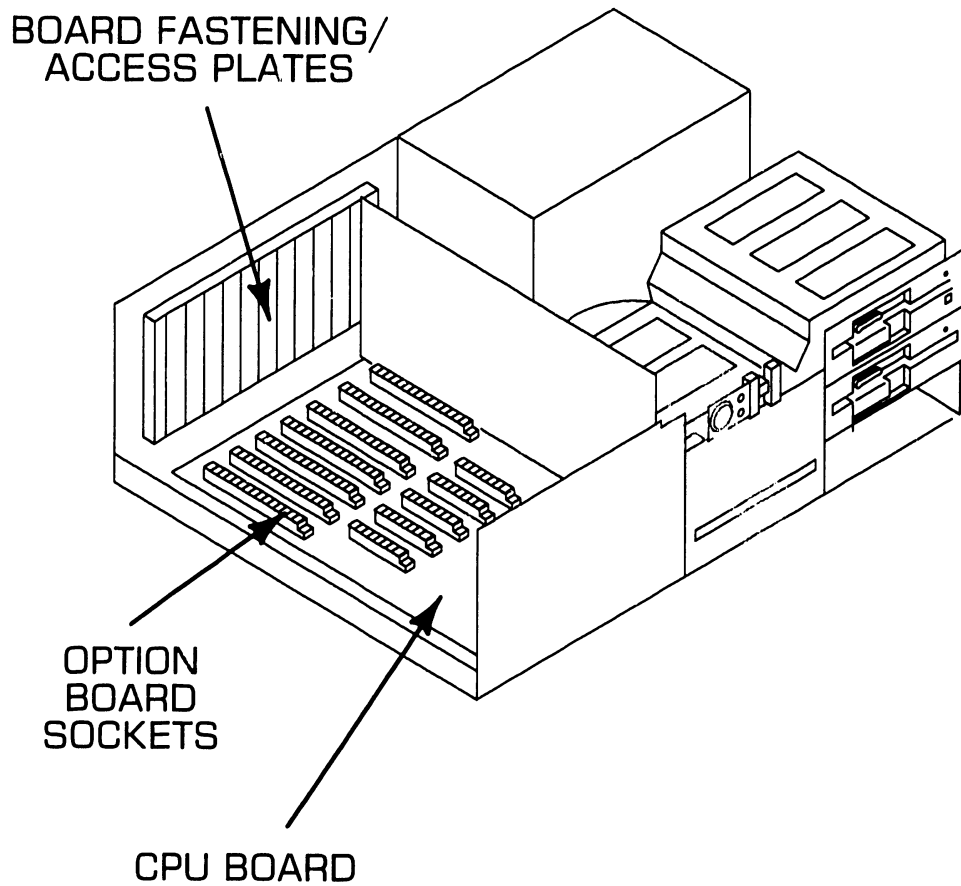
= switch position

# 9.4 UNPACKING AND SETUP

## 9.4 Connections

---

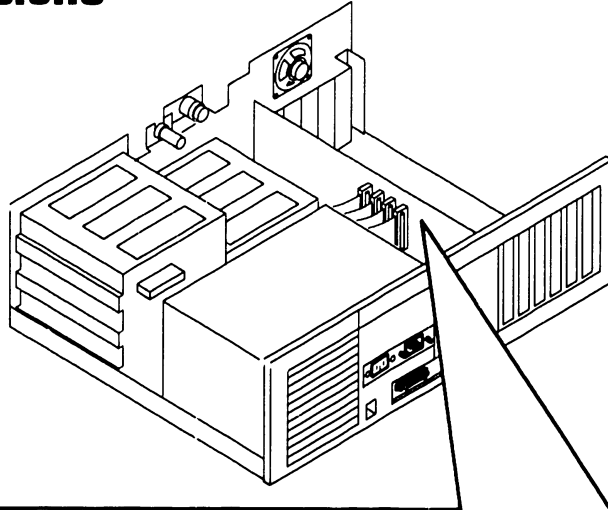
### 9.4.1 Electronics Enclosure: Board Locations



# 9.4 UNPACKING AND SETUP

## 9.4 Connections

### 9.4.2 Winchester Disk/Floppy Diskette Cabling Connections



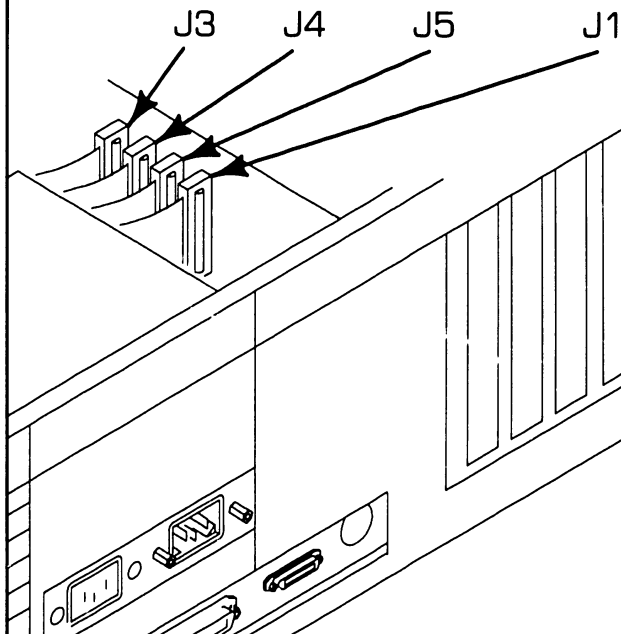
WINCHESTER/FLOPPY DISK  
CONTROLLER BOARD CABLING  
CONNECTIONS:

