WANG

5103

OFFICE INFORMATION SYSTEMS

Models: OIS-40
OIS-40B
OIS-45
OIS-50
OIS-55
OIS-60
OIS-65
OIS-70

Customer Engineering
Product Maintenance Manual

741-1267-B

PREFACE

This document is the Illustrated Product Maintenance Manual for the Wang Office Information Systems 40/40B/45/50/55/60/65/70. The scope of this manual reflects the type of maintenance philosophy selected for this product (swap unit, printed circuit assembly, chip level or any combination thereof).

The purpose of this manual is to provide instructions to operate, trouble-shoot, and repair OIS 40/40B/45/50/55/60/65/70 Systems. It will updated on a regular schedule.

Sixth Edition (May, 1987)

This edition of the Wang OIS 40/40B/45/50/55/60/65/70 Product Maintenance Manual obsoletes document 741-1267-A and Publications Update Bulletin (PUB) 741-1267-A1, and contains additional information to support the OIS 45/55/65 models of the system. The material in this document may be used only for the purpose stated in the Preface. Updates and/or changes to this document will be published as PUBs or subsequent editions.

CUSTOMER ENGINEERING

PUBLICATION UPDATE BULLETIN

TITLE: Appendix A Upgrade Job (UJ) Installation **DATE:** 11/03/87

This PUB affects: 741-1267-B
742-1267-B

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Previous Notice(s): None

REASON FOR CHANGE:

This PUB contains Appendix A to the OIS-40 - 70 Illustrated Manual. The appendix provides instructions for installing UJ kits on systems at customer sites. The upgrades include changing PCBs, disk drives, and rear panels.

INSTRUCTIONS:

Remove and insert attached pages and/or microfiche as follows:

	REMOVE PAGES	INSERT PAGES
1.		Title through A-28
2.		
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10.		

	REMOVE FICHE	INSERT FICHE
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2.	4	4
3.		
4.		

This page constitutes a permanent record of revisions; place it directly following title page.

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ONE INDUSTRIAL AVENUE LOWELL MASSACHUSETTS 01851 TEL 617 459 5000 TWX 710 343 6769 TELEX 94 7421

PRINTED IN U.S.A.

COMPANY PROPRIETARY STATEMENT

COMPANY CONFIDENTIAL

TABLE OF CONTENTS

SECTION 1
INTRODUCTION

SECTION 2
IDENTIFICATION

SECTION 3
CONTROLS AND INDICATORS

TABLE OF CONTENTS

SECTION 3 (Cont.)
CONTROLS AND INDICATORS

TABLE OF CONTENTS

SECTION 4
OPERATION

SECTION 5
PREVENTIVE MAINTENANCE

SECTION 6
TROUBLESHOOTING

TABLE OF CONTENTS

SECTION 6 (Cont.)
TROUBLESHOOTING

SECTION 7
REPAIR

TABLE OF CONTENTS

SECTION 7 (Cont.)
REPAIR

SECTION 8
ADJUSTMENTS

TABLE OF CONTENTS

SECTION 9
UNPACKING AND SETUP

TABLE OF CONTENTS

SECTION 9 (Cont.)
UNPACKING AND SETUP

SECTION 10
FUNCTIONAL DESCRIPTION

TABLE OF CONTENTS

SECTION 11
SPECIFICATIONS

SECTION 12
ILLUSTRATED PARTS

SECTION
1
INTRODUCTION

SECTION 1 CONTENTS

SECTION 1
INTRODUCTION

1 INTRODUCTION

1.1 Scope and Purpose

This manual contains installation, operation, troubleshooting, and repair information for the OIS 40/45/50/55/60/65/70 (Office Information Systems 40/45/50/55/60/65/70), a full function, small clustered word processing office system with multi-user capability. The manual also contains a functional description of the OIS 40/45/50/55/60/65/70 and an illustrated breakdown of replaceable parts.

The purpose of the manual is to provide Customer Engineering personnel with the information necessary to install, troubleshoot, and repair any model of the OIS 40/45/50/55/60/65/70 in the field. Familiarity with word processing and office information systems is recommended for the effective use of this manual.

1.2 Organization and Layout

This manual is divided into 12 sections numbered 1 through 12. Each section describes a separate maintenance subject and is arranged to minimize references to other sections. Referencing to other frames is made by means of a hand symbol () followed by the section number(s) being referenced. Also, all or most of the information pertaining to a specific task is located on a single or double frame. Each frame, in turn, contains illustrations, numbered steps, and/or text describing the individual steps required to accomplish each task. Each section is preceded by the section number and a section table of contents. The sections, and the corresponding frames, are arranged in numerical sequence from left-to-right and from top-to-bottom on the individual fiche cards.

SECTION 2

IDENTIFICATION

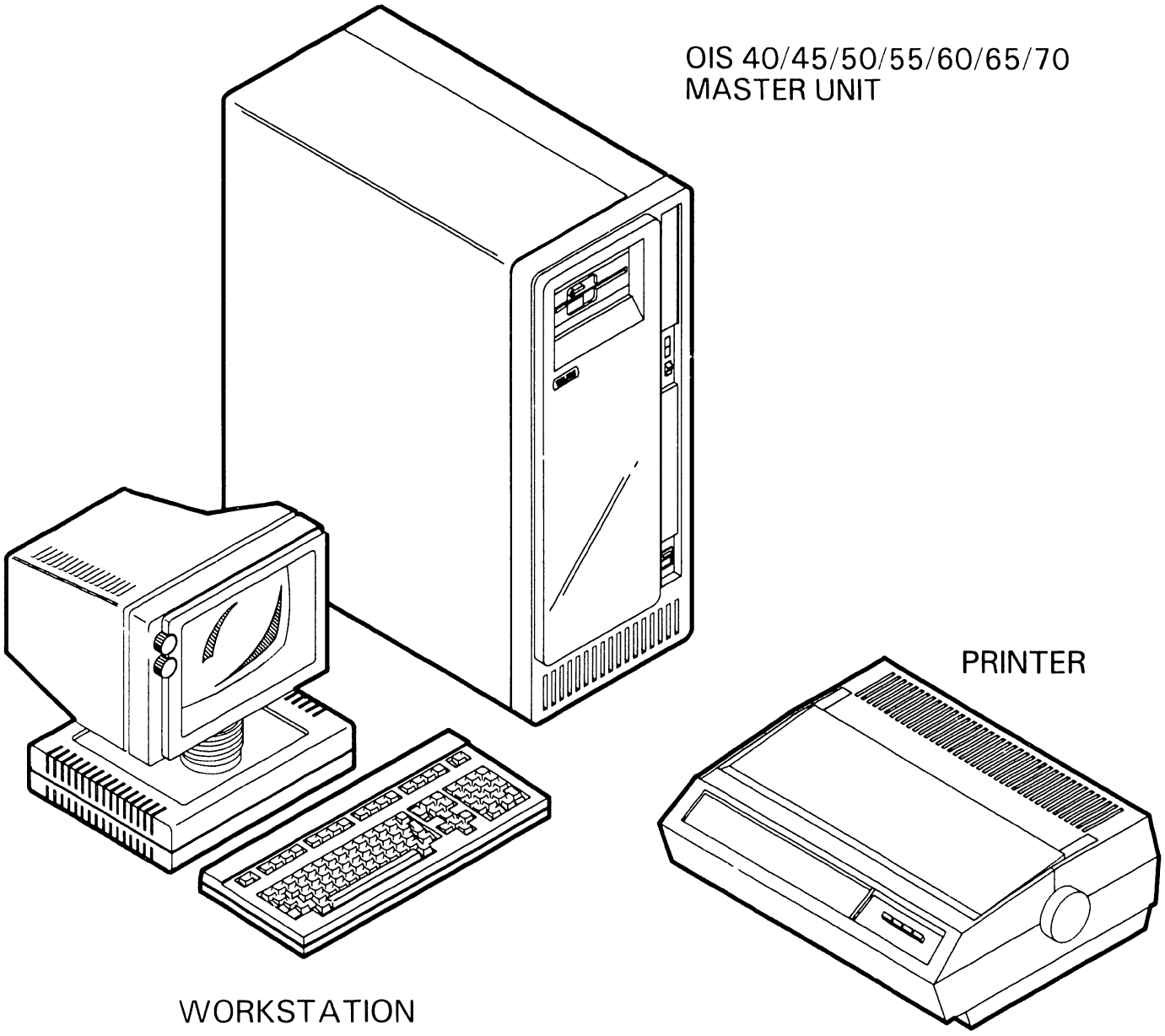
SECTION 2 CONTENTS

SECTION 2
IDENTIFICATION

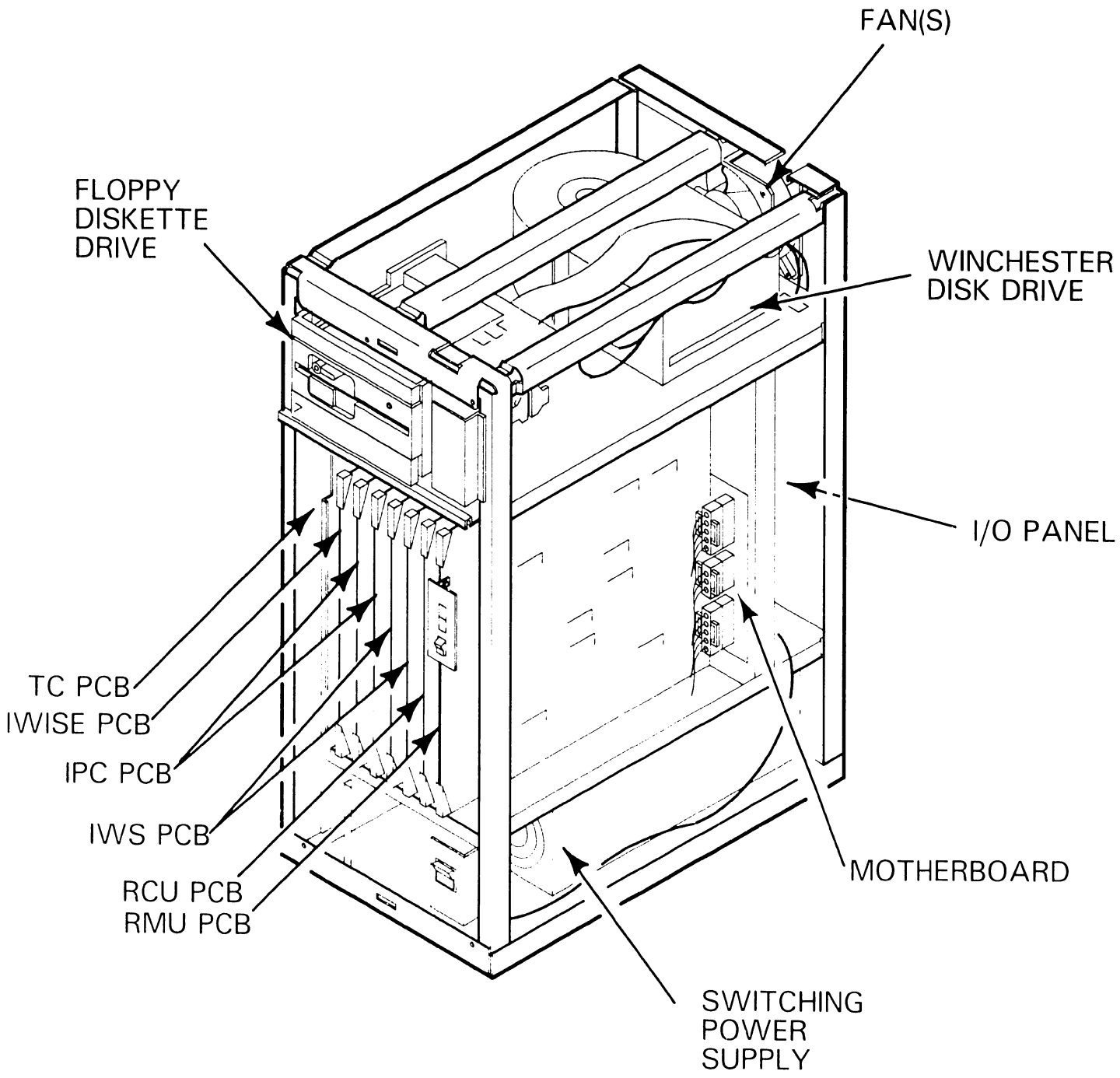
2.1 IDENTIFICATION

Major Assemblies

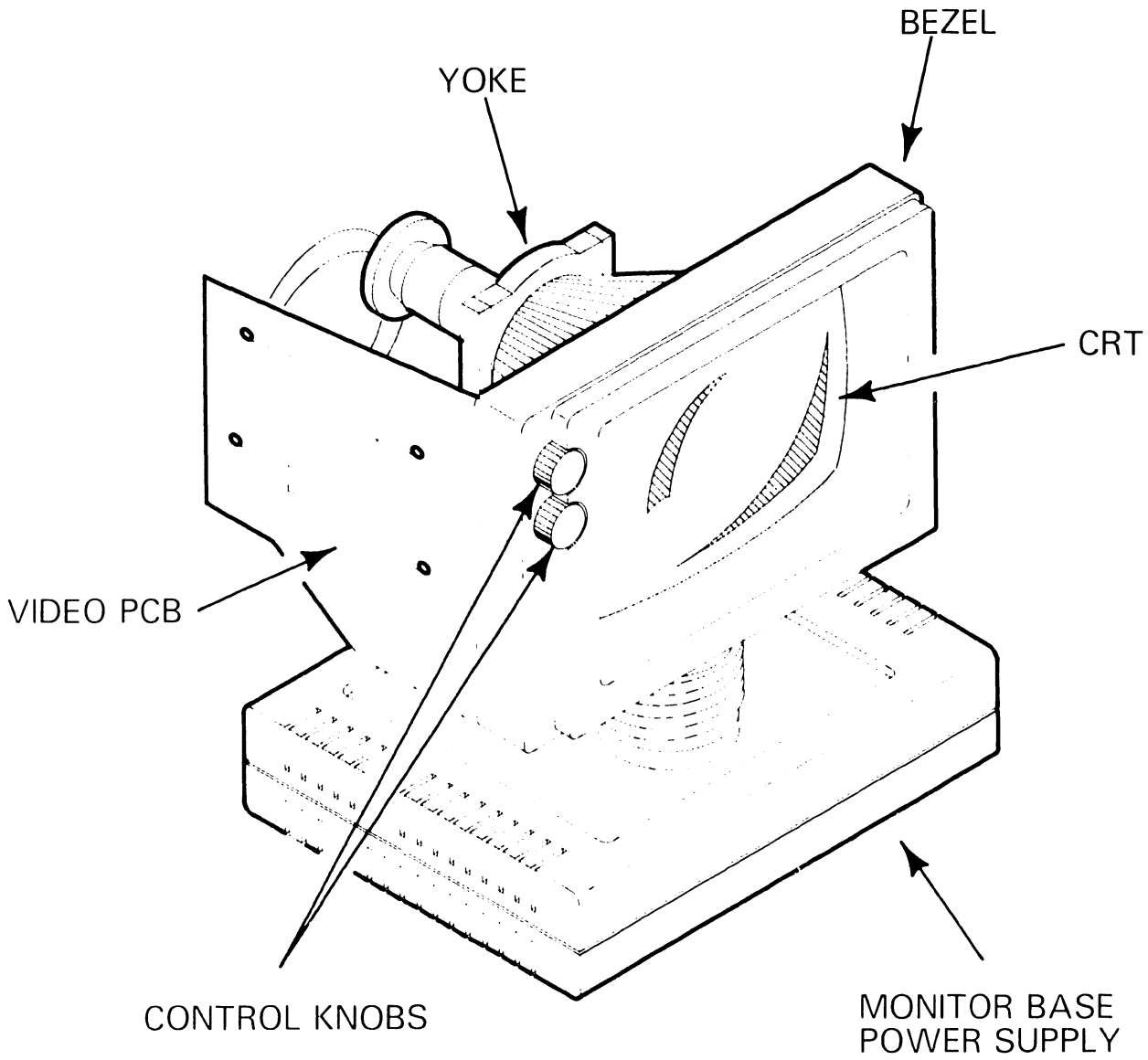
2.1.1 System Components



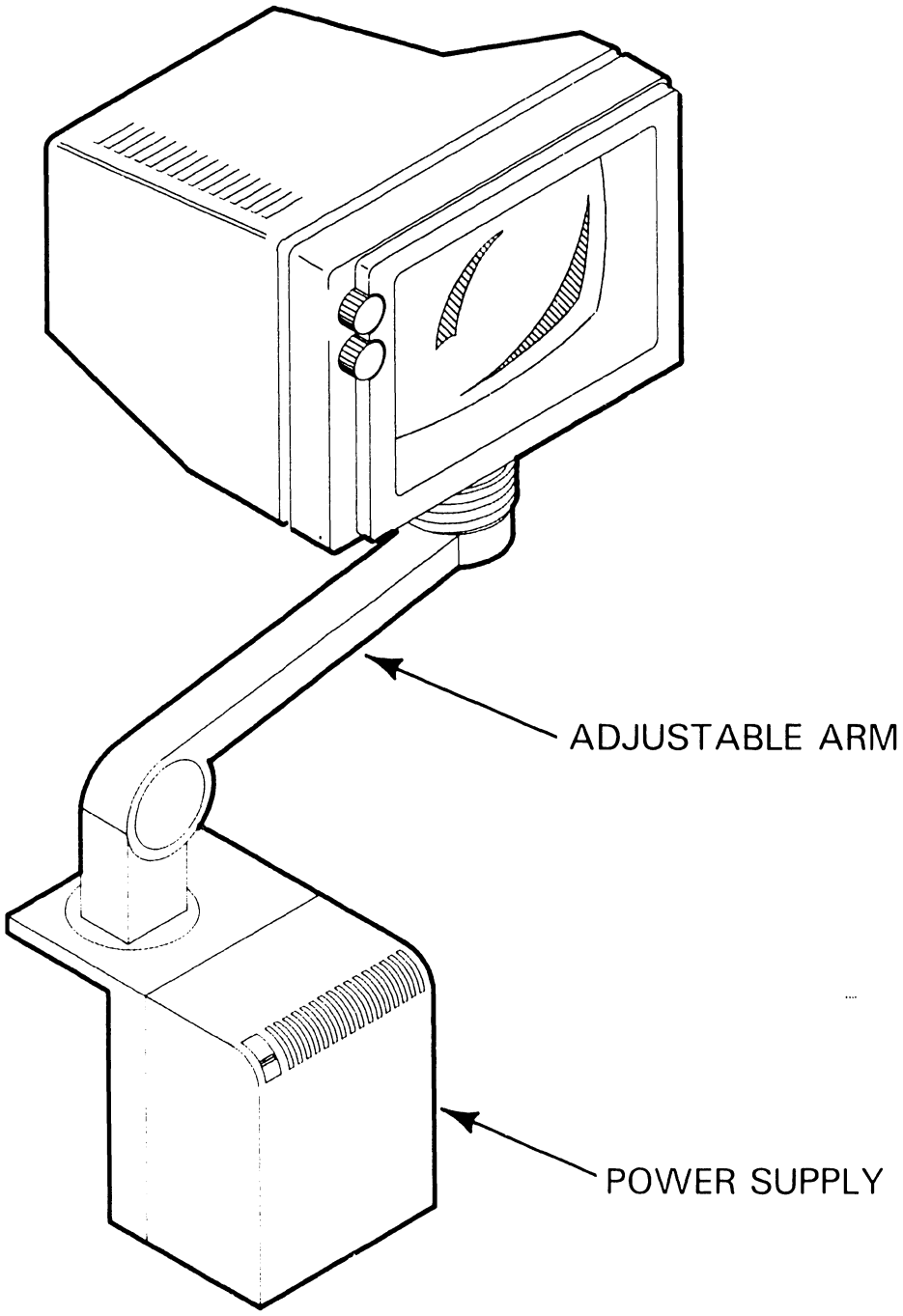
Master Unit Major Parts



OIS Workstation Monitor Major Parts



Monitor Arm Major Parts



SECTION 3

CONTROLS AND INDICATORS

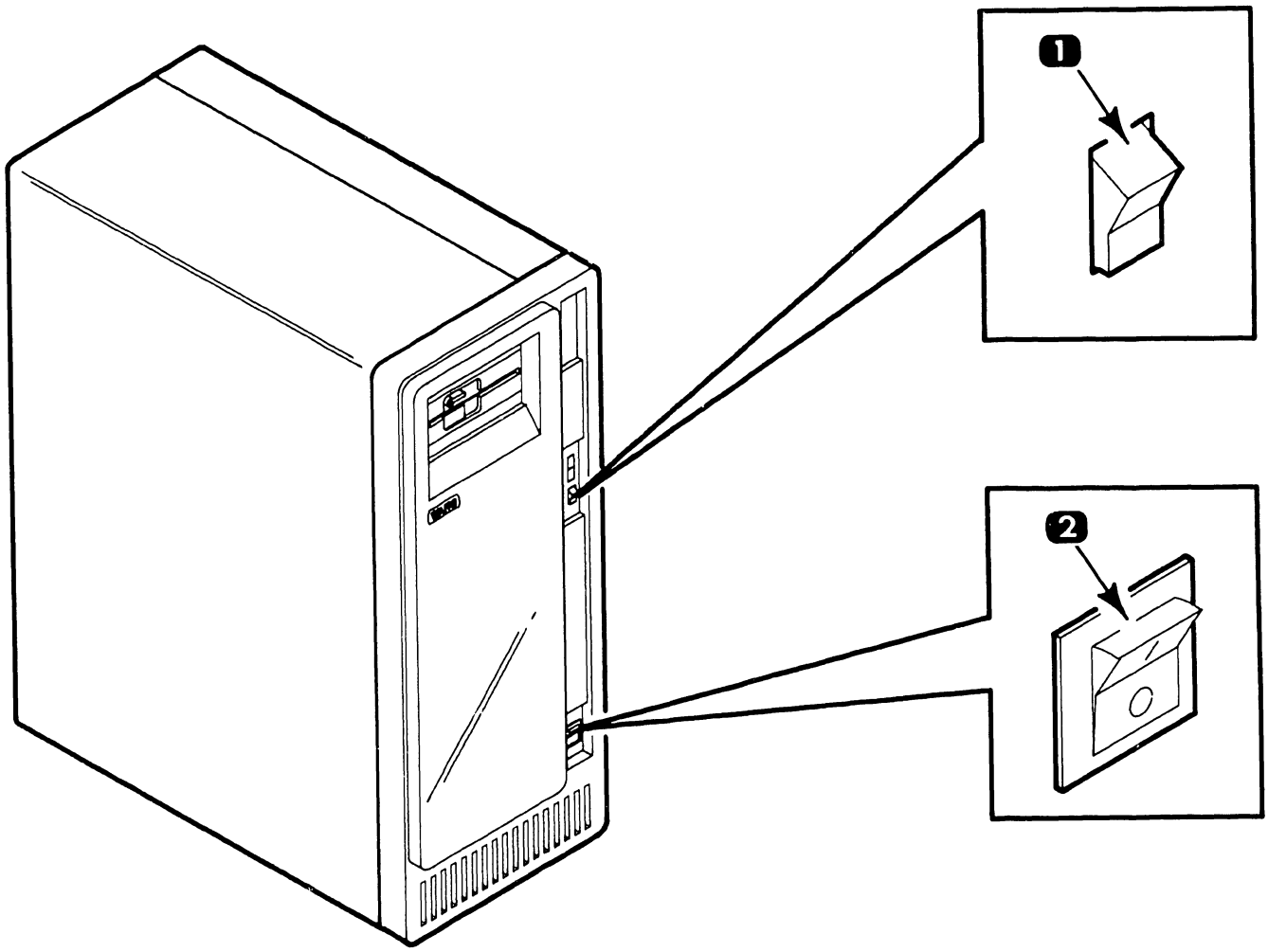
SECTION 3 CONTENTS

SECTION 3
CONTROLS AND INDICATORS

3.1 CONTROLS AND INDICATORS

Operator Controls

3.1.1 Master Unit Front Panel Controls

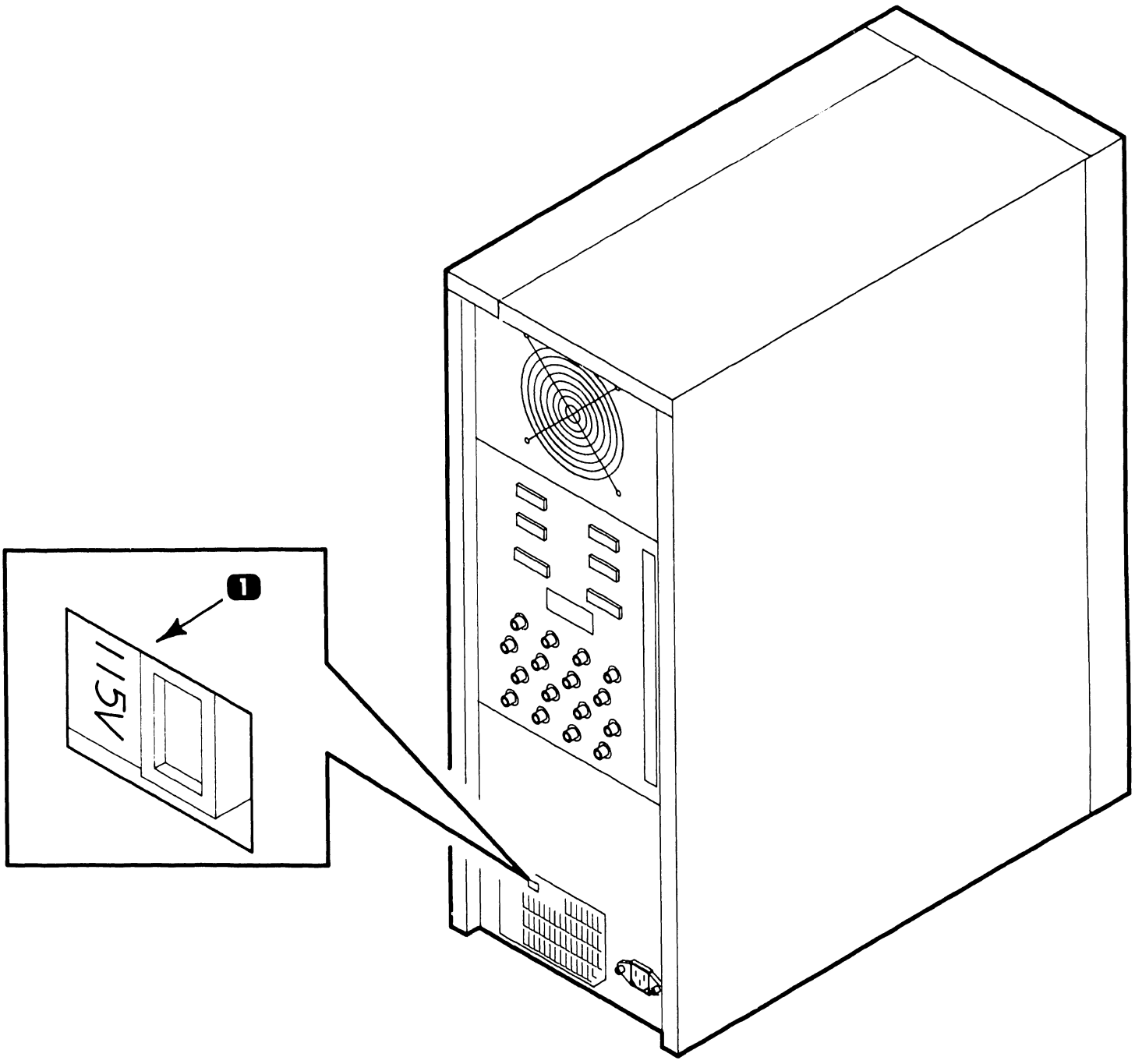


Item	*Name*	*Type and Function*
1	IPL Disk Select Switch	Rocker-type switch; indicates to CPU which drive contains program. (-) position selects diskette drive; (— — —) position selects Winchester drive.
2	Power-On Switch	Rocker-type switch; pressing "1" applies ac power to Master Unit, initiates B.I.T. power-up diagnostics, and Initial Program Load (provided diagnostics pass). "0" powers-down unit.

3.1 CONTROLS AND INDICATORS

Operator Controls

3.1.2 Master Unit Rear Panel Controls

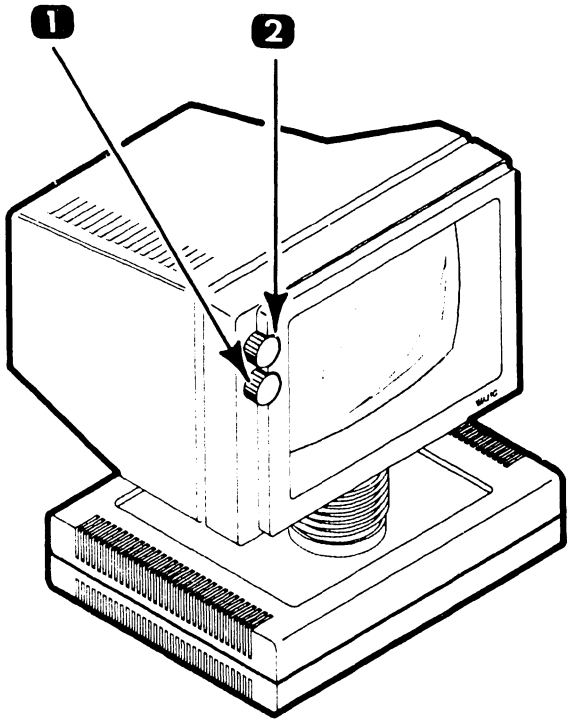


Item	*Name*	*Type and Function*
1	Voltage Select Switch	Slider-type switch; selects ac operating voltage of 115V or 230V, determined by available line voltage (shown in 115V position).

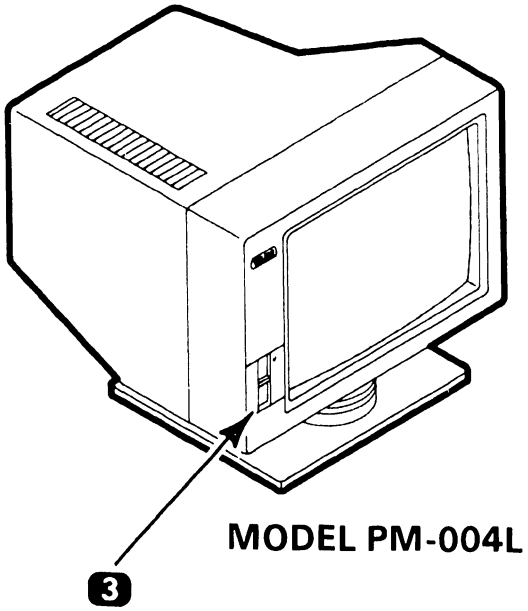
3.1 CONTROLS AND INDICATORS

Operator Controls

3.1.3 Workstation Monitor Controls



MODEL PM-004



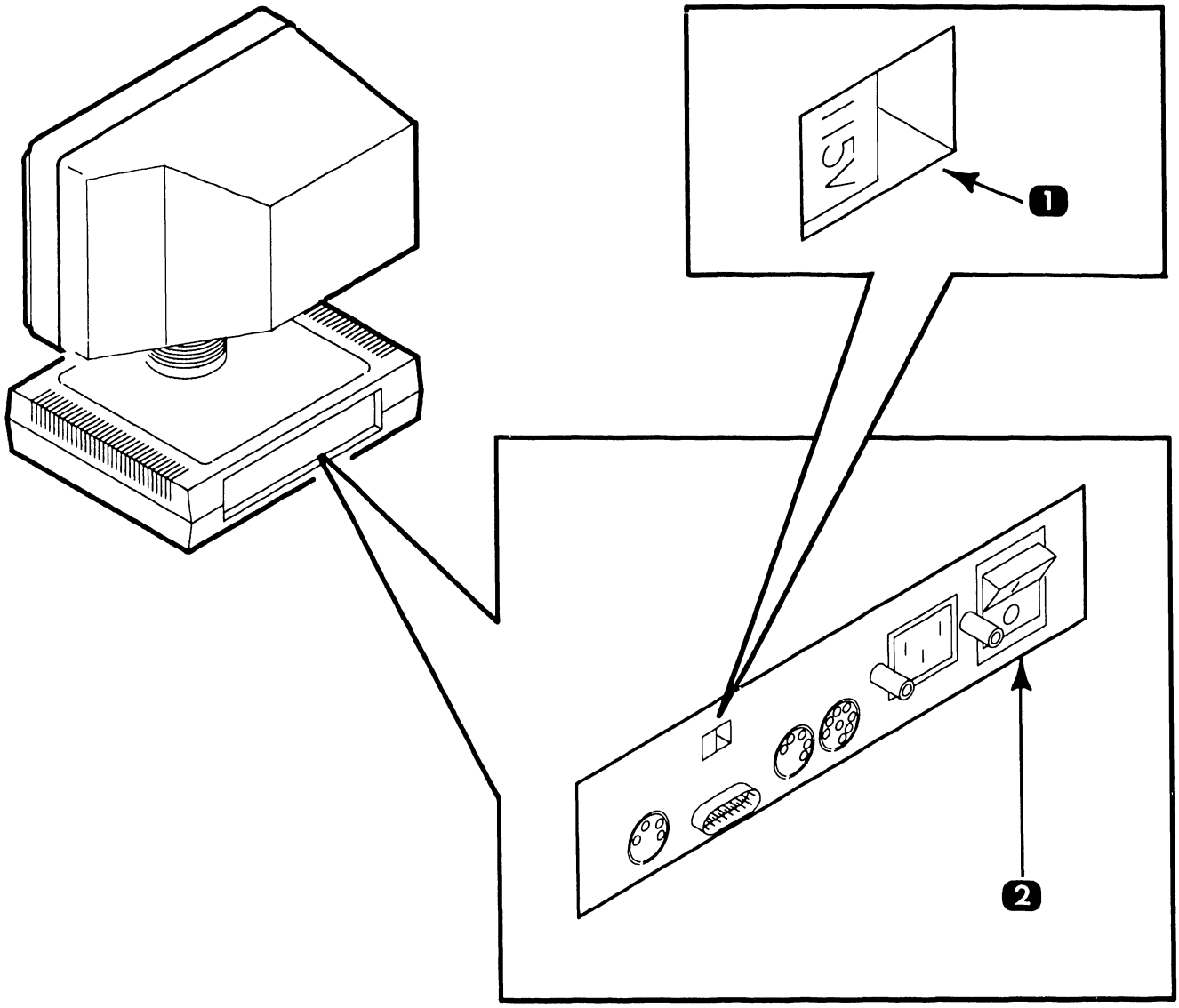
MODEL PM-004L

Item	*Name*	*Type and Function*
1	Monitor Contrast Control	Potentiometer-type control; adjusts desired contrast of monitor display.
2	Monitor Brightness Control	Potentiometer-type control; adjusts desired brightness of monitor display.
3	Monitor Brightness Control	Slider-type control; adjusts desired brightness of monitor display.

3.1 CONTROLS AND INDICATORS

Operator Controls

3.1.4 Workstation Base Controls

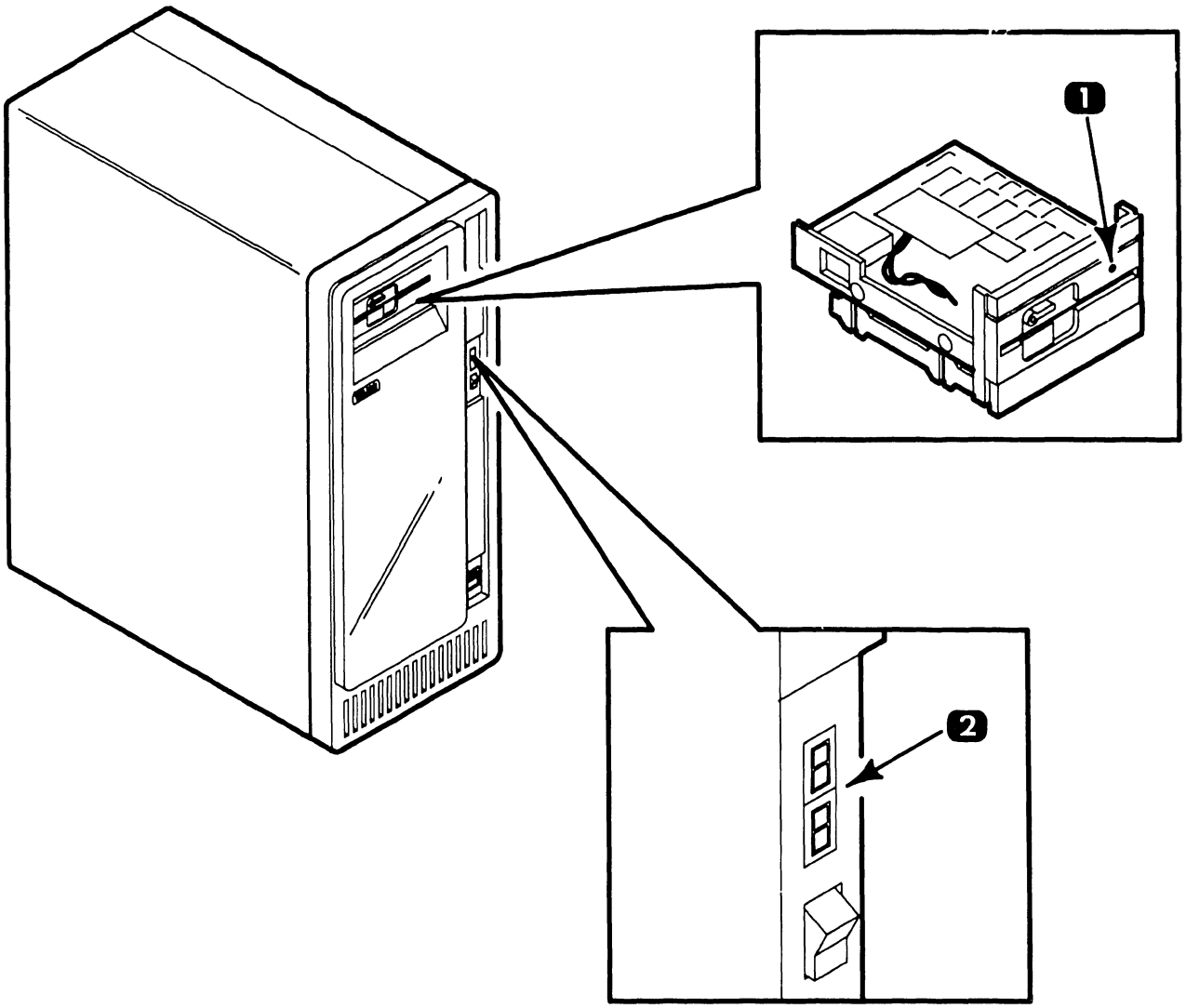


Item	*Name*	*Type and Function*
1	Voltage Select Switch	Slider-type switch; selects ac operating voltage of 115V or 230V determined by available line voltage (shown in 115V position).
2	Power-on Switch	Rocker-type switch; set to "1" applies ac power to workstation. Set to "0" corresponds to a power-down state.

3.2 CONTROLS AND INDICATORS

Operator Indicators

3.2.1 Master Unit Front Panel Indicators

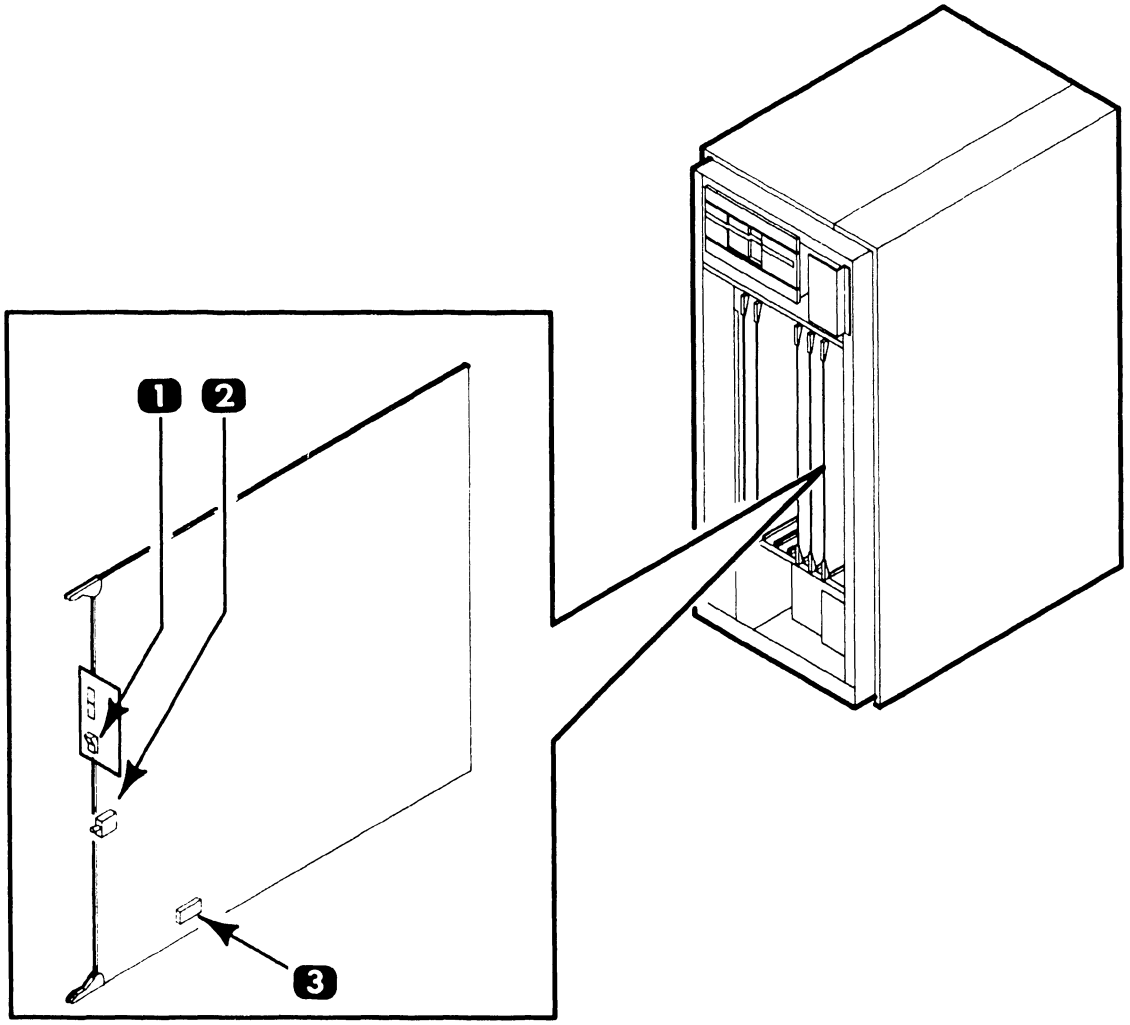


Item	*Name*	*Type and Function*
1	Diskette Drive Activity LED	LED; illuminates to indicate activity on diskette drive.
2	Diagnostic LEDs	LED; upper digit displays B.I.T. power-up diagnostic currently being executed. If a fatal error occurs, both digits together indicate error type.

3.3 CONTROLS AND INDICATORS

Service Controls

3.3.1 Master Unit RMU Board Controls

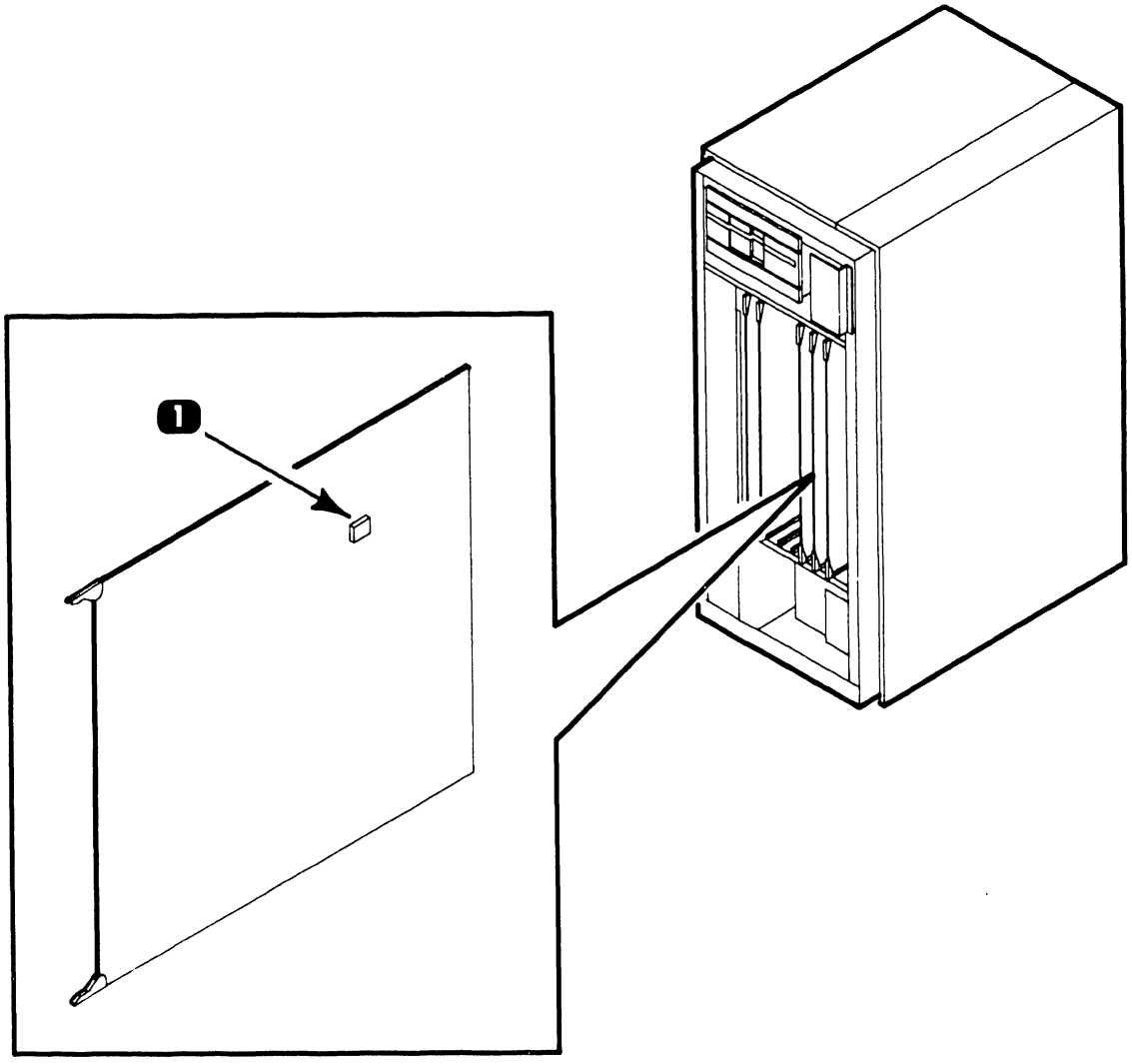


Item	*Name*	*Type and Function*
1	IPL Disk Select Switch SW1	Rocker-type switch; indicates to CPU which drive contains program. (—) position selects diskette drive; (— — —) position selects Winchester drive.
2	Non-Maskable Interrupt (NMI) Switch SW2	Pushbutton-type switch; causes software to skip B.I.T. power-up diagnostic (LED test) and start IPL immediately.
3	Normal/Diagnostic Mode Switch SW3	Rocker-type 8-bit switch bank; selects different software configurations during system power-up. 9.4.2.

3.3 CONTROLS AND INDICATORS

Service Controls

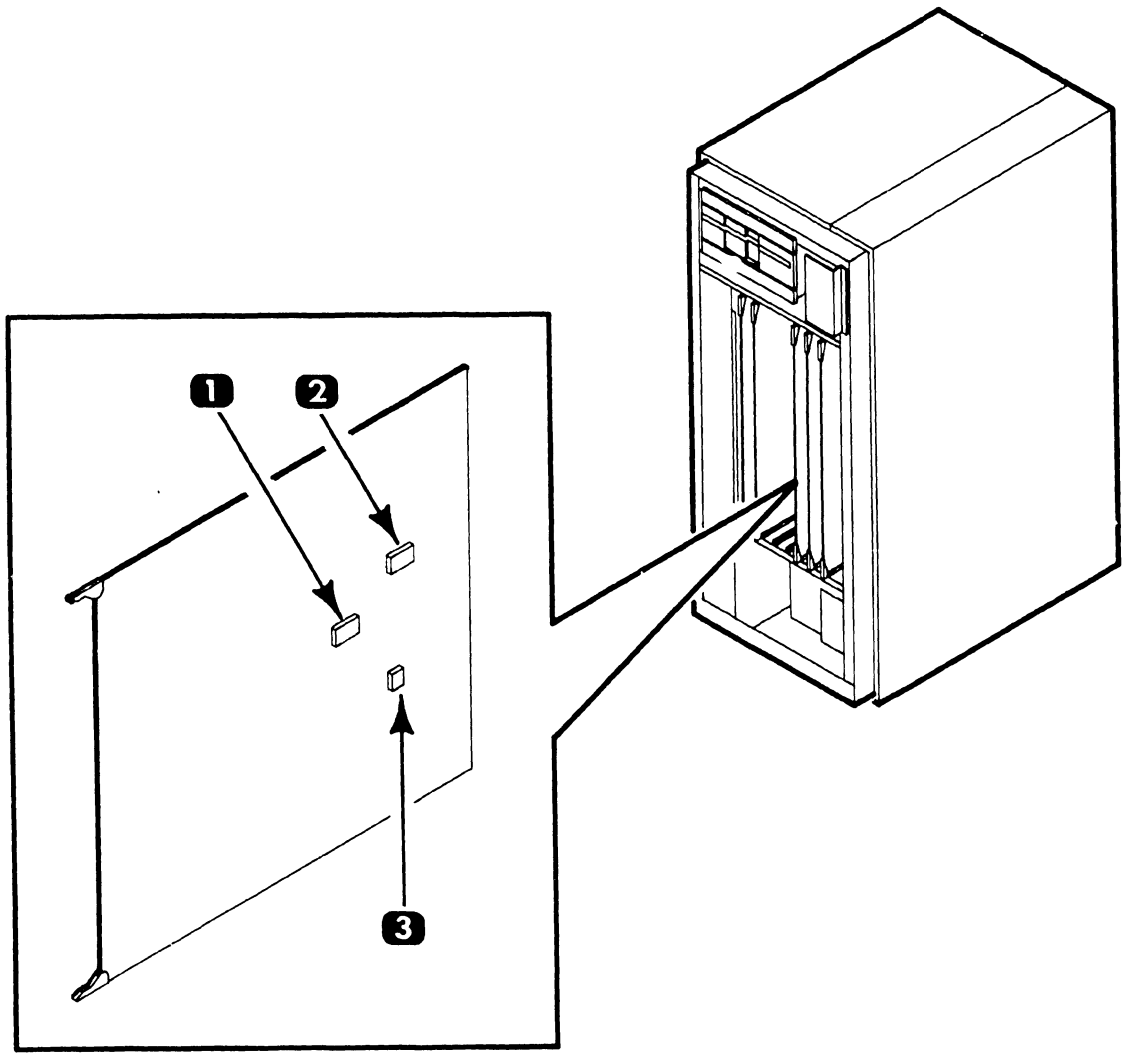
3.3.2 Master Unit RCU Board Controls



Item	*Name*	*Type and Function*
1	Disk Drive Device Type Switch SW1	Rocker-type 4-bit switch bank; programmed to read disk drive type device (Winchester). 9.4.3.

3.3 CONTROLS AND INDICATORS
Service Controls

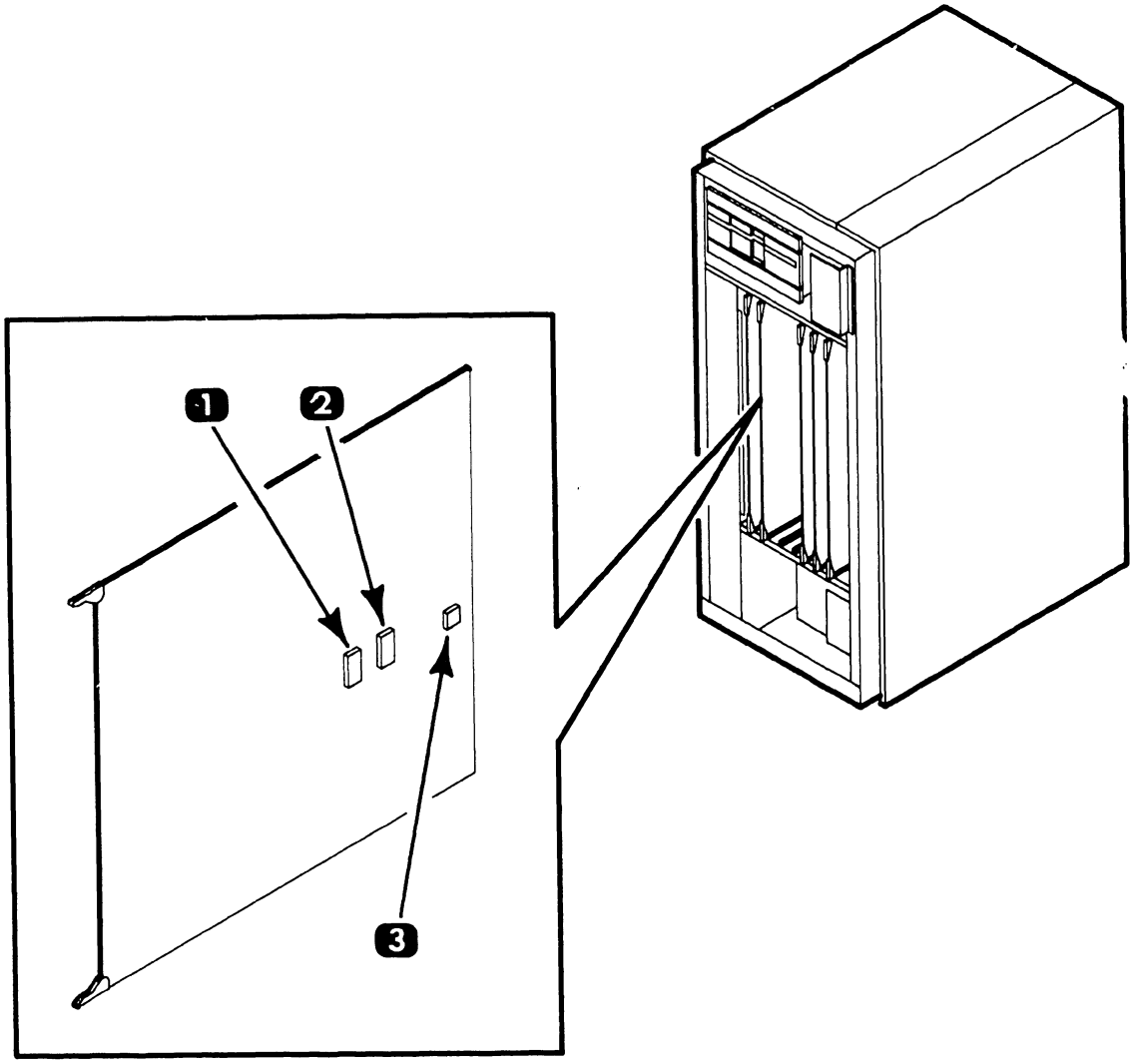
3.3.3 Master Unit IWS Board Controls



Item	*Name*	*Type and Function*
1	IN07 Command Switch SW1	Rocker-type 8-bit switch bank; selects workstation options and sets-up display characteristics. ☞ 9.4.4.
2	IN08 Command Switch SW2	Rocker-type 8-bit switch bank; selects workstation options only (e.g. bit 4 ON selects serial keyboard). ☞ 9.4.4.
3	Device Type Switch SW3	Rocker-type 4-bit switch bank; selects peripheral device type. Set to hex 5 to select workstation. ☞ 9.4.4.

3.3 CONTROLS AND INDICATORS
Service Controls

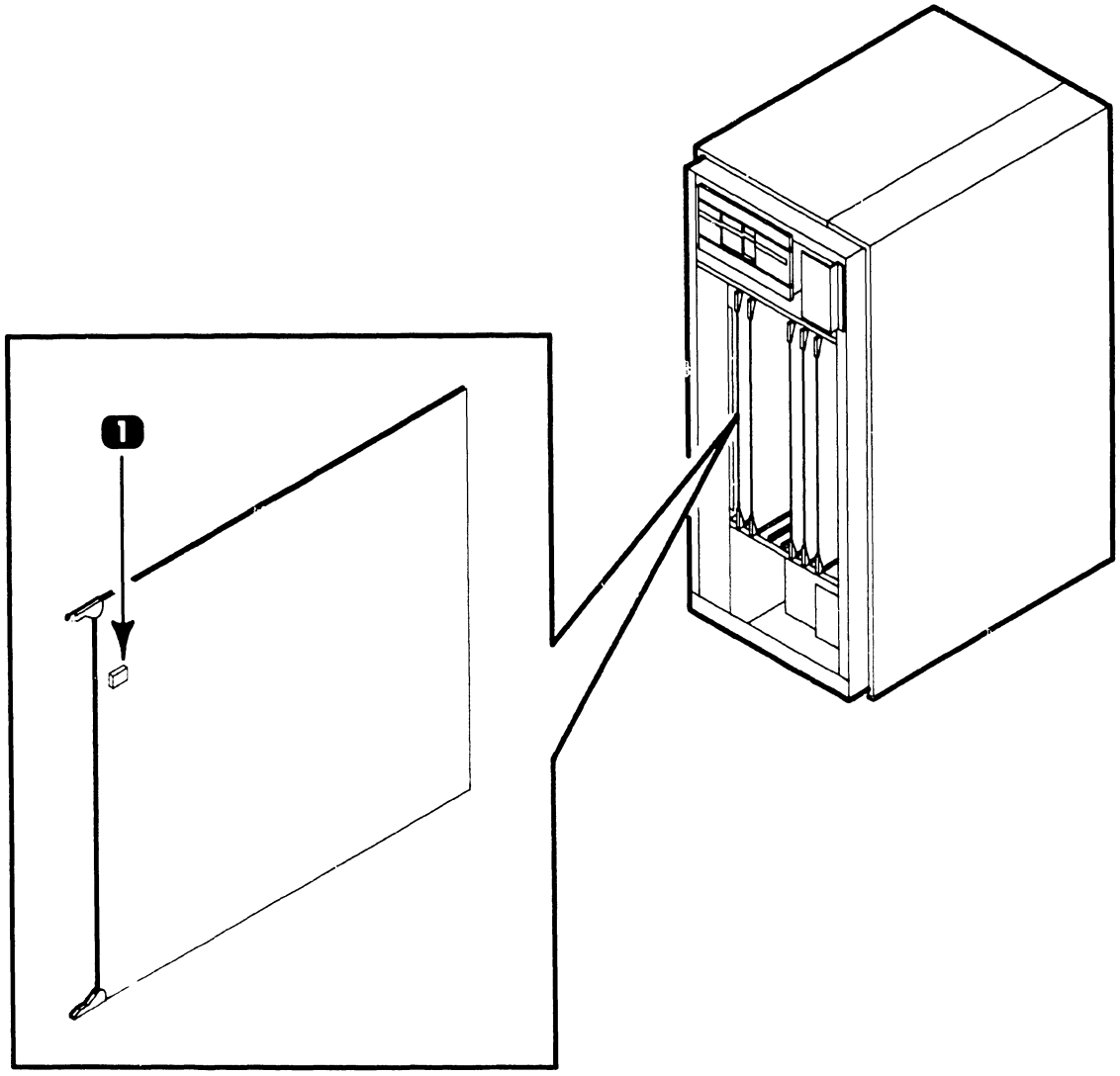
3.3.4 Master Unit IPC Board Controls



Item	*Name*	*Type and Function*
1	IN08 Command Switch SW1	Rocker-type 8-bit switch bank; selects options. Not used in present system configuration.
2	IN07 Command Switch SW2	Rocker-type 8-bit switch bank; sets-up system memory size (64K). ☞ 9.4.5.
3	Device Type Switch SW3	Rocker-type 4-bit switch bank; selects peripheral device type. Set to hex 4 to select printer. ☞ 9.4.5.

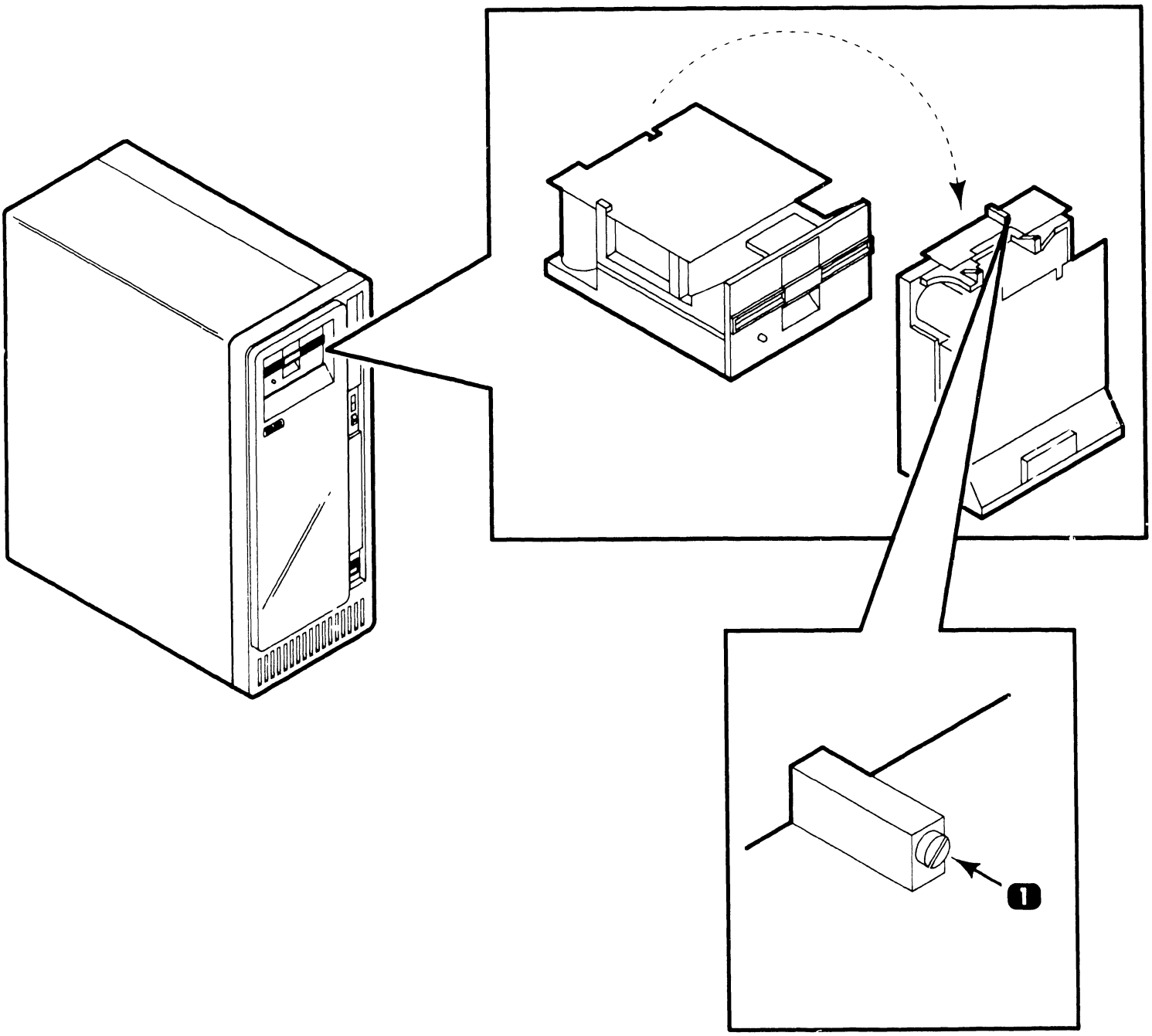
3.3 CONTROLS AND INDICATORS
Service Controls

3.3.5 Master Unit IWISE Board Controls



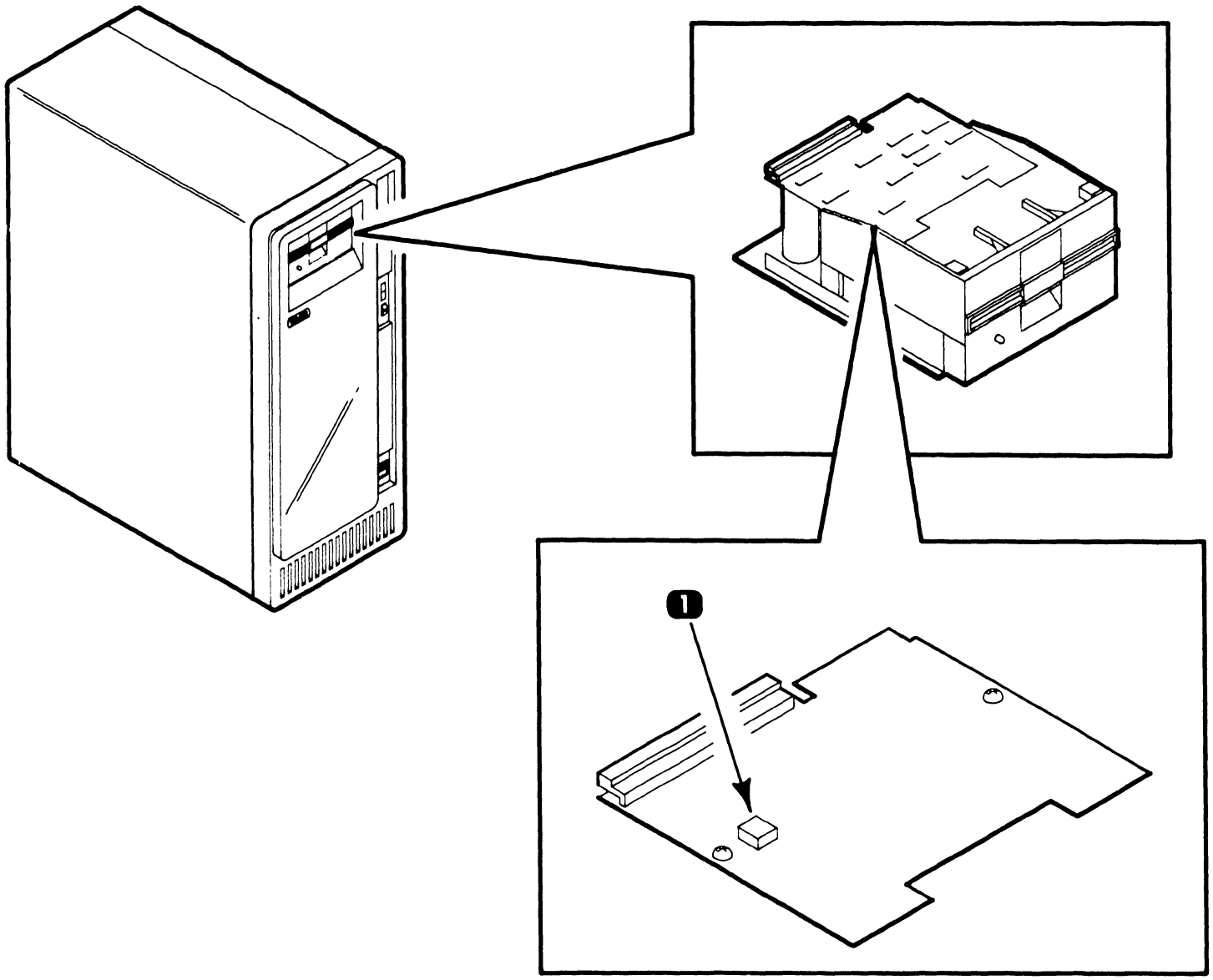
Item	*Name*	*Type and Function*
1	Run/Diagnostic Mode Switch SW1	Rocker-type 4-bit switch bank; selects operating mode for system IWISE function. Switch 1 ON selects Diagnostic mode. Switch 1 OFF selects RUN mode. Switches 2, 3, 4 are not connected. 9.4.7.

3.3.6 Master Unit Diskette Drive Control (Tandon)



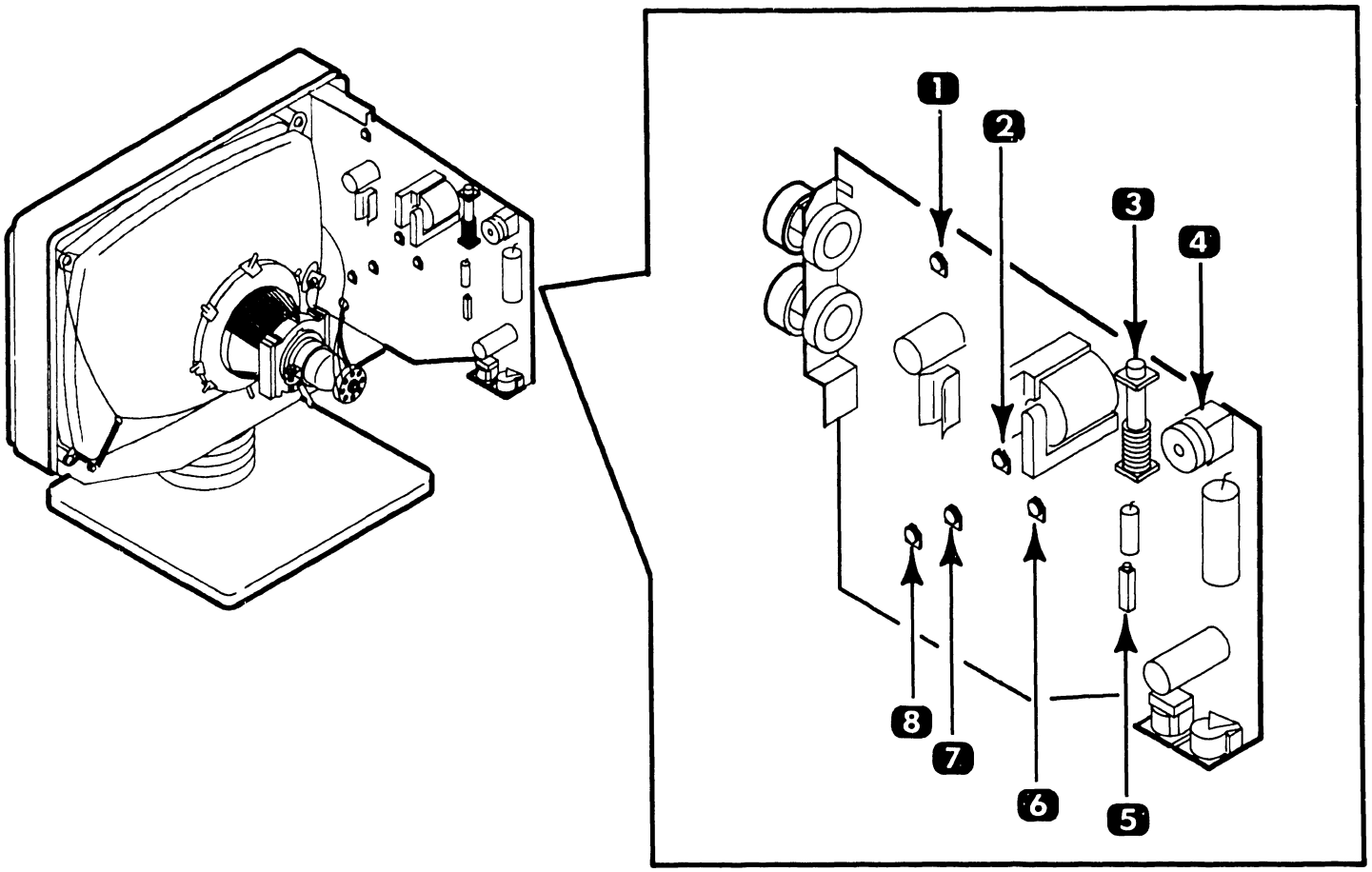
Item	*Name*	*Type and Function*
1	Motor Speed Adjustment R4	Potentiometer; adjusts spindle speed of diskette drive.

3.3.7 Master Unit Diskette Drive Control (MPI)



Item	Name	Type and Function
1	Motor Speed Adjustment R38	Potentiometer; adjusts spindle speed of diskette drive.

3.3.8 Workstation Monitor Alignment Controls (8244 PCB)

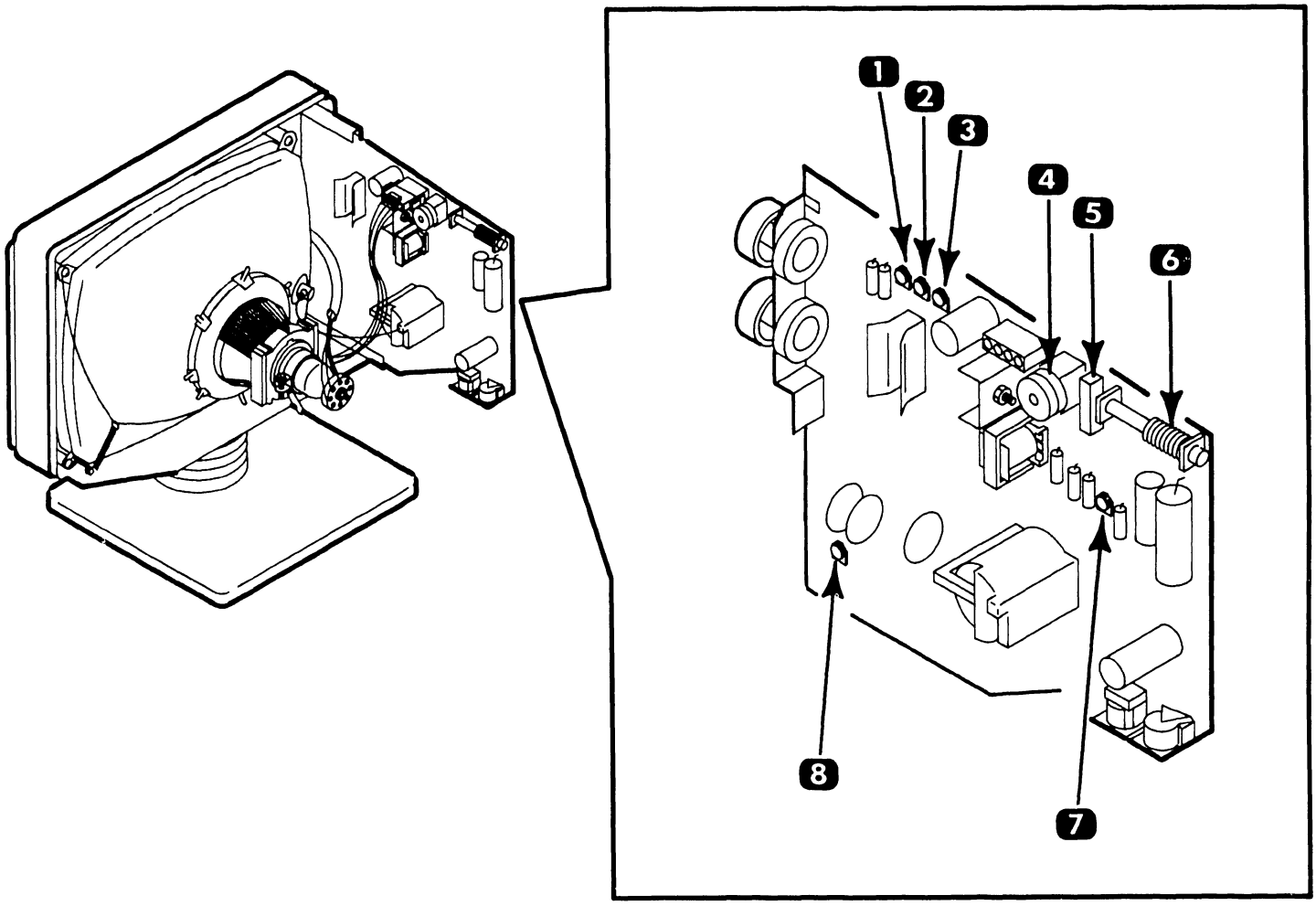


Item	Name	Type and Function
1	Focus Adjust R7	Potentiometer; adjusts focus of overall display.
2	Vertical Linearity R19	Potentiometer; adjusts character rows for equal height.
3	Horizontal Width Z2	Coil; adjusts display width.
4	Horizontal Linearity Z1	Coil; adjusts equal character width across screen.
5	Horizontal Hold R26	Potentiometer; minimizes character distortion.
6	Horizontal Phase R28	Potentiometer; centers overall character display.
7	Vertical Size R36	Potentiometer; adjusts display height.
8	Vertical Hold R45	Potentiometer; adjusts vertical stability.

3.3 CONTROLS AND INDICATORS

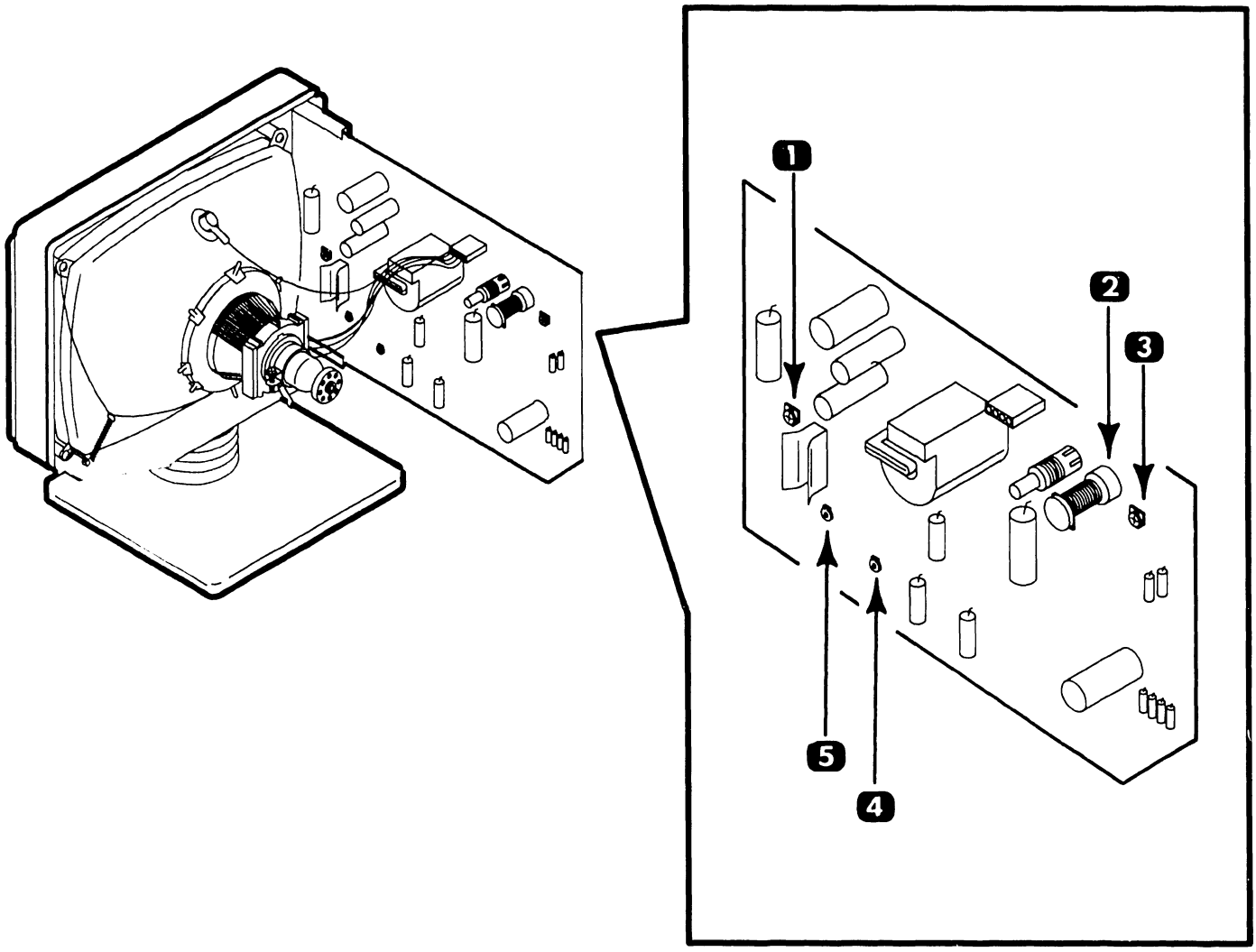
Service Controls

3.3.9 Workstation Monitor Alignment Controls (8344 PCB)



Item	*Name*	*Type and Function*
1	Vertical Size R7	Potentiometer; adjusts display height.
2	Vertical Hold R6	Potentiometer; adjusts vertical stability.
3	Vertical Linearity R5	Potentiometer; adjusts character rows for equal height.
4	Horizontal Linearity Z2	Coil; adjusts equal character width across screen.
5	Horizontal Hold R1	Potentiometer; minimizes character distortion.
6	Horizontal Width Z1	Coil; adjusts display width.
7	Horizontal Phase R26	Potentiometer; centers overall character display.
8	Focus Adjust R61	Potentiometer; adjusts focus of overall display.

3.3.9.A Workstation Monitor Alignment Controls (8514 PCB)

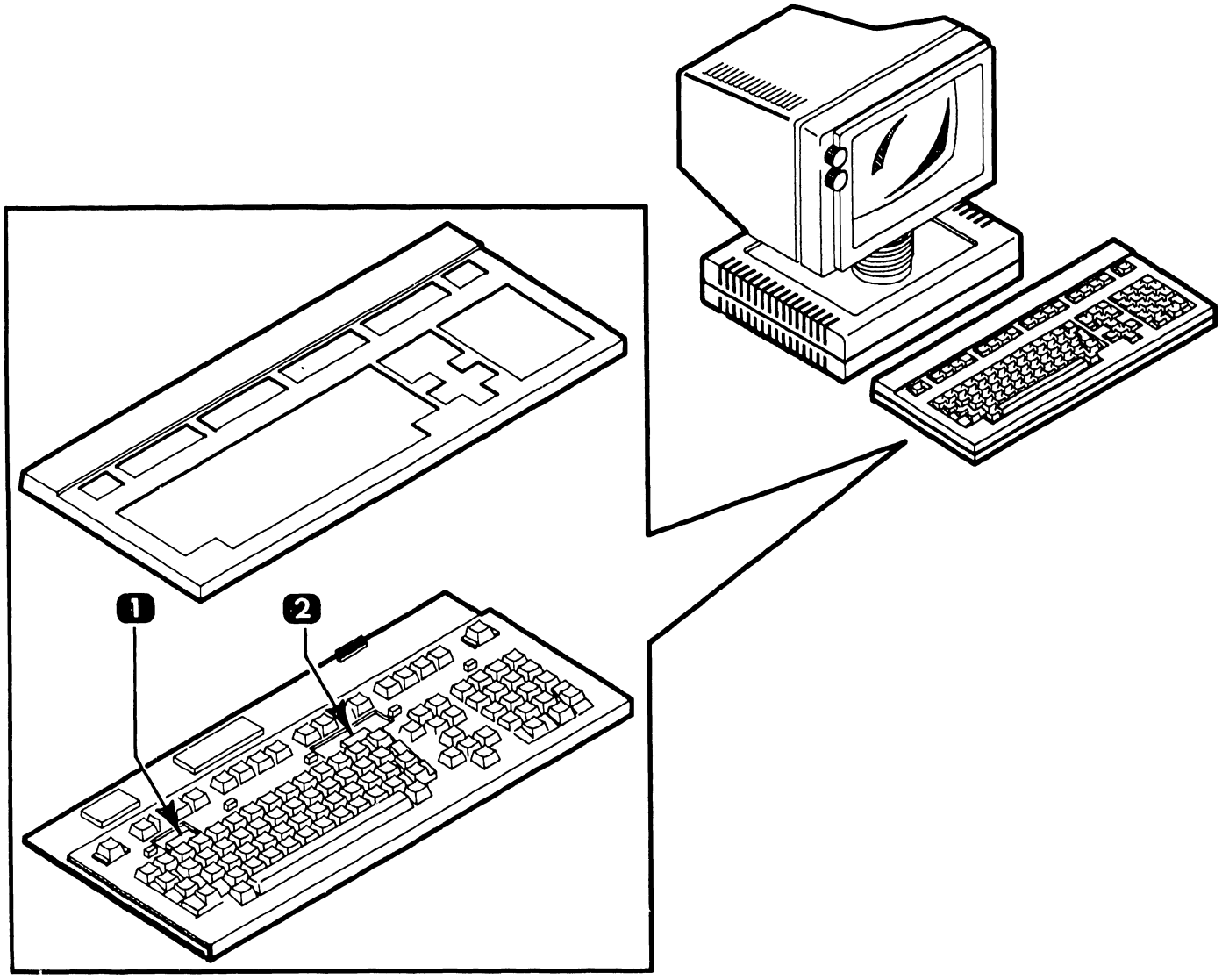


Item	*Name*	*Type and Function*
1	Vertical Linearity R31	Potentiometer; adjusts character rows for equal height.
2	Horizontal Width Z2	Coil; adjusts display width.
3	Focus Adjust R3	Potentiometer; adjusts focus of overall display.
4	Vertical Size R74	Potentiometer; adjusts display height.
5	Brightness Limit R77	Potentiometer; adjusts brightness range of front panel control.

3.3 CONTROLS AND INDICATORS

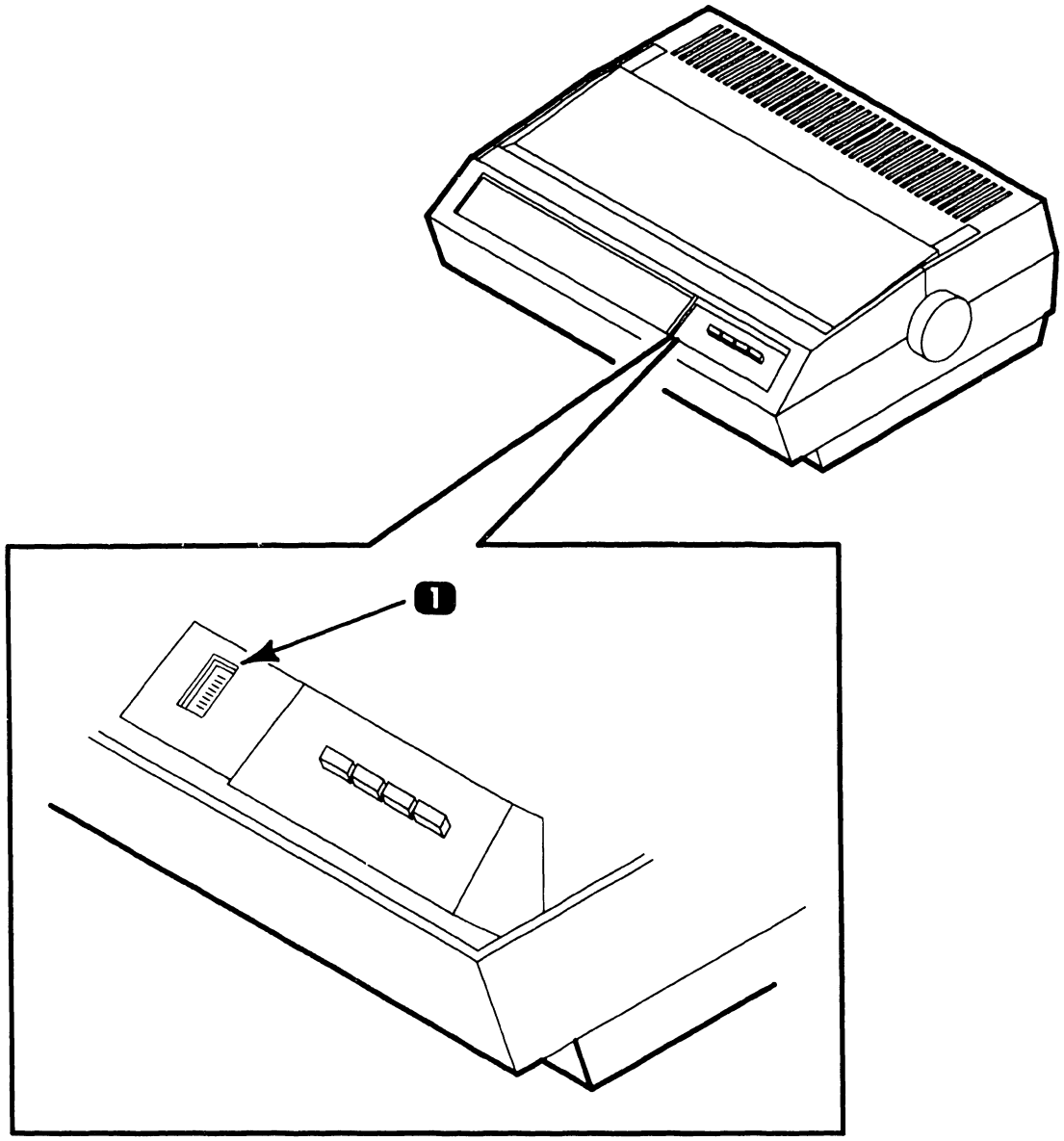
Service Controls

3.3.10 Workstation Keyboard Controls



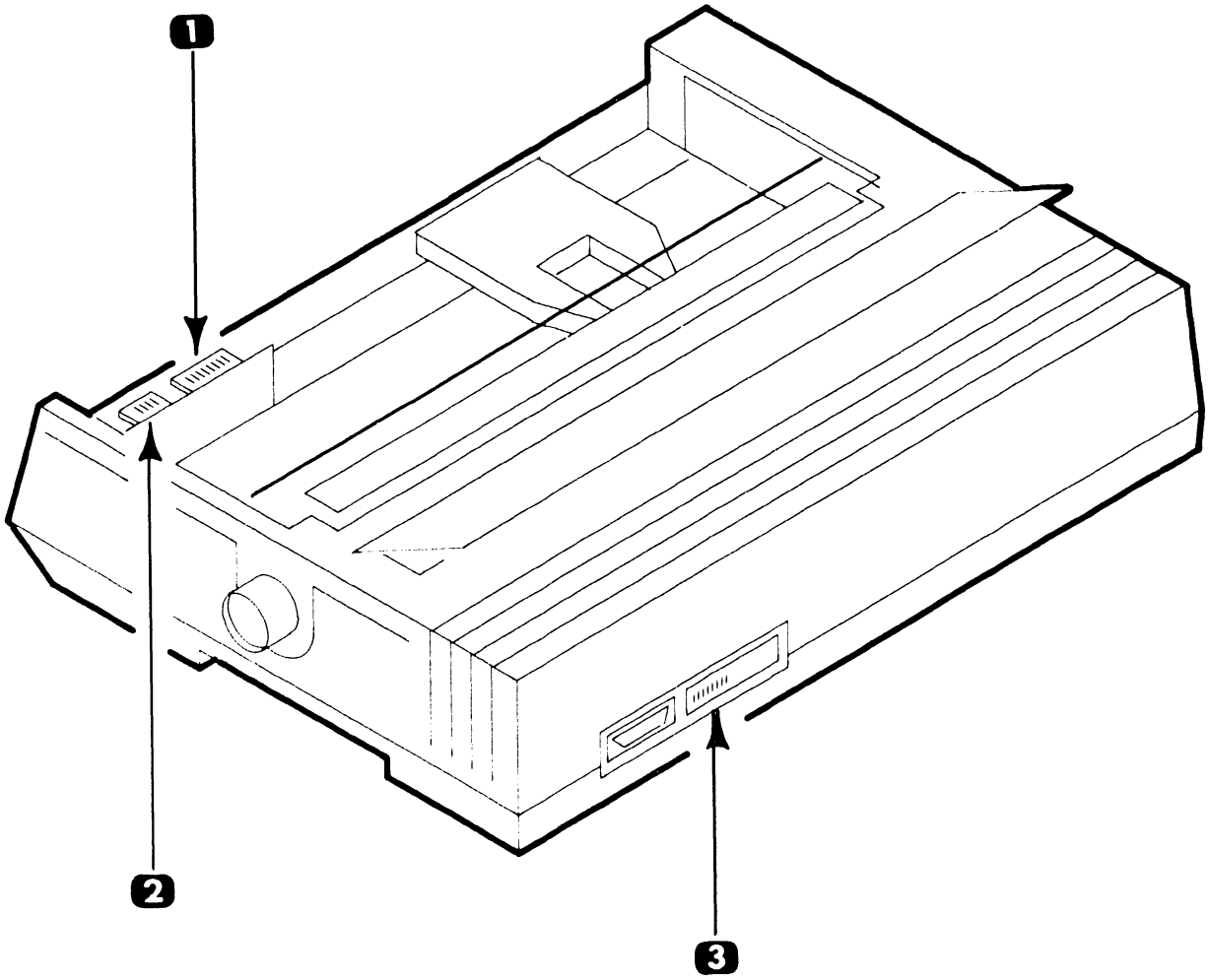
Item	*Name*	*Type and Function*
1	Language Select Switch SW1	Rocker-type 8-bit switch bank; selects language option. All switches should be set to OFF for standard english. 9.4.8.
2	Language Select Switch SW2	Rocker-type 8-bit switch bank; selects language option. All switches should be set to OFF for standard english. 9.4.8.

3.3.11 Printer Options Control (Diablo 620)



Item	*Name*	*Type and Function*
1	Communications Options Switch	Slider 8-bit switch bank; selects communications options and operating characteristics of Daisy printer. 9.4.9.