J1-FLOPPY DATA CABLES  
CONNECTOR

J3-DRIVE "D" CONNECTOR

J4-DRIVE "C" CONNECTOR

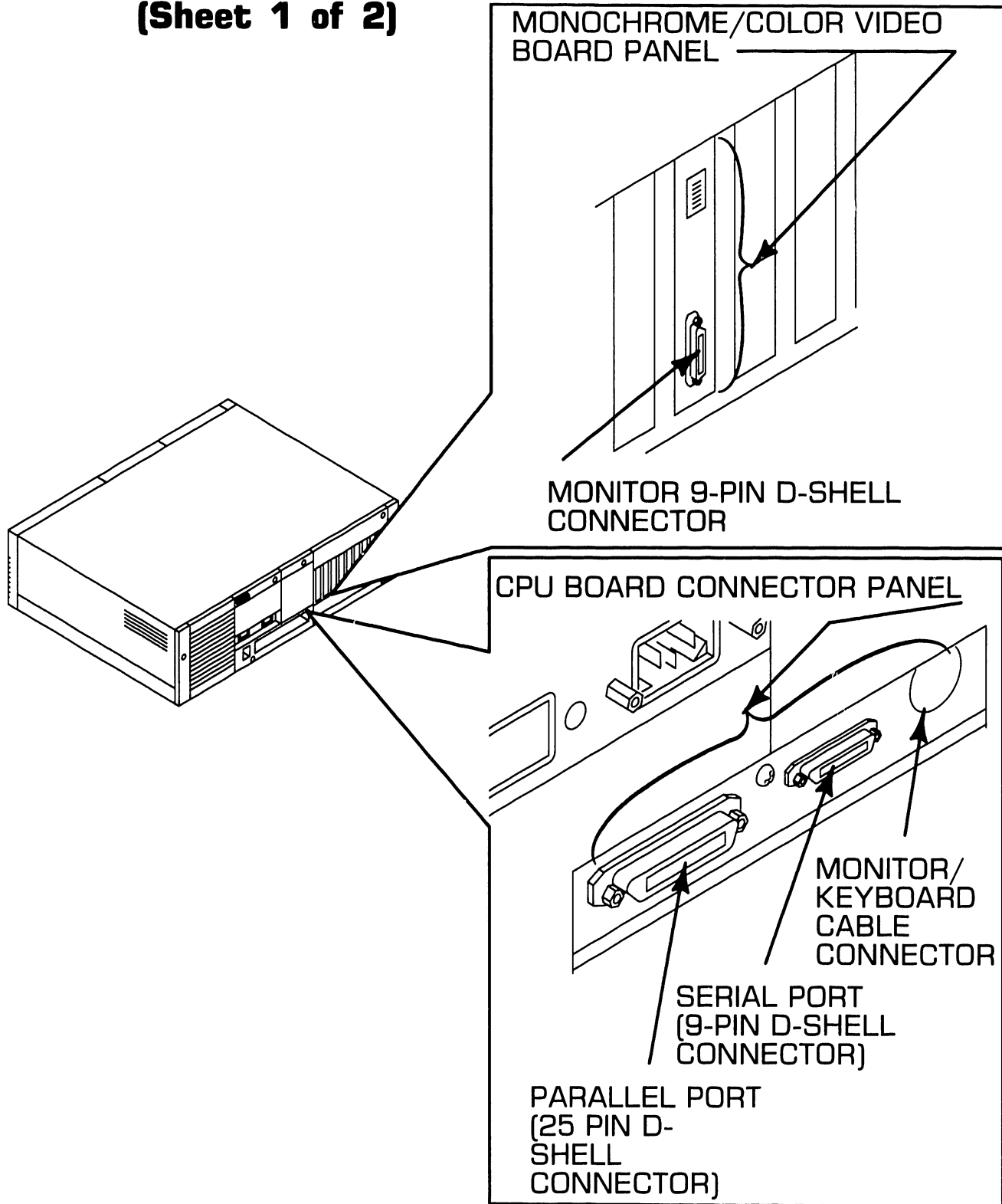
J5-WINCHESTER DATA CABLES  
CONNECTOR (DRIVES "C" AND "D")