3.3.12 Printer Options Controls (Juki PM015)

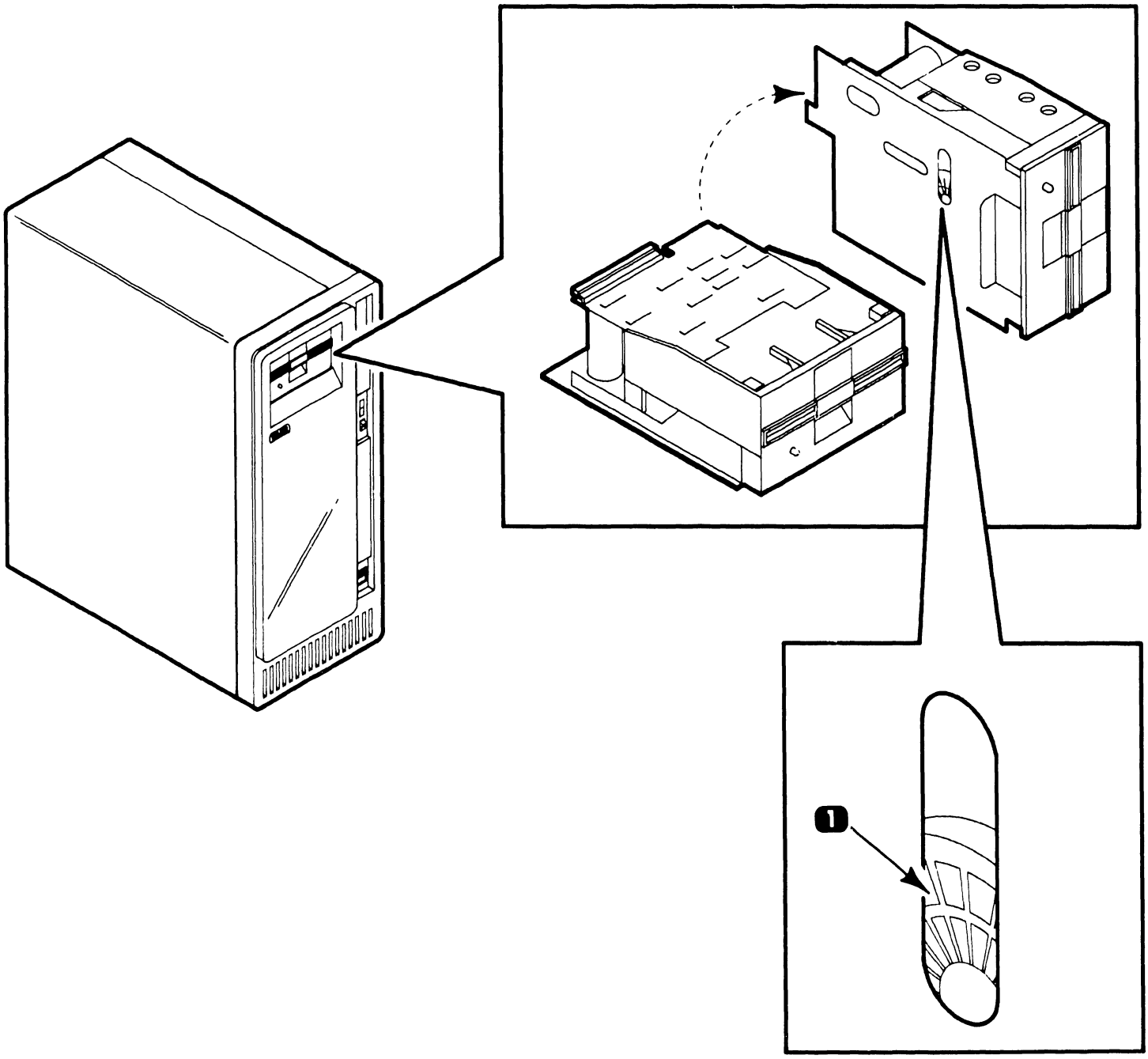


Item	*Name*	*Type and Function*
1	Printer Functions SW21	Slider 6-bit switch bank; controls functions such as line feed, form length, paper feed, and print impression level.
2	Type/Pitch SW22	Slider 4-bit switch bank; selects type size and pitch.
3	Communications Options Switch SW12	Slider 8-bit switch bank selects baud rate and serial interface options.

3.4 CONTROLS AND INDICATORS

Service Indicators

3.4.1 Master Unit Diskette Drive Timing Mark Indicator (Tandon and MPI)

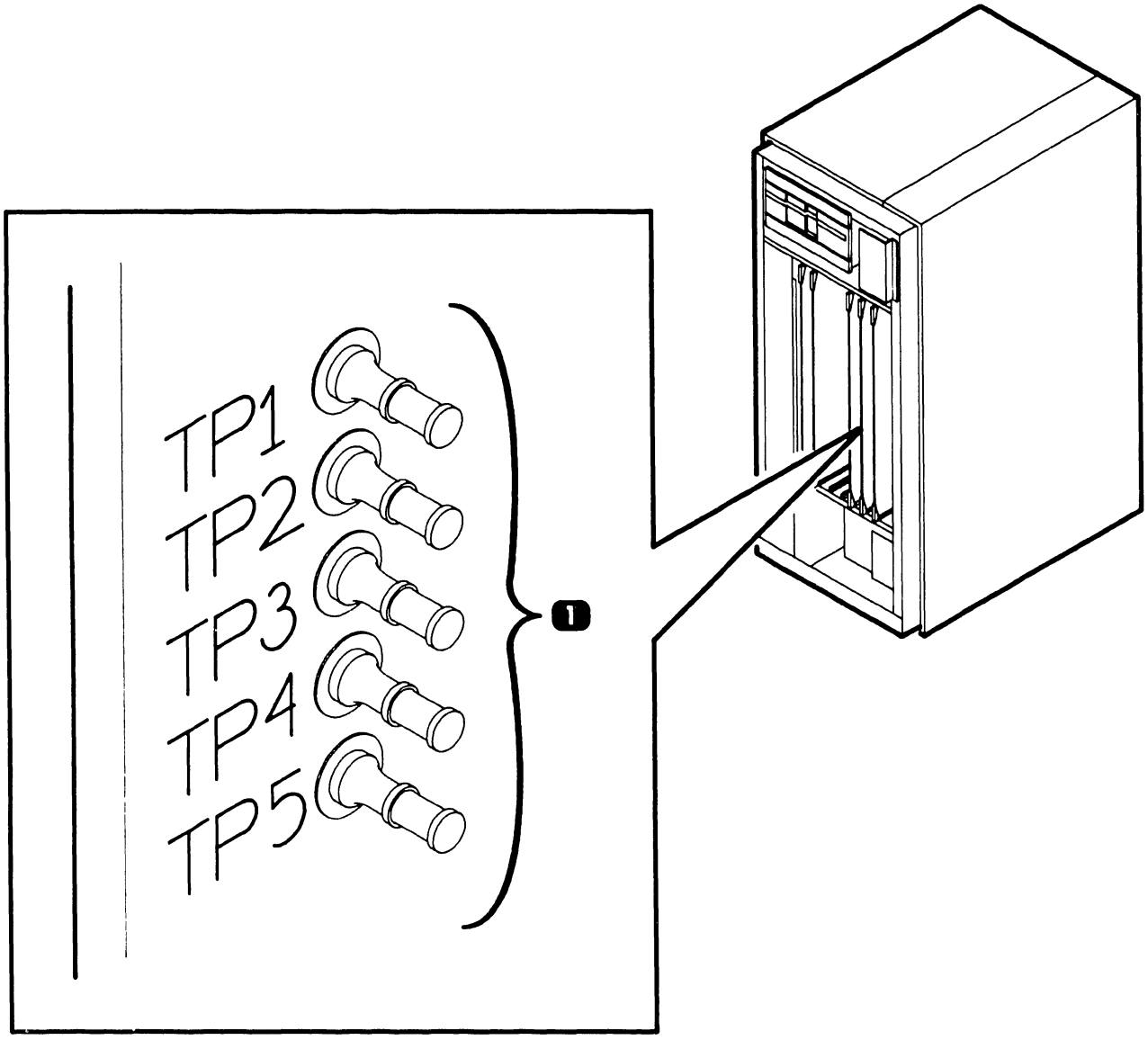


Item	*Name*	*Type and Function*
1	Motor Speed Timing Mark Indicator	Visual Marks; indicates spindle speed for diskette drive motor speed adjustment.

3.4 CONTROLS AND INDICATORS

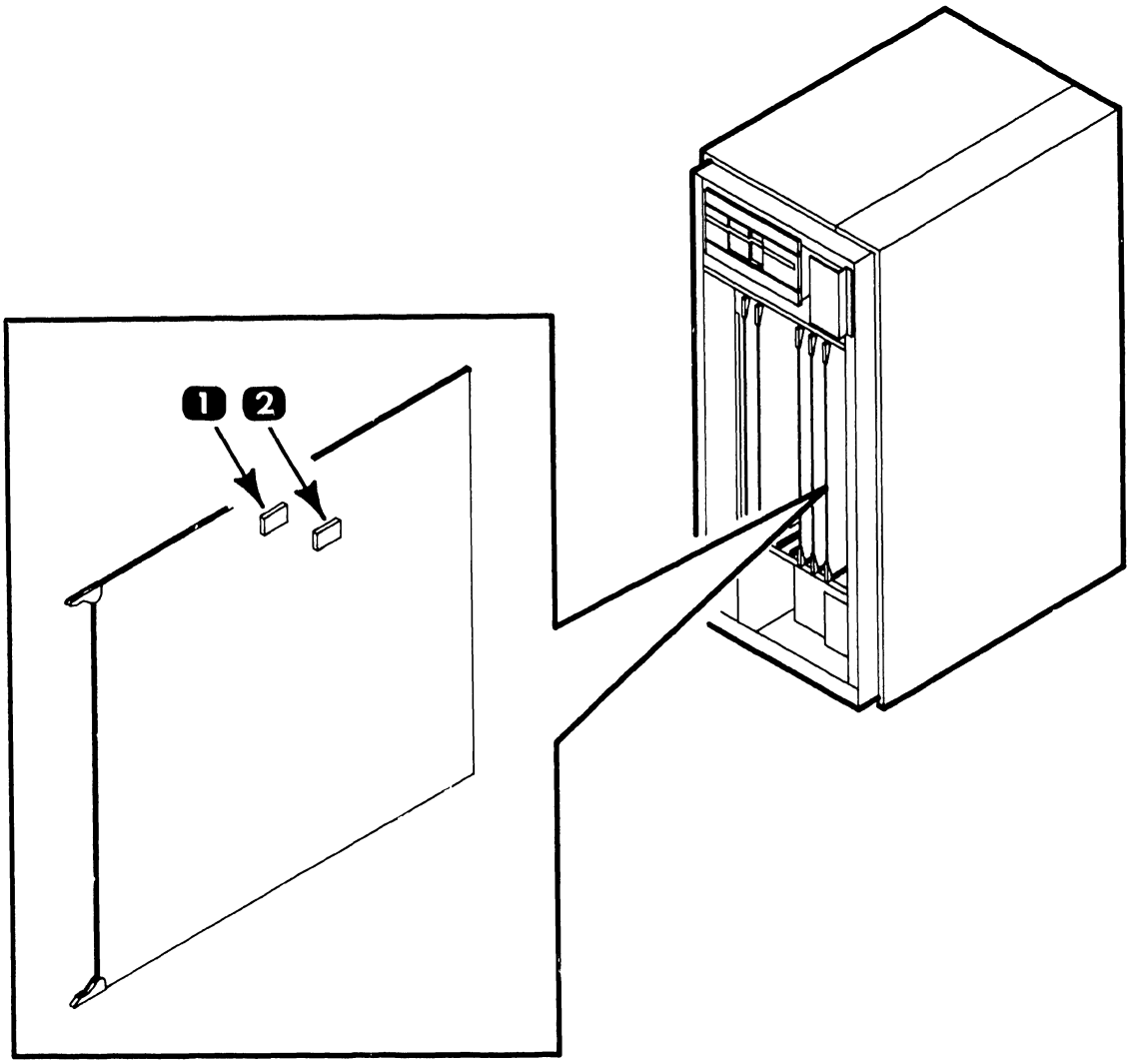
Service Indicators

3.4.2 Master Unit RCU Board Test Point Indicators



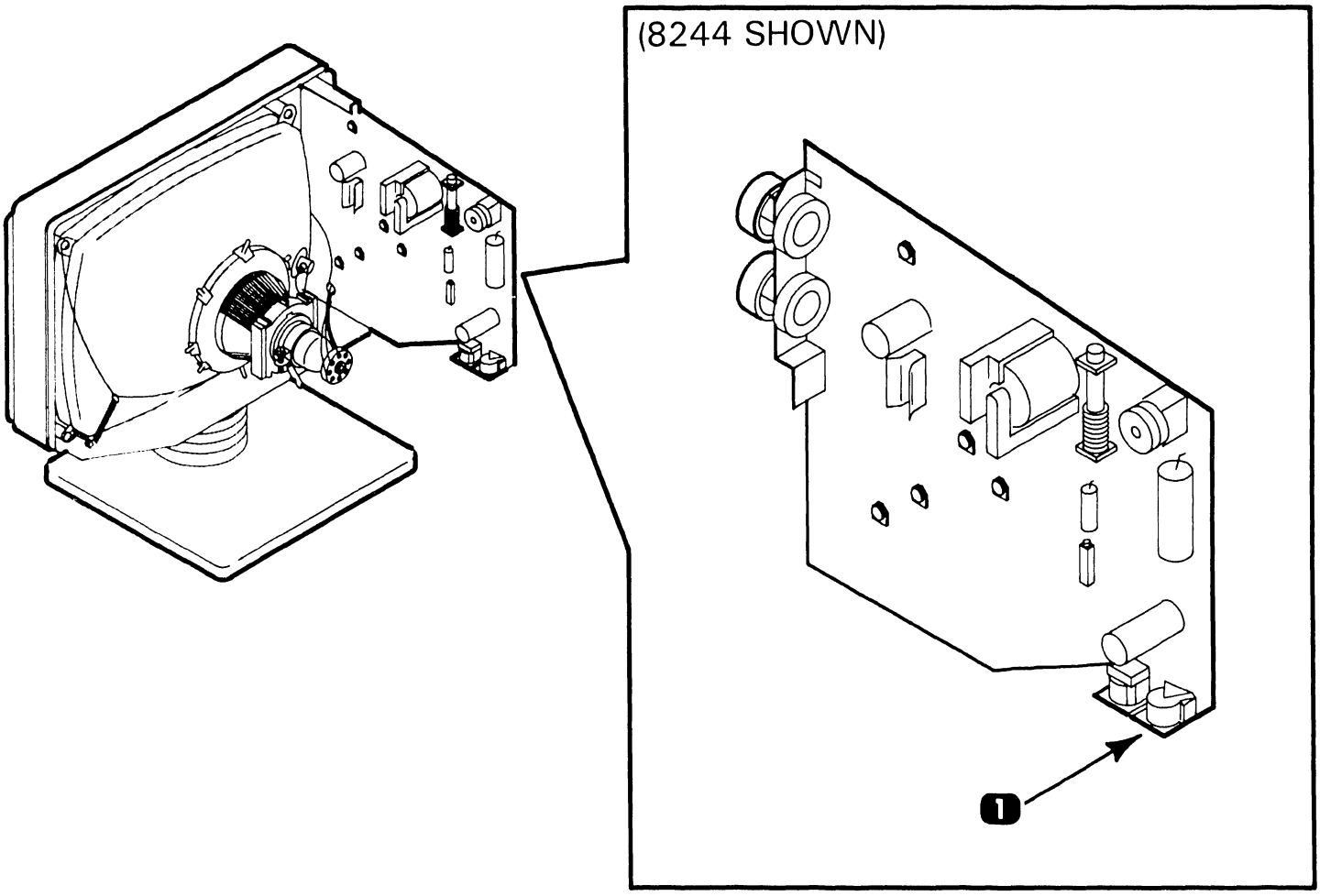
Item	*Name*	*Type and Function*
1	Voltage Test Points TP1-TP5	Terminals; voltage test points for checking Master Unit dc voltages.

3.4.3 Master Unit RMU Board VCO Test Points



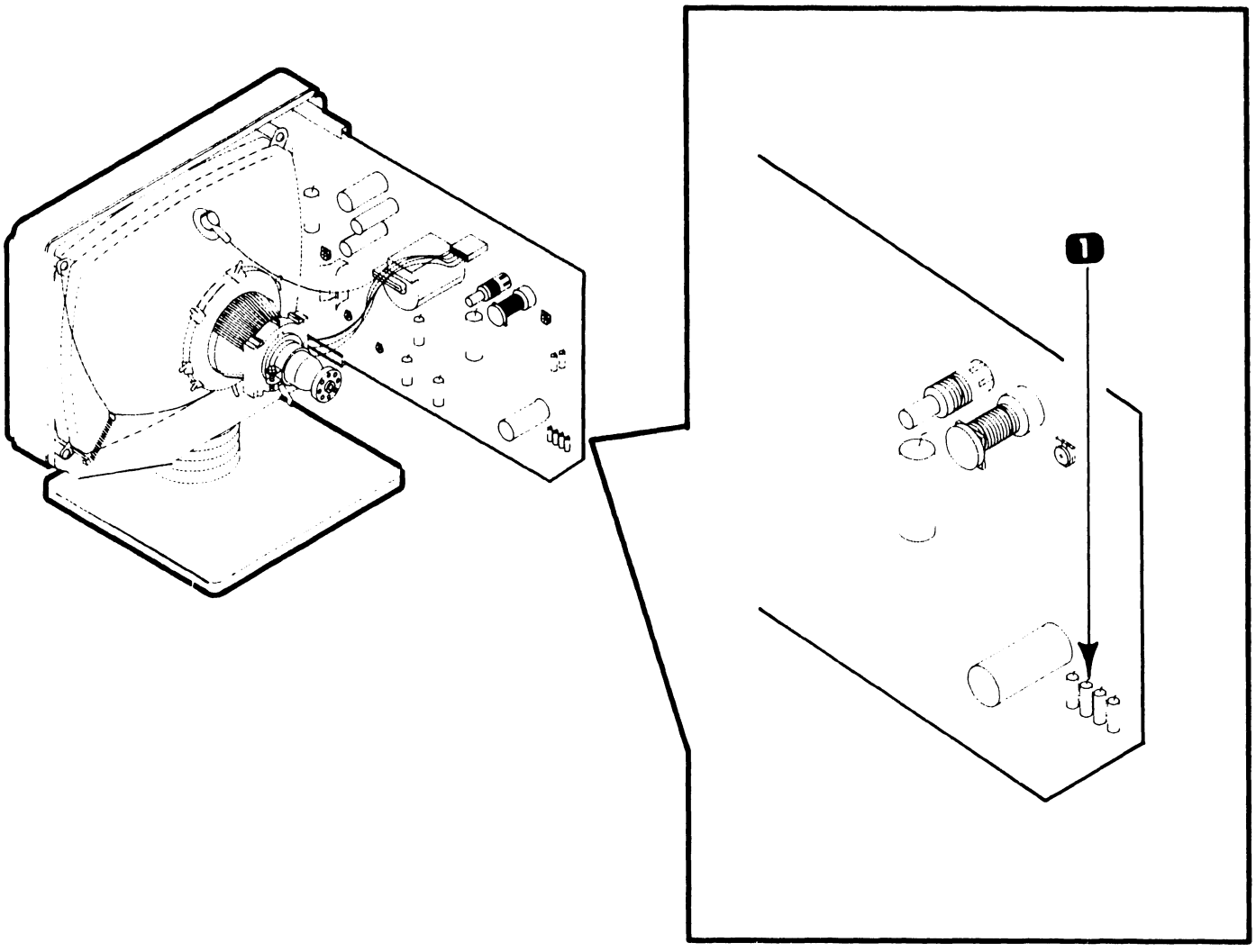
Item	*Name*	*Type and Function*
1	VCO Test Point L83	Integrated circuit; VCO test point location to check for proper VCO timing.
2	VCO Test Point L85	Integrated circuit; VCO test point location to check for proper VCO timing.

3.4.4 Workstation Monitor Test Point (8244 or 8344 PCB)



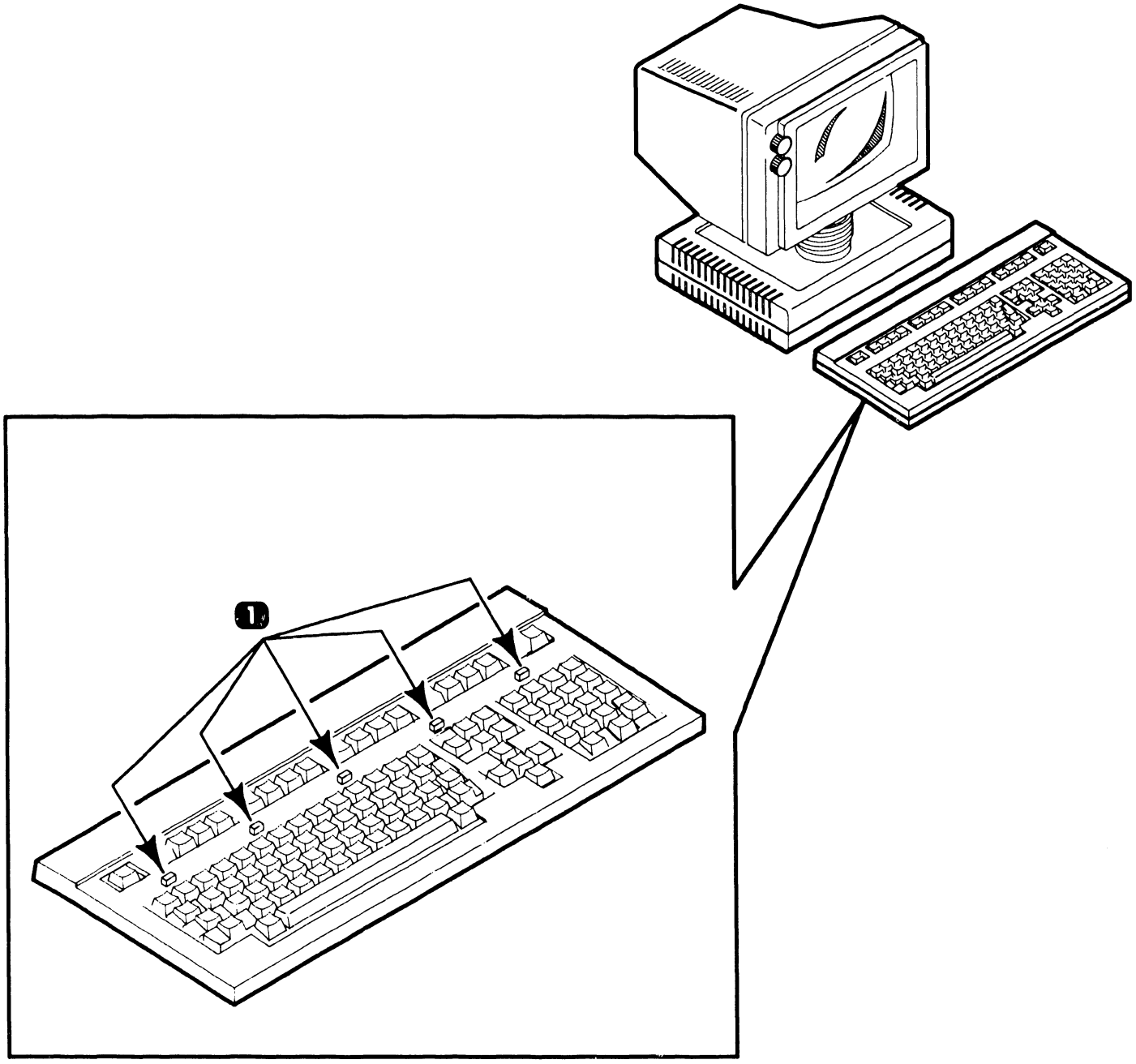
Item	*Name*	*Type and Function*
1	+12 Volt Test Point J2	Connector; monitor point for +12 vdc output of workstation base power supply.

3.4.4A Workstation Monitor Test Point (8514 PCB)



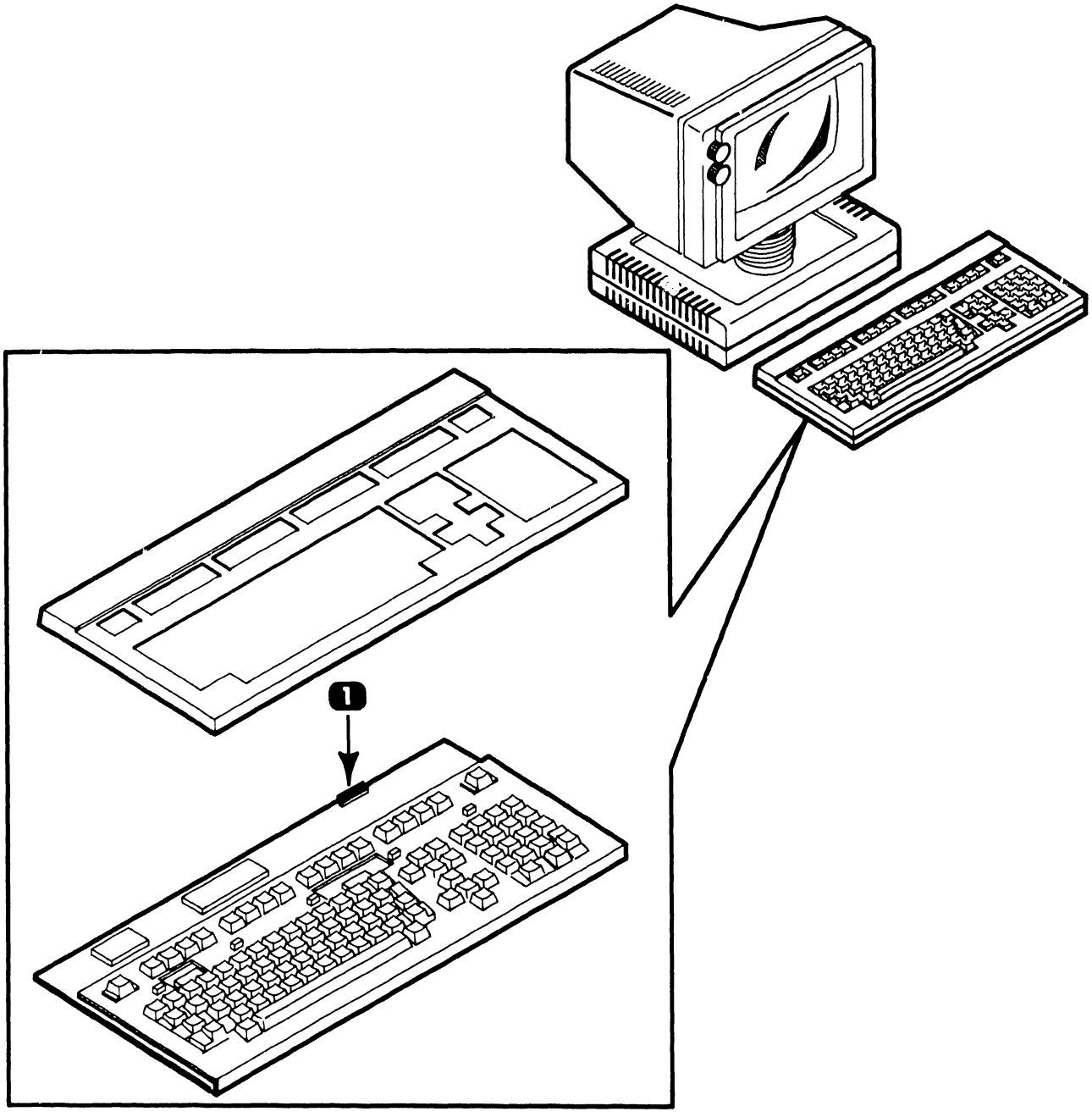
Item	*Name*	*Type and Function*
1	+12 Volt Test Point	RF Choke; monitor test point for + 12 vdc output of workstation base power supply.

3.4.5 Workstation Keyboard Indicators



Item	Name	Type and Function
1	Keyboard Diagnostic LED's	LEDs; These LED's are software programmable and may be used to indicate diagnostic error codes. Note: Not supported on Internal Workstation.

3.4.6 Workstation Keyboard Test Point



Item	Name	Type and Function
1	+5 Volt Test Point J1	Connector; monitor point for +5 vdc output of workstation base power supply.

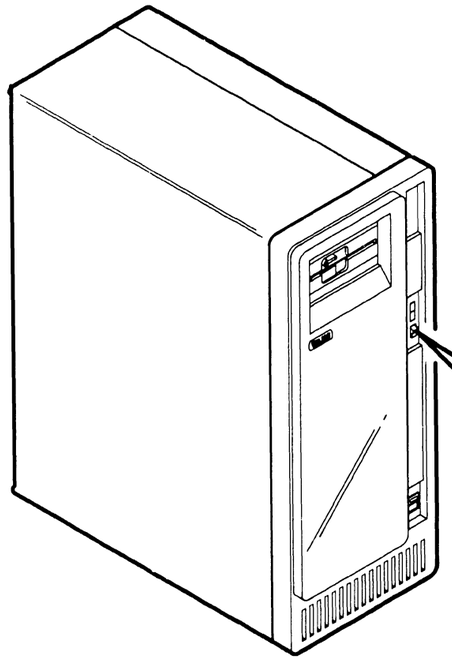
SECTION 4

OPERATION

SECTION 4 CONTENTS

SECTION 4
OPERATION

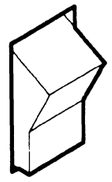
4.1 Power-Up and B.I.T. Diagnostic Procedure

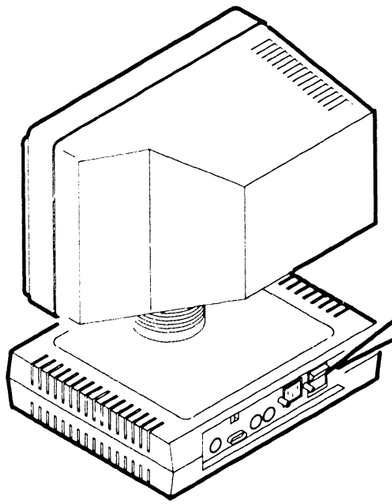


CAUTION

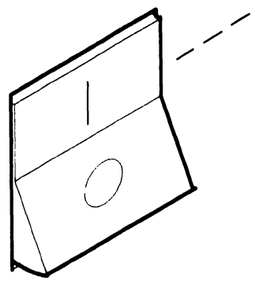
Never switch Master Unit power ON or OFF when a floppy diskette is mounted in drive. Also, never mount or remove a diskette while floppy activity LED is on.

1 Set IPL DISK SELECT switch to (---).



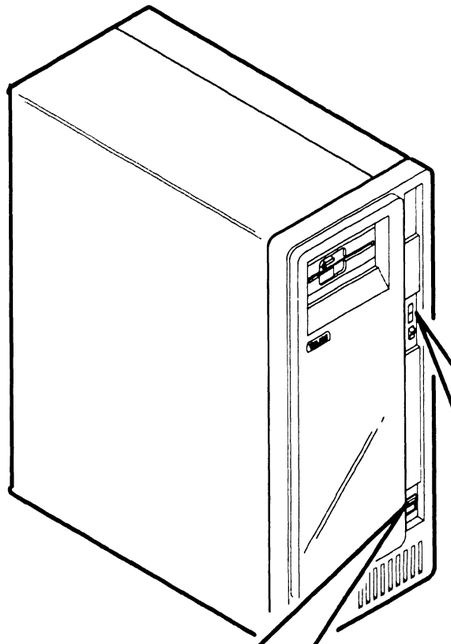


2 Press "1" on workstation base AC power switch.

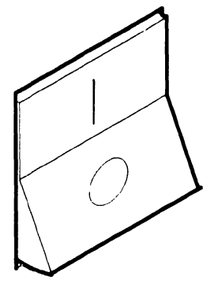


NOTE

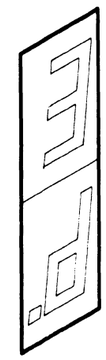
Power-On all other peripherals.



3 Press "1" on Master Unit AC power switch.



4 Diagnostic LED's cycle through B.I.T. error codes for 20 seconds or display error code. 6.4.2 "UP" displayed momentarily at end of B.I.T. power-up test.

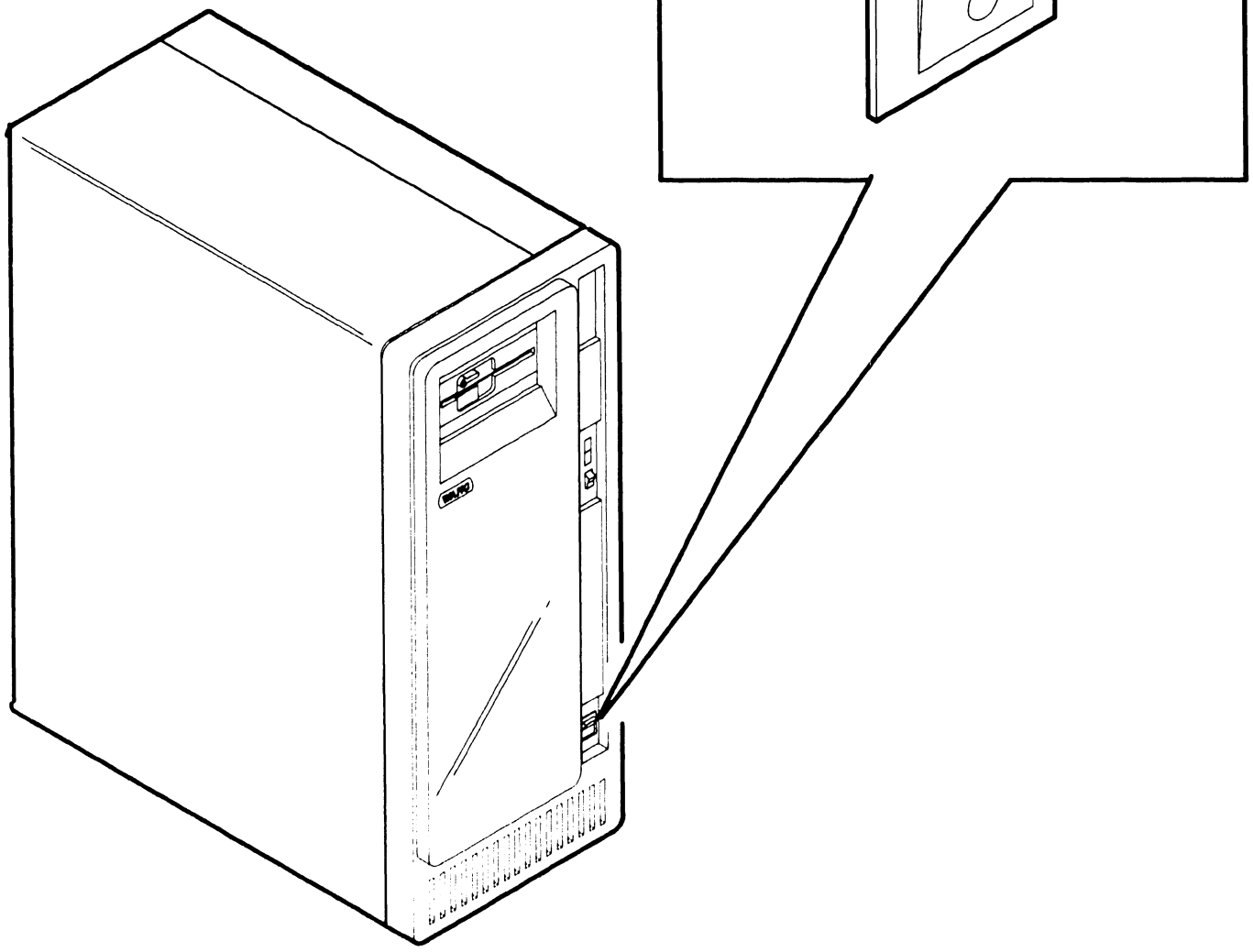


5 If system is not connected to IWISE, enter correct date and time on screen.

4.2 Power-Down Procedure

CAUTION
Ensure no diskette is in floppy drive.

1. Power-down all system peripheral devices.
2. Press "0" on Master Unit AC power switch.



SECTION 5

PREVENTIVE MAINTENANCE

SECTION 5 CONTENTS

SECTION 5
PREVENTIVE MAINTENANCE

5.1 PREVENTIVE MAINTENANCE
Materials Required

The CE tool kit is required for preventive maintenance (PM) on OIS 40/45/50/55/60/65/70 systems.

5.2 PREVENTIVE MAINTENANCE

PM Schedules

Action/Frequency	*6 Months*	*12 Months*	*Section*
Operational Check (IPL)	X	X	4.1
Clean exterior	X		5.4
Clean interior	X		5.4
Inspect	X		5.5
Adjust	X		5.6
Diagnostic Check	X		
Clean contacts & connectors		X	5.4
Apply ECN's		X	
Replace parts (if required)		X	
Repair scratches		X	

5.3 PREVENTIVE MAINTENANCE

Operational Check

A weekly equipment operational check is recommended. This test consists of running power-up diagnostics and checking the front panel diagnostic LEDs for possible error codes. The test takes approximately 20 seconds to complete and is activated when the system is initially powered-on.

5.4 PREVENTIVE MAINTENANCE
Cleaning

Exterior:

1. Remove dust from exterior with cloth and vacuum.
2. Wipe case clean with soft cloth.

Interior:

1. Remove Master Unit front and side panels ( 7.2.1, 7.2.2) and vacuum interior.
2. Clean fan blades with cloth.

Contacts and Connectors:

1. Remove all PCBs ( 7.2.3) and clean contacts if necessary. Vacuum dust on PCBs.
2. Clean I/O cable connectors.

Diskette Drive:

1. Remove dust from drive using vacuum cleaner.

5.5 PREVENTIVE MAINTENANCE
Inspection

1. Check for loose, missing, or damaged parts.
2. Check PCB and PROM revision levels.
3. Check PCB and I/O cable circuitry.
4. Check fan operation.
5. Inspect covers for scratches or blemishes.
6. Check PCB switch settings.
   9.4
7. Create an archive diskette and check floppy drive for audible spindle noise.

5.6 PREVENTIVE MAINTENANCE
Adjustments

Mechanical:  8.3.1

Electrical:

1. Diskette Drive Spindle Speed:
    8.2.3
2. Workstation Video Monitor Board:
    8.2.1, 8.2.2

SECTION 6

TROUBLESHOOTING

SECTION 6 CONTENTS

SECTION 6
TROUBLESHOOTING

6 TROUBLESHOOTING

6.1 Tools and Equipment

Tools and equipment required to troubleshoot OIS 40 45 50 55 60 65 70 systems consists of a standard CE tool kit, a DVM, an oscilloscope, and three diagnostic test routines. The diagnostic routines are contained on separate diskettes and should be available when troubleshooting at the customers site as an aid in isolating system problems. The diskette-based troubleshooting diagnostics are described in section 6.2.

6.2.1 Master DTOS Diagnostic

The OIS 40 45 50 55 60 65 70 Master DTOS diagnostic is contained on a single floppy diskette. General use of the diagnostic is intended for situations where the PROM-based power-up diagnostics fail to isolate a board or assembly failure within the Master Unit. In addition, the diagnostic can be used for confidence testing to ensure that all devices operate properly.

Once the Master monitor diskette is IPL'd via the Master Unit floppy diskette drive, the operator can select, execute, control and monitor desired combinations of the test programs that comprise the diagnostic.

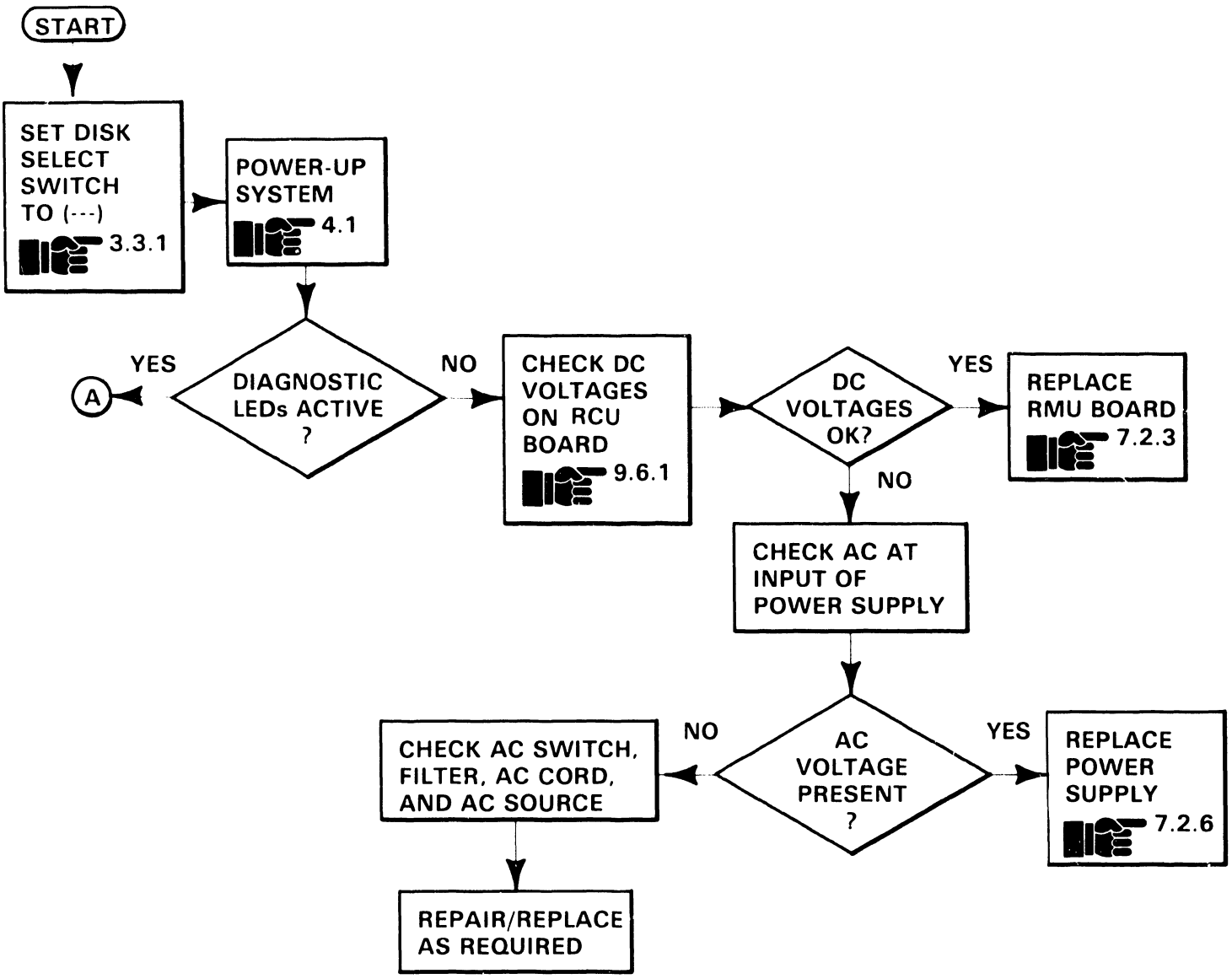
6.2.2 On-Line DTOS Diagnostic

The OIS 40 45 50 55 60 65 70 On-Line DTOS diagnostic allows the operator to select and run diagnostic programs for individual slave devices (e.g. workstations) connected to the Master Unit. Its primary uses are for unit test and repair, and board test and repair.

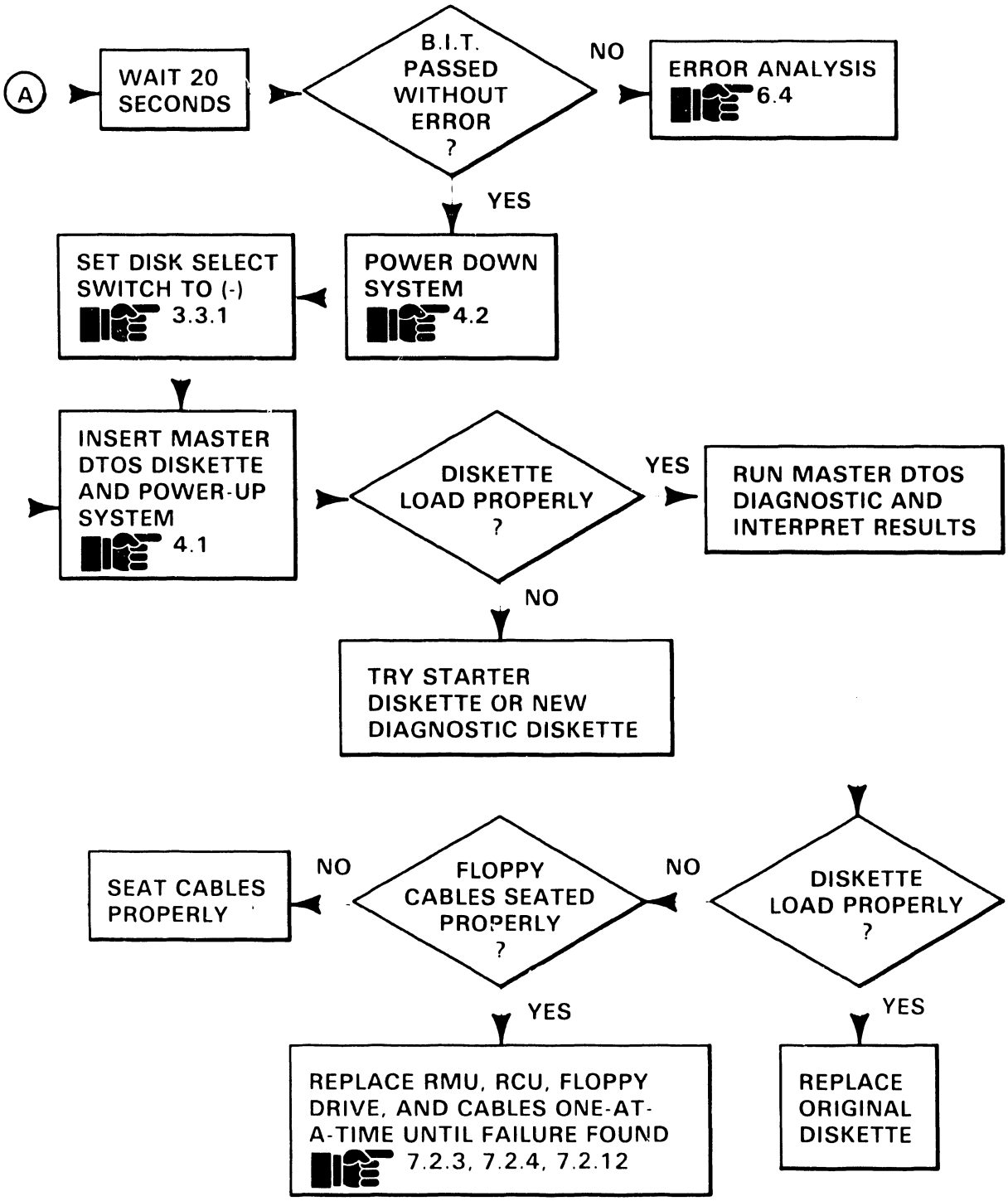
6.2.3 OIS 50 Class Diagnostic (SYSEX 50C)

SYSEX50C is a system exerciser that allows simultaneous exercising of each major logic board in the OIS 40 45 50 55 60 60-1 65 70 Master Unit plus some logic in attached slaves. The diagnostic generates a large amount of random activity on selected drives. It is designed to isolate intermittent conditions and for system checkout. A useful feature of SYSEX50C is that it allows slave memory to be used to perform some of the read, write, or random read operations. SYSEX50C IPL's from any IWS or serial workstation port of the system.