# 9.4 UNPACKING AND SETUP

## 9.4 Connections

### 9.4.3 Electronics Enclosure: I/O Connections (Sheet 1 of 2)

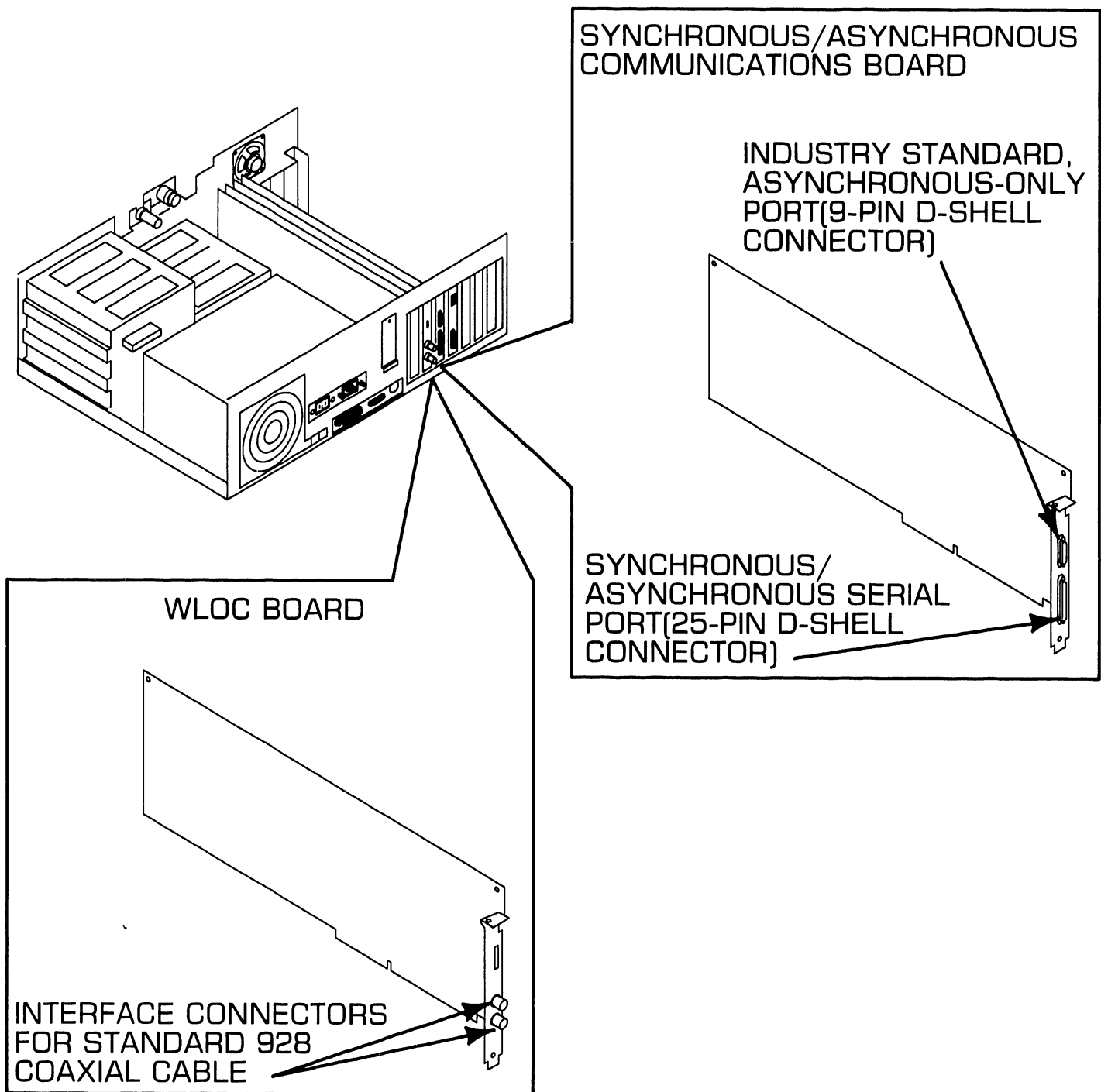




# 9.4 UNPACKING AND SETUP

## 9.4 Connections

### 9.4.3 Electronics Enclosure: I/O Connections (Sheet 2 of 2)

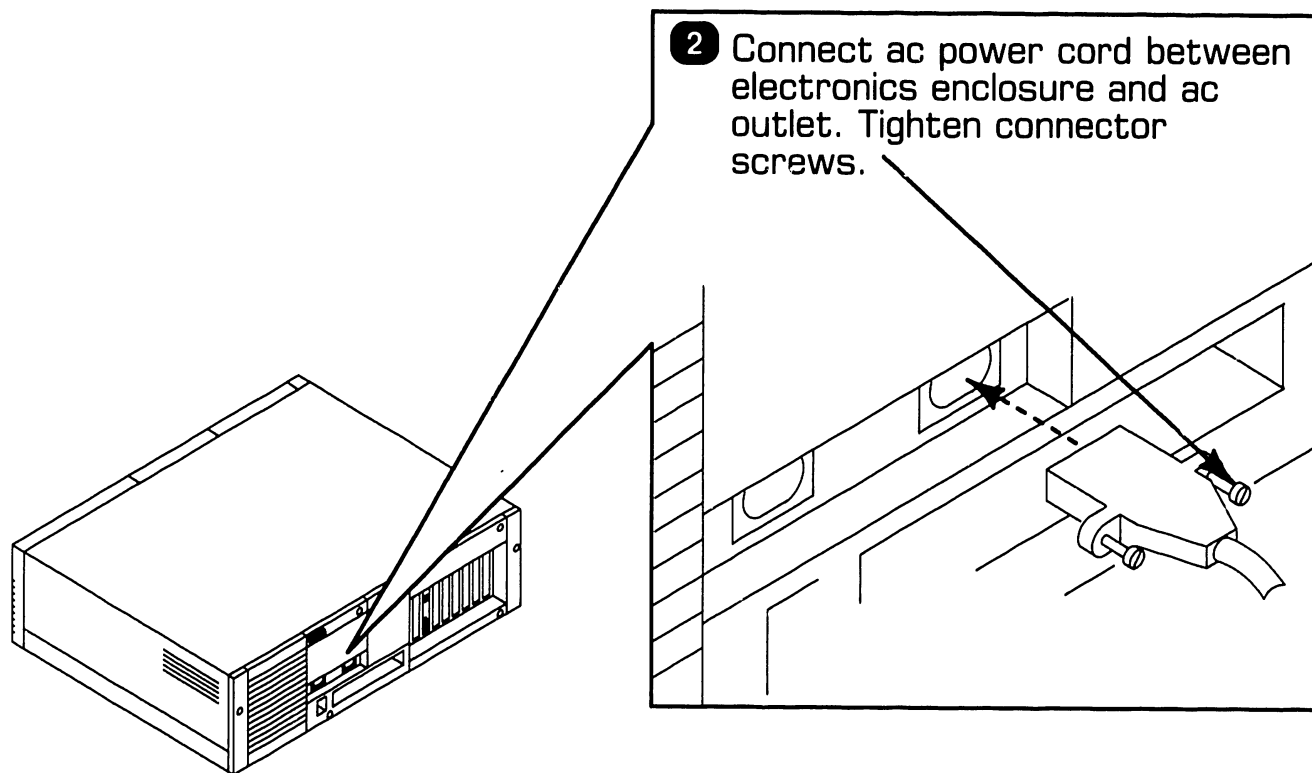


# 9.4 UNPACKING AND SETUP

## 9.4 Connections

### 9.4.4 Electronics Enclosure: AC Power Connection

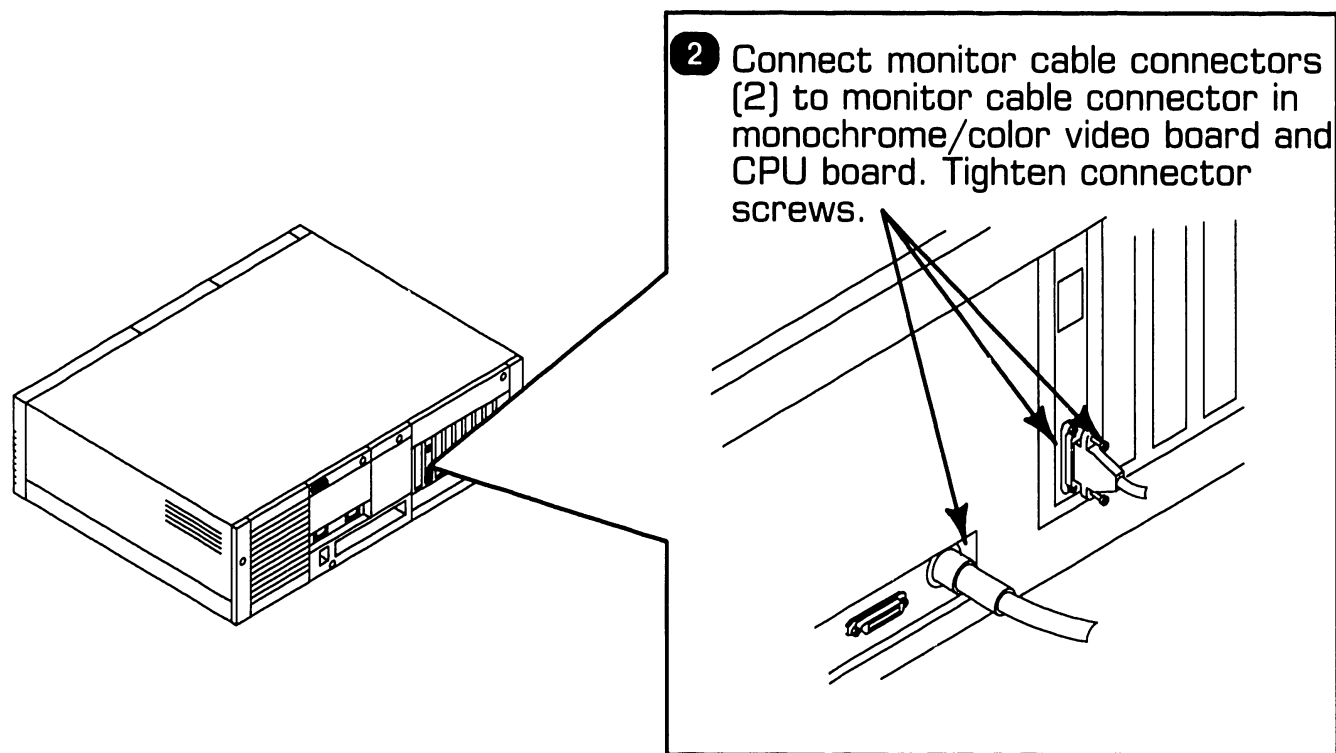
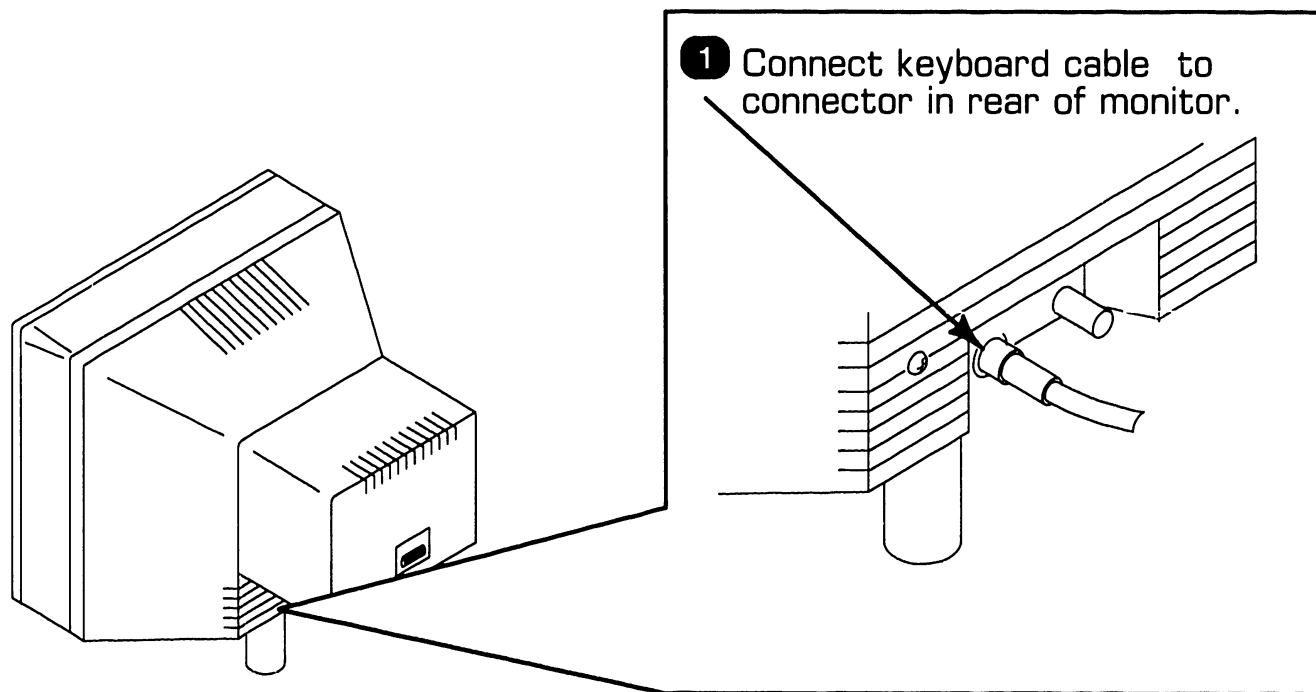
- 1 Set voltage selection switch to proper line voltage ( ▶9.3.1).



# 9.4 UNPACKING AND SETUP

## 9.4 Connections

### 9.4.5 Monochrome Monitor Connections



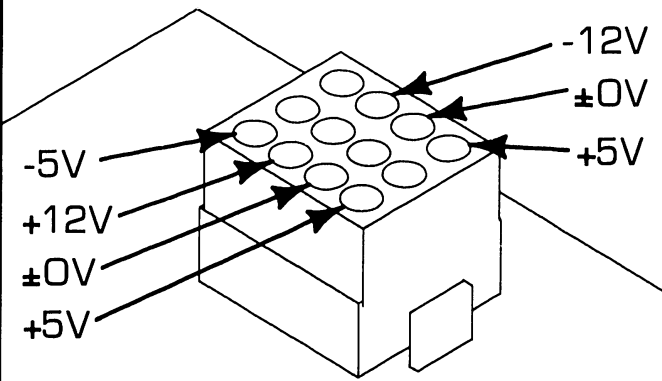
# 9.5 UNPACKING AND SETUP

## 9.5 Voltage Checks

### 9.5.1 CPU Board: DC Voltage and Ripple Checks

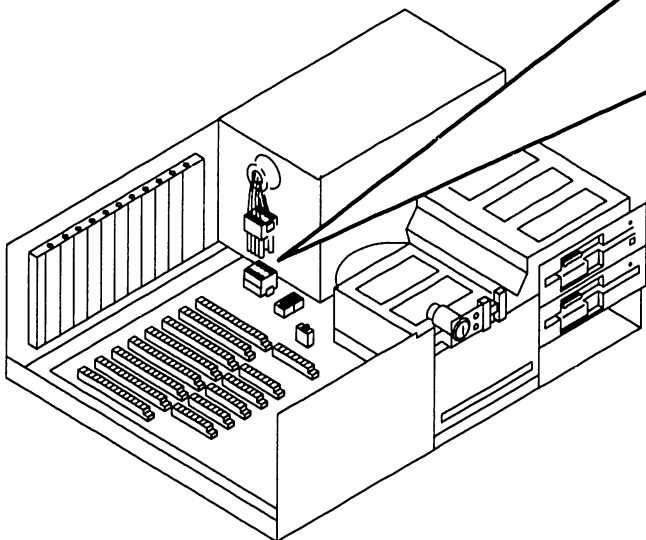
- 1 Remove top/front cover (► 7.2.2).
- 2 Set electronics enclosure power-on/off button to ON position(► 3.1.1).

**J21 CONNECTOR TEST POINTS**



- 3 Connect common lead of DVM to  $\pm 0V$  test point on CPU board J21 connector.
- 4 Connect positive lead of DVM to -5V, -12V, +12V, +5V test points on J21 connector and verify dc voltage limits.

Test Point Voltage	Limits(Vdc)
-5V	-4.75 -5.25
-12V	-11.4 -12.6
+12V	+11.4 +12.6
+5V	+4.75 +5.25

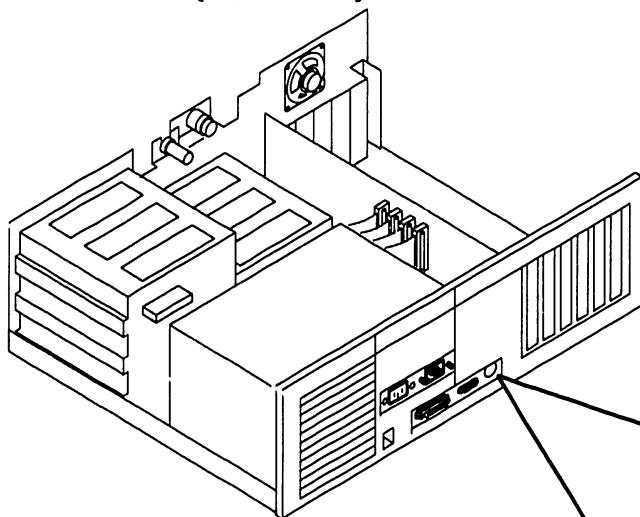


# 9.5 UNPACKING AND SETUP

## 9.5 Voltage Checks

### 9.5.2 CPU Board Rear Panel: Monitor and Keyboard DC Voltage and Ripple Checks

- 1 Remove top/front cover ( ➡ 7.2.2).
- 2 Set electronics enclosure power-on/off button to ON position( ➡ 3.1.1).
- 3 Connect common lead of DVM to  $\pm 0V$  test point on CPU board J21 connector( ➡ 9.5.1).



J3 CONNECTOR ON CPU BOARD.

A detailed diagram of the J3 connector, which is a circular multi-pin connector. Two specific pins are highlighted with arrows and labeled: one as +12V and another as +5V. A third arrow points to the common ground area.

+12V

+5V

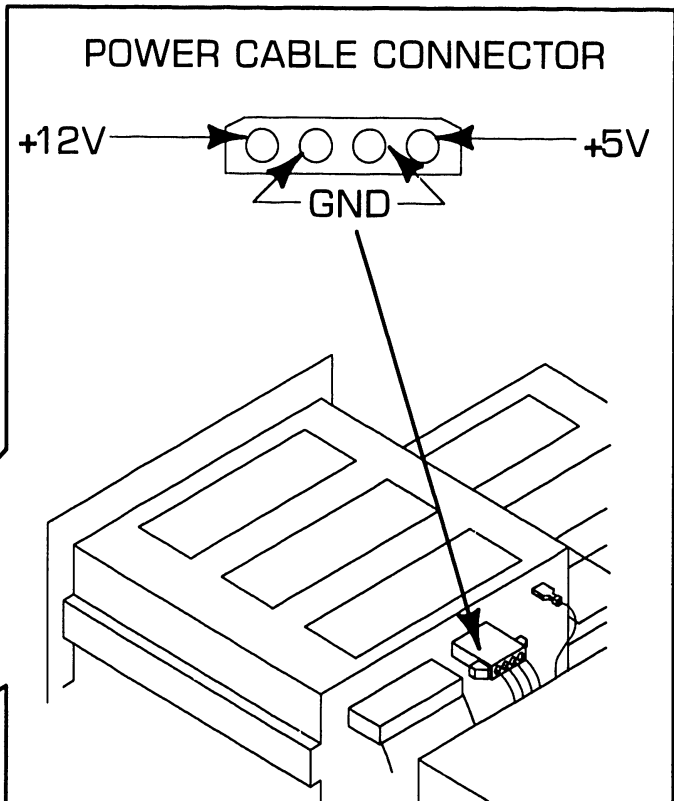
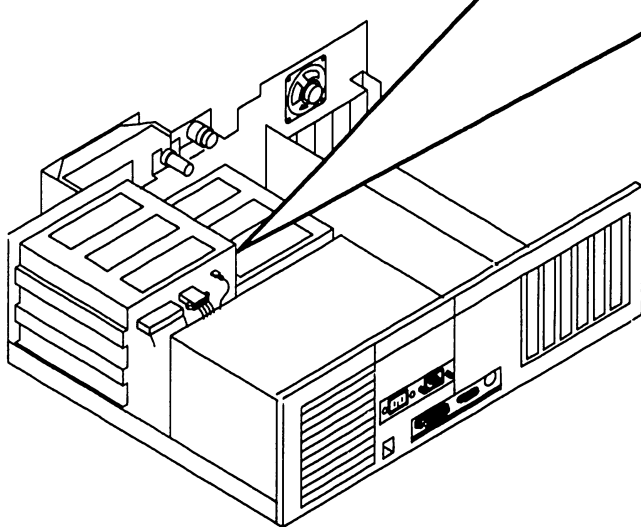
- 4 Connect positive lead of DVM to +5V,+12V test points on J3 connector on CPU board rear panel and verify dc voltage limits.