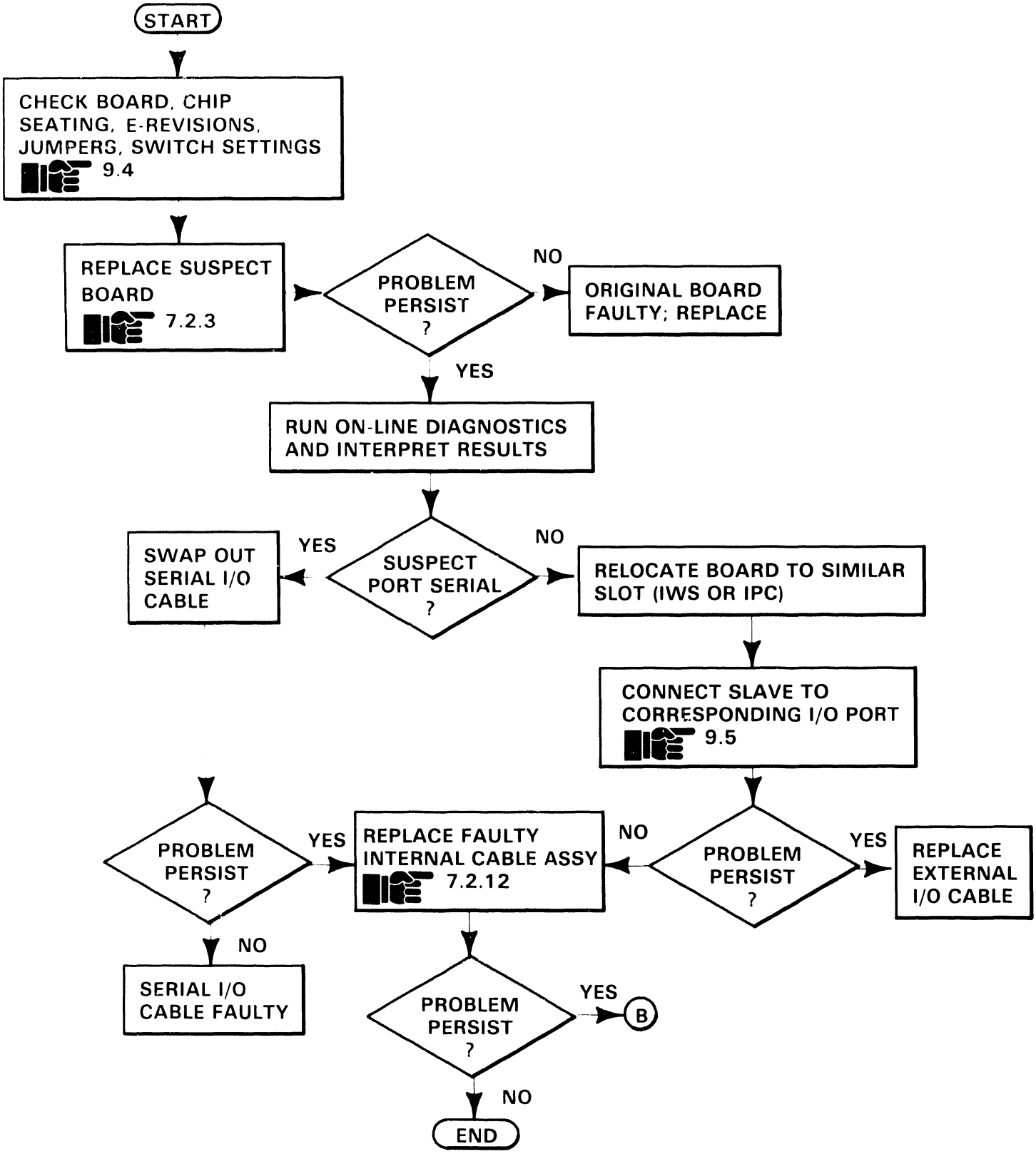
6.3.1 Power-Up Procedure (Sheet 1 of 2)



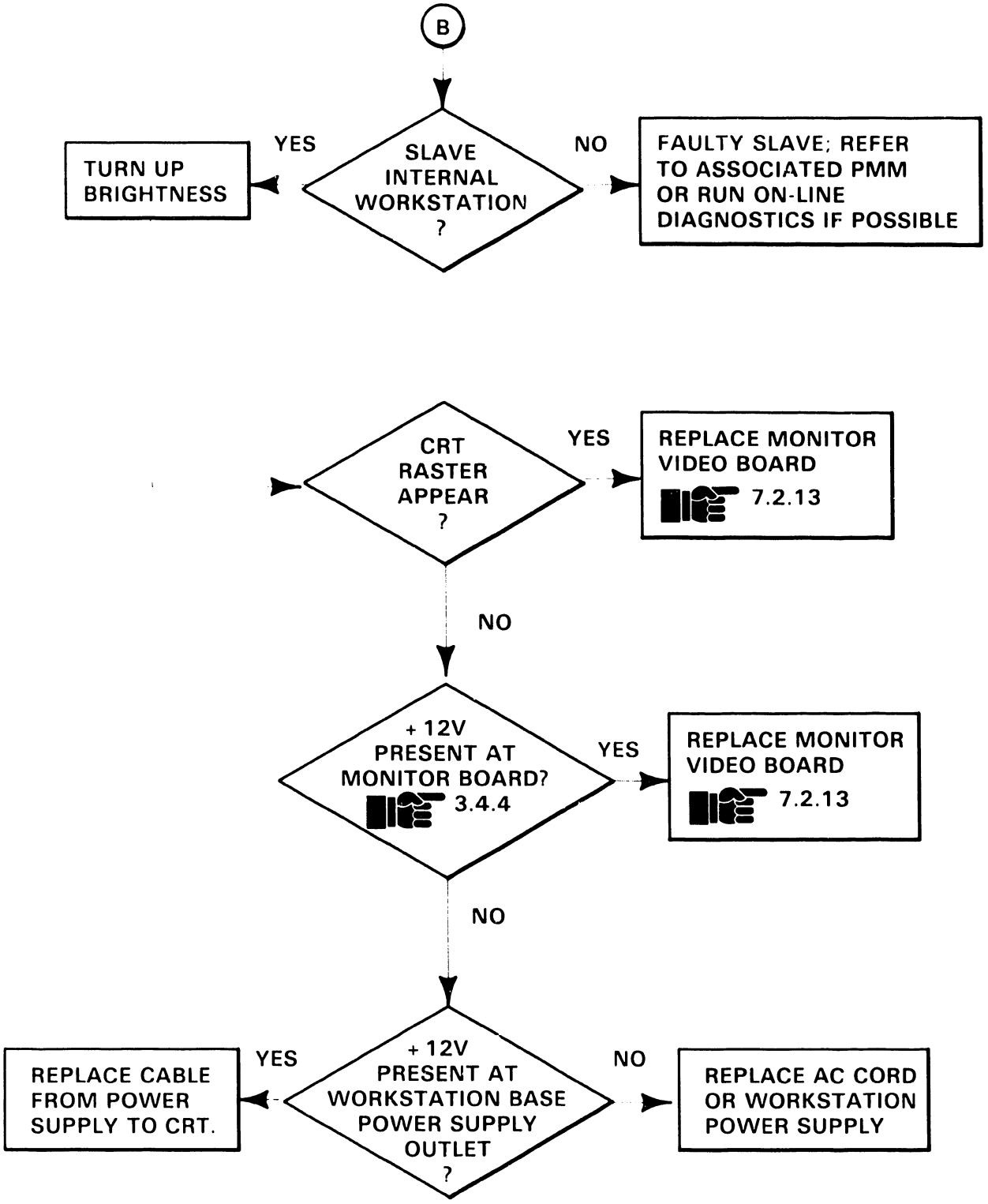
6.3.1 Power-Up Procedure (Sheet 2 of 2)



6.3.2 Rear I/O Connector Panel (Sheet 1 of 2)



6.3.2 Rear I/O Connector Panel (Sheet 2 of 2)



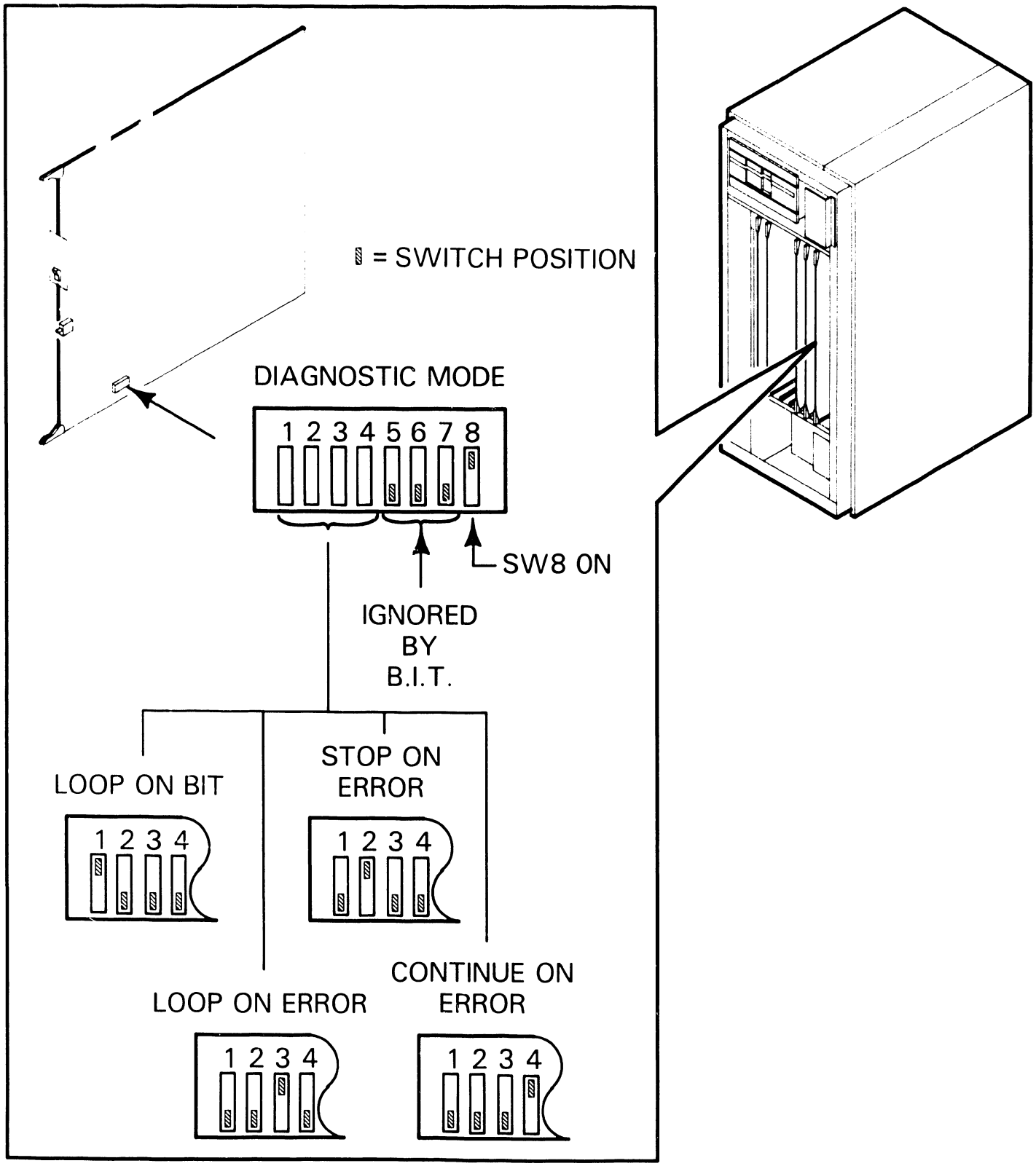
6.4.1 B.I.T. Diagnostic Options Switches (Sheet 1 of 2)

Switch SW3 on the RMU board selects certain operating modes for the B.I.T. diagnostic. SW3 is enabled as the B.I.T. Diagnostic Option Switch when switch 8 is on. Otherwise, SW3 is in the 'NORMAL' mode (system applications). It is recommended that SW3-8 remain OFF to ensure a smooth transition into the bootstrap (assuming no errors are encountered during power-up). If the B.I.T. detects an error, it will stop and display the test number (upper display) and error number (lower display) with SW3-8 OFF. The various B.I.T. operating modes as selected by SW3 are:

B.I.T. OPTIONS SWITCH SETTINGS

SW3 Switch No.	*Status*	*Function*
8	ON	Enables entire switch as B.I.T. options switch.
	OFF	Disables switches 1-7 for B.I.T. operation.
7-5		Ignored by B.I.T.
4	ON	CONTINUE ON ERROR: In this mode, diagnostic continues even if a 'fatal' or 'non-fatal' error occurs. B.I.T. will stop, however, if a non-recoverable error is encountered.
3	ON	LOOP ON ERROR: A 'fatal' or 'non-fatal' error will cause B.I.T. to automatically execute a "retry" each time it encounters the error, until the B.I.T. passes or switch 3 is set to OFF.
2	ON	STOP ON ERROR: B.I.T. will stop as soon as it encounters an error.
1	ON	LOOP ON B.I.T.: B.I.T. executes repeatedly until switch 1 is set to OFF.

6.4.1 B.I.T. Diagnostic Options Switches (Sheet 2 of 2)



6.4.2 B.I.T. Error Codes (Sheet 1 of 9)

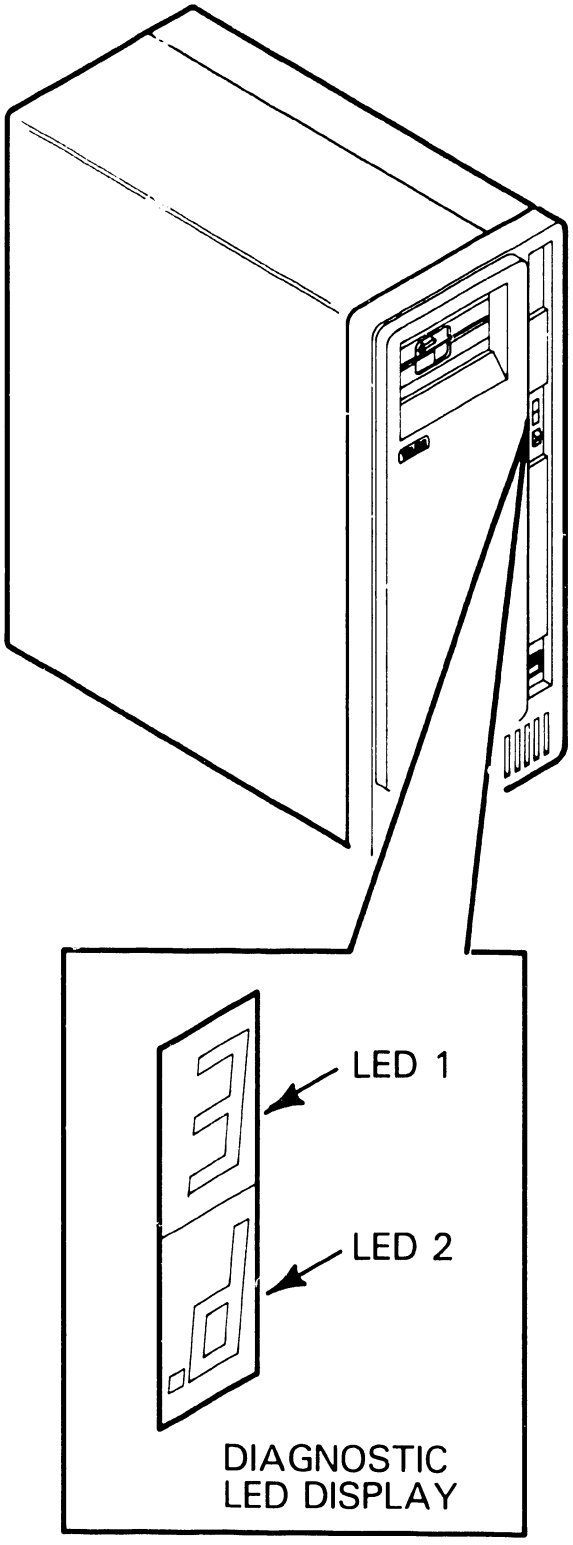
The following table presents a list of OIS 40 45 50 55 60 65 70 B.I.T. error codes, test error descriptions, and the suspected failed assembly for each code. LED 1 designates the upper LED display. LED 2 designates the lower. The abbreviations of the suspected Failed Assemblies and acronyms outlined in the table are

List of Suspected Failed Assemblies (SFA)

"RMU" - Resource Management Unit Board
"RCU" - Resource Control Unit Board
"IWS" - Internal Workstation Board
"FL" - Floppy Drive and Cables
"W" - Winchester Drive and Cables
"CABLES" - Workstation Cables (Internal and External on Master Unit).

List of Acronyms

PRF - Parameter Register Files
CPE - Channel Parity Error
MPE - Memory Parity Error
DLS - Data Link Status
SS - Slave Status



6.4.2 B.I.T. Error Codes (Sheet 2 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		Segment Display Test	
0		Visual feedback for error detection	RMU
		CTC Test No.	
1	1	Write/Read miscompare	RMU, RCU
1	2	Down-Count failed	RMU, RCU
		Upper RAM Test	
2	0-7	Data error	RMU, RCU
2	P	Parity error	RMU, RCU
2	PS	Parity Status Register error	RMU, RCU
2	P8	NMI error	RMU, RCU
		PRF Test	
3	d	RCU busy (will loop until ready)	RCU, RMU
3	0	RCU Command Response to RMU not accepted	RCU, RMU
3	1	Command Accepted	RCU, RMU
3	2	Command Accepted but not complete	RCU, RMU
3	3	None of the above	RCU, RMU
3	.P	If any parameter reg. files affected	RCU, RMU

6.4.2 B.I.T. Error Codes (Sheet 3 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		CTC Test	
4	1	CTC not interrupting (channels 0-3)	RMU
4	2	Incorrect vector	RMU
		Floppy Deadman Timer Test	
.4	1	No Interrupt	RMU, FL
.4	2	Incorrect Vector (should be CTC 2)	RMU, FL
.4	3	Interrupt not cause by DEADMAN TIMER	RMU, FL
.4	4	FDC still has interrupt pending	RMU, FL
		RCU Interrupt Test	
5	.d	RCU busy (will not loop until ready)	RCU, RMU
5	1	RCU response bad on block write command	RCU, RMU
5	2	Bad Vector (should be CTC 0)	RCU, RMU
5	3	No Interrupt	RCU, RMU
		Winchester Deadman Timer Test	
.5	.d	RCU busy (will loop until ready)	RCU, W, RMU
.5	1	No Interrupt	RCU, W, RMU
.5	2	Incorrect Vector (should be CTC 0)	RCU, W, RMU
.5	3	Drive not selected	RCU, W, CABLES
.5	4	Drive not ready (will loop until ready)	RCU, W, CABLES

6.4.2 B.I.T. Error Codes (Sheet 4 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		Set Slave List	
6	.d	RCU busy (will not loop until ready)	RCU, RMU
6	.0	RCU command response to RMU not accepted	RCU, RMU
6	.1	Invalid command	RCU, RMU
6	.2	Command accepted but incomplete	RCU, RMU
6	.3	None of the above	RCU, RMU
		Map Slave Status	
7	.d	RCU busy (will loop until ready)	RCU, RMU
7	.0	RCU Command Response to RMU not accepted	RCU, RMU
7	.1	Invalid Command	RCU, RMU
7	.2	Command accepted but incomplete	RCU, RMU
7	.3	None of the above	RCU, RMU

6.4.2 B.I.T. Error Codes (Sheet 5 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		NOTE The following errors will be displayed, but will not prevent continuation of the testing. Display time is approximately one second. These slaves will not be mapped as available.	
7	.4	CPE detected by both DLS and SS	IWS, CABLES
7	.5	CPE detected only by slave status	IWS, CABLES
7	.6	MPE detected by both DLS and SS	IWS, CABLES
7	.7	MPE detected only by slave status detected by data link status	IWS, CABLES
7	.8	Received parity error	IWS, CABLES
7	.9	No Data/Timeout (NDTO)	IWS, CABLES
7	.P	Slave lost power	IWS, CABLES
7	.F	If no slaves available, display error and loop on test	Turn W/S on IWS, RCU, CABLES
		Slave Control - Write Section	
8	.d	RCU busy (will loop until ready)	RCU, CABLES
8	.0	RCU command response to RMU not accepted	RCU, CABLES
8	.1	Invalid Command	RCU, CABLES
8	.2	Command accepted but incomplete	RCU, CABLES
8	.3	None of the above	RCU, CABLES

6.4.2 B.I.T. Error Codes (Sheet 6 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	LED 2	Test/Error Description	S.F.A.
		NOTE The following errors will be displayed, but will not prevent continuation of the testing. Display time is approximately one second.	
8	.4	CPE detected by both DLS and SS	IWS, CABLES
8	.5	CPE detected only by Slave Status	IWS, CABLES
8	.6	MPE detected by both DLS and SS	IWS, CABLES
8	.7	MPE detected only by Slave Status	IWS, CABLES
8	.8	Received Parity Error	IWS, CABLES
8	.9	No Data/Timeout (NDTO)	IWS, CABLES
8	.P	Check power-up state again, if failure	IWS, CABLES
		Slave Control - Read Section	
.8	.d	RCU busy (will loop until ready)	RCU, CABLES
.8	.0	RCU Command Response to RMU not accepted	RCU, CABLES
.8	.1	Invalid command	RCU, CABLES
.8	.2	Command accepted but incomplete	RCU, CABLES
.8	.3	None of the above	RCU, CABLES

6.4.2 B.I.T. Error Codes (Sheet 7 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		NOTE The following errors will be displayed, but will not prevent continuation of the testing. Display time is approximately one second.	
.8	.4	CPE detected by both DLS and SS	IWS, CABLES
.8	.5	CPE detected only Slave Status	IWS, CABLES
.8	.6	MPE detected by both DLS and SS	IWS, CABLES
.8	.7	MPE detected only Slave Status	IWS, CABLES
.8	.8	Received Parity Error	IWS, CABLES
.8	.9	No Data/Timeout (NDTO)	IWS, CABLES
.8	.P	Check power-up state again, if failure	IWS, CABLES
.8	.E	Compare data to known good data	IWS, CABLES
		NOTE If no slaves pass these tests, then a loop back to TEST #7 will be performed until a slave passes.	

6.4.2 B.I.T. Error Codes (Sheet 8 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
		IPL Test (Floppy)	
9	1	I/O Error	RMU, FL
9	2	Floppy Drive not ready	Remove diskette and power off Master. Power on Master and remount diskette in the drive. FL
		IPL Test (Winchester)	
.9	.1	IPL Test (Winchester)	RCU, W
.9	.2	Winchester Drive not ready	W
A	E	Lights when IWISE is initially IPL'd	Normal Operation
E	0	Invalid Volume Label	Perform a Volume Recovery
E	1	Not System Disk	If system software is on the Winch. Drive set disk select sw. to ———. If system software is on diskette drive, set switch to —.
E	2	Extended Memory Selected	Check system configuration off starter. Extended memory should not be supported. RMU.

6.4.2 B.I.T. Error Codes (Sheet 9 of 9)

B.I.T. ERROR CODE ANALYSIS

LED 1	*LED 2*	*Test/Error Description*	*S.F.A.*
E	3	Wrong Configuration	Winchester/Diskette not identified to system.
E	4	TCB insufficient control block memory.	Same as code E2
E	5	VCB insufficient control block memory.	Same as code E2
E	6	DCB insufficient control block memory	Same as code E2
E	7	FCB insufficient control block memory	Same as code E2
E	8	Unsupported disk type.	RCU disk type switches (wrong switch settings).
E	d	Cannot mount system disk	RMU, RCU, FL, W and CABLES.
E	B	Incorrect PROM installed	Check PROM installation.
E	F	Invalid IPL sector	Perform a volume recovery.
F	b	I/O error during reading of label or master code.	Perform a volume recovery.
F	F	Master memory parity error	Power supply, RMU, RCU, reset system.

SECTION 7 REPAIR

SECTION 7 CONTENTS

SECTION 7
REPAIR

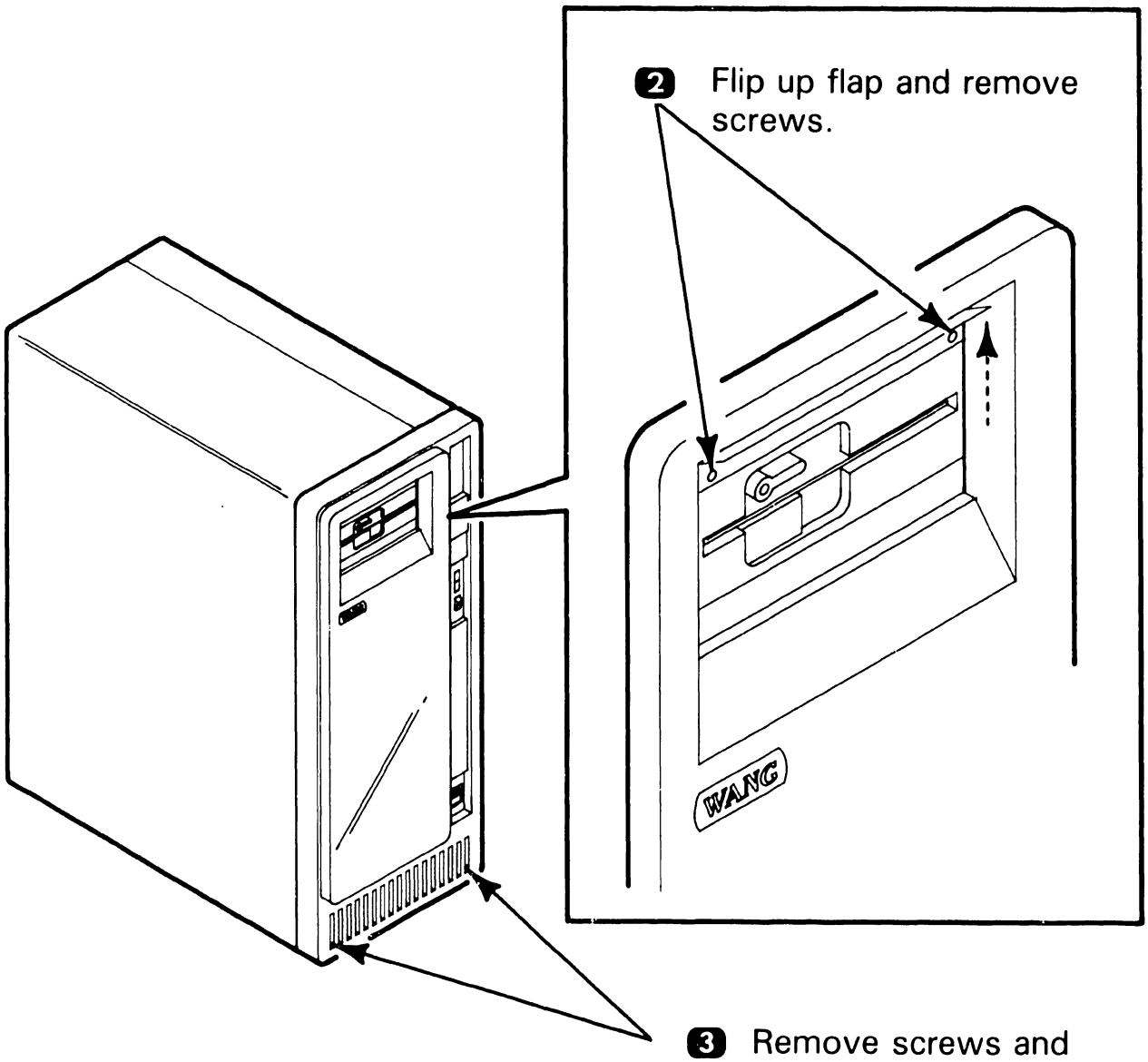
7.1 Tools and Test Equipment

No special tools or test equipment are required to repair OIS 40/45/50/55/60/65/70 systems. All necessary repair can be accomplished using the Wang CE tool kit (WLI#726-9401). Two tools that are particularly useful are the magnetic and stubby "T" screwdriver handles.

7.2 Removal Procedures

7.2.1 Master Unit Front Panel Removal

1. Power-off Master Unit and disconnect ac power. 4.1



7.2 Removal Procedures

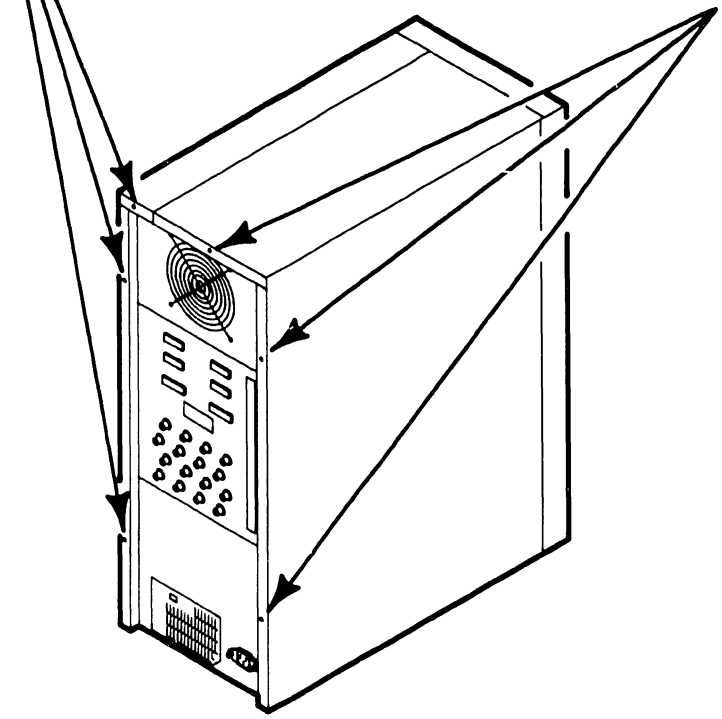
7.2.2 Master Unit Side Cover Removal

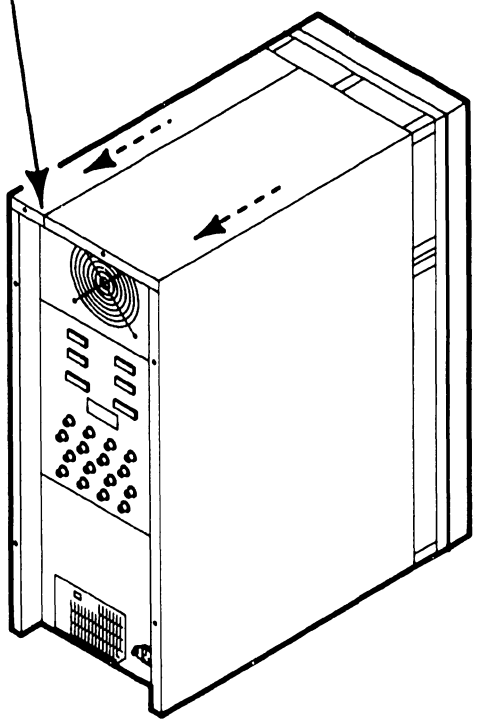
1. Power-off Master Unit and disconnect ac power. 4.2

2. Remove three screws and slide right panel two inches toward rear.

3. Remove three screws and slide left panel two inches toward rear.

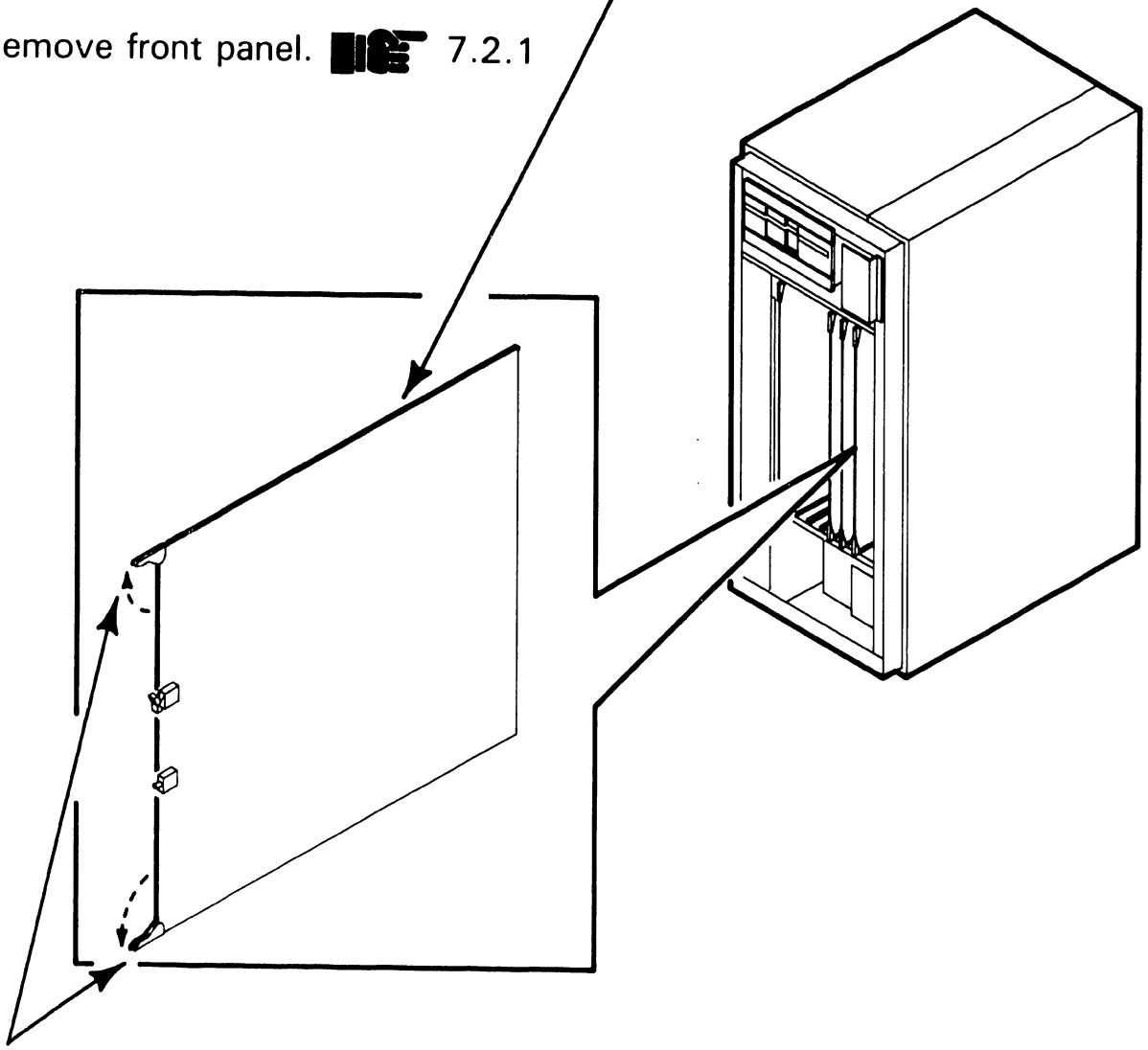
4. Disengage panel tabs and remove both side panels.





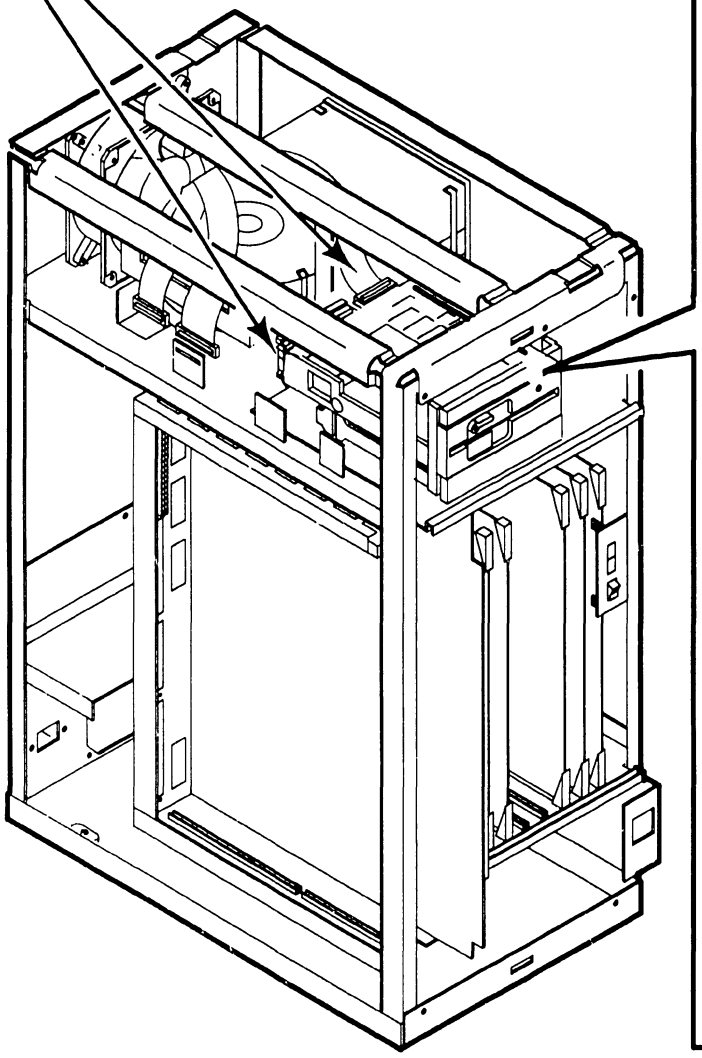
7.2.3 Master Unit PCB Removal

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Position top and bottom PCB lever clamps to open position by pulling clamp away from board.
4. Pull board out of card cage by sliding on guide rails.

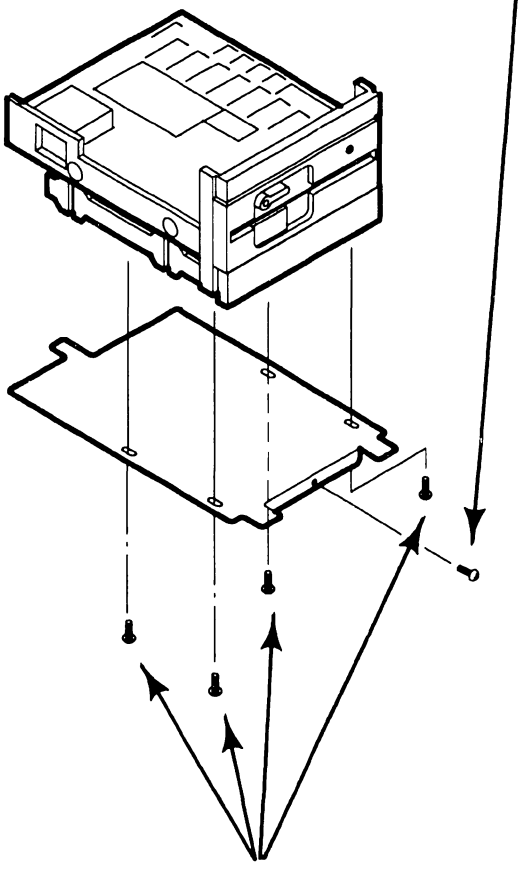


7.2.4 Floppy Disk Drive Removal

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2
4. Disconnect power and I/O ribbon cables from unit.



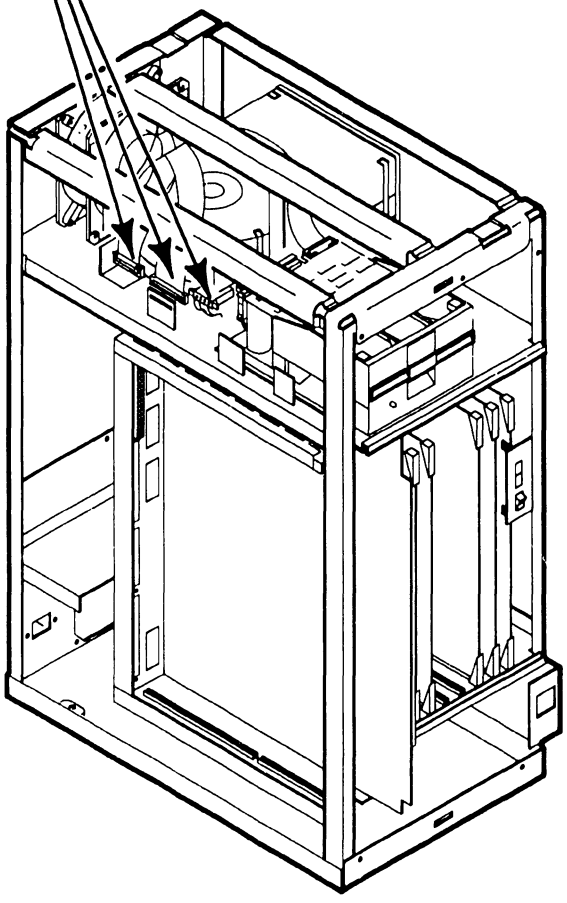
5. Remove screw securing floppy mounting plate to Master Unit chassis.

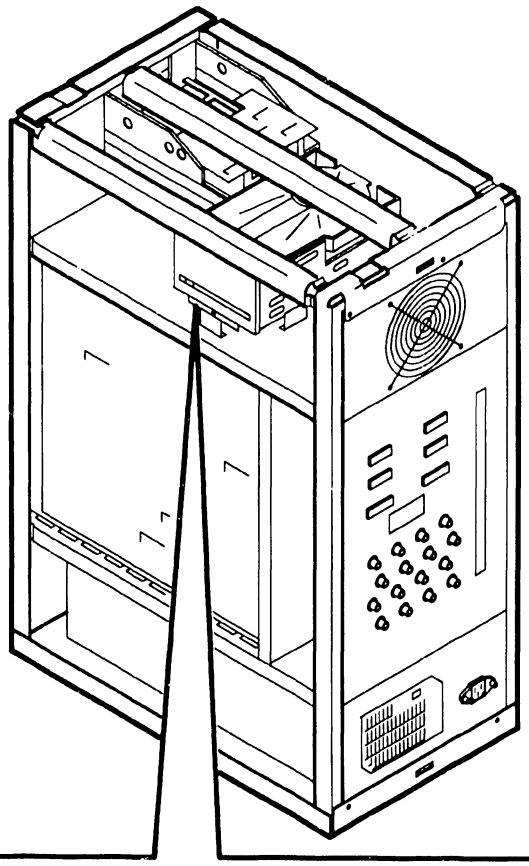


6. Remove floppy drive from chassis and remove four screws that secure mounting plate.

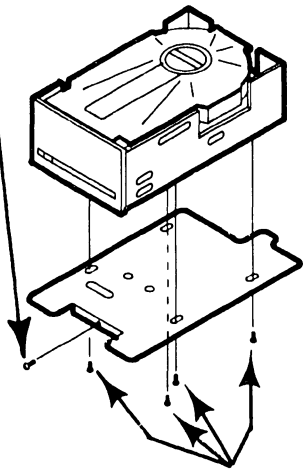
7.2.5 Winchester Disk Drive Removal

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2
4. Disconnect power and I/O ribbon cables from rear of unit.





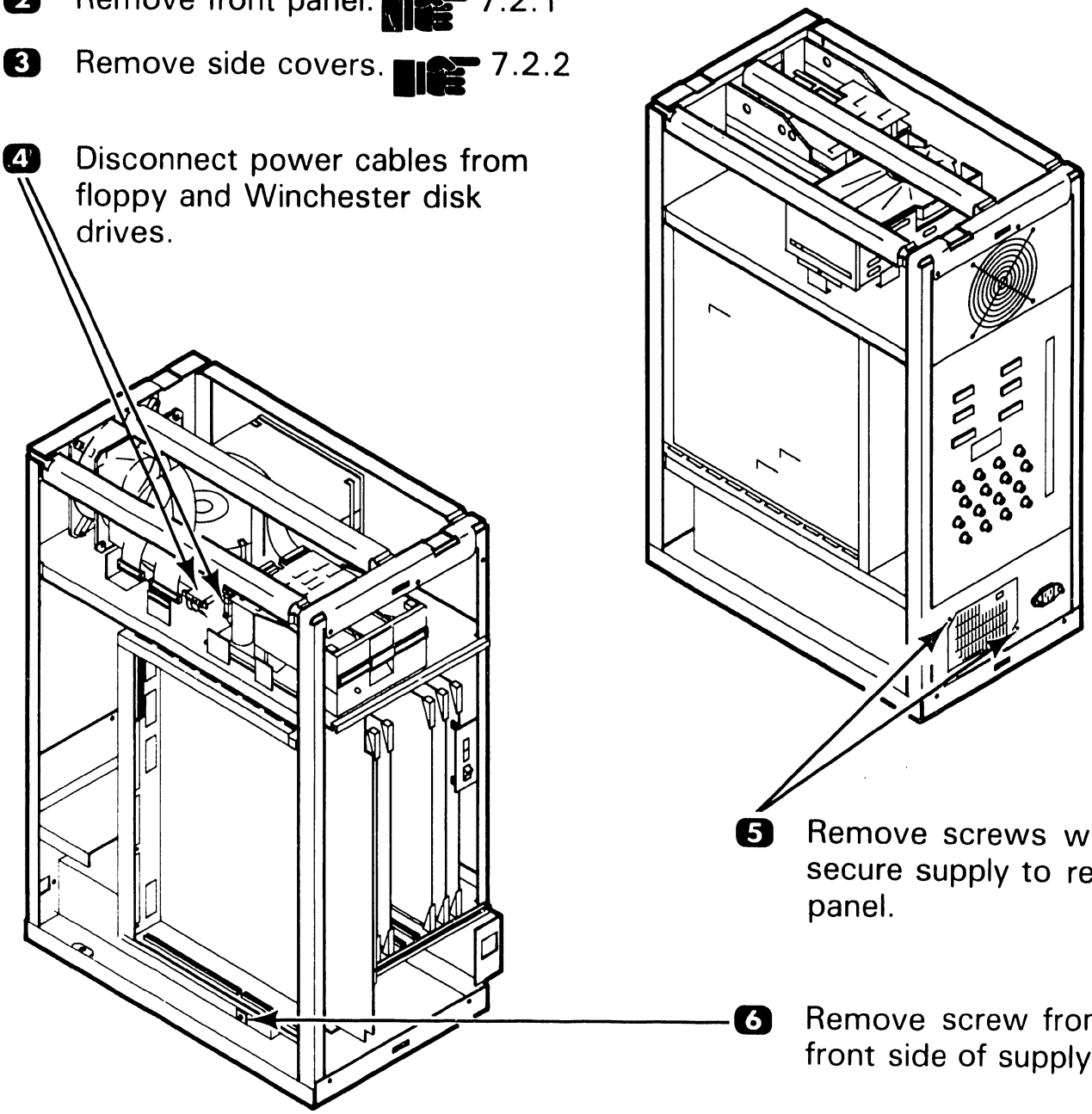
5. Remove screw securing Winchester mounting plate to Master Unit chassis.