Test Point Voltage	Limits(Vdc)
+5V	+4.75 +5.25
+12V	+11.4 +12.6

# 9.5 Voltage Checks

## 9.5.3 Floppy Diskette Drive: DC Voltage and Ripple Checks

- 1 Remove top/front cover ( ▶ 7.2.2).
- 2 Disconnect power cable connector from floppy drive ( ▶ 7.2.4).
- 3 Set electronics enclosure power-on/off button to ON position ( ▶ 3.1.1).



- 4 Connect common lead of DVM to one of ground test points on floppy diskette power cable connector.
- 5 Connect positive lead of DVM to +5V,+12V test points on floppy diskette power cable connector and verify dc voltage limits.

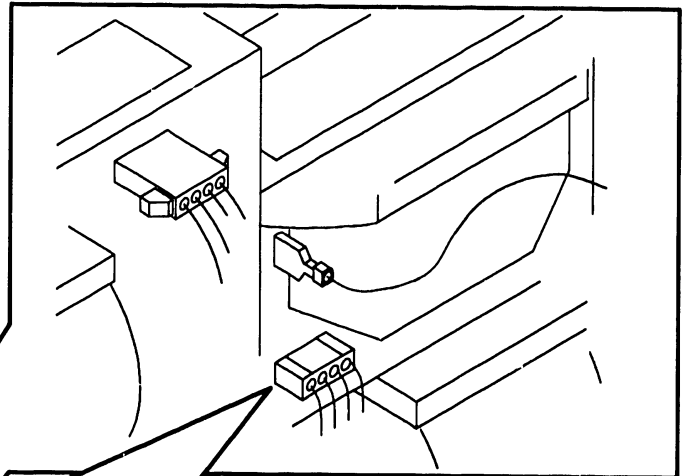
Test Point Voltage	Limits(Vdc)
+5V	+4.75 +5.25
+12V	+11.4 +12.6

# 9.5 UNPACKING AND SETUP

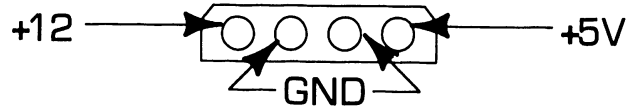
## 9.5 Voltage Checks

### 9.5.4 Winchester Disk Drive: DC Voltage and Ripple Checks

- 1 Remove top/front cover (▶ 7.2.2).
- 2 Disconnect power cable from rear of Winchester disk drive (▶ 7.2.5).
- 3 Set electronics enclosure power-on/off button to ON position (▶ 3.1.1).

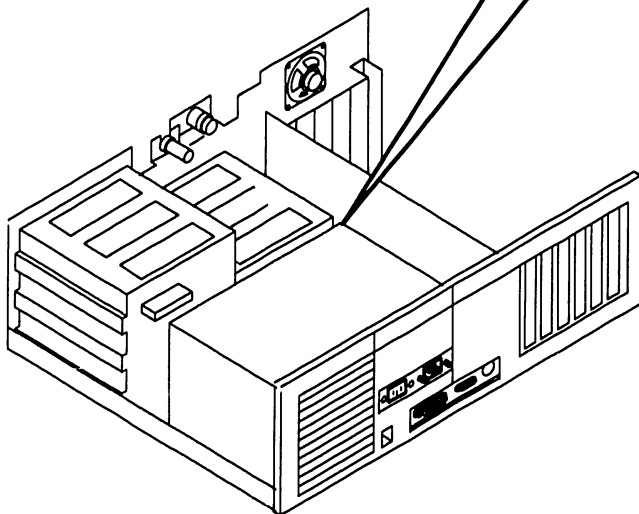


#### POWER CABLE CONNECTOR



- 4 Connect common lead of DVM to one of ground test points on power cable connector.
- 5 Connect positive lead of DVM to +5V, +12V test points on power cable connector and verify dc voltage limits.

Test Point Voltage	Limits(Vdc)
+5V	+4.75 +5.25
+12V	+11.4 +12.6



# 9.6 UNPACKING AND SETUP

## 9.6.1 Installing Options

---

### 9.6.1 80287 Coprocessor Installation

1. Remove top/front cover (▶7.2.2)
2. Remove any board(s) hindering access to CPU board socket L53 (▶7.2.3).
3. Position coprocessor over L53 socket; align coprocessor notch with socket notch.
4. Align coprocessor pins with socket holes; press coprocessor firmly into place.
5. Replace any board(s) removed before installing coprocessor (▶9.6.2).
6. Secure top/front cover to enclosure.



# UNPACKING AND SETUP

## 9.6 Installing Options

---

### 9.6.2 Option Board Installation

1. Remove top/front cover (▶7.2.2).
2. Remove screw that secures fastening/access plate to enclosure.
3. Lift fastening/access plate out of slot.
4. Align board connectors with CPU board sockets.
5. Gently push down on top of board so board connectors firmly mate with option sockets; board should slide between grooves of card guide that is attached to inside front of enclosure.
6. Replace screw that secures option board to enclosure.
7. Connect cables (if applicable).
8. Secure top/front cover to enclosure.

# 9.6 UNPACKING AND SETUP

## 9.6.6 Installing Options

---

### 9.6.3 Floppy Diskette Drive "B" Installation

1. Remove terminating resistor pack from optional "B" drive (Note: 3 1/2-inch drives do not have removable terminator).
2. Remove top/front cover (►7.2.2).
3. Press in on floppy drive "A" guide rails; pull drive "A" slightly forward.
4. Partially slide optional floppy drive into location "B" of enclosure.
5. Attach drive cable harness connector to floppy drive "B."
6. Connect power supply cable and grounding strap to floppy drive "B."
7. Slide floppy drives "A" and "B" completely into enclosure.
8. Remove drive "B" plastic cover plate by pushing outward on tab that secures plate to top/front cover.
9. Secure top/front cover to electronics enclosure.

# UNPACKING AND SETUP

## 9.6 Installing Options

---

### 9.6.4 Winchester Drive "C" Installation

1. Remove top/front cover (►7.2.2).
2. Partially slide drive into location "C."
3. Attach drive cable harness connectors, power supply cable, and grounding strap to drive "C."
4. Completely slide drive into enclosure.
5. Secure top/front cover to enclosure.

# 9.6

# UNPACKING AND SETUP

## Installing Options

---

### 9.6.5 Full-Height Winchester Drive "D" Installation

1. Place drive bottom side up.
2. Loosen captive screws at rear of drive.
3. Carefully lift board up, exposing inside of drive.
4. Remove terminating resistor pack. Use small flat blade screwdriver to gently pry resistor pack out of socket. (If terminating resistor is a switch bank, set all switches on bank to off (open) position.)
5. Screw board back into drive.
6. Remove top/front cover (►7 2.2).
7. Turn drive right side up and partially slide it into location "D."
8. Attach drive cable harness connectors, power supply cable, and grounding strap to drive "D."
9. Completely slide drive into enclosure.
10. Secure top/front cover to enclosure.

# UNPACKING AND SETUP

## 9.6 Installing Options

---

### 9.6.6 Half-Height Winchester Drive "D" Installation

1. Place drive bottom side up.
2. Set terminating resistor switches to off position. (If terminating resistor pack is present instead of switch bank, use small flat blade screwdriver to gently pry pack out of socket.)
3. Set switch 2 of drive select (DS) bank to "on" position; all other switches on DS bank should be "off."
4. Remove top/front cover (►7.2.2).
5. Turn drive top side up and partially slide it into location "D."
6. Attach drive cable harness connectors, power supply cable, and grounding strap to drive "D."
7. Completely slide drive into enclosure.
8. Secure top/front cover to enclosure.

# 9.6 UNPACKING AND SETUP

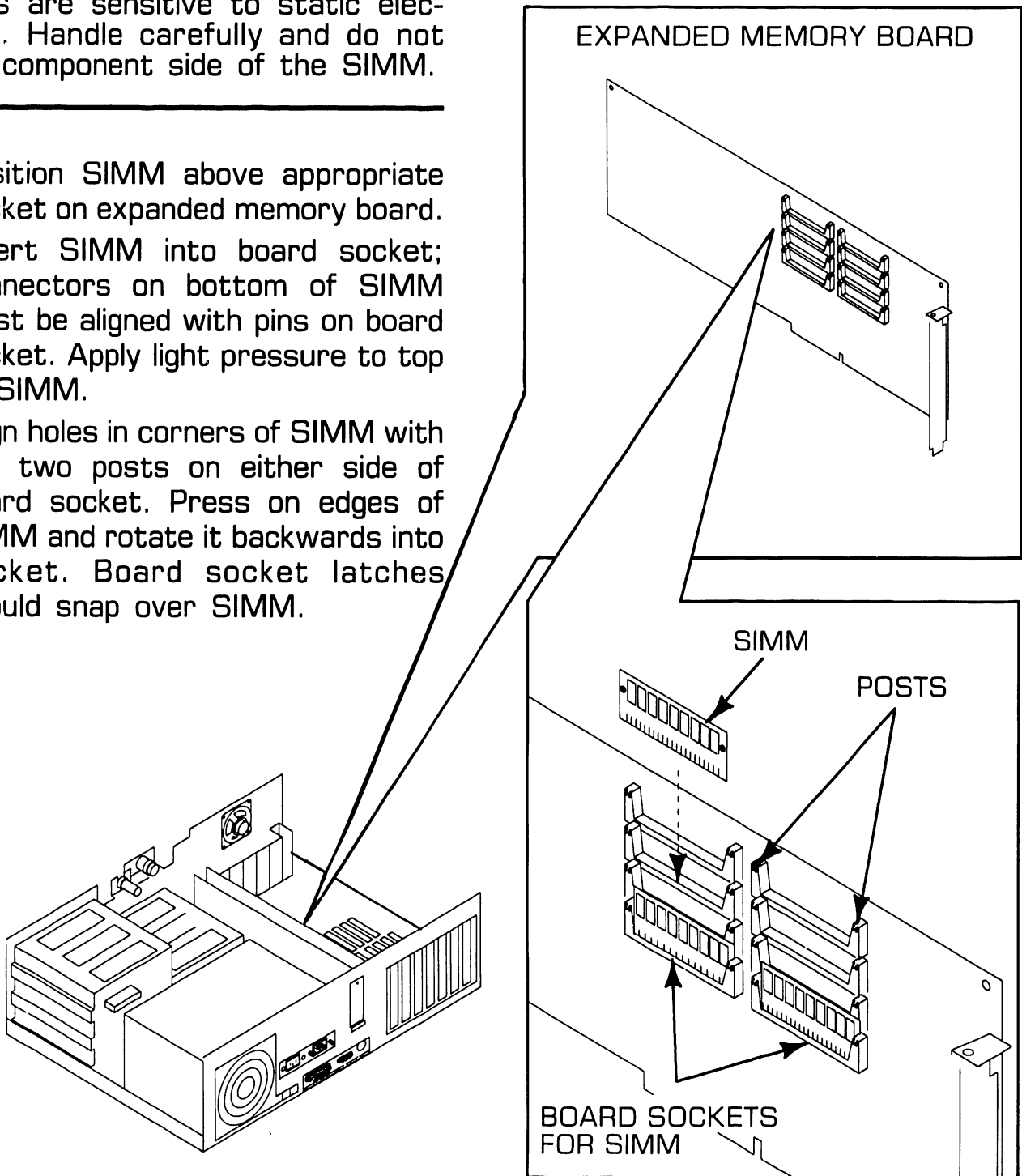
## 9.6.6 Installing Options

### 9.6.7 Installing Single In-Line Memory Module (SIMM)

#### CAUTION

SIMMs are sensitive to static electricity. Handle carefully and do not touch component side of the SIMM.

1. Position SIMM above appropriate socket on expanded memory board.
2. Insert SIMM into board socket; connectors on bottom of SIMM must be aligned with pins on board socket. Apply light pressure to top of SIMM.
3. Align holes in corners of SIMM with the two posts on either side of board socket. Press on edges of SIMM and rotate it backwards into socket. Board socket latches should snap over SIMM.



# 9.7 UNPACKING AND SETUP

## 9.7 Software Installation

---

### 9.7.1 INSTALL Program: Description

The INSTALL program consists of four utilities: SETUP, HDINIT (Winchester or hard disk initialization), FDISK (Winchester partition), and FORMAT (partition format). These utilities are executed from a file on system diskette 1.

SETUP is a software program that identifies the options installed on the system. This utility must be executed after all internal and external options have been configured. If the CPU board or lithium battery is replaced, or if any new options are added, SETUP must be run again.

The HDINIT (Winchester initialization) utility formats the hard disk drive and detects and marks any defective tracks on the disk.

The FDISK (Winchester partition) utility creates the largest MS-DOS partition acceptable on the hard disk drive (operating system will recognize a disk partition of up to 32MB).

The FORMAT (partition format) program sets up an MS-DOS boot sector in the partition created by FDISK. FORMAT also prepares the partition to accept files by setting up a file allocation table and root directory.

Any of the INSTALL utilities may be run singly by entering the utility's name when the command processor

prompt appears on the monitor screen. After the utility's name has been entered, the RETURN key must be pressed. For example, if the prompt A> is on the screen, the SETUP utility may be run by typing "SETUP" after the prompt; i.e., A>SETUP.

The INSTALL program has two operational modes: an interaction mode that permits the operator to skip steps when executing a utility; and an automated mode that initiates automatic system execution of all INSTALL utilities without user intervention.

---

#### **CAUTION**

Use of automated mode destroys all data on the hard disk drive.