6. Remove Winchester from chassis and remove four screws that secure mounting plate to drive.

7.2.6 Power Supply Removal (Sheet 1 of 2)

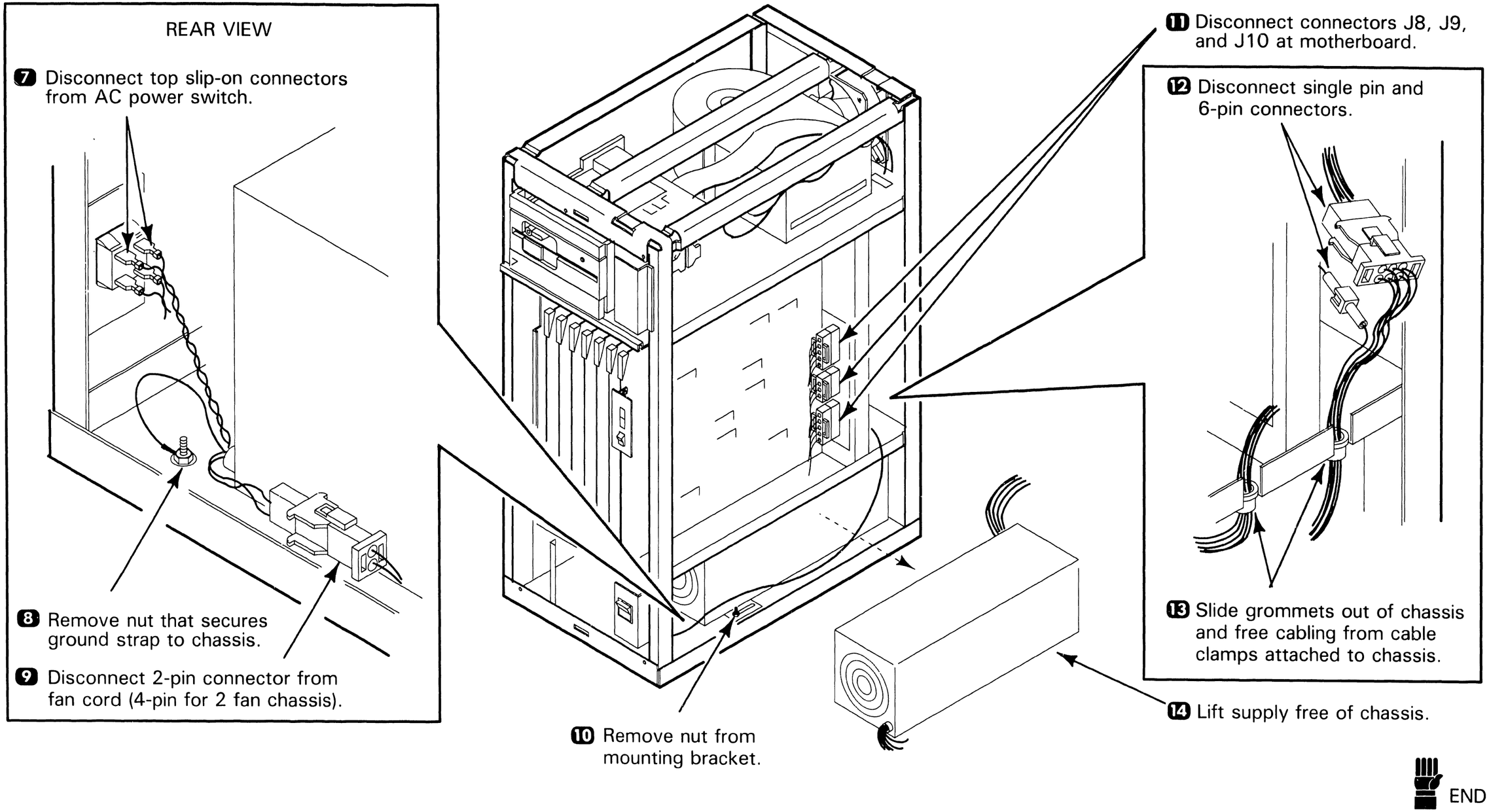
1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2
4. Disconnect power cables from floppy and Winchester disk drives.



5. Remove screws which secure supply to rear panel.
6. Remove screw from front side of supply.

NEXT

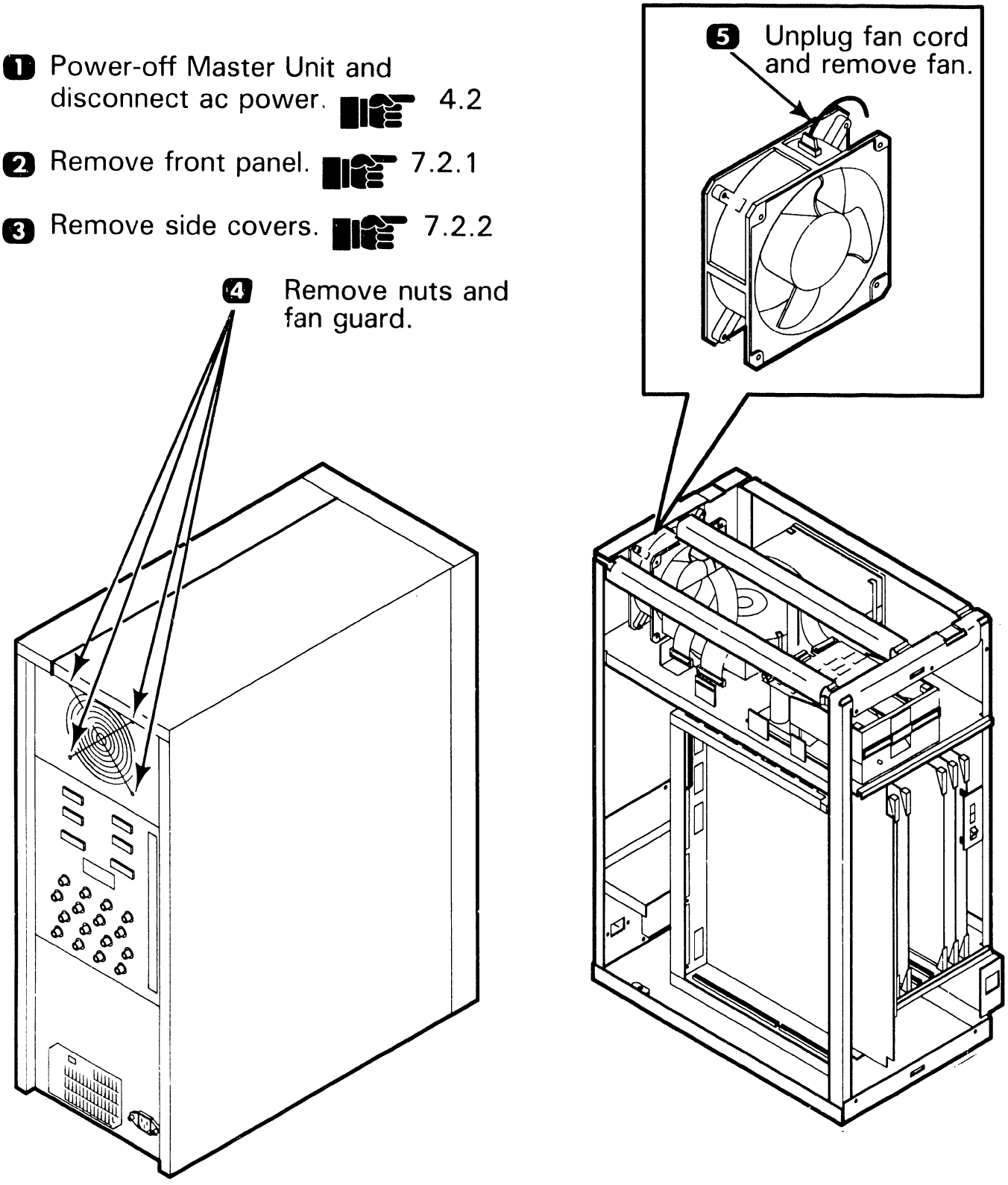
7.2.6 Power Supply Removal (Sheet 2 of 2)



END

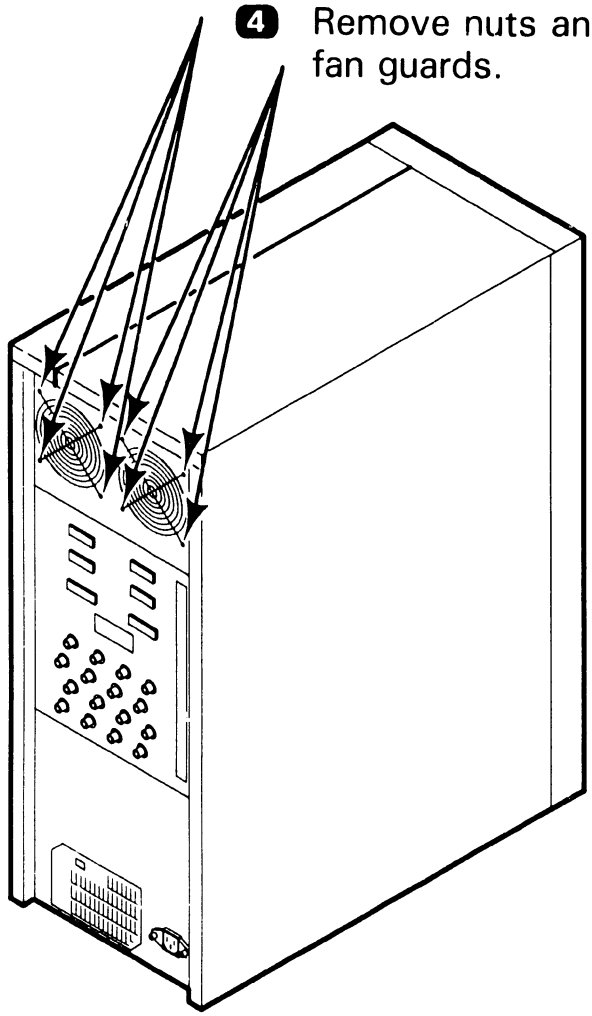
7.2.7 Fan Removal (Single Fan Chassis)

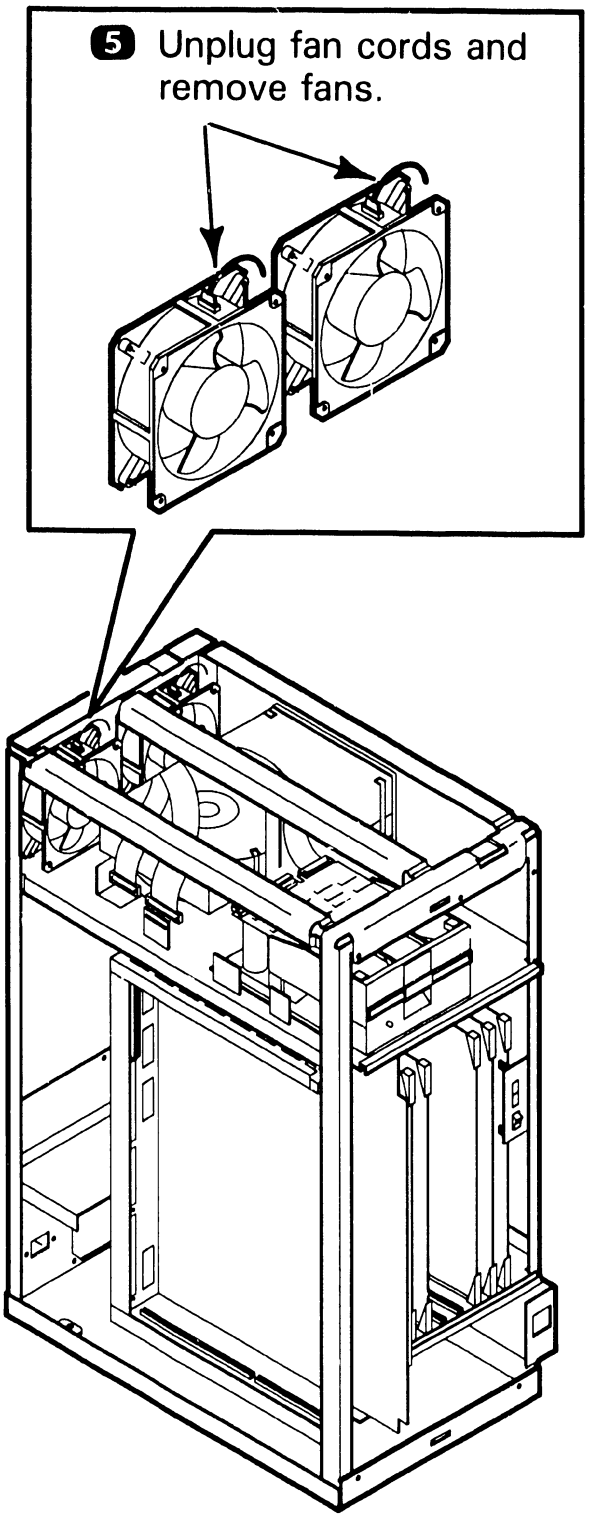
1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2
4. Remove nuts and fan guard.
5. Unplug fan cord and remove fan.



7.2.8 Fan Removal (Dual Fan Chassis)

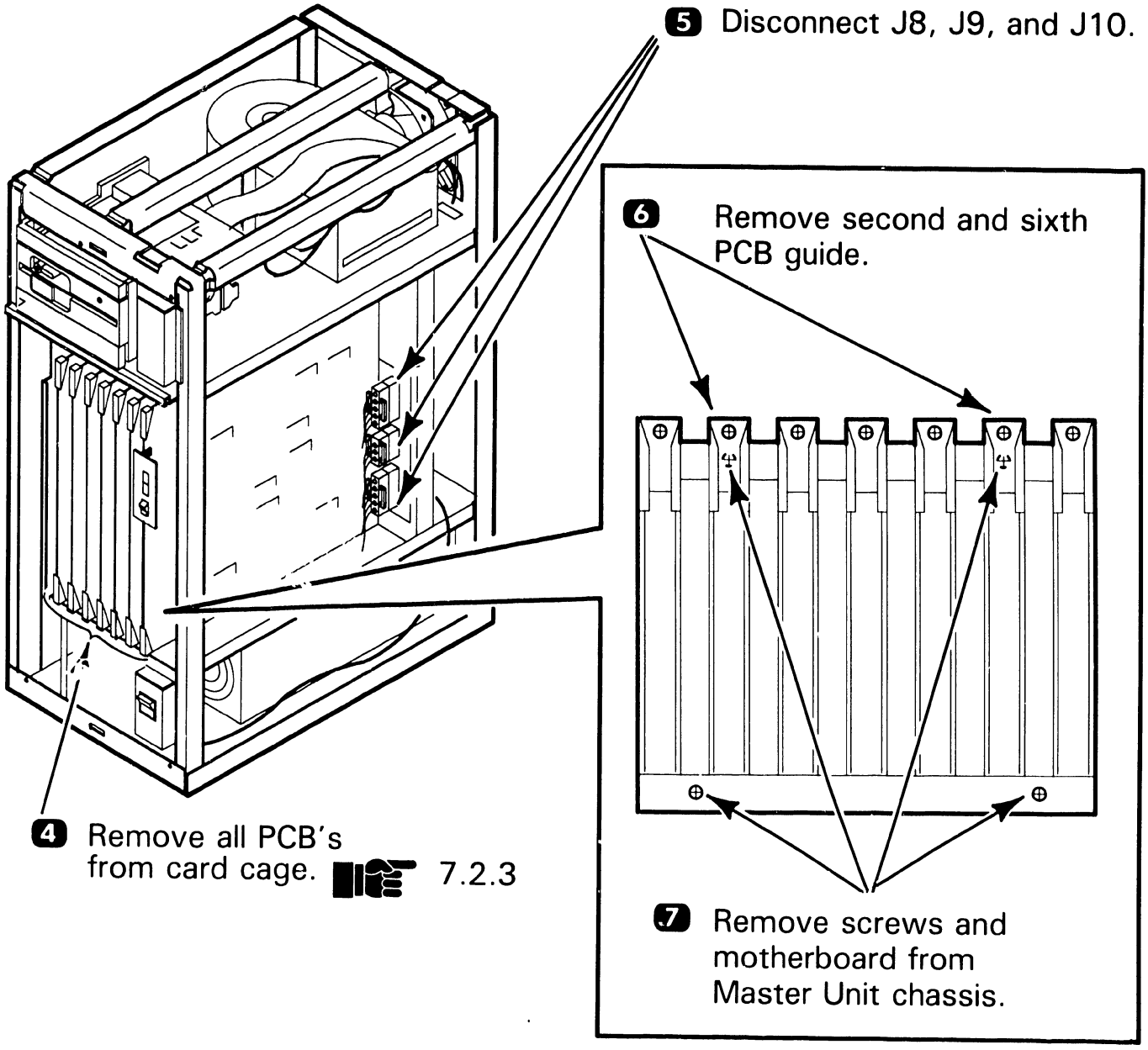
1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2





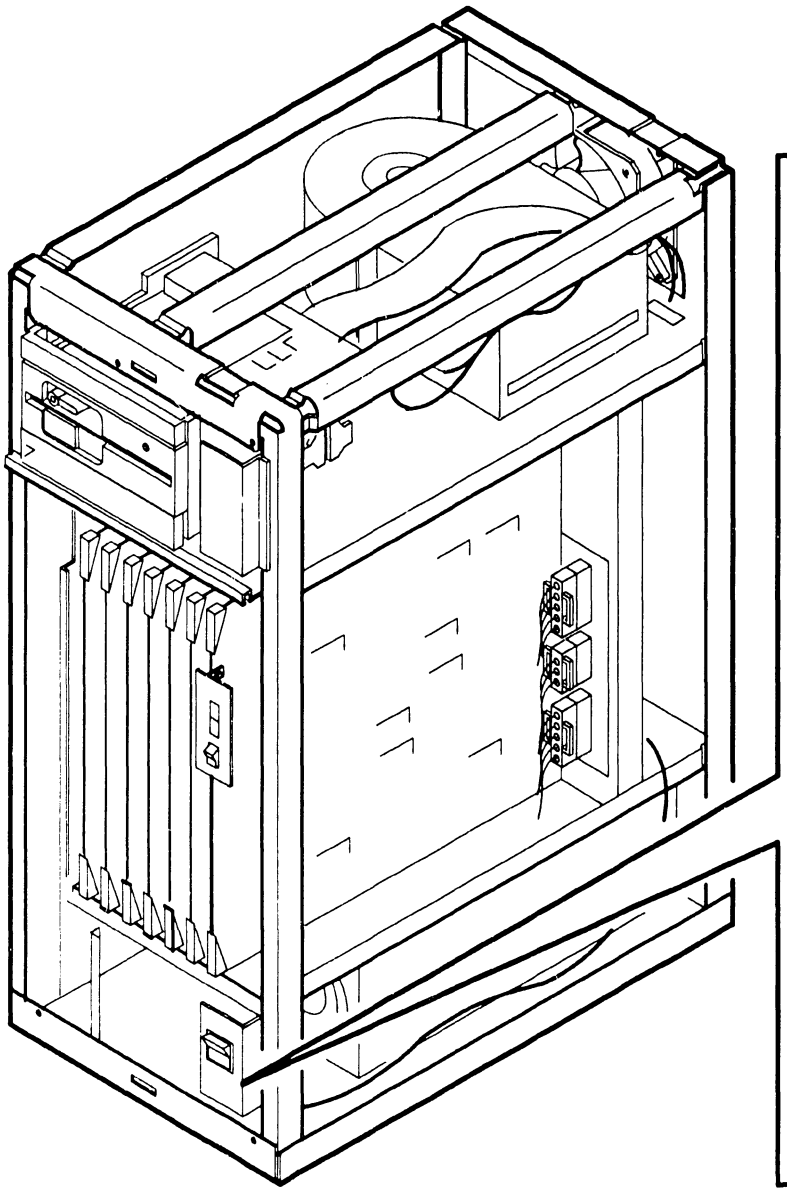
7.2.9 Motherboard Removal

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2



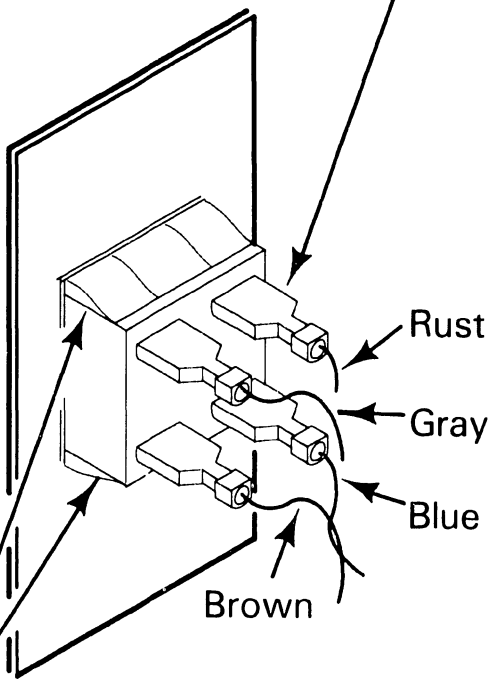
7.2.10 AC Power Switch Removal

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2



REAR VIEW

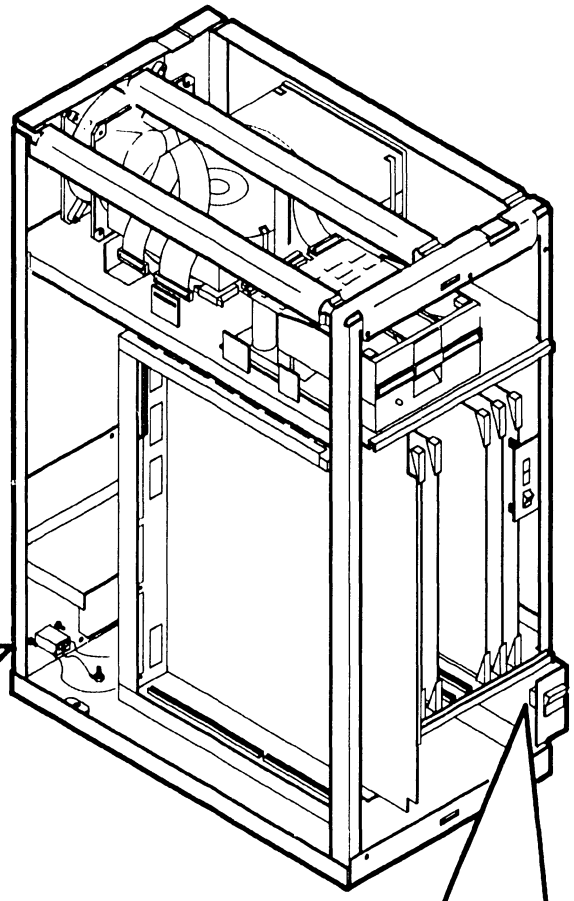
4. Disconnect each connector from slip-on terminals. Note locations for reconnection.



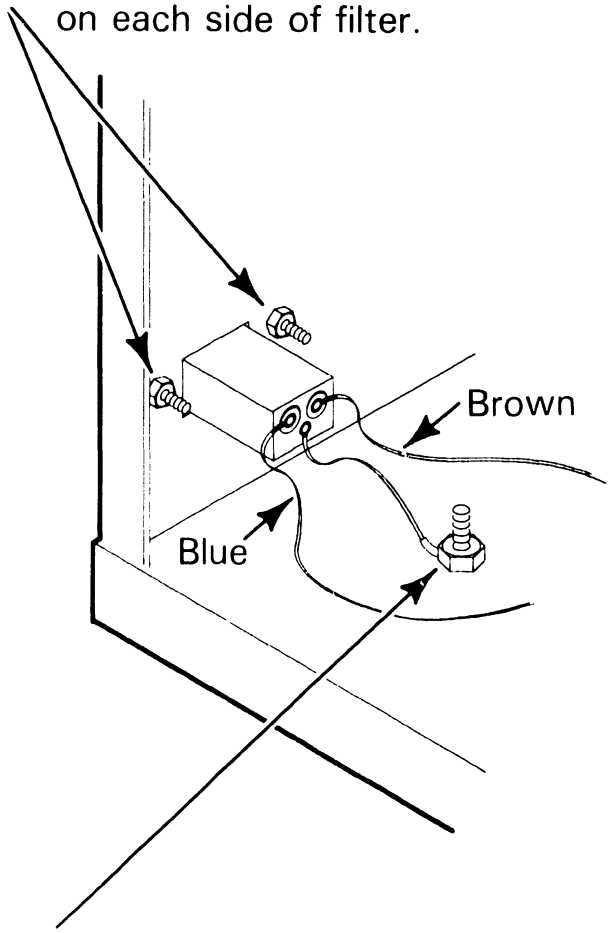
5. Pinch top and bottom switch tabs and remove switch.

7.2.11 AC Filter Removal (Sheet 1 of 2)

1. Power-off Master Unit and disconnect ac power. 4.2
2. Remove front panel. 7.2.1
3. Remove side covers. 7.2.2

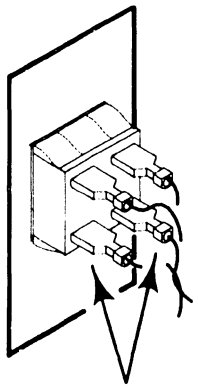


4. Remove nuts and lockwashers on each side of filter.



5. Loosen nut and remove filter ground wire connection.

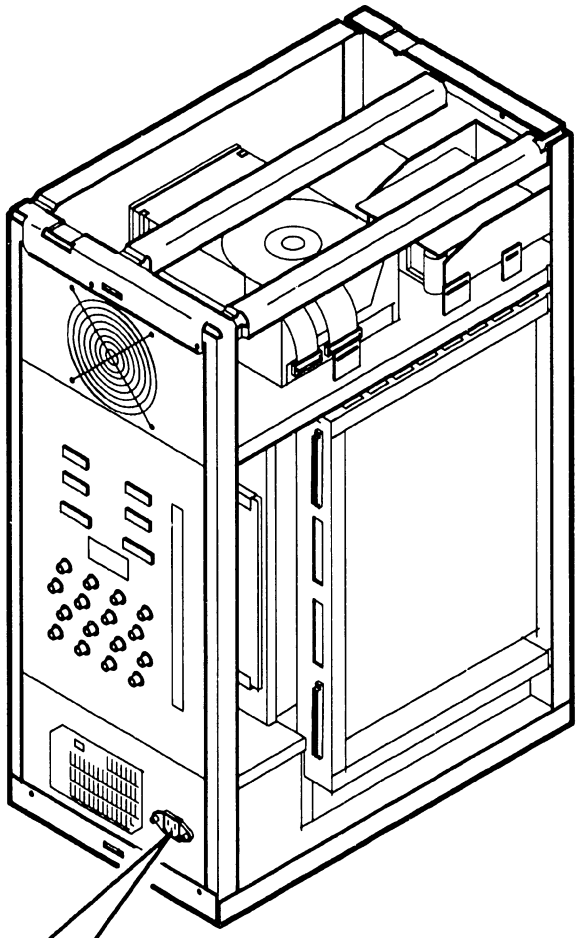
REAR VIEW



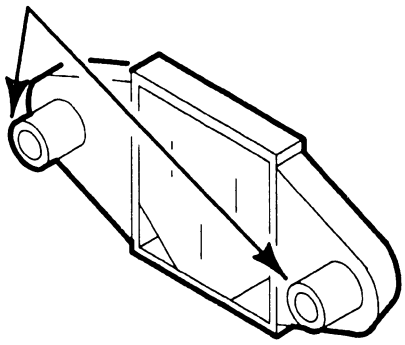
6. Remove bottom two slip-on connectors.Note location for proper reconnection.

NEXT

7.2.11 AC Filter Removal (Sheet 2 of 2)



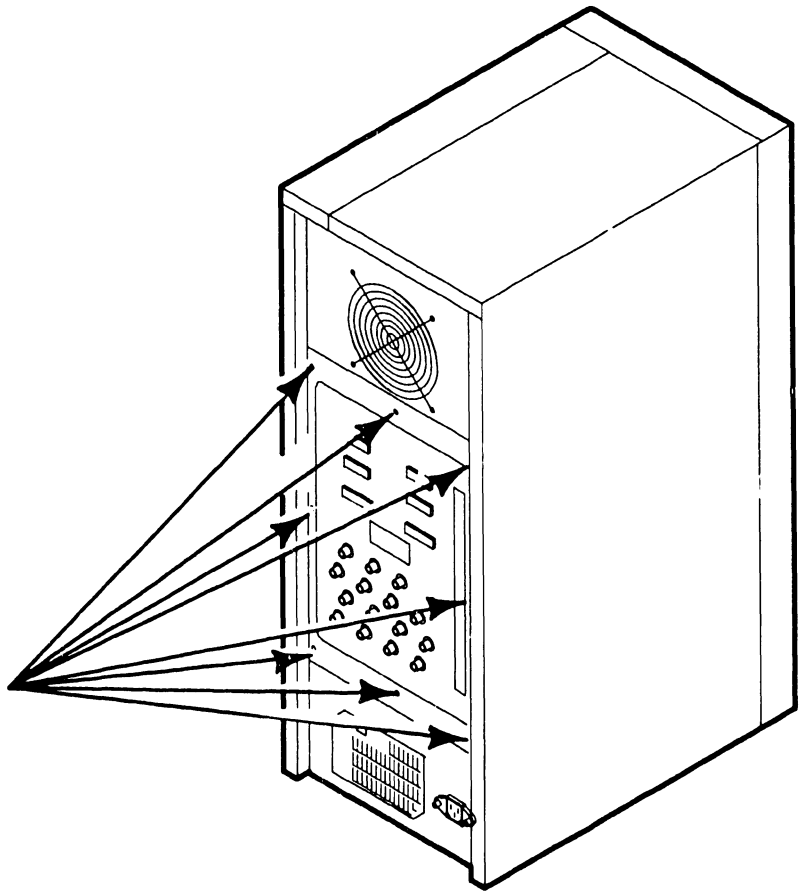
7 Remove screws and filter.



END

7.2.12 I/O Connector Panel Removal (Sheet 1 of 2)

1. Power-off Master Unit and disconnect ac power. 4.2

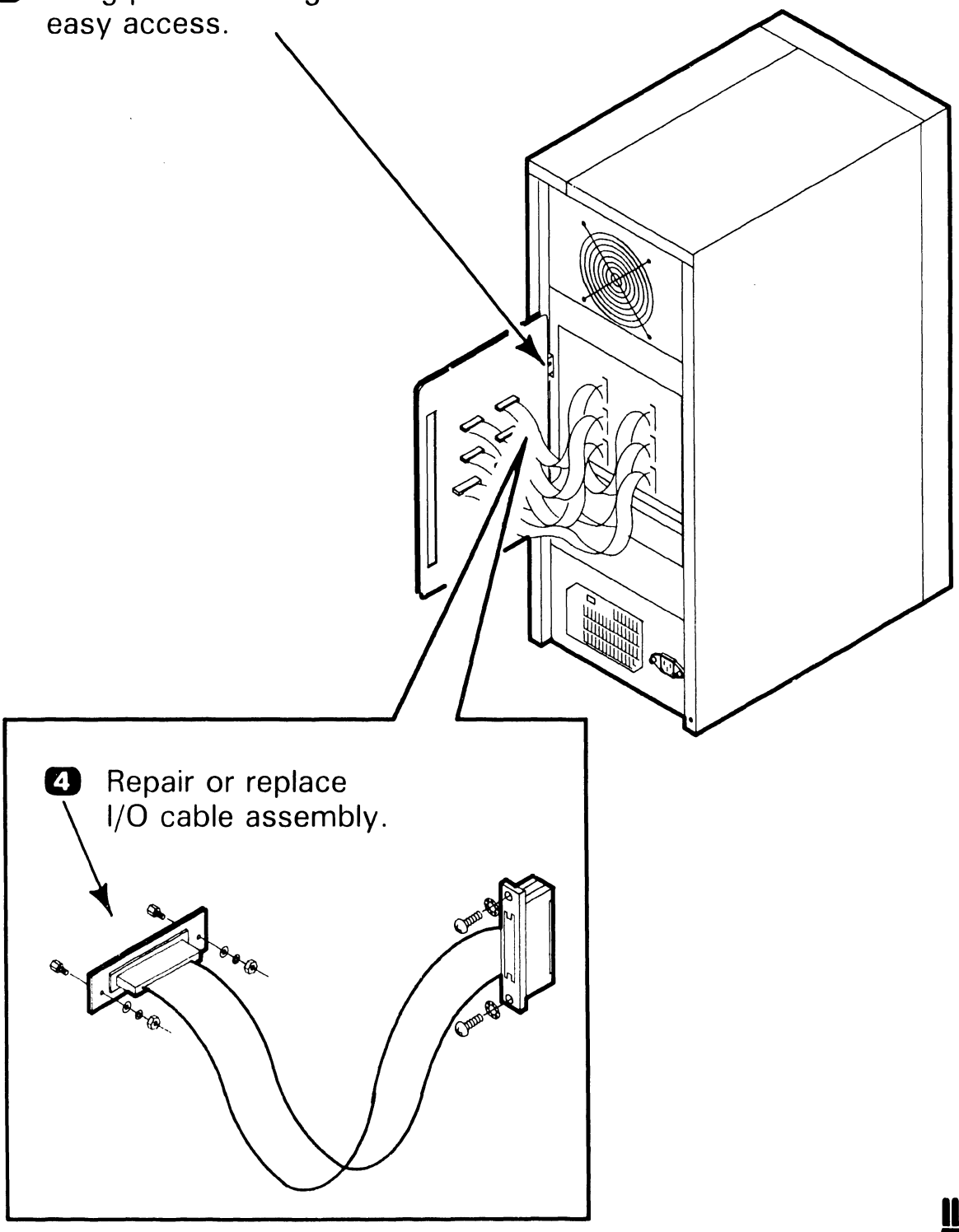


2. Remove screws and I/O panel.

NEXT

7.2.12 I/O Connector Panel Removal (Sheet 2 of 2)

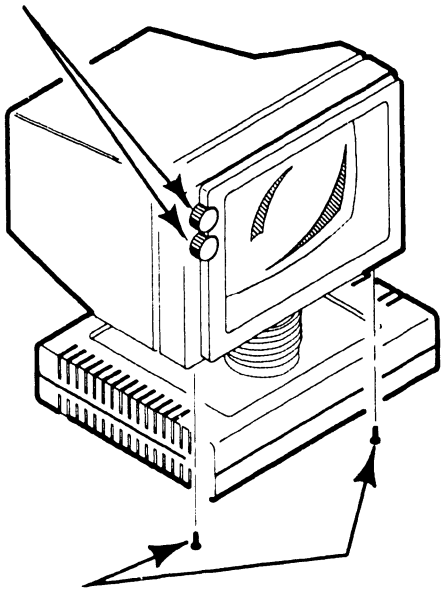
3 Hang panel on hinges for easy access.



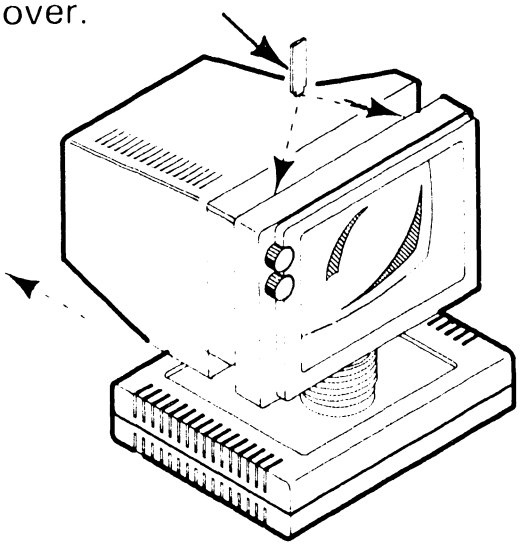
END

7.2.13 CRT Monitor Disassembly (Sheet 1 of 2)

1. Power-off monitor power supply and disconnect ac power. 7.2.15
2. Disconnect all external cables from power supply base. 7.2.15
3. Remove control knobs.



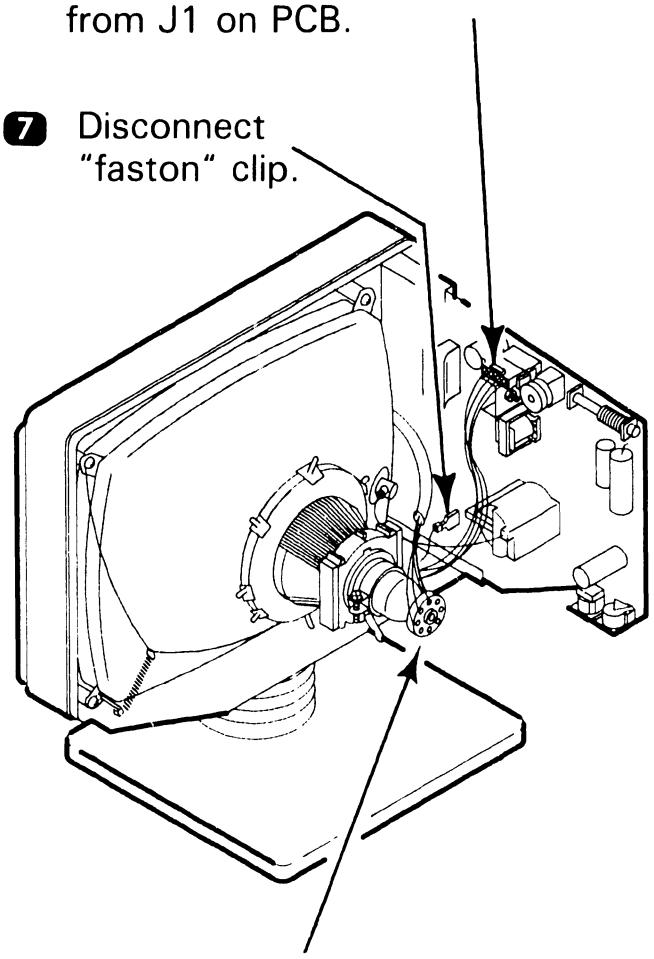
4. Rotate monitor, remove screws, and separate cover from faceplate.
5. Push spring tabs using plastic cover removal tool and remove cover.



NOTE

Except for control knobs and location of PCB holding screw, following procedure applies to both CRT monitors (PM004 and PM004L).

6. Unplug CRT cable connector from J1 on PCB.
7. Disconnect "faston" clip.



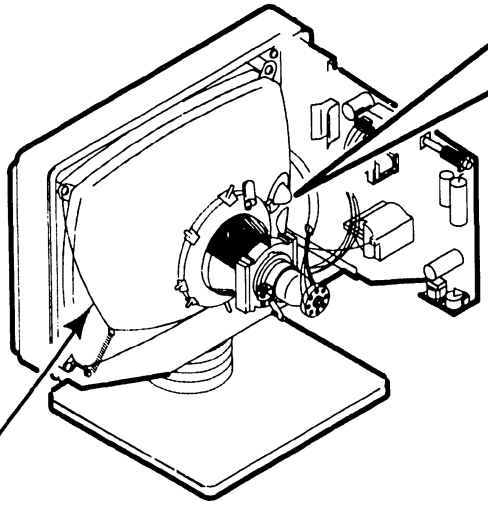
8. Disconnect CRT neck socket connector.

NEXT

7.2.13 CRT Monitor Disassembly (Sheet 2 of 2)

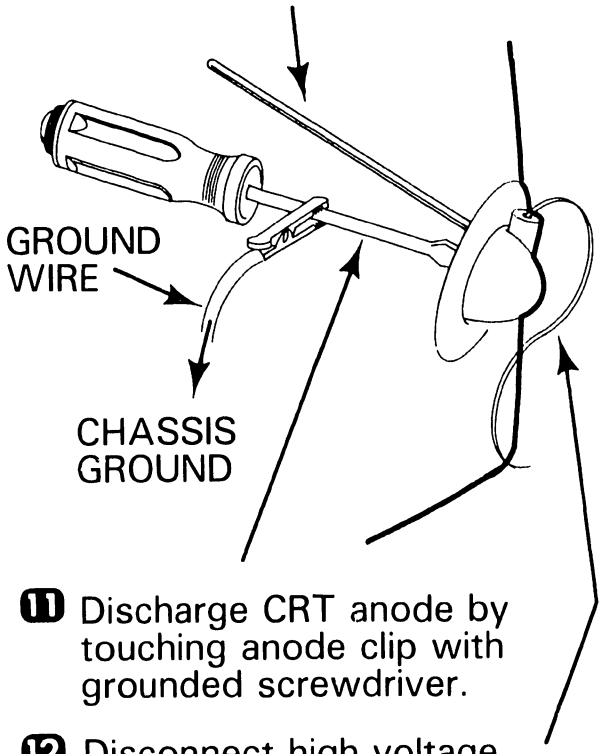
DANGER

THE CRT CAN HOLD A CHARGE OF SEVERAL KILOVOLTS. TO PREVENT ACCIDENTAL DISCHARGE WHICH COULD RESULT IN SERIOUS INJURY, DISCHARGE CRT ANODE AS FOLLOWS:



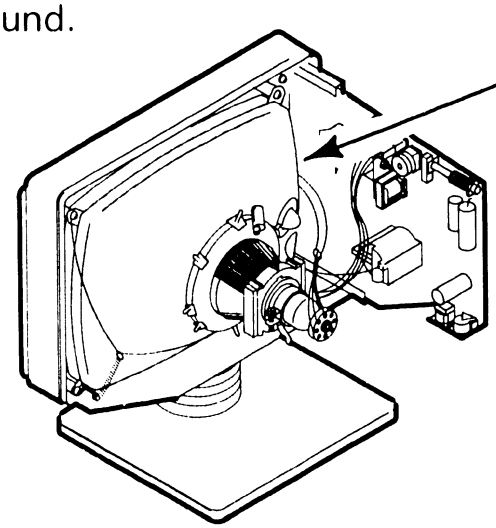
9 Attach one end of an insulated wire to metal shaft of plastic handle heavy duty screwdriver. Attach other end to chassis ground.

10 Using a non-conducting tool (plastic alignment tool) raise edge of rubber anode cap and insert screwdriver.



11 Discharge CRT anode by touching anode clip with grounded screwdriver.

12 Disconnect high voltage connector from CRT.



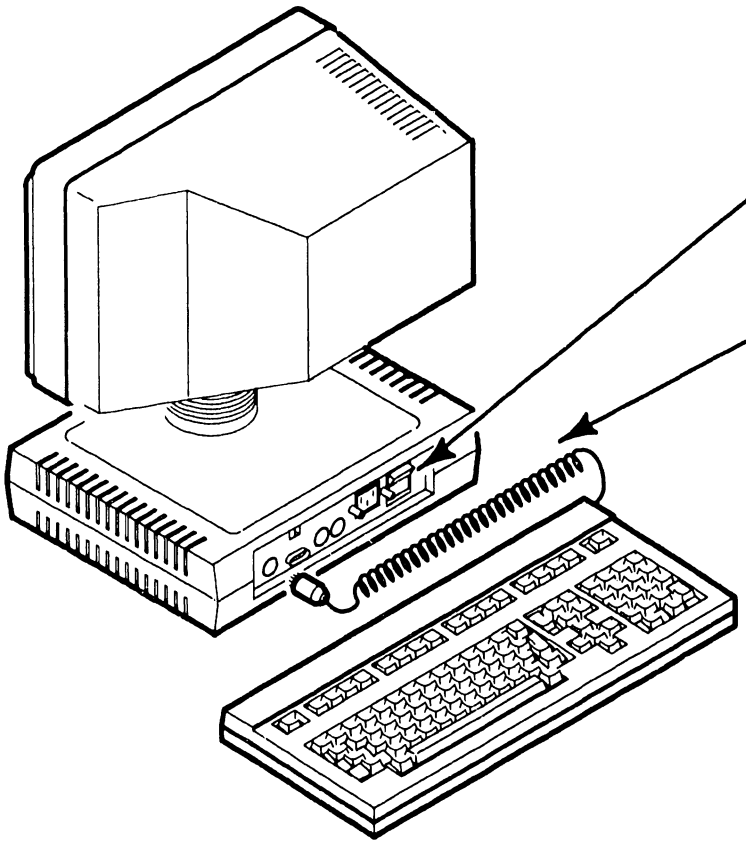
13 Remove holding screw to remove monitor board from faceplate.

WARNING

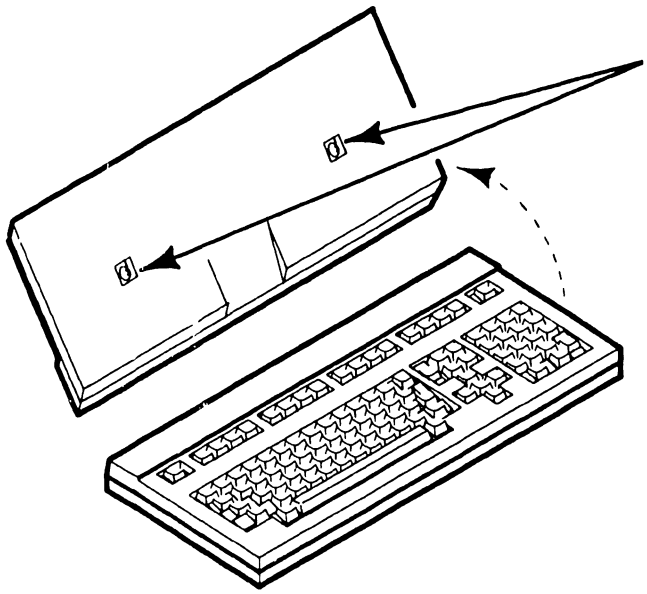
When reassembling CRT Monitor, ensure "Faston" clip ground lug is reconnected before powering-on monitor.