---

# 9.7 UNPACKING AND SETUP

## 9.7 Software Installation

---

### 9.7.2 Preparing Winchester Drive

---

#### **CAUTION**

Preparing Winchester drive results in destruction of all data already present on hard disk.

---

1. Run "HDINIT" utility.\*
2. Run "FDISK" utility.
3. Run "FORMAT" utility.
4. Type "SYSC:" to copy system files to Winchester.
5. Copy files from system diskettes to Winchester drive.

\*Executing "HDINIT" utility can take 2 to 4 hours.



**SECTION**

**10**

**FUNCTIONAL  
DESCRIPTION**

# **SECTION 10 CONTENTS**

---

## **SECTION 10 FUNCTIONAL DESCRIPTION**

(Unavailable at present time)

**SECTION**

**11**

**SPECIFICATIONS**

# SECTION 11 CONTENTS

---

## SECTION 11 SPECIFICATIONS

	Page
11.1 HARDWARE .....	11-1

# SPECIFICATIONS

## 11 .1 Hardware

---

### **Electronics Enclosure Dimensions (resting flat, no stand)**

Height: 6.6 in. (16.8 cm)  
Width: 21.38 in. (54.3 cm)  
Depth: 16.25 in. (41.3 cm)

### **Electronics Enclosure Weight**

52 lb (23.6 kg)

### **Electronics Enclosure Power Requirements**

Voltage: 90 to 132 Vac  
(115 Vac nominal)  
180 to 264 Vac (220 Vac nominal)

Frequency: 47 to 63 Hz (60 Hz nominal)

Current (operating): 3A @ 115 Vac;  
1.5A @ 220 Vac

### **Monochrome Monitor Dimensions**

Height: 11.4 in. (29.0 cm)  
Width: 12.5 in. (31.8 cm)  
Depth: 12.4 in. (31.5 cm)

### **Monochrome Monitor Weight**

14 lb (6.36 kg)

### **Color Monitor Dimensions**

Height: 13.5 in. (34.3 cm)  
Width: 14 in. (35.6 cm)  
Depth: 15.7 in. (39.9 cm)

### **Color Monitor Weight**

29.5 lb (13.4 kg)

### **Keyboard Dimensions**

Height: 1.65 in. (4.19 cm)  
Width: 19.9 in. (50.5 cm)  
Depth: 7.6 in. (19.3 cm)

### **Keyboard Weight**

3.25 lb (1.48 kg)

### **System Environmental Requirements**

Relative Humidity: 20% to 80% (non-condensing)

Ambient Temperature: 60°F to 90°F  
(15°C to 32°C)

Maximum Altitude: 6562 ft (2000 m)

Heat Dissipation (Electronics Enclosure): 870 Btu/hr

**SECTION 12**  
**ILLUSTRATED**  
**PARTS**

# SECTION 12 CONTENTS

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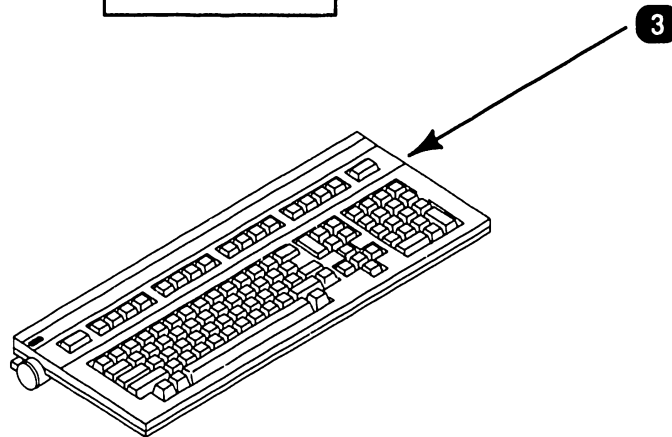
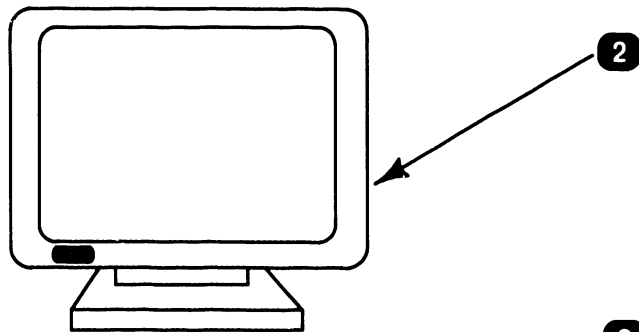
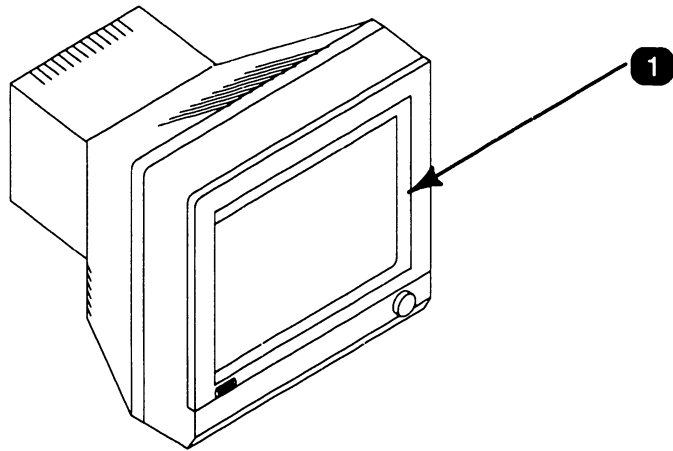
## SECTION 12 ILLUSTRATED PARTS

	Page
12.1 SYSTEM COMPONENTS .....	12-1

# 12.1 ILLUSTRATED PARTS

## System Components (Sheet 1 of 4)

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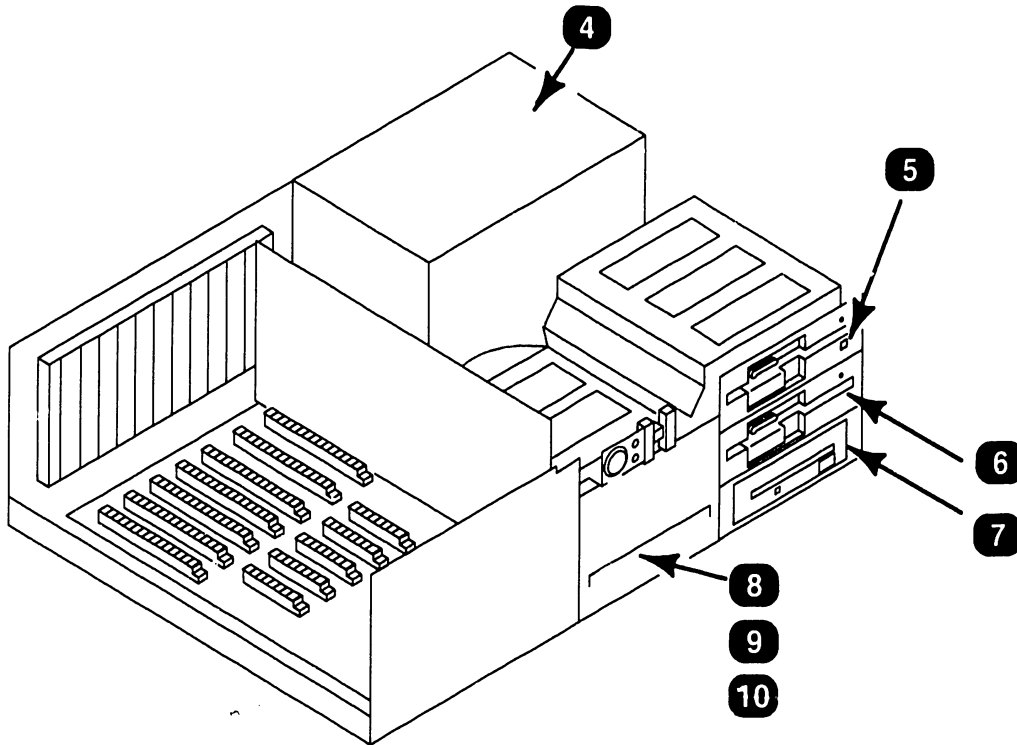
<i>Item</i>	<i>Part Number</i>	<i>Description</i>
1	279-0757	Monochrome monitor
2	725-3446	Color monitor
3	725-3401-US	Keyboard

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# 12.1 ILLUSTRATED PARTS

## System Components (Sheet 2 of 4)

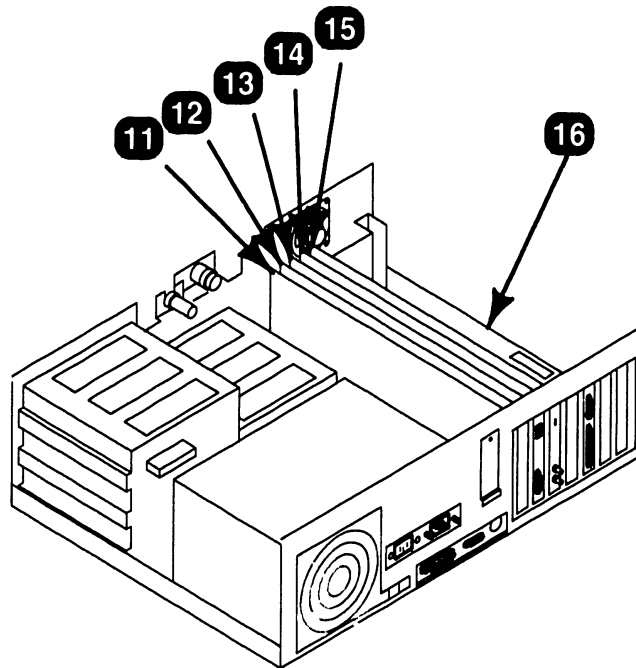


<i>Item</i>	<i>Part Number</i>	<i>Description</i>
4	270-1078	Power supply
5	279-0760	1.2MB diskette drive
6	279-0765	360KB diskette drive
7	279-0766	720KB diskette drive
8	279-0768	33MB Winchester disk drive
9	279-0769	42MB Winchester disk drive
10	279-0770	67MB Winchester disk drive

# 12.1 ILLUSTRATED PARTS

## System Components (Sheet 3 of 4)

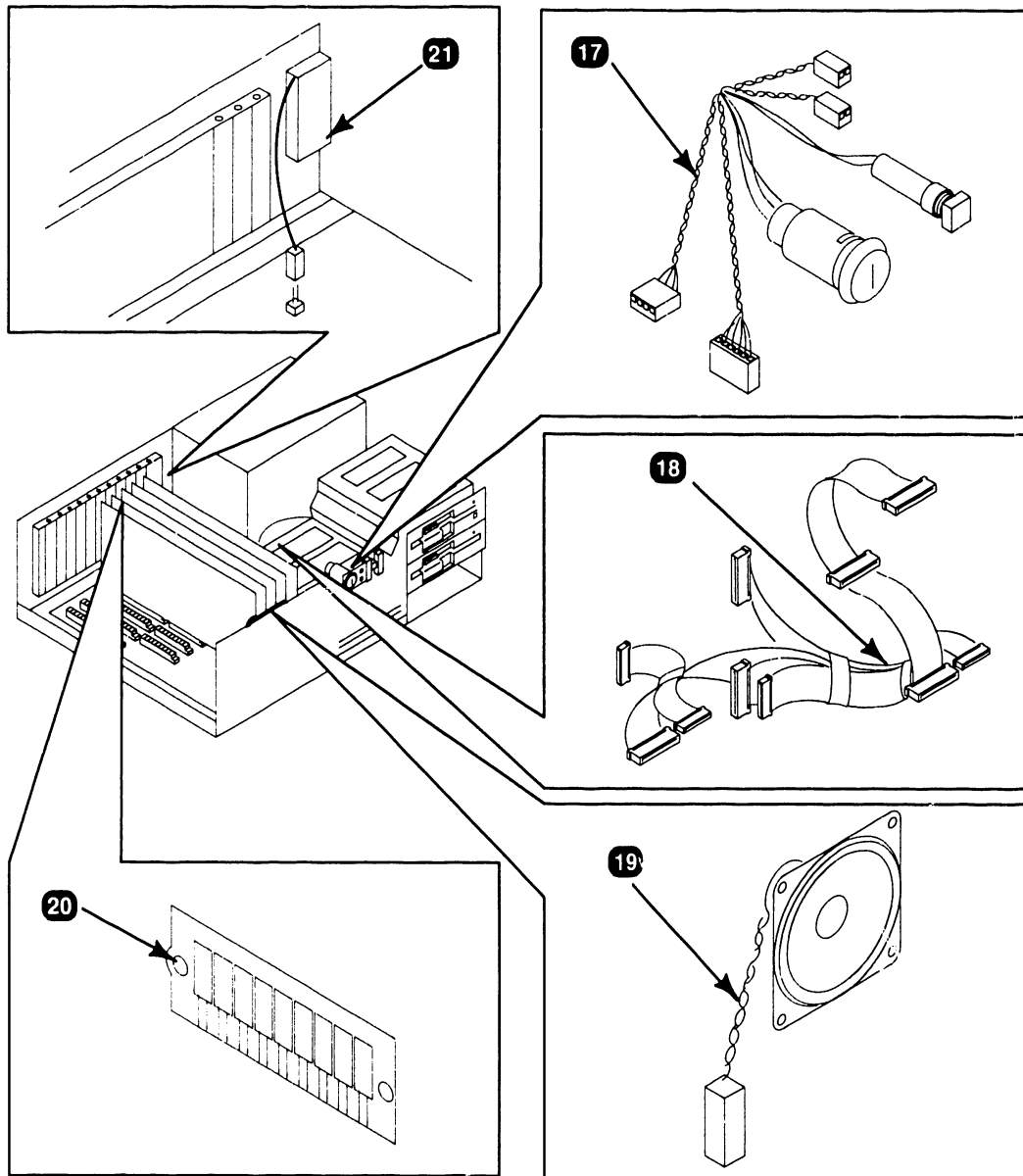
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<i>Item</i>	<i>Part Number</i>	<i>Description</i>
11	210-8770-A	Winchester/floppy controller board (will replace Western Digital controller, P/N 725-3359)
12	725-3358	Monochrome/color video board
13	210-9454-A	Wang local office connection (WLOC) board
14	210-9453	Expanded memory board
15	210-9455	Synchronous/asynchronous communications board
16	210-9451-A	CPU board

# 12.1 System Components (Sheet 4 of 4)

## ILLUSTRATED PARTS



Item	Part Number	Description
17	220-2523	Keylock cable assembly
18	220-3477	Disk cable assembly
19	220-2526	Speaker and cable
20	376-6050	Single In-Line Memory Module (SIMM)
21	666-1016	Lithium battery

**WANG**

LABORATORIES, INC

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