END

7.2.14 Keyboard Disassembly (Sheet 1 of 2)



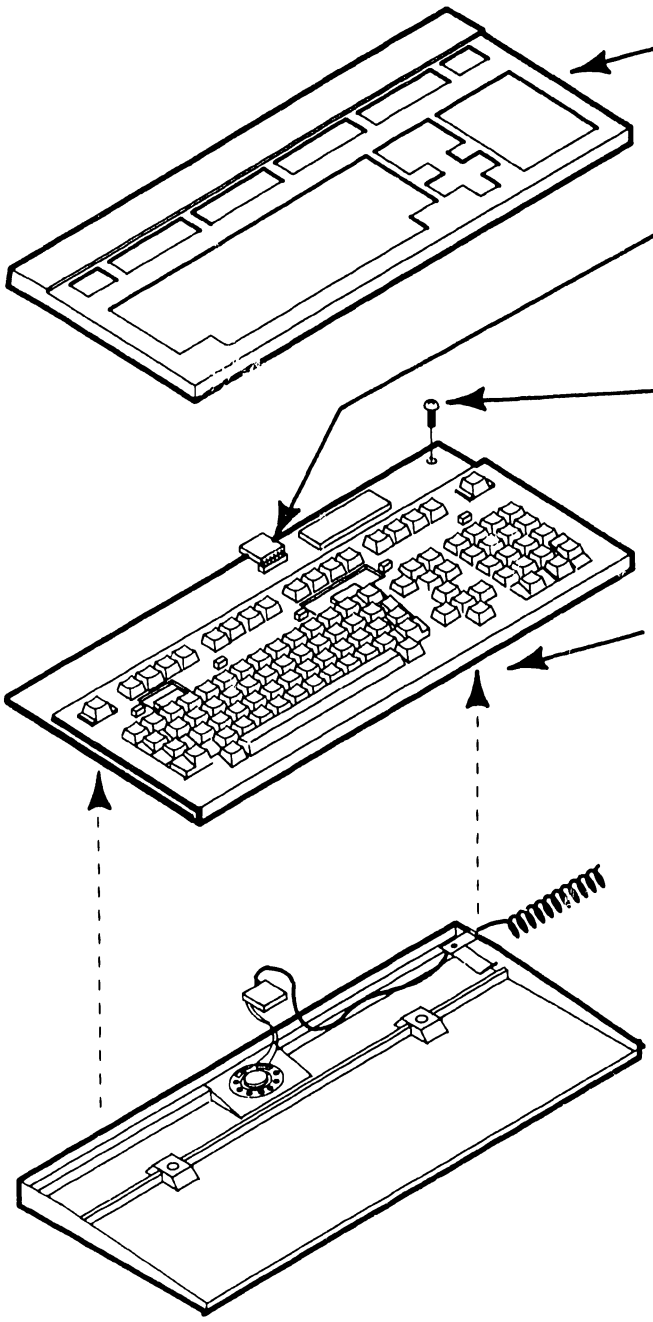
1. Power-off monitor power supply.
2. Disconnect keyboard cable from monitor base.



3. Remove bottom screws.

NEXT

7.2.14 Keyboard Disassembly (Sheet 2 of 2)

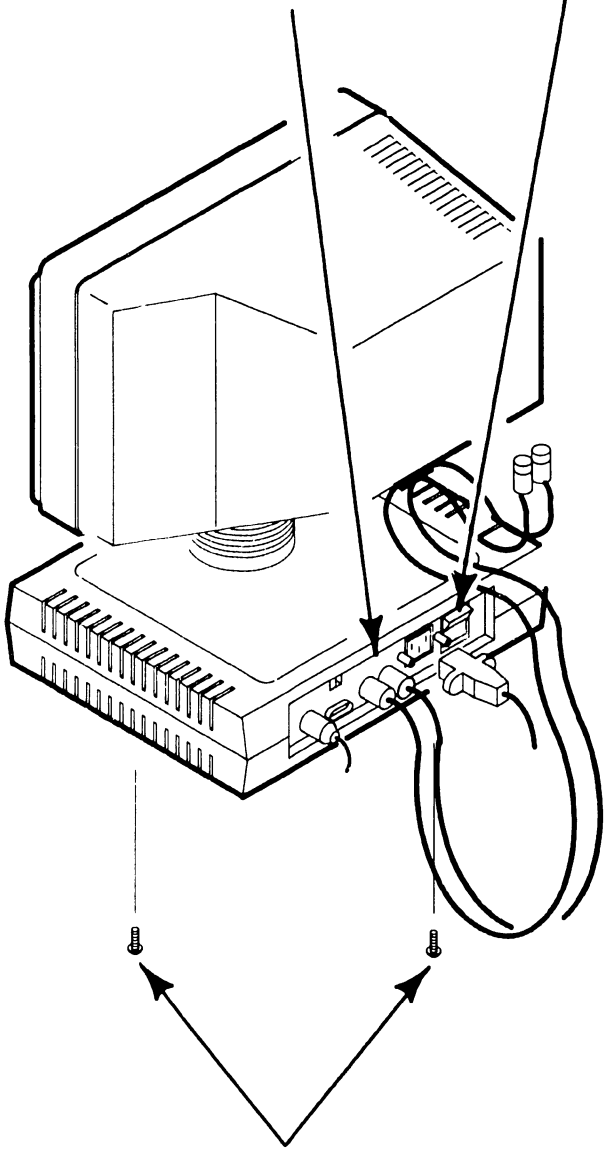


4. Lift and remove top cover.
5. Disconnect keyboard cable from J1.
6. Remove cable clamp screw.
7. Separate PC board/keyboard assembly from bottom cover. (Ensure J1 plug and cable assembly remains in bottom cover.)

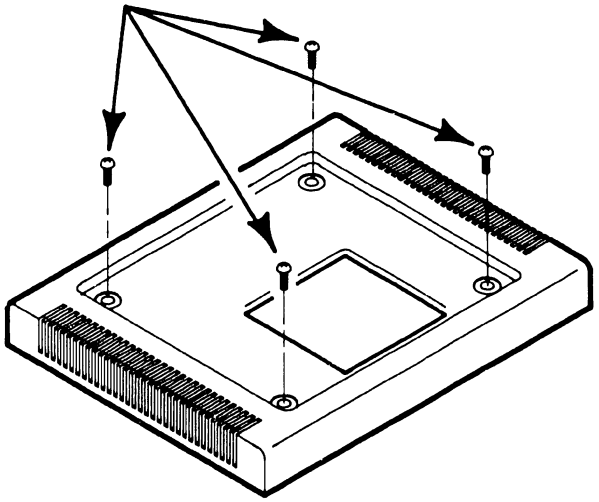
END

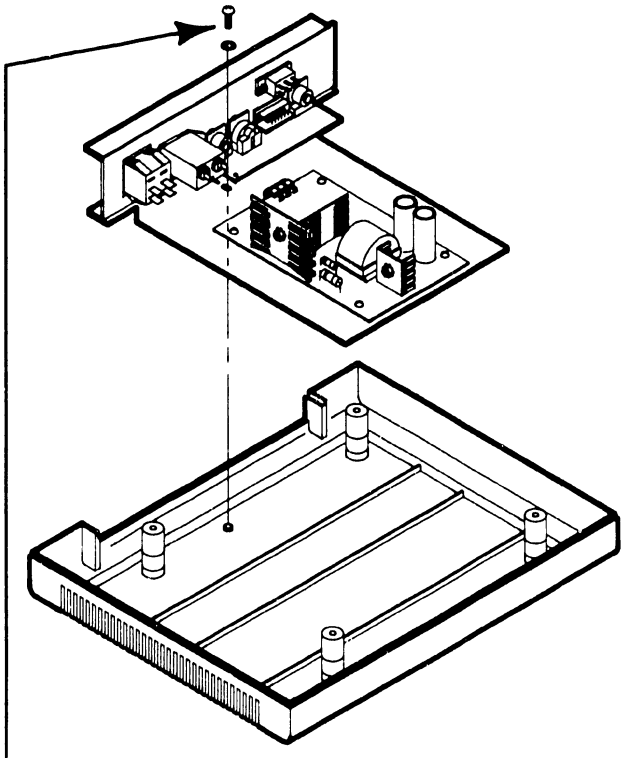
7.2.15 Workstation Power Supply Base Disassembly

1. Power-off monitor power supply and disconnect ac power.
2. Disconnect all external cables from power supply base.



3. Remove screws and monitor from power supply base.
4. Remove screws and separate top and bottom halves.

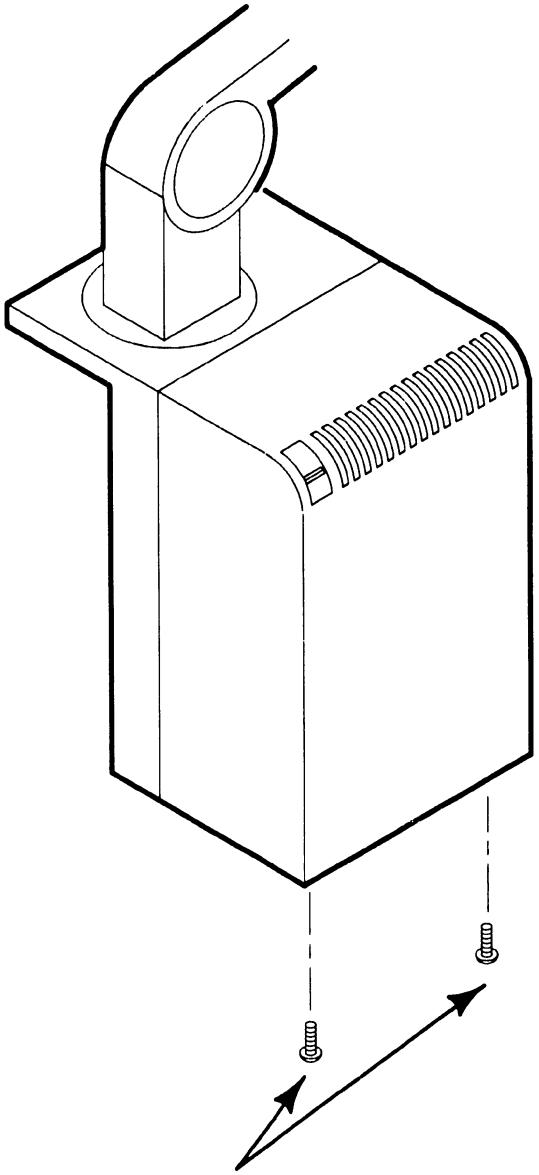




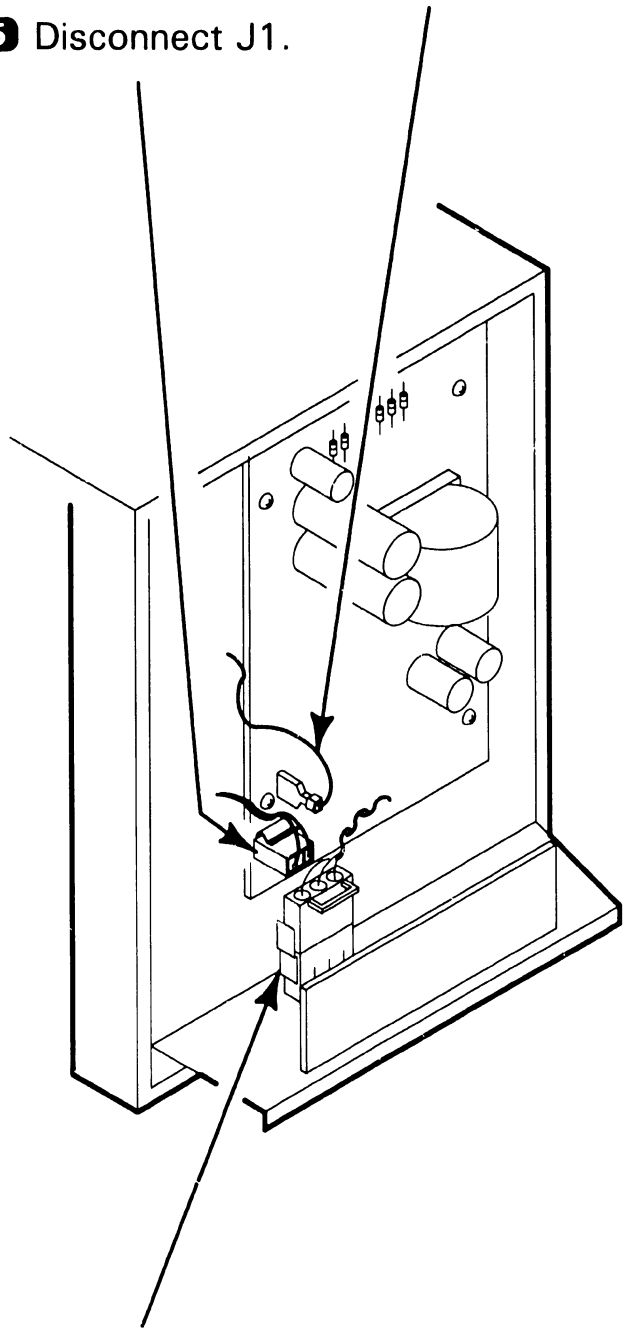
5. Remove screw and pull switching power supply and rear panel from retaining tabs.

7.2.16 OIS Monitor Arm Power Supply Disassembly (Sheet 1 of 2)

1. Power off power supply and disconnect ac power.
2. Disconnect external cables.



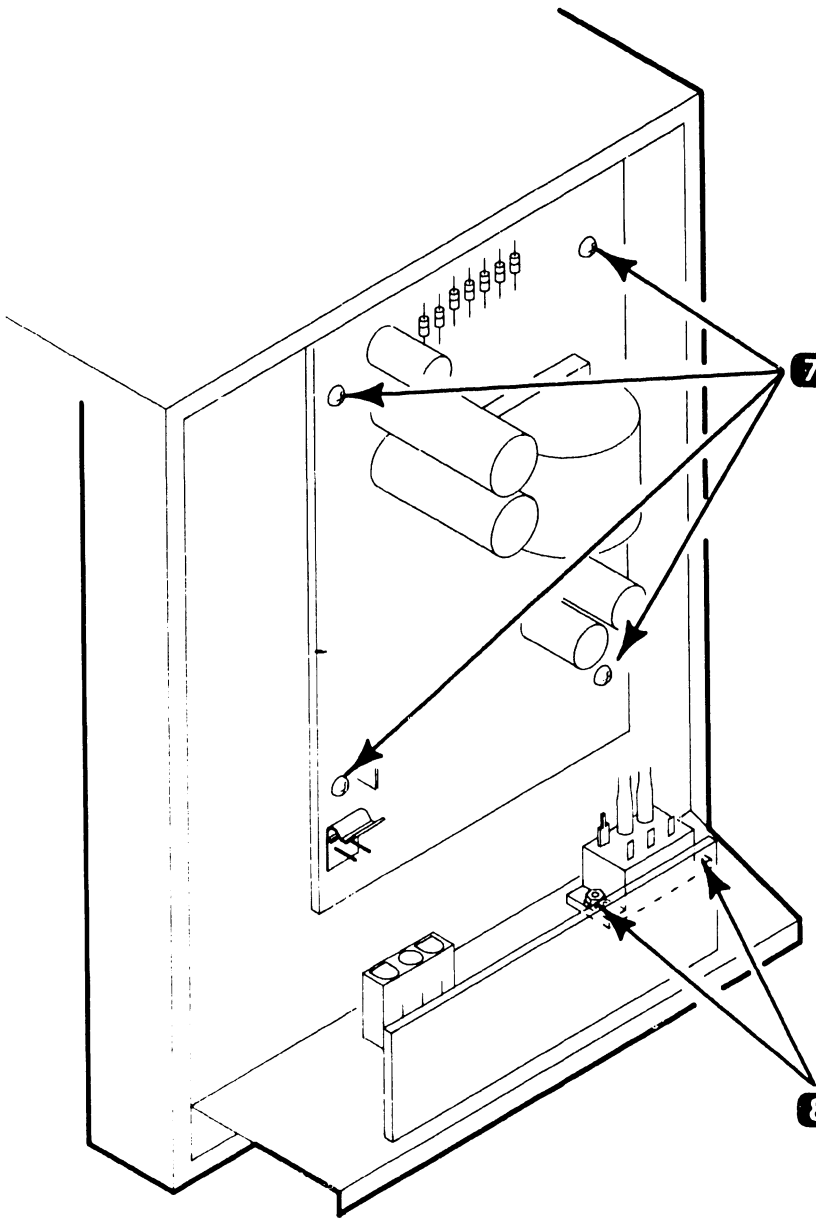
3. Remove screws and cover.
4. Disconnect green wire from J2.
5. Disconnect J1.



6. Disconnect DC output connector.

NEXT

7.2.16 OIS Monitor Arm Power Supply Disassembly (Sheet 2 of 2)

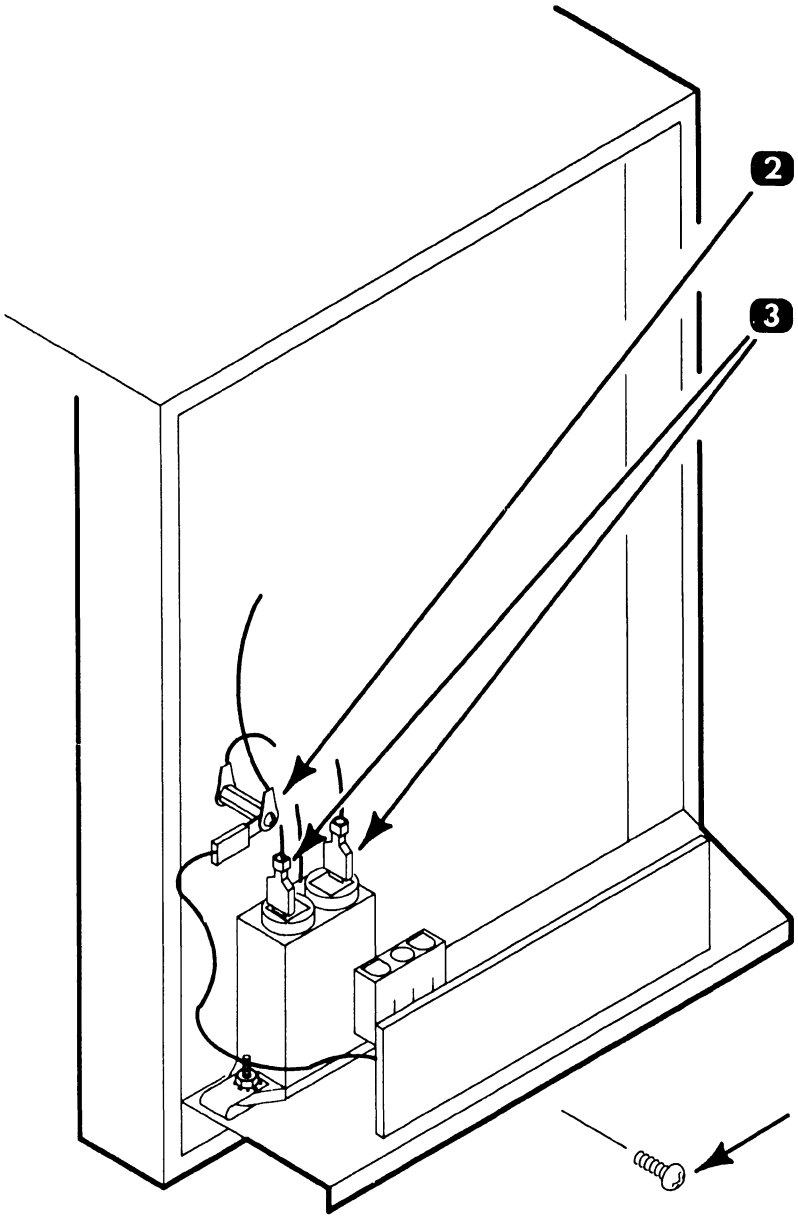


7 Remove four screws.

8 Remove two nuts securing AC select switch and remove circuit board.

END

7.2.17 OIS Monitor Arm Power Supply Connector Panel Disassembly



1. Disassemble power supply. 7.2.16
2. Remove stud screw and standoff.
3. Remove slip-on connectors from AC connector. Note locations for reconnection.
4. Remove screw.

SECTION
8
ADJUSTMENTS

SECTION 8 CONTENTS

SECTION 8
ADJUSTMENTS

* Refer to PM-004L Maintenance Manual (741/742-1647) for adjustment of 8514 PCB.

8 ADJUSTMENTS

8.1 Tools and Equipment

8.1.1 Special Tools

No special tools or equipment are required to perform adjustments and alignment on OIS 40/45/50/55/60/65/70 systems. All adjustments and alignment can be performed using the standard Wang standard CE tool kit.

8.2 Electrical Adjustments

8.2.1 Monitor Board 8244 Adjustment Procedure (Sheet 1 of 4)

1. Tools Required:
   - Eight inch plastic scale.
   - Small flat blade plastic screwdriver.
   - Long non-metallic ferrite core adjustment tool.
2. Power-down monitor and remove cables and monitor cover. 7.2.13

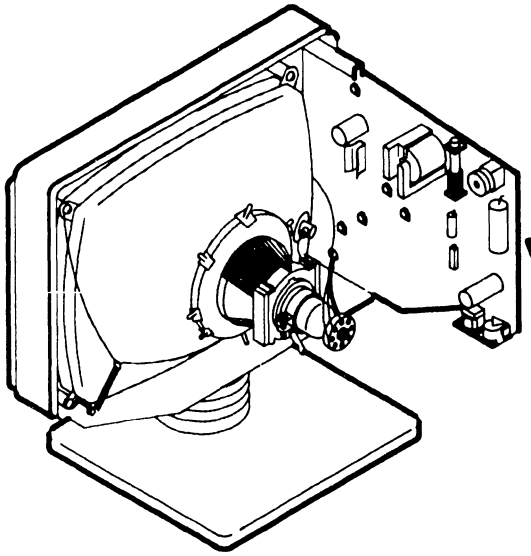
WARNING

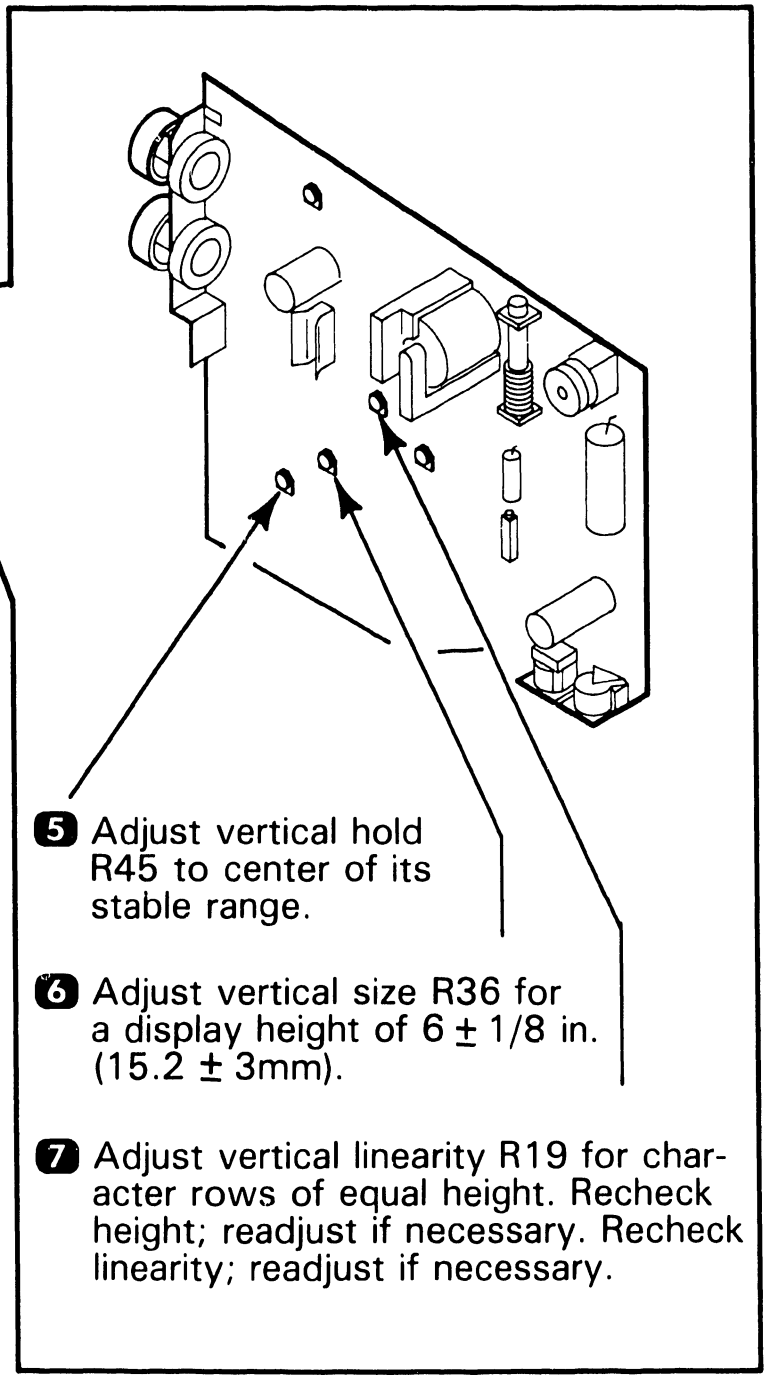
HIGH VOLTAGE IS PRESENT ON COMPONENT SIDE OF MONITOR BOARD. ALL ADJUSTMENTS (EXCEPT HORIZONTAL HOLD, WIDTH AND LINEARITY) ARE MADE THROUGH NON-COMPONENT SIDE OF BOARD.

3. Reconnect monitor cables and power-up system. 4.1.1
4. Create a WP document and fill entire screen with HO characters.

NEXT

8.2.1 Monitor Board 8244 Adjustment Procedure (Sheet 2 of 4)





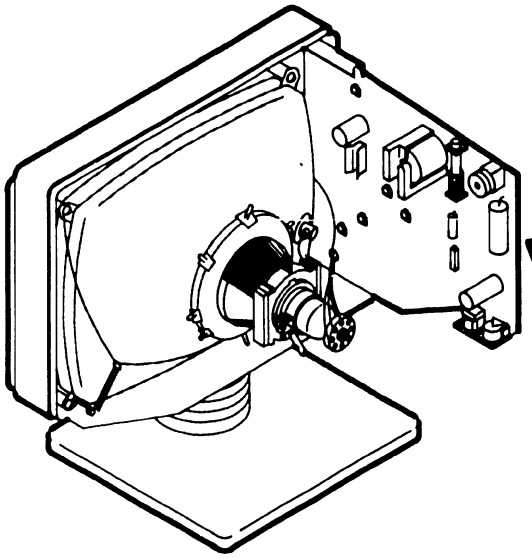
5 Adjust vertical hold R45 to center of its stable range.

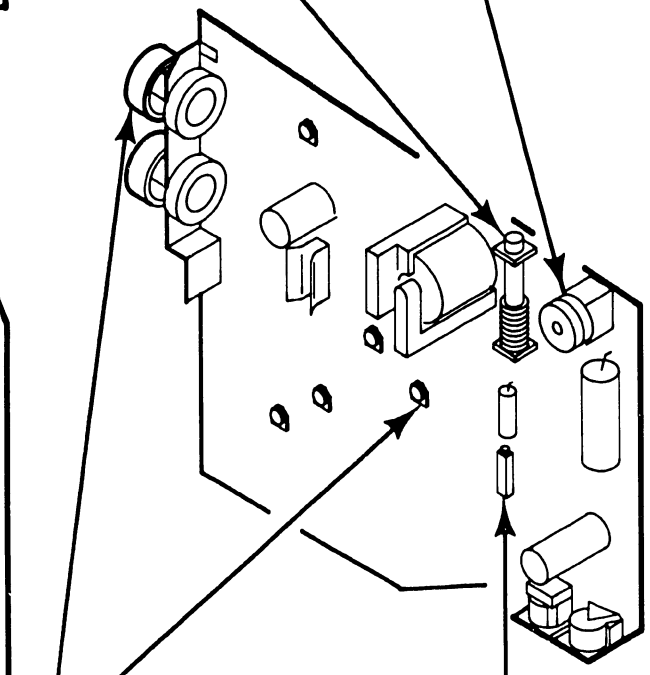
6 Adjust vertical size R36 for a display height of 6 ± 1/8 in. (15.2 ± 3mm).

7 Adjust vertical linearity R19 for character rows of equal height. Recheck height; readjust if necessary. Recheck linearity; readjust if necessary.

NEXT

8.2.1 Monitor Board 8244 Adjustment Procedure (Sheet 3 of 4)





8 Adjust horizontal width coil Z2 for a display width of 8±1/8 in.(20.3 ± 3 mm).

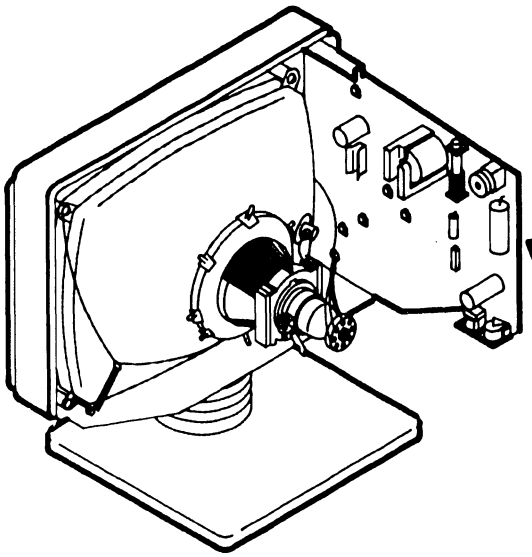
9 Adjust horizontal linearity coil Z1 for equal character width across screen.

10 Adjust BRIGHTNESS to display raster and adjust horizontal phase R28 to center display in the raster.

11 Check top row of characters for distortion. Adjust horizontal hold R26 to remove distortion, if any.

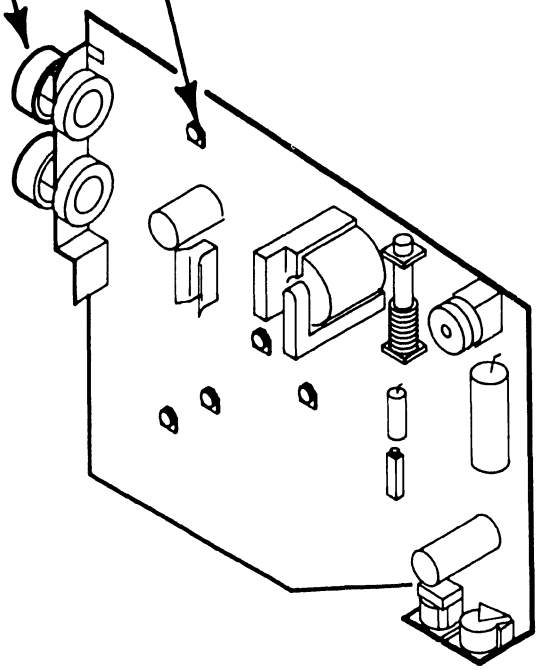
NEXT

8.2.1 Monitor Board 8244 Adjustment Procedure (Sheet 4 of 4)



12 Adjust BRIGHTNESS until raster disappears.

13 Adjust focus control R7 for best overall character display.



14 Power-down monitor and replace monitor cover.

END

8.2.2 Monitor Board 8344 Adjustment Procedure (Sheet 1 of 4)

1. Tools Required:
   - Eight inch plastic scale.
   - Small flat blade plastic screwdriver.
   - Long non-metallic ferrite core adjustment tool.
2. Power-down monitor and remove cables and monitor cover. 7.2.13

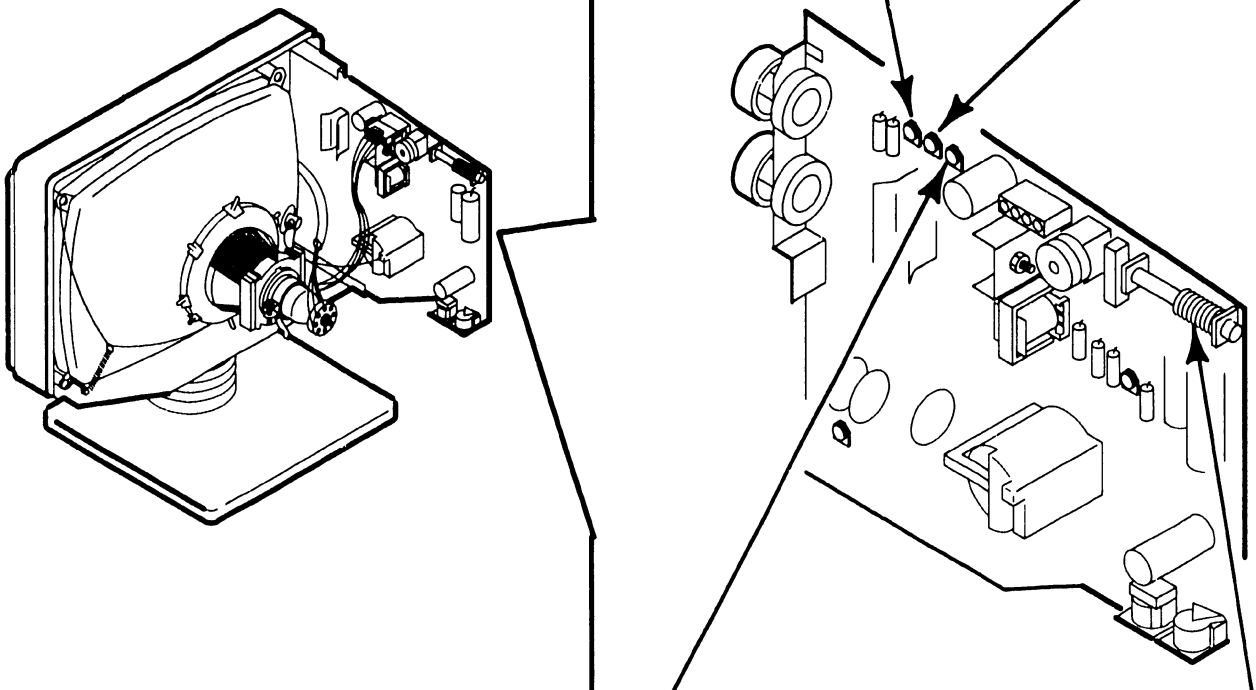
WARNING

HIGH VOLTAGE IS PRESENT ON COMPONENT SIDE OF MONITOR BOARD. ALL ADJUSTMENTS (EXCEPT HORIZONTAL HOLD, WIDTH AND LINEARITY) ARE MADE THROUGH NON-COMPONENT SIDE OF BOARD.

3. Reconnect monitor cables and power-up system. 4.1.1
4. Create a WP document and fill entire screen with HO characters.

NEXT

8.2.2 Monitor Board 8344 Adjustment Procedure (Sheet 2 of 4)



5 Adjust vertical hold R6 to center of its stable range.

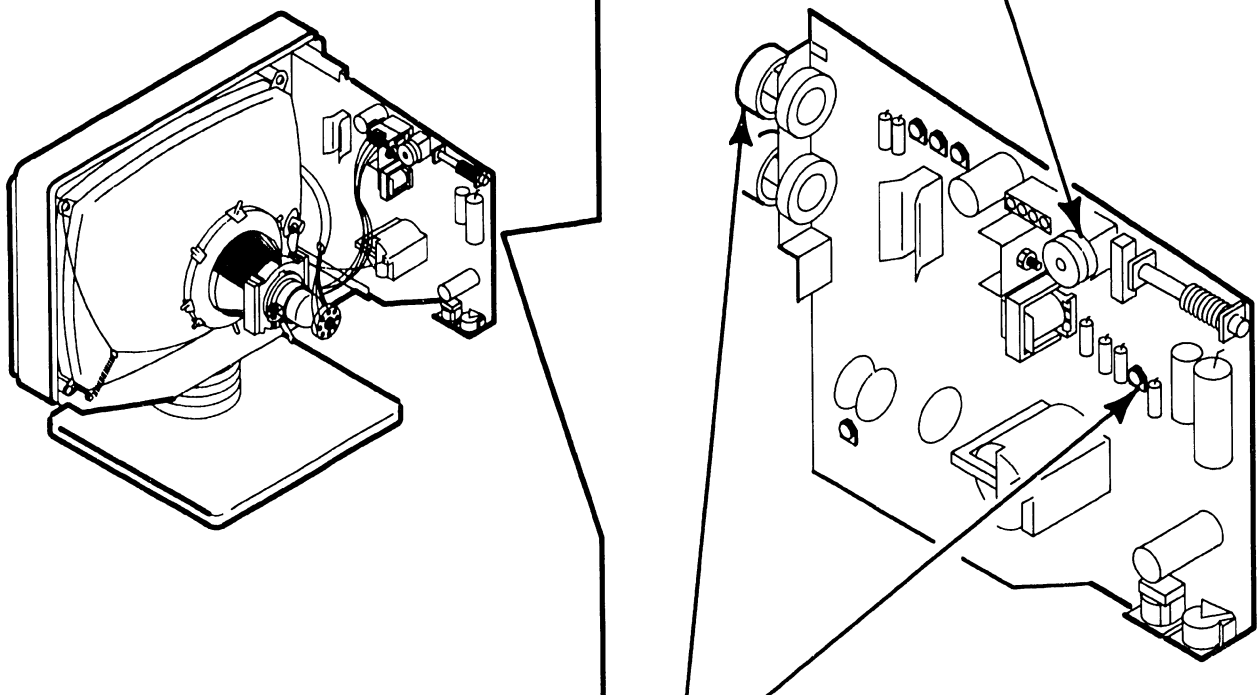
6 Adjust vertical size R7 for a display height of 6 ± 1/8 in.(15.2 ± 3mm.).

7 Adjust vertical linearity R5 for character rows of equal height. Recheck height; readjust if necessary. Recheck linearity; readjust if necessary.

8 Adjust horizontal width coil Z1 for a display width of 8 ± 1/8 in. (20.3 ± 3mm).

NEXT

8.2.2 Monitor Board 8344 Adjustment Procedure (Sheet 3 of 4)

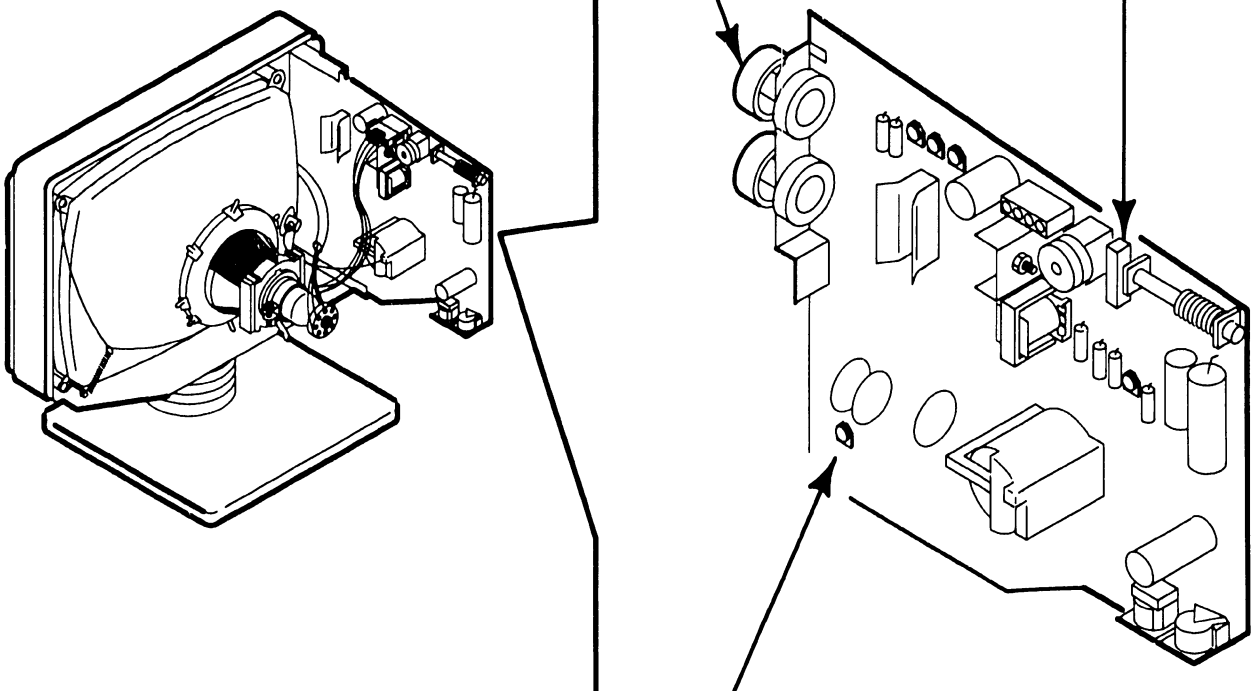


9 Adjust horizontal linearity coil Z2 for equal character width across screen.

10 Adjust BRIGHTNESS to display raster and adjust horizontal phase R26 to center display in the raster.

NEXT

8.2.2 Monitor Board 8344 Adjustment Procedure (Sheet 4 of 4)



11 Check top row of characters for distortion. Adjust R1 to remove distortion, if any.

12 Adjust BRIGHTNESS until raster disappears.

13 Adjust focus control R61 for best overall character display.

14 Power-down monitor and replace monitor cover.

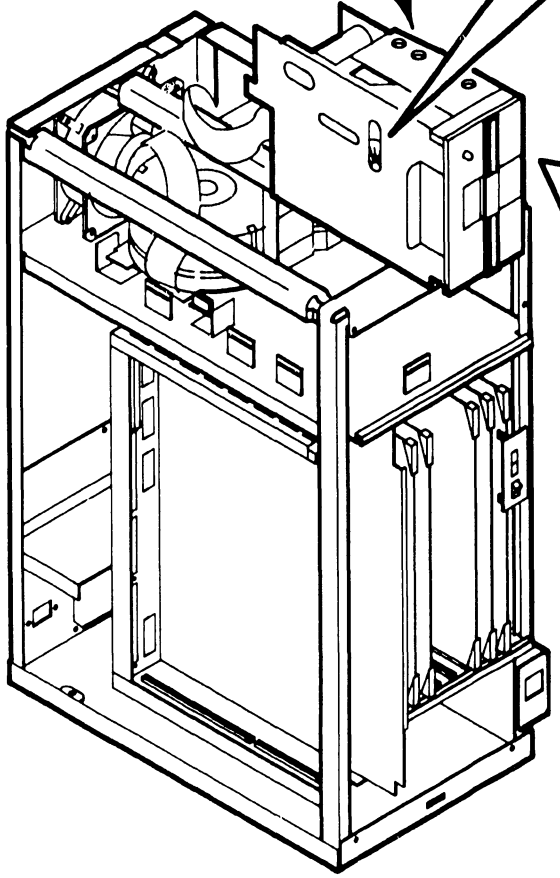
END

8.2.3 Floppy Drive Motor Speed Adjustment

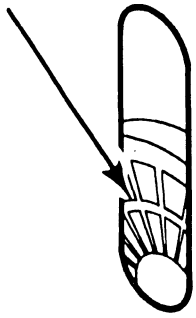
NOTE

The following adjusting procedure applies to the MPI and Tandon full height floppy drives. The half height floppy has no field adjustments.

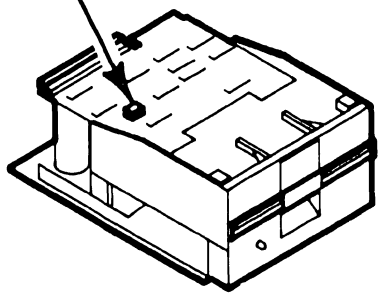
1. Remove floppy drive from Master Unit. 7.2.4
2. Rest drive on top of Master Unit with cables attached.



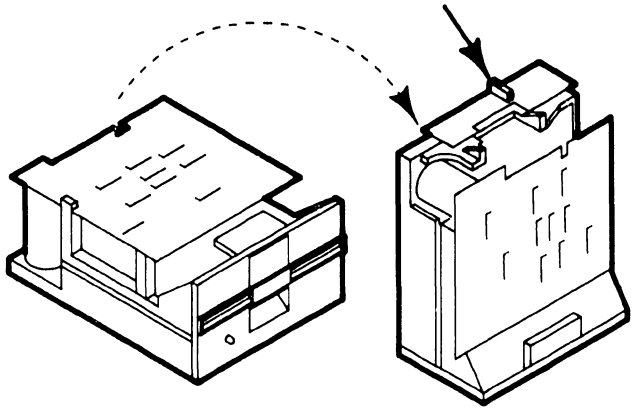
3. Power-up Master Unit. 4.1.1
4. Shine fluorescent light through slot and observe 60 Hz (outer marks) and 50 Hz (inner marks) timing marks.



5. For MPI drive, adjust R38 until timing marks appear stationary.

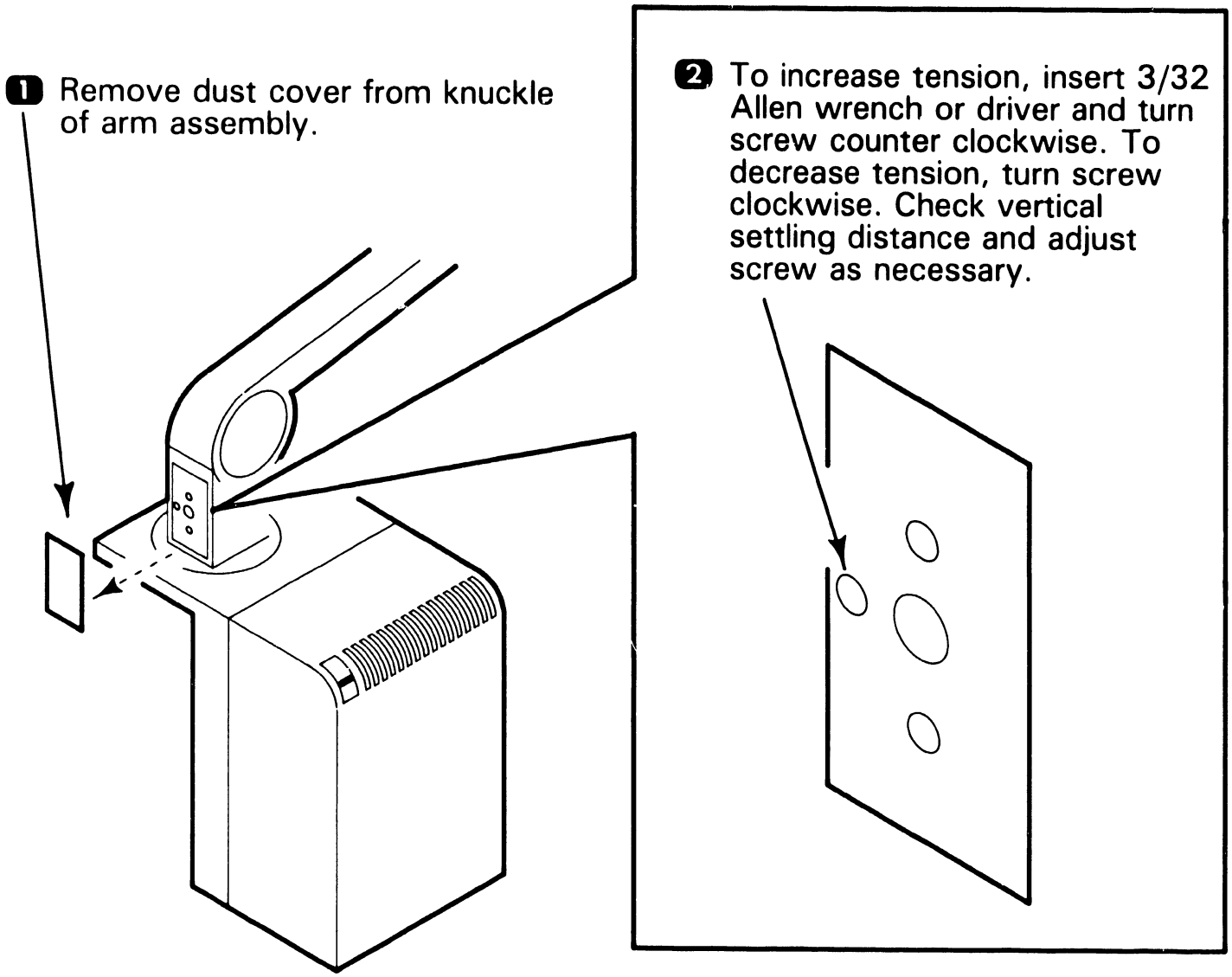


6. For Tandon drive, adjust R4 until timing marks appear stationary.



8.3 Mechanical Adjustments

8.3.1 OIS Monitor Arm Tension Adjustment



SECTION 9

UNPACKING AND SETUP

SECTION 9 CONTENTS

SECTION 9
UNPACKING AND SETUP

SECTION 9 CONTENTS

SECTION 9 (CON'T)
UNPACKING AND SETUP

9 UNPACKING AND SETUP

9.1 Installation Site Check

Proper location and site preparation are important for overall operating efficiency. Ideally, the area should be easily accessible, relatively dust free, and temperature and humidity controlled. An adequate number of dedicated, regulated, noise-free AC power outlets should be provided to minimize electromagnetic interference.

Each OIS Master draws 5 amps at power-up and 2.75 amps during operation.

Each workstation draws 3.0 amps at power-up and 1.0 amp during operation.

Ensure adequate clearance (12 inches, minimum) is provided at the rear of the Master Unit to allow proper airflow by the fan(s).

9.2 UNPACKING AND SETUP

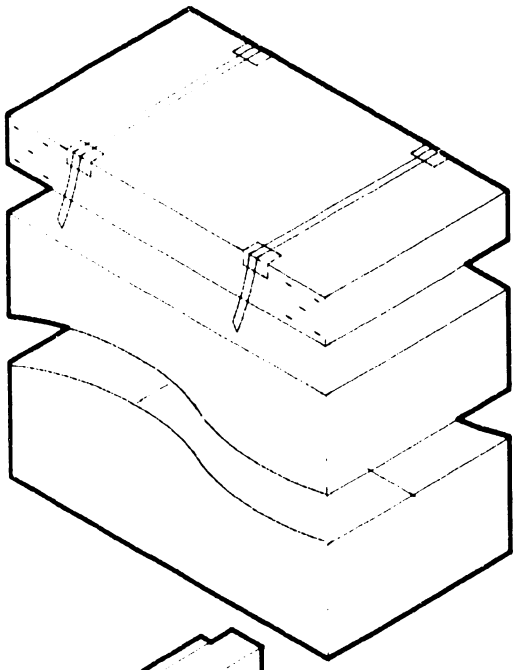
Tools and Equipment

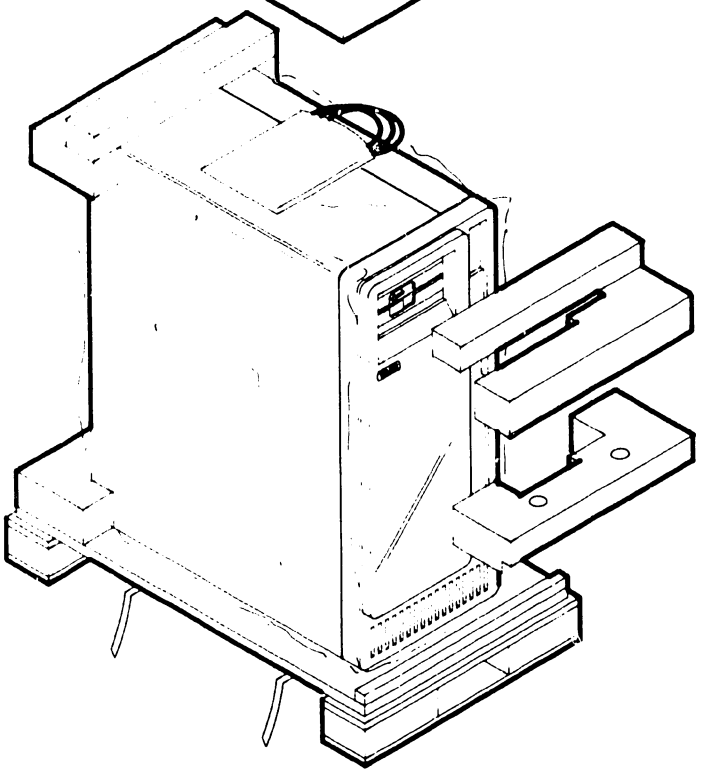
- Standard CE tool kit WLI#726-9401.
- Digital Multimeter.
- Pin removal/insertion tool WLI#726-9814.
- Oscilloscope

9.3 UNPACKING AND SETUP

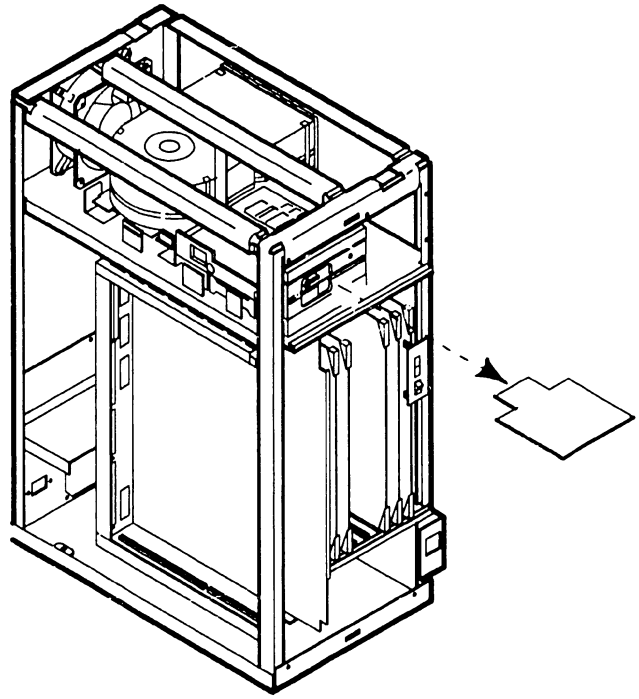
Unpacking Procedures

9.3.1 Unpacking and Inspecting Master Unit



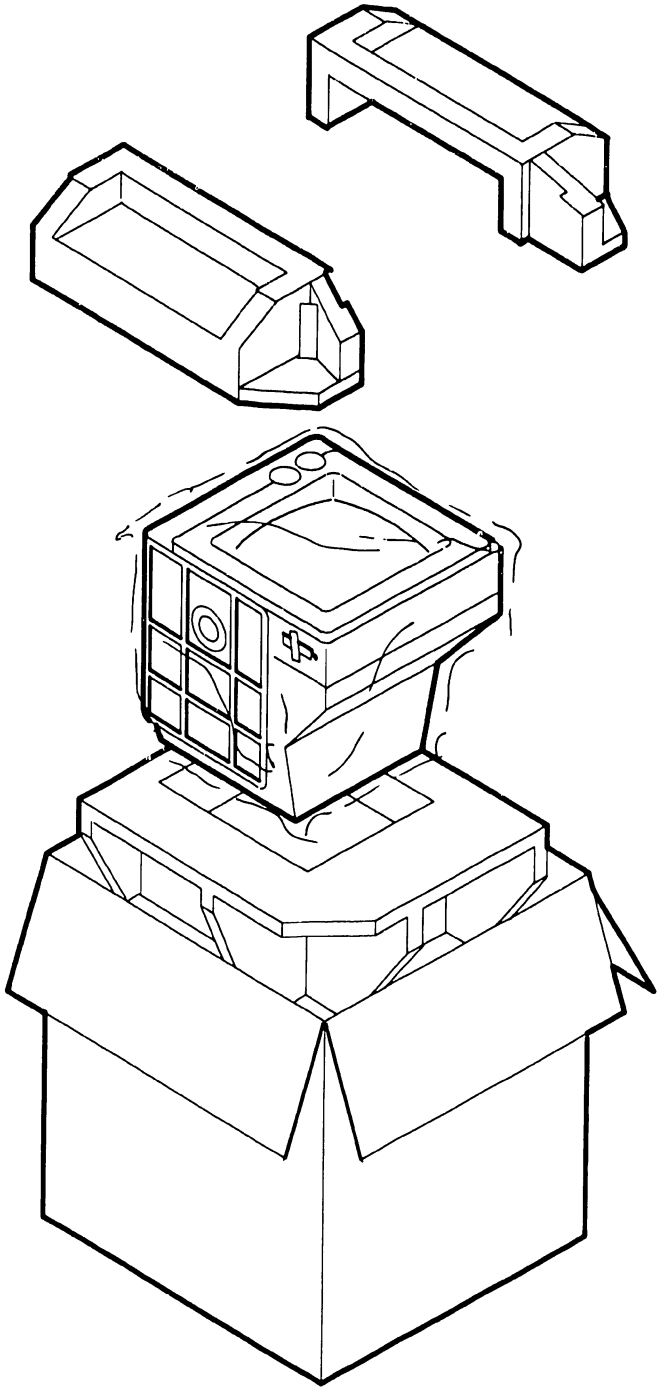


1. Remove OIS 40/45/50/55/60/65/70 Unit from shipping carton.
2. Visually inspect unit for external damage.
3. Remove front panel. 7.2.1
4. Remove side covers. 7.2.2
5. Check all cable connections and inspect for internal damage and loose parts.
6. Remove shipping protector from diskette drive.



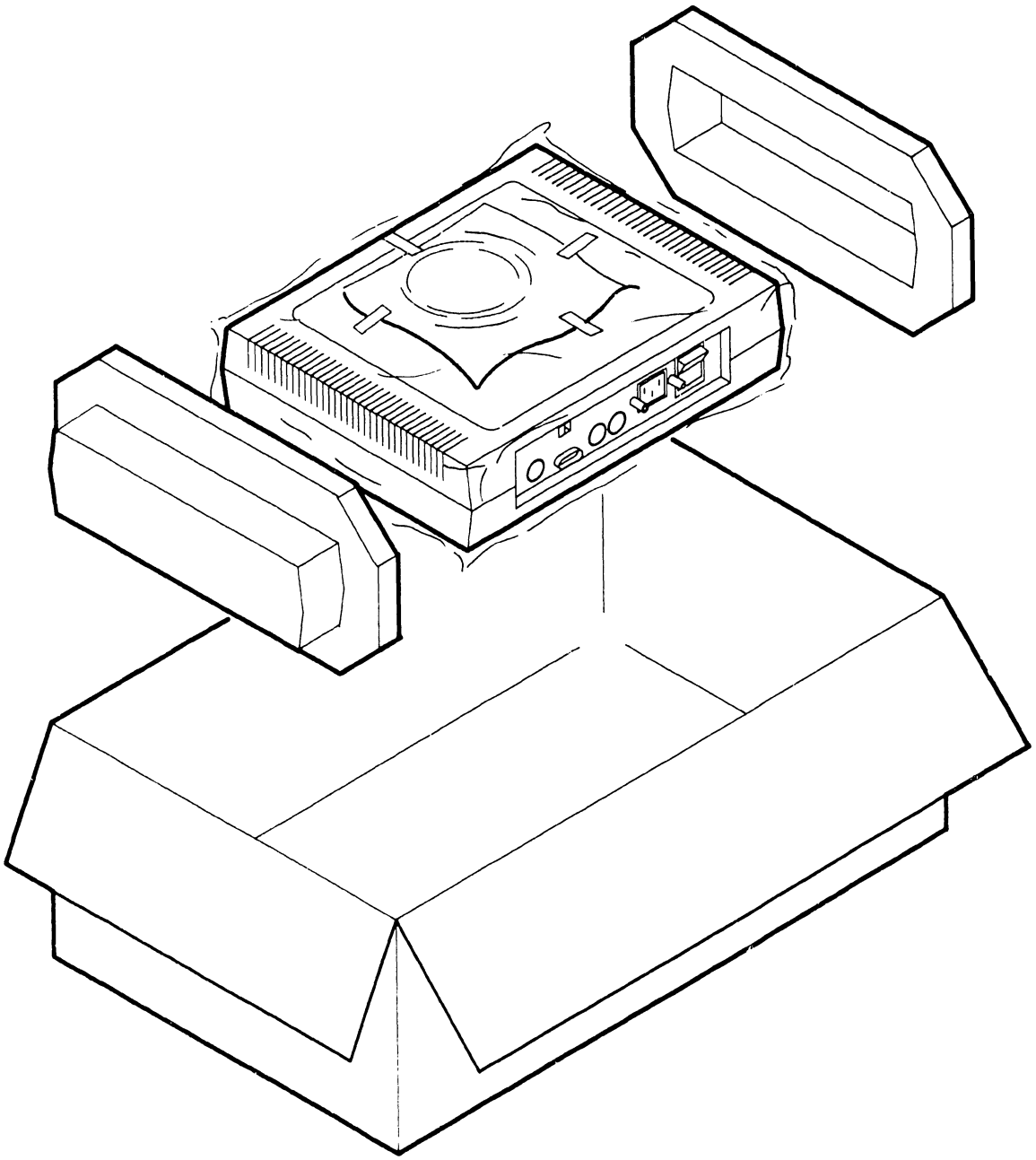
9.3.2 Unpacking Workstation Monitor

1. Remove Monitor from shipping carton.
2. Visually inspect unit for external damage.



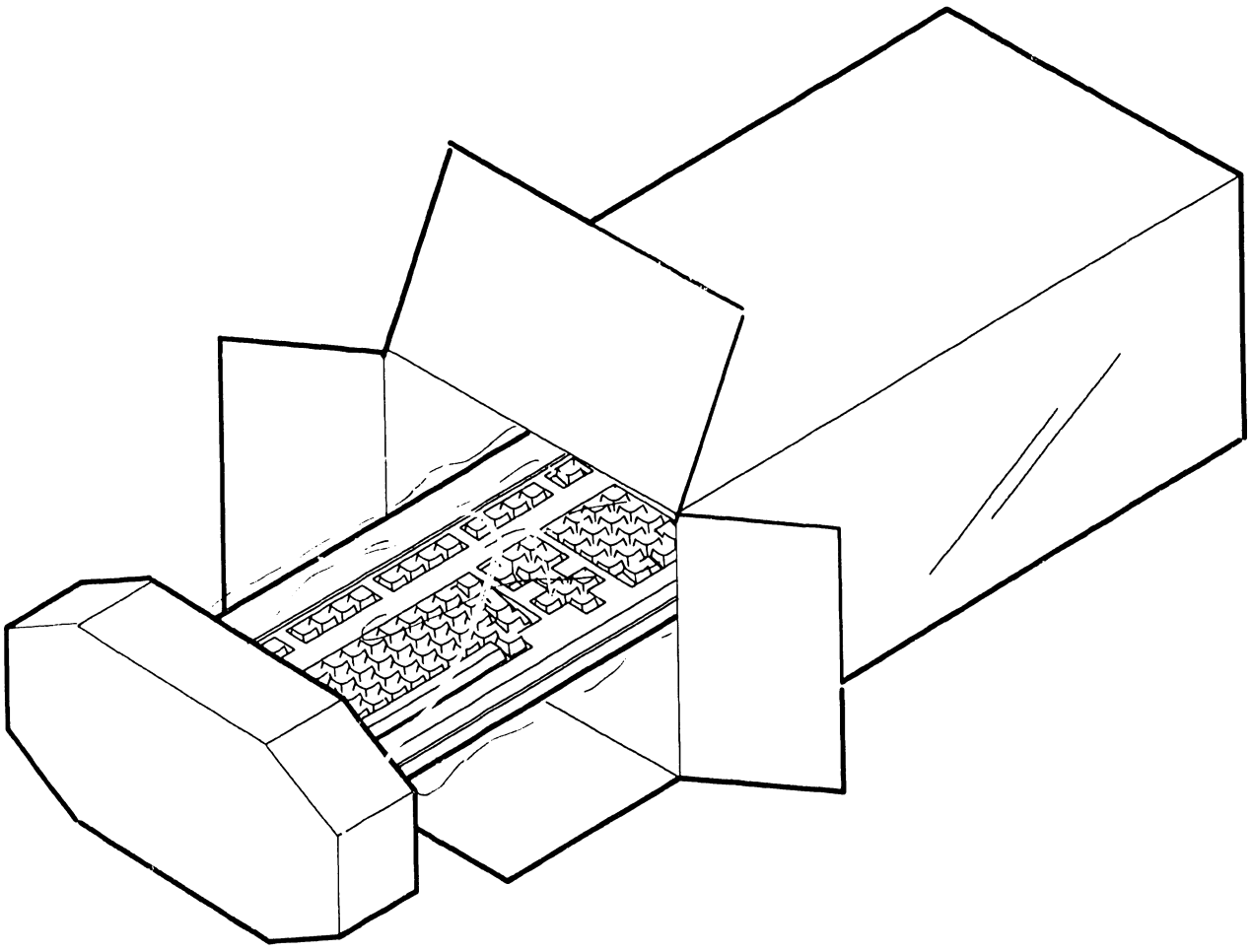
9.3.3 Unpacking Power Supply Base

1. Remove Base from shipping carton.
2. Visually inspect unit for external damage.



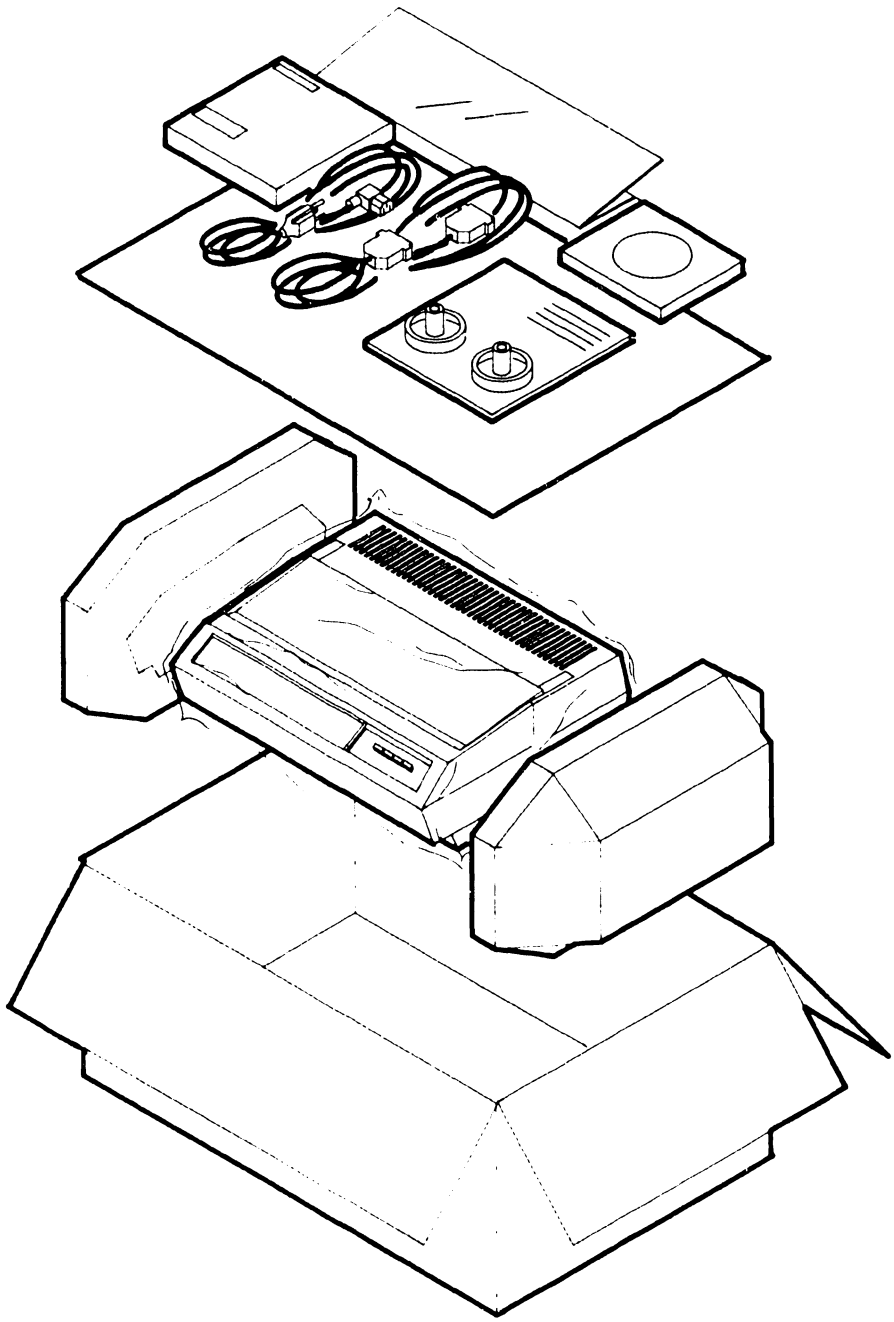
9.3.4 Unpacking Keyboard

1. Remove Keyboard from shipping carton.
2. Visually inspect unit for external damage

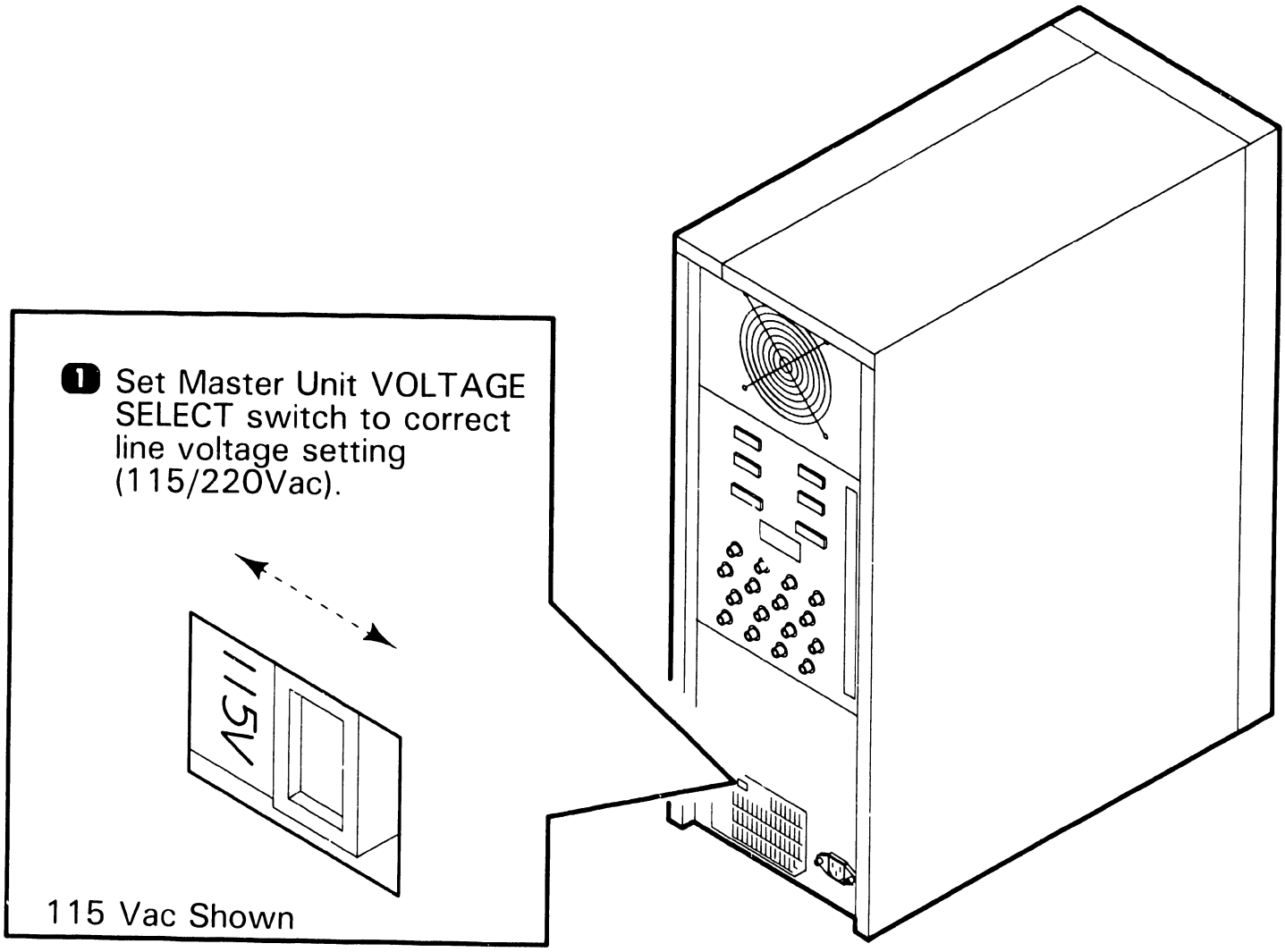


9.3.5 Unpacking Printer

1. Remove Printer from shipping carton.
2. Visually inspect unit for external damage.



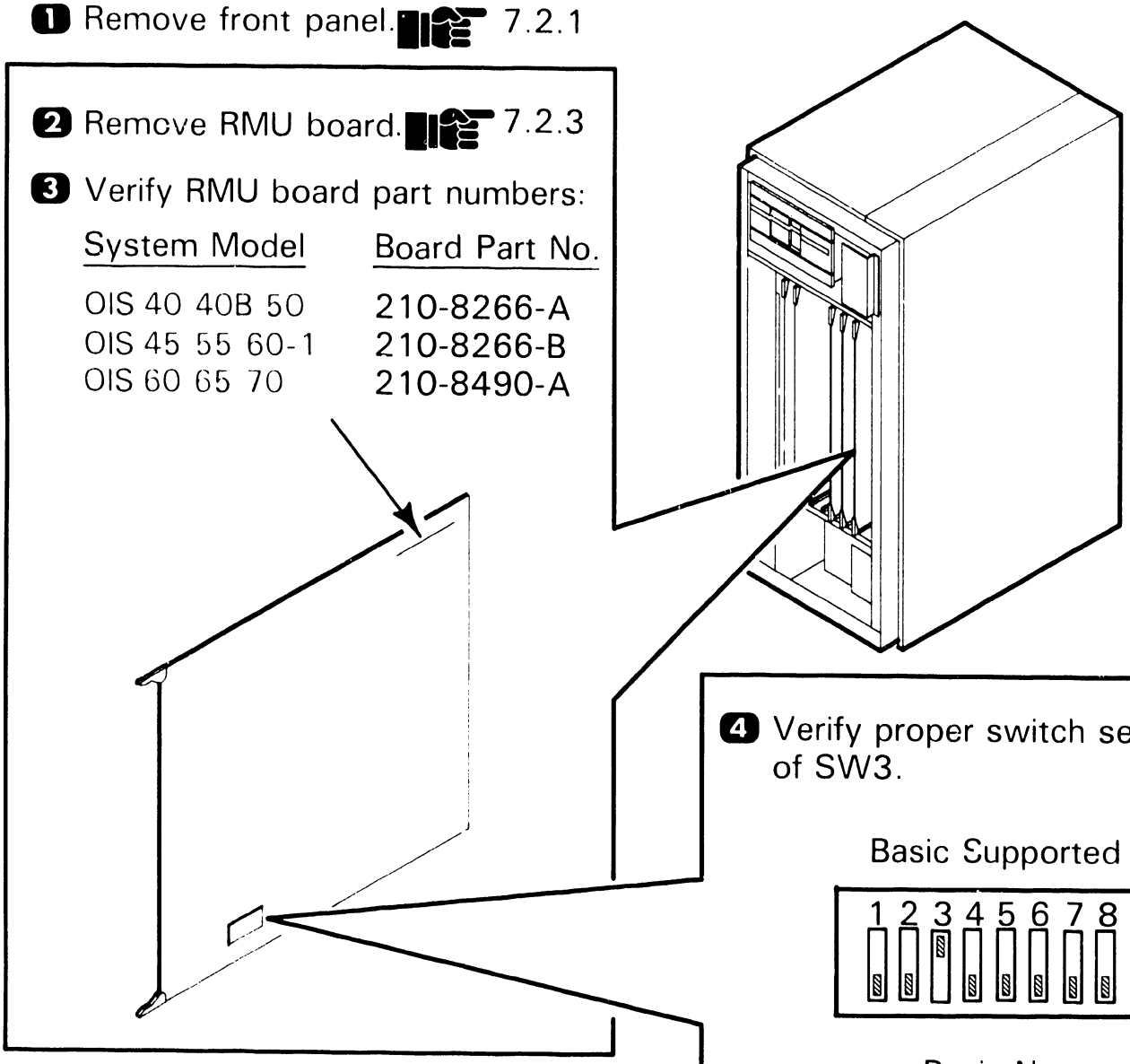
9.4.1 Master Unit Line Voltage Select Switch



9.4.2 Master Unit RMU Board Switch Settings

1. Remove front panel. 7.2.1
2. Remove RMU board. 7.2.3
3. Verify RMU board part numbers:

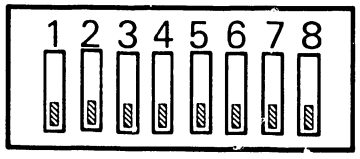
System Model	Board Part No.
OIS 40 40B 50	210-8266-A
OIS 45 55 60-1	210-8266-B
OIS 60 65 70	210-8490-A



4. Verify proper switch settings of SW3.

Basic Supported

Basic Not Supported

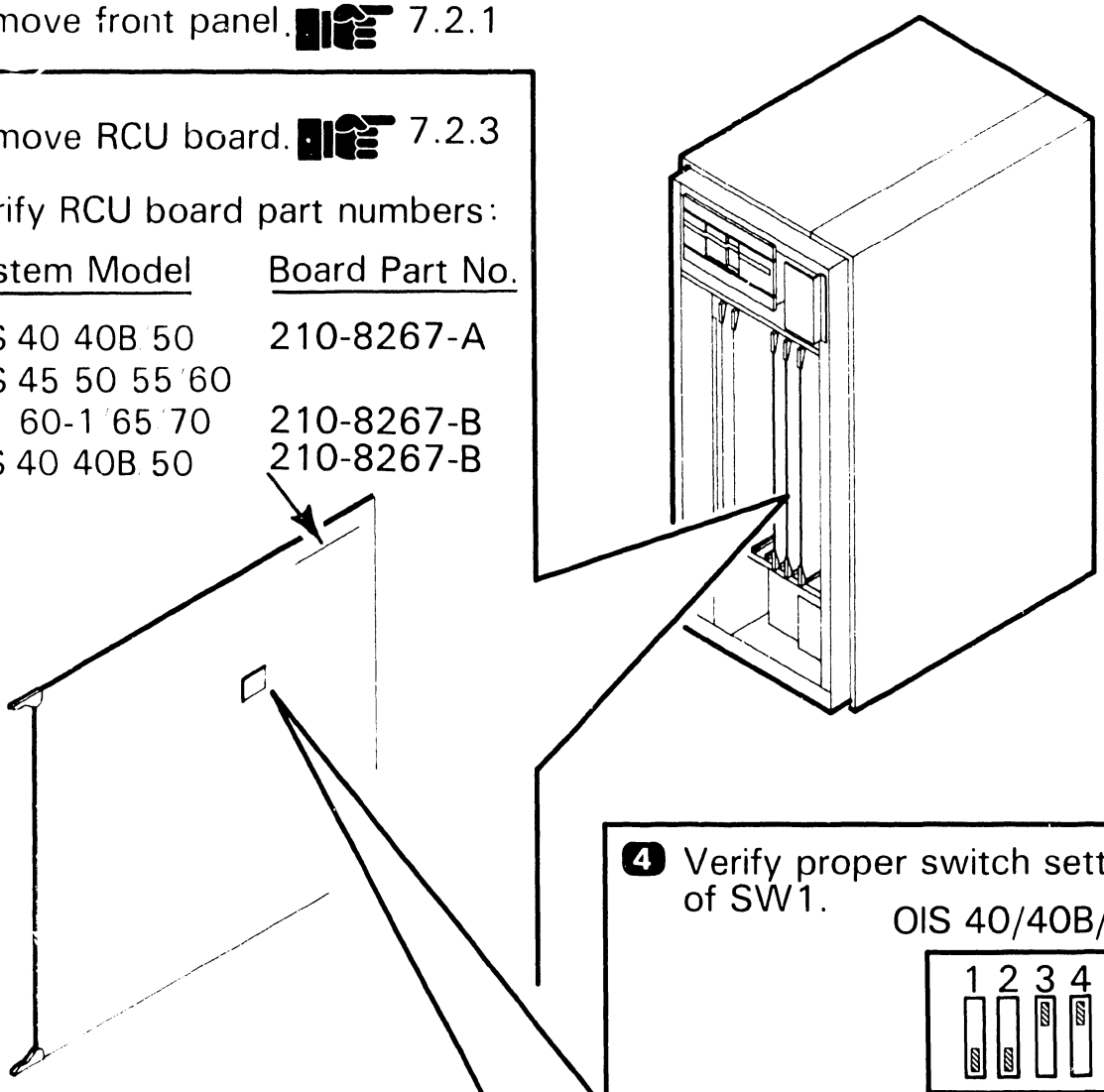


▨=switch position

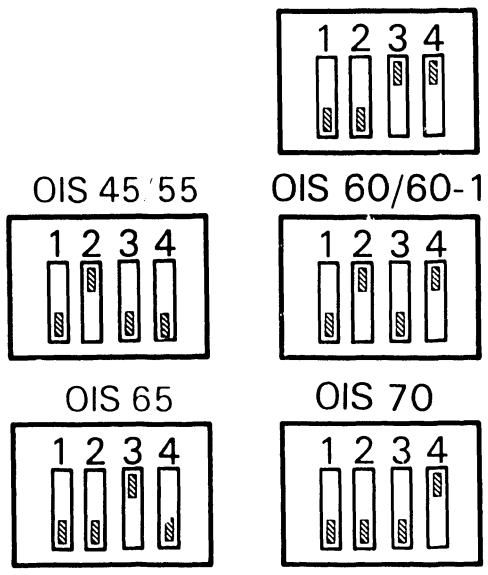
9.4.3 Master Unit RCU Board Switch Settings

1. Remove front panel. 7.2.1
2. Remove RCU board. 7.2.3
3. Verify RCU board part numbers:

System Model	Board Part No.
OIS 40 40B 50	210-8267-A
OIS 45 50 55 60 60-1 65 70	210-8267-B
OIS 40 40B 50	210-8267-B

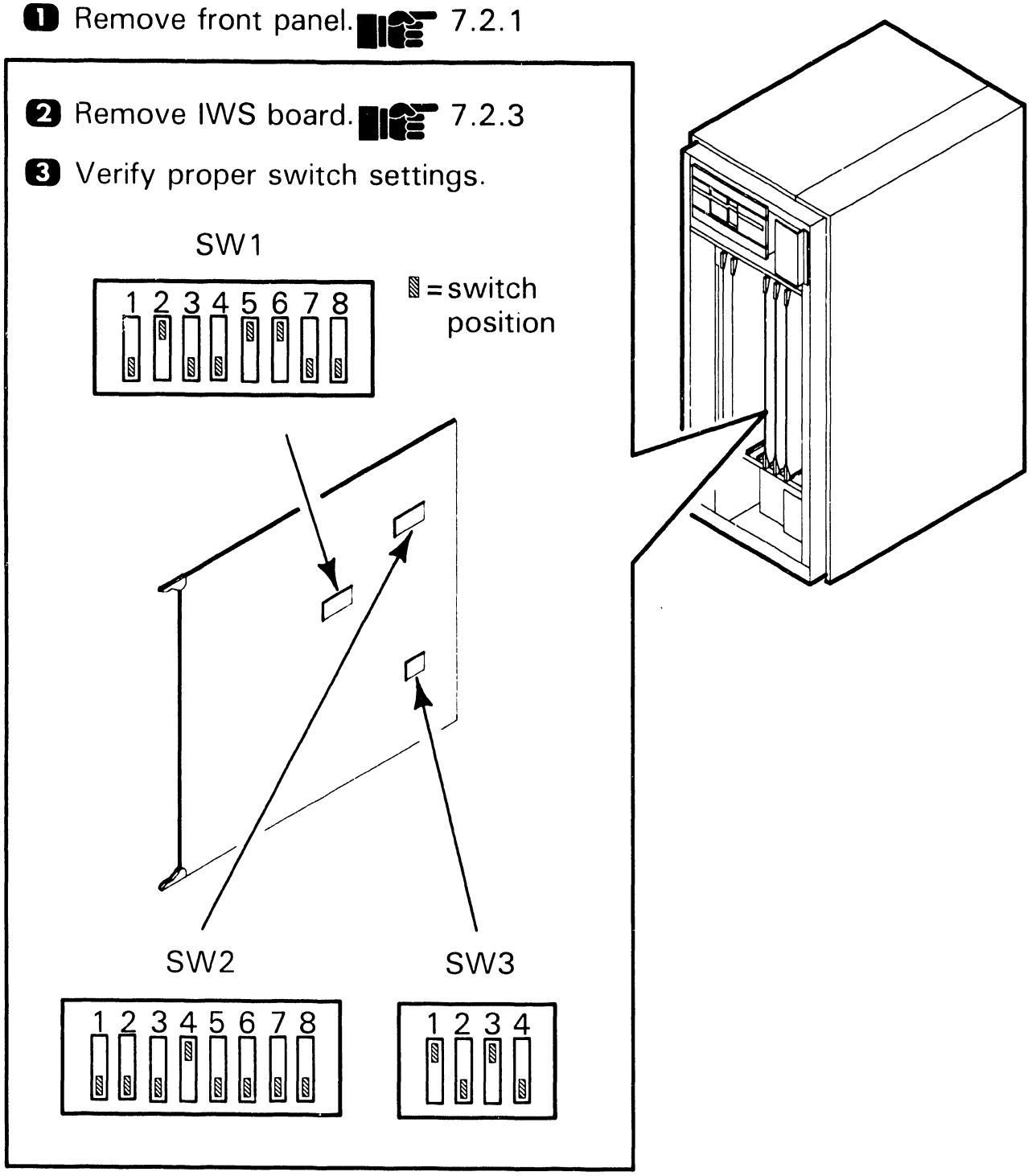


4. Verify proper switch settings of SW1.



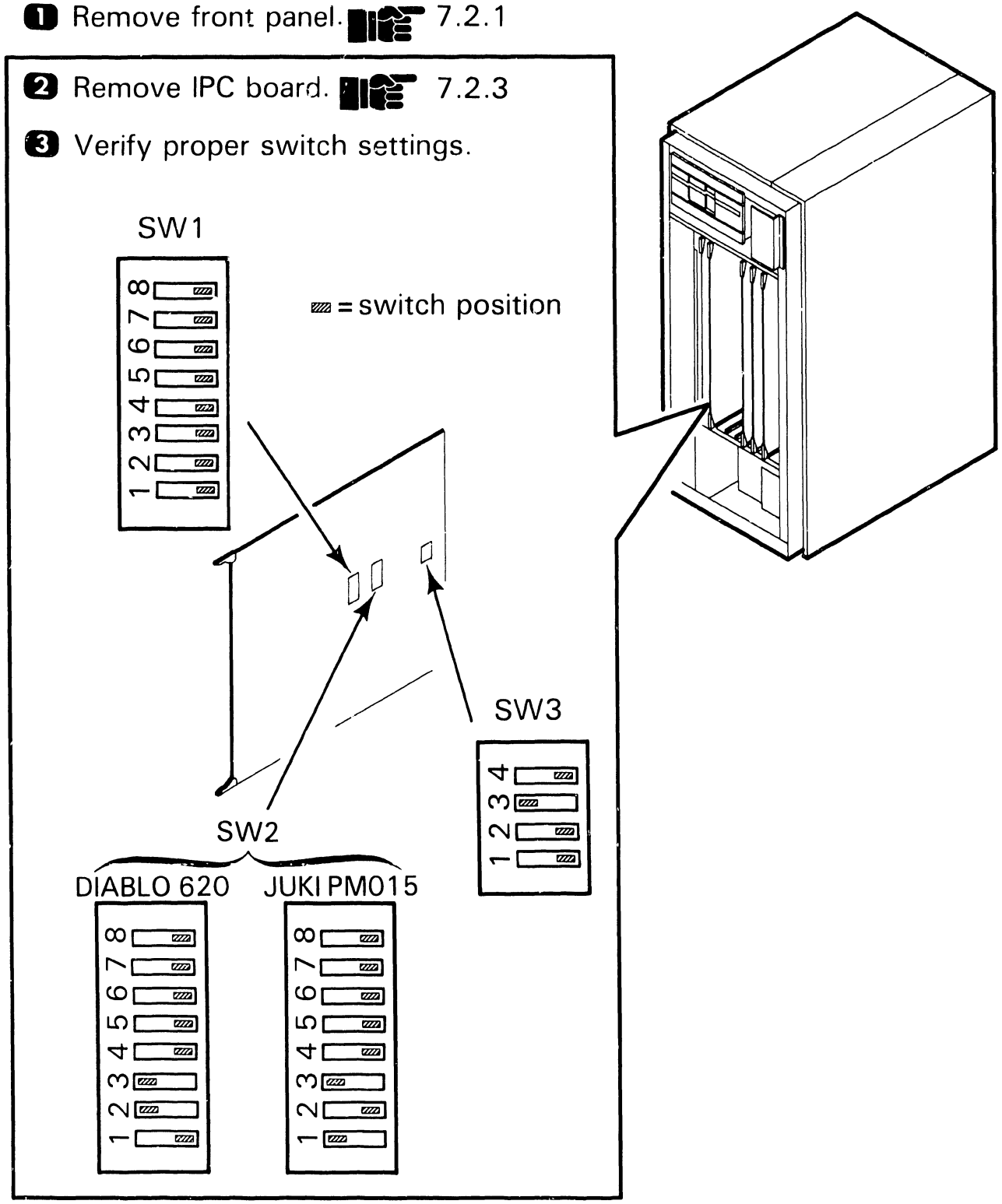
9.4.4 Master Unit IWS Board Switch Settings

1. Remove front panel. 7.2.1
2. Remove IWS board. 7.2.3
3. Verify proper switch settings.



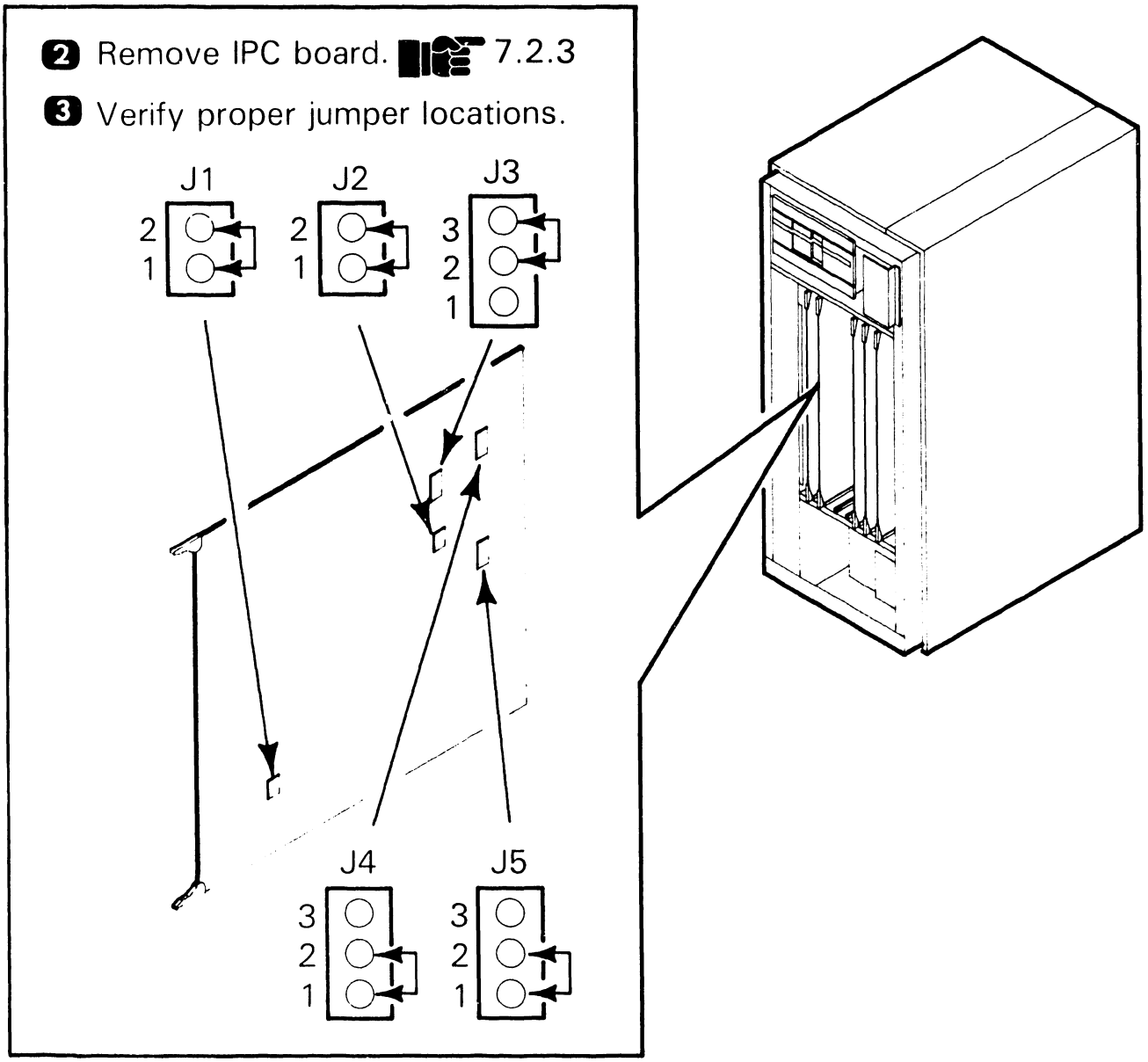
9.4.5 Master Unit IPC Board Switch Settings

1. Remove front panel. 7.2.1
2. Remove IPC board. 7.2.3
3. Verify proper switch settings.



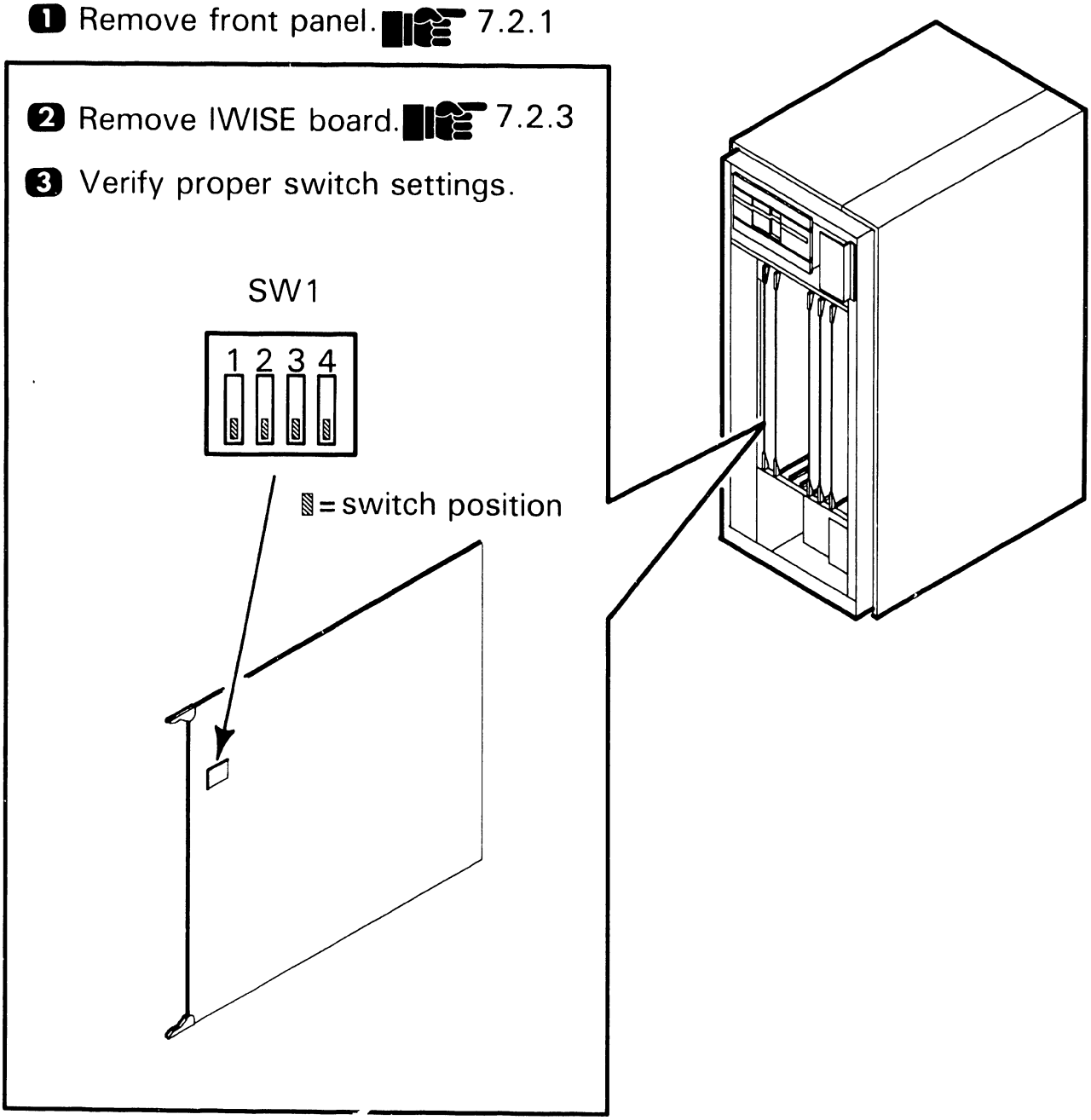
9.4.6 Master Unit IPC Board Jumper Locations

1. Remove front panel. 7.2.1
2. Remove IPC board. 7.2.3
3. Verify proper jumper locations.



9.4.7 Master Unit IWISE Board Switch Settings

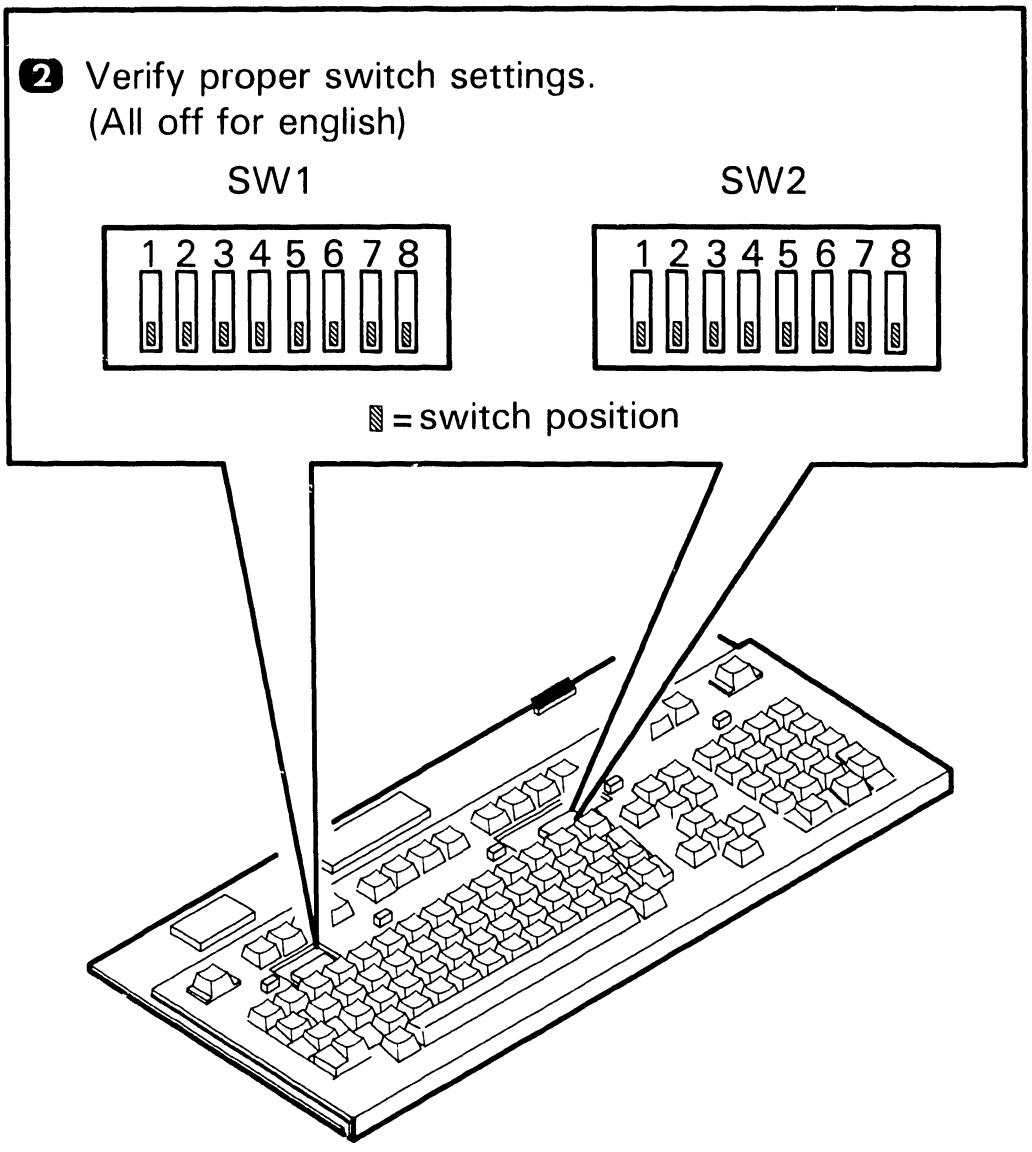
1. Remove front panel. 7.2.1
2. Remove IWISE board. 7.2.3
3. Verify proper switch settings.



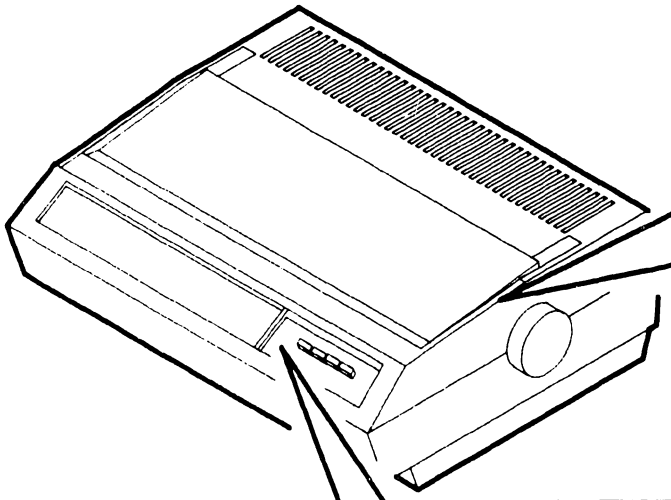
9.4.8 Keyboard Switch Settings

❶ Remove top cover. ☞ 7.2.14

❷ Verify proper switch settings.
(All off for english)

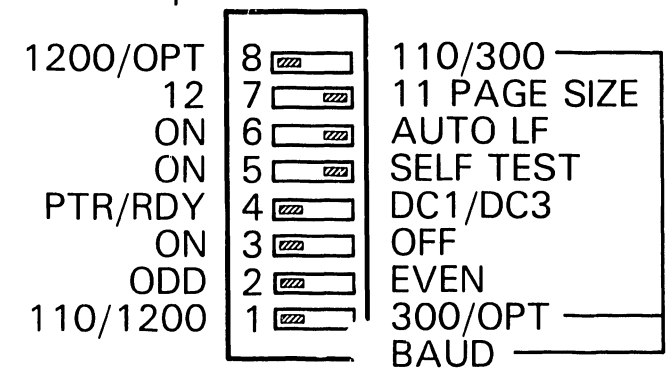


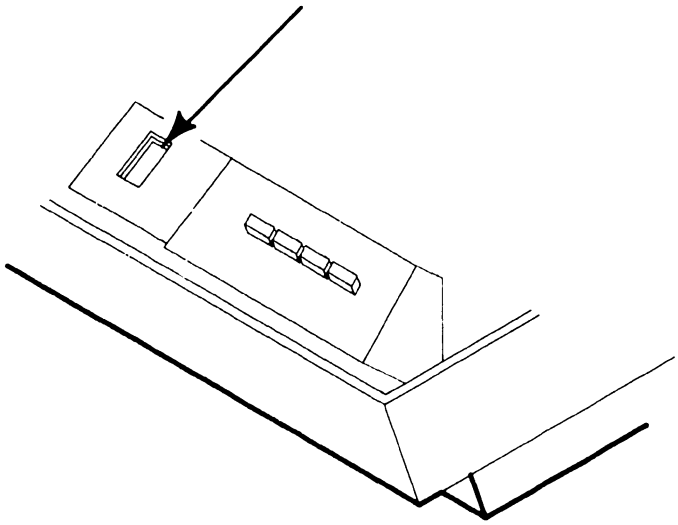
9.4.9 Printer Switch Settings (Diablo 620)



1. Remove top cover by pressing locking tabs (inside) and lifting up.

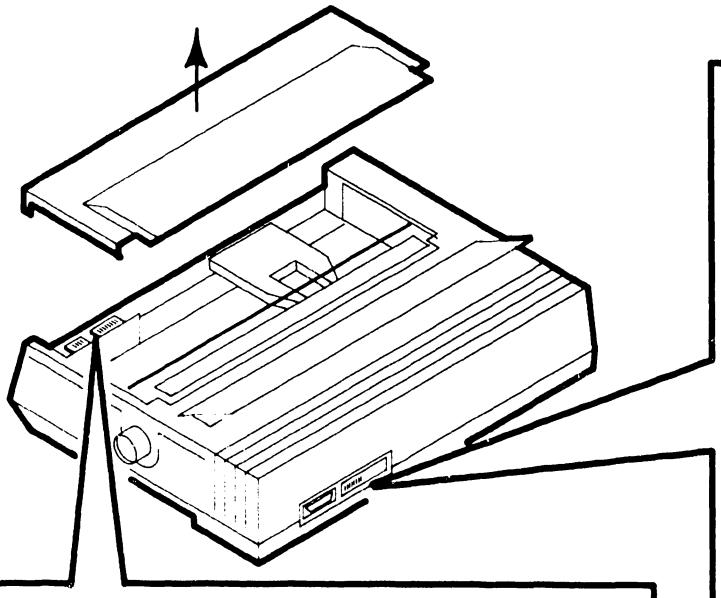
2. Verify proper switch settings.
▨ = switch position



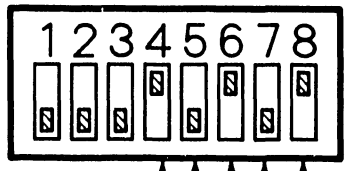


9.4.10 Printer (Juki PM015) Switch Settings (Sheet 1 of 2)

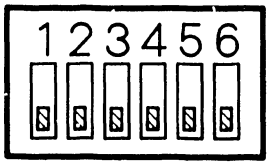
1. Remove top cover by lifting cover edge up and toward front of unit.



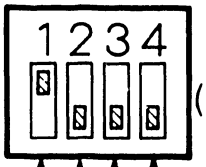
3. Set the baud rate and serial interface options (SW12) to the desired settings (Sheet 2).



2. Set Printer Function Switches as follows:



SW21 to OFF.



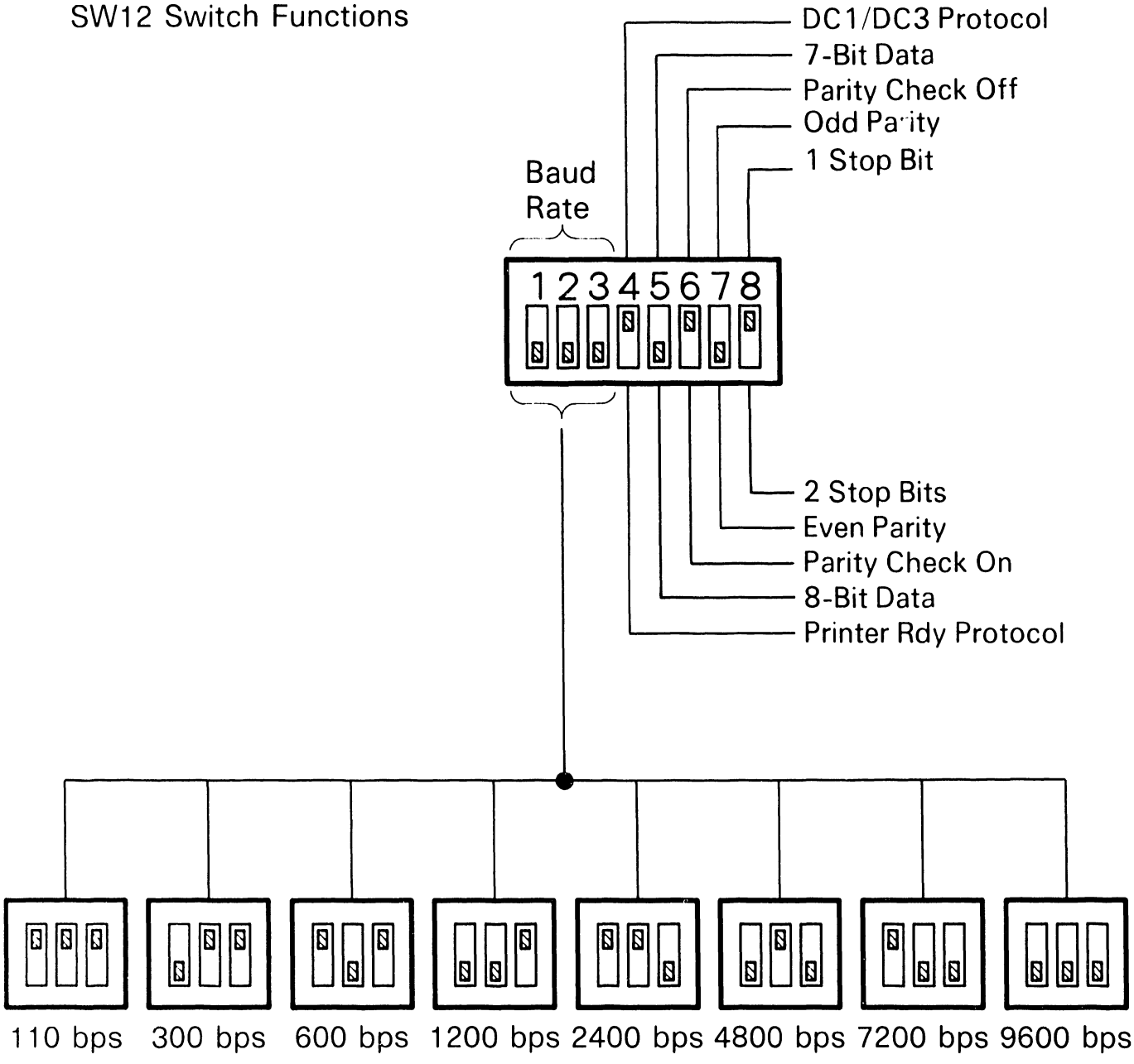
SW22 to desired positions.
(Shown in 10-pitch position)

Proportional Space
15 Pitch
12 Pitch
10 Pitch

NOTE: See Switch Label on Printer Frame for pitch settings of SW22.

9.4.10 Printer (Juki PM015) Switch Settings (Sheet 2 of 2)

SW12 Switch Functions

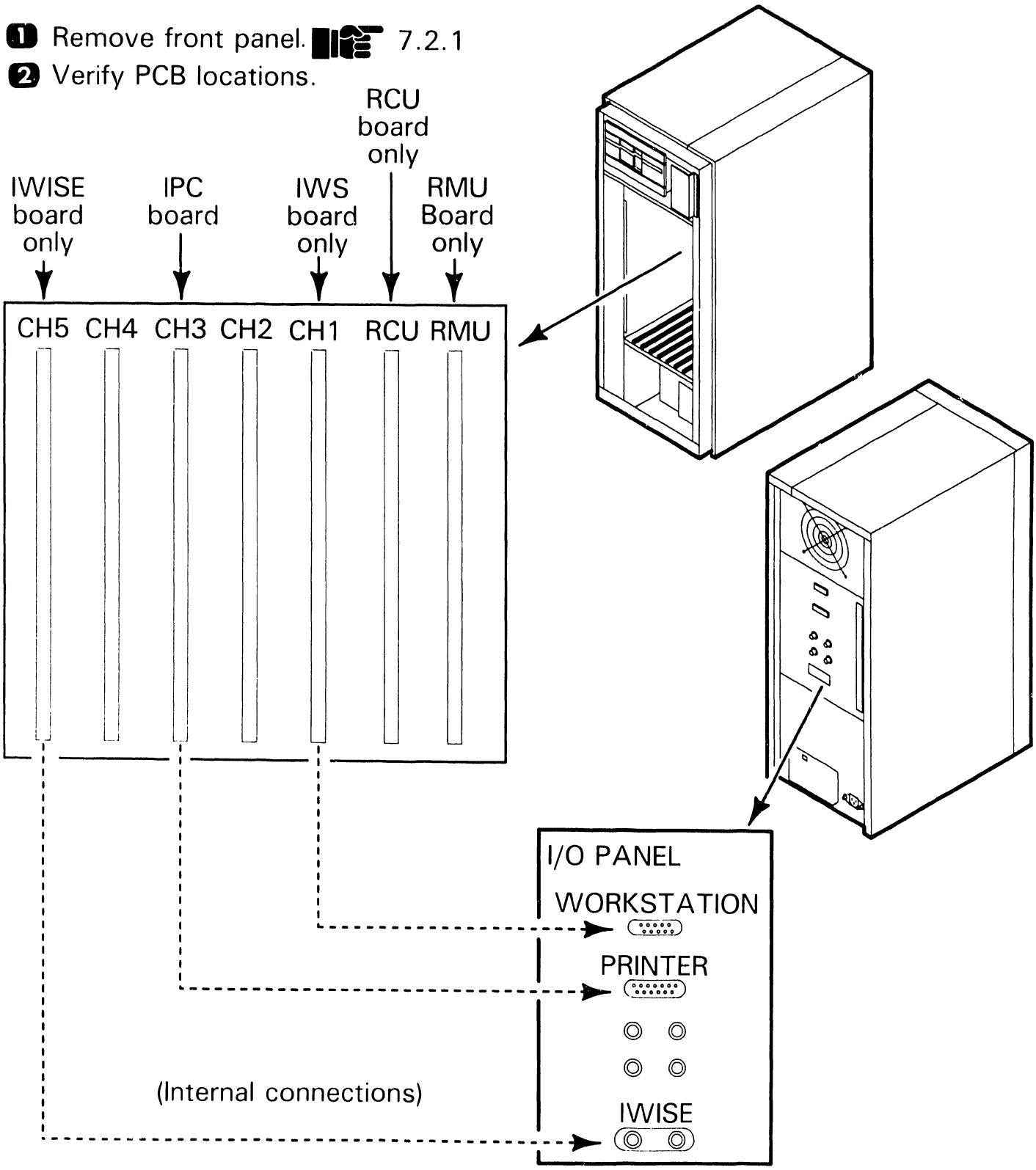


▯ = switch position

END

9.5.1 OIS-40/40B/45 Master Unit PCB Locations/ IO Connections

1. Remove front panel. 7.2.1
2. Verify PCB locations.



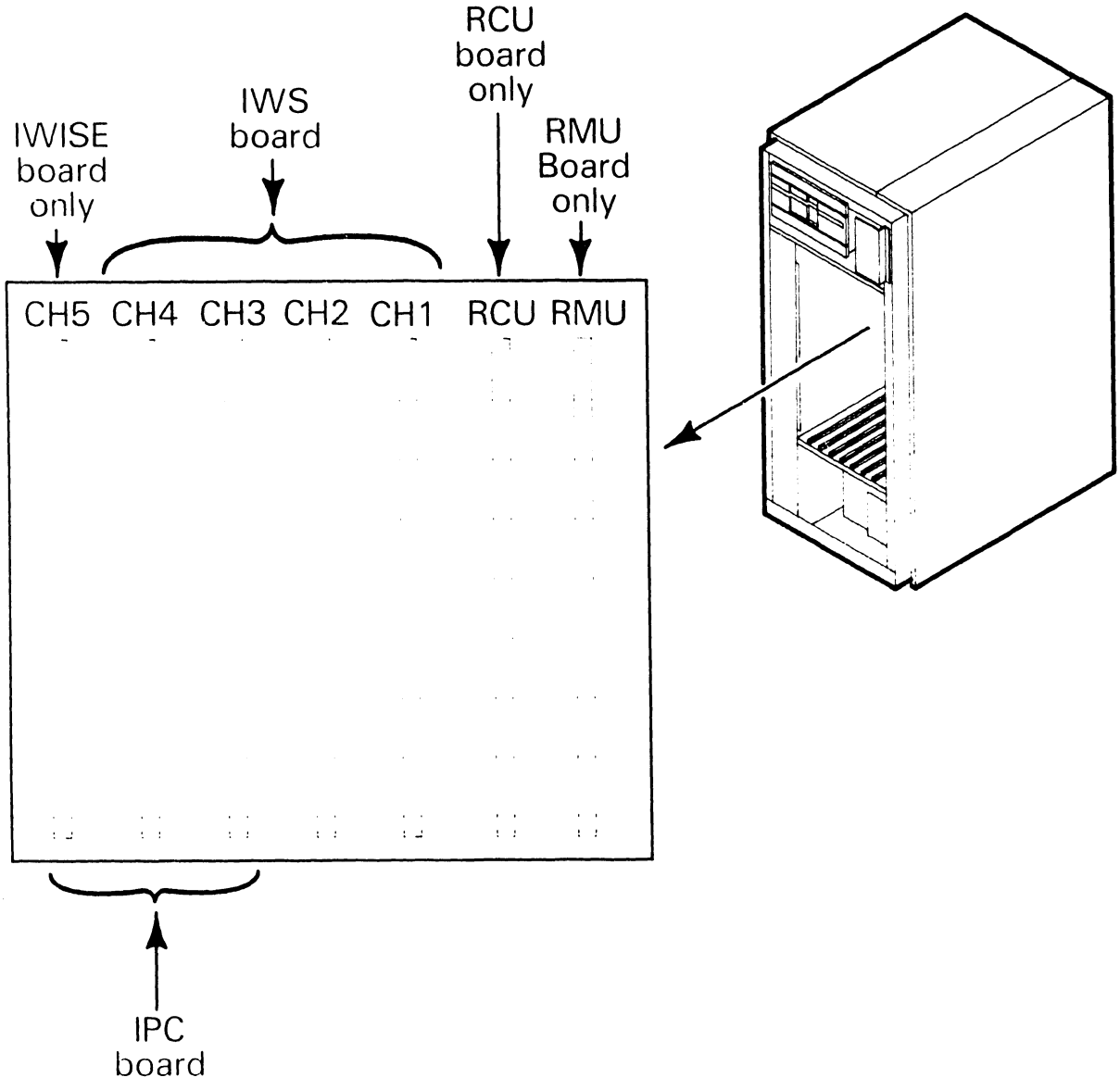
9.5.2 OIS-50/55/60/65/70 Master Unit PCB Locations

1. Remove front panel. 7.2.1

CAUTION

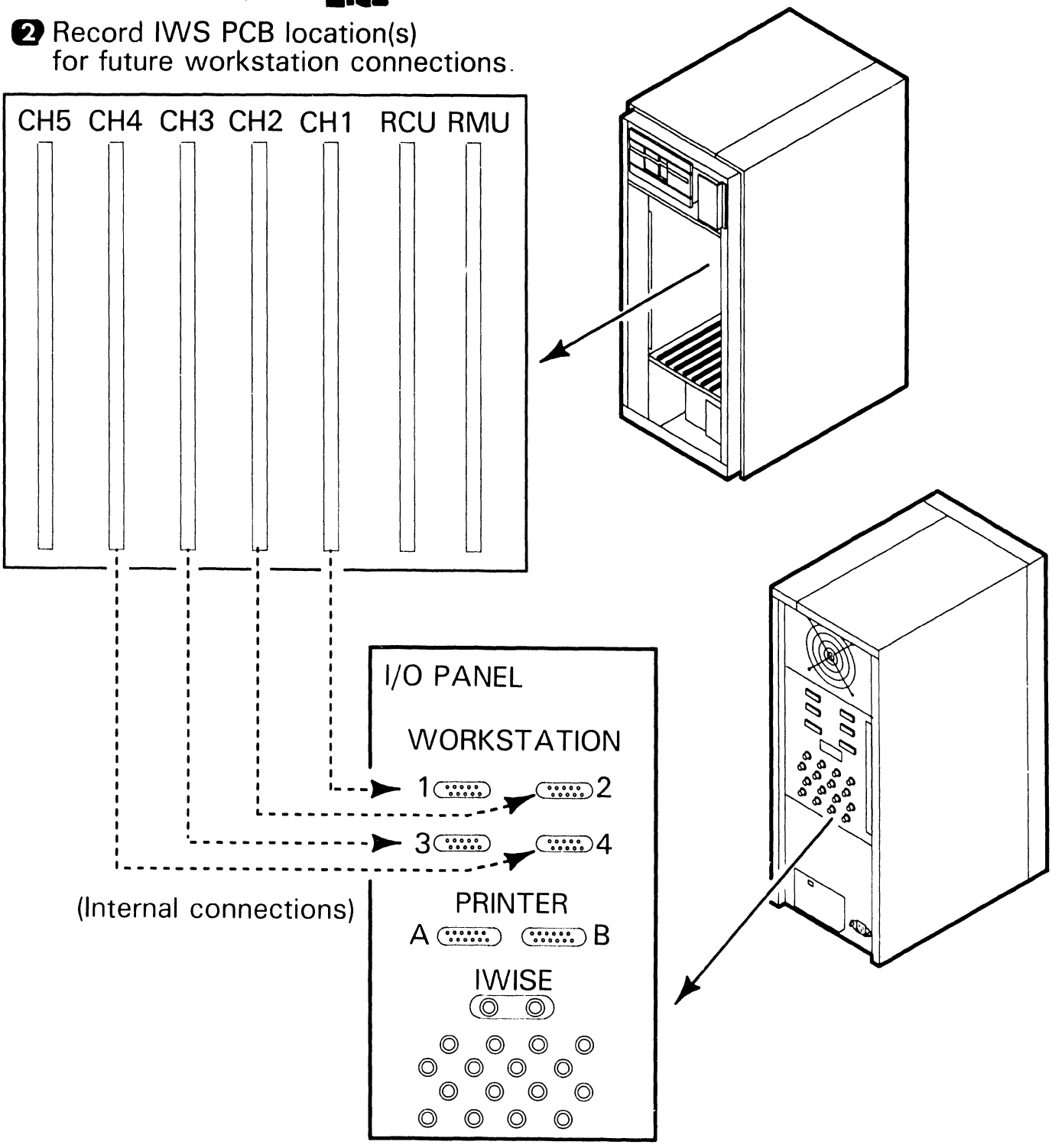
If system contains two IPC boards, they may reside in channels 3 and 4, or 3 and 5, but never in 4 and 5.

2. Verify PCB locations.



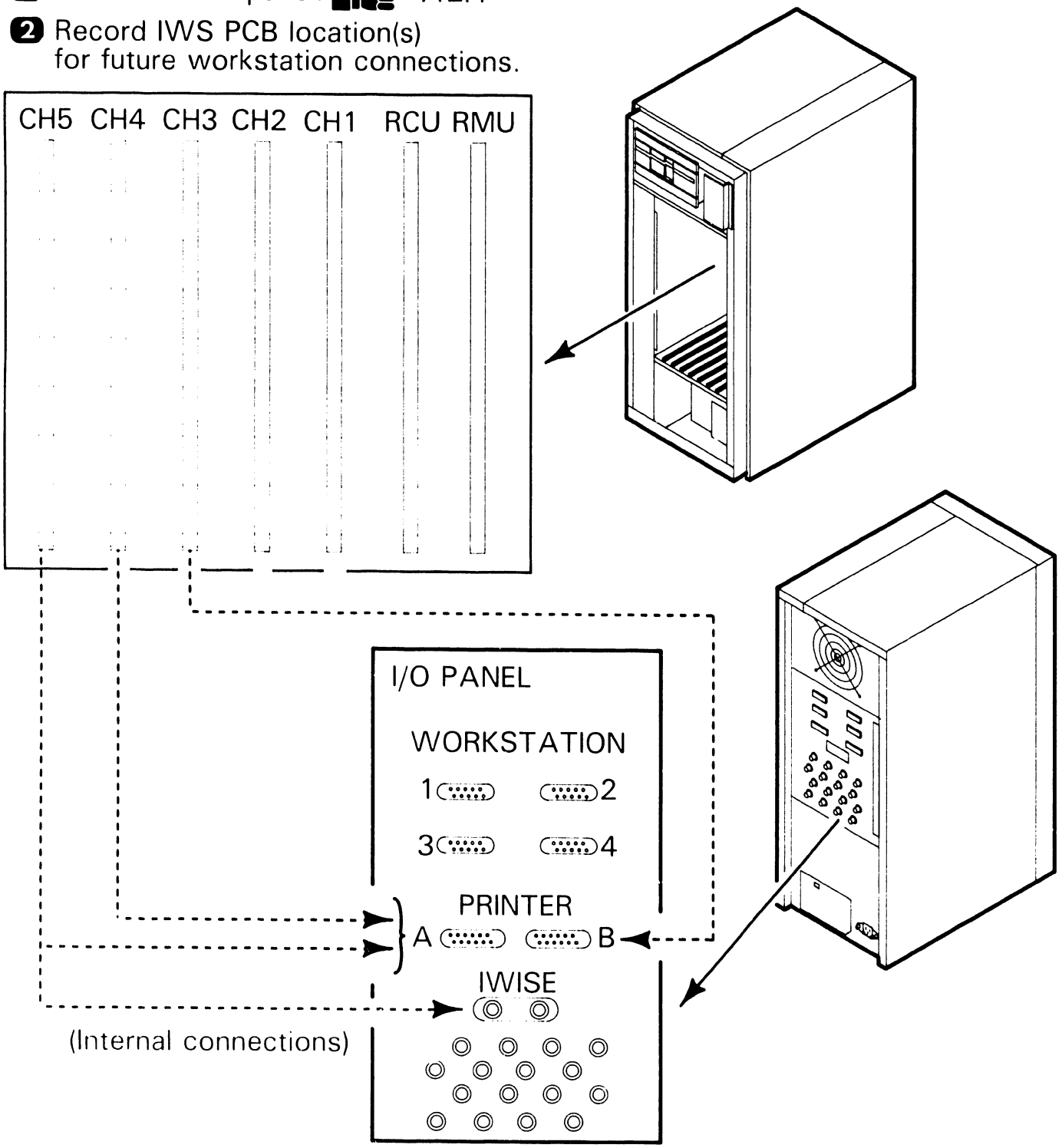
9.5.3 OIS-50/55/60/65/70 Master Unit IWS PCB Card Cage/ IO Panel Connections

1. Remove front panel. 7.2.1
2. Record IWS PCB location(s) for future workstation connections.



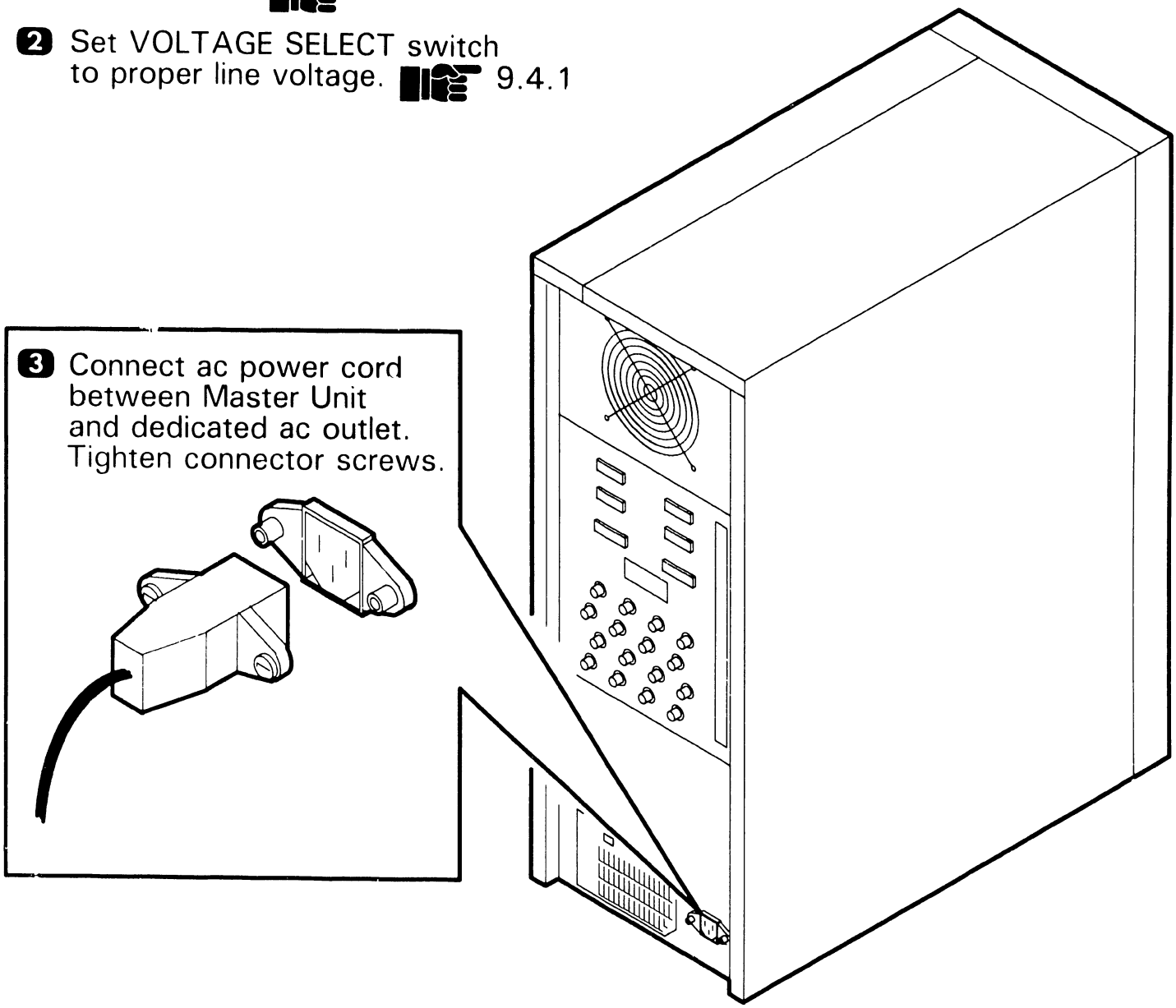
9.5.4 OIS-50/55/60/65/70 Master Unit Printer PCB and IWISE PCB Card Cage/IO Panel Connections

1. Remove front panel.  7.2.1
2. Record IWS PCB location(s) for future workstation connections.



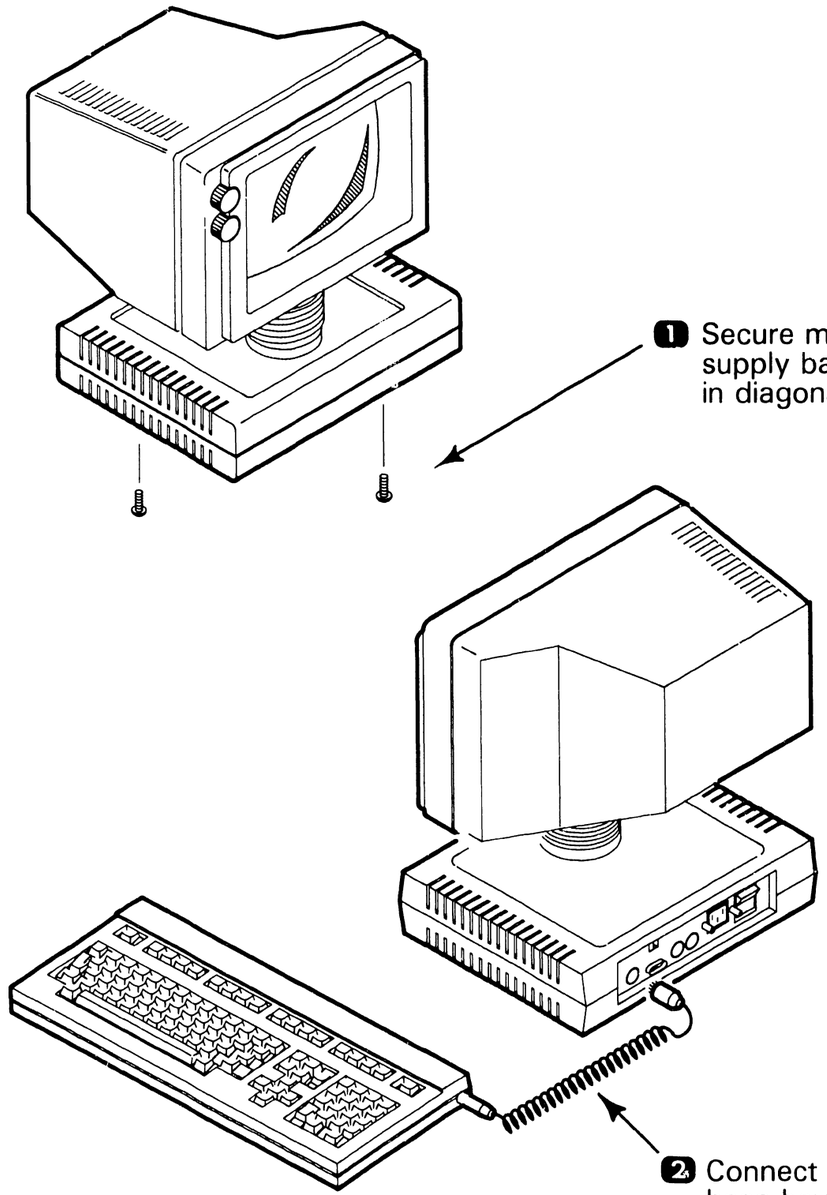
9.5.5 Master Unit AC Power Connection

1. Ensure ac power switch is set to "0". 3.1.1
2. Set VOLTAGE SELECT switch to proper line voltage. 9.4.1
3. Connect ac power cord between Master Unit and dedicated ac outlet. Tighten connector screws.

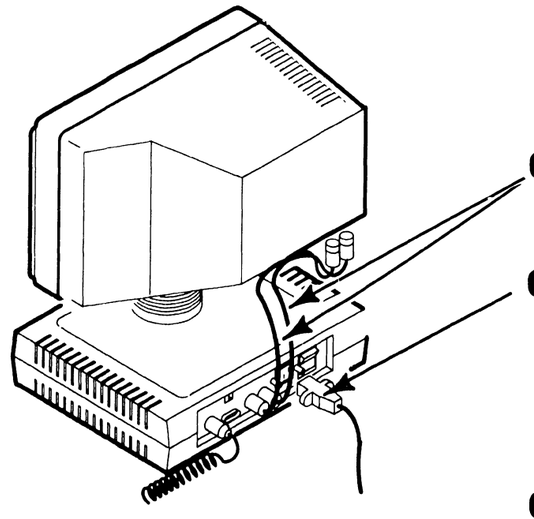


9.5 Connections

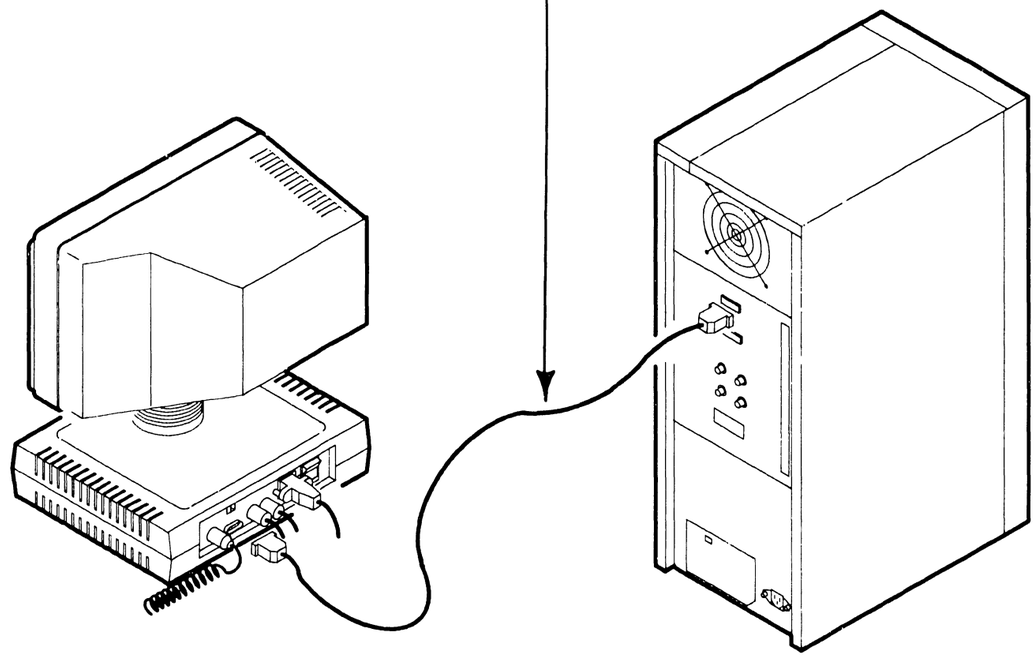
9.5.6 OIS-40/40B/45 Workstation Connections



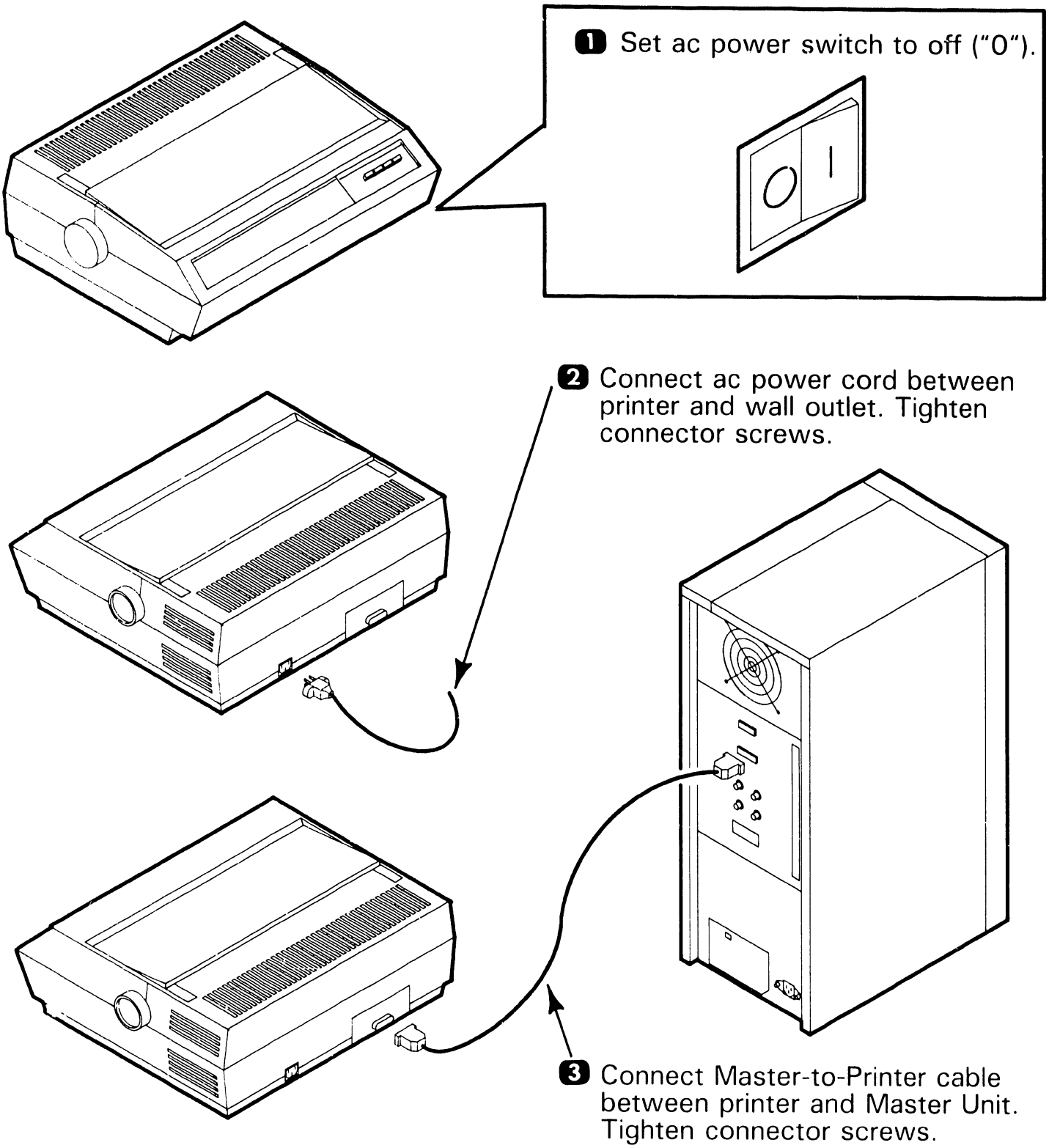
1. Secure monitor to power supply base(install screws in diagonal corners).
2. Connect keyboard cable to base keyboard connector.



3. Connect video and power cables between monitor and base (match symbols for proper connection).
4. Connect ac power cord between workstation and wall outlet. Tighten connector screws.
5. Connect internal workstation cable between workstation and Master Unit. Tighten connector screws.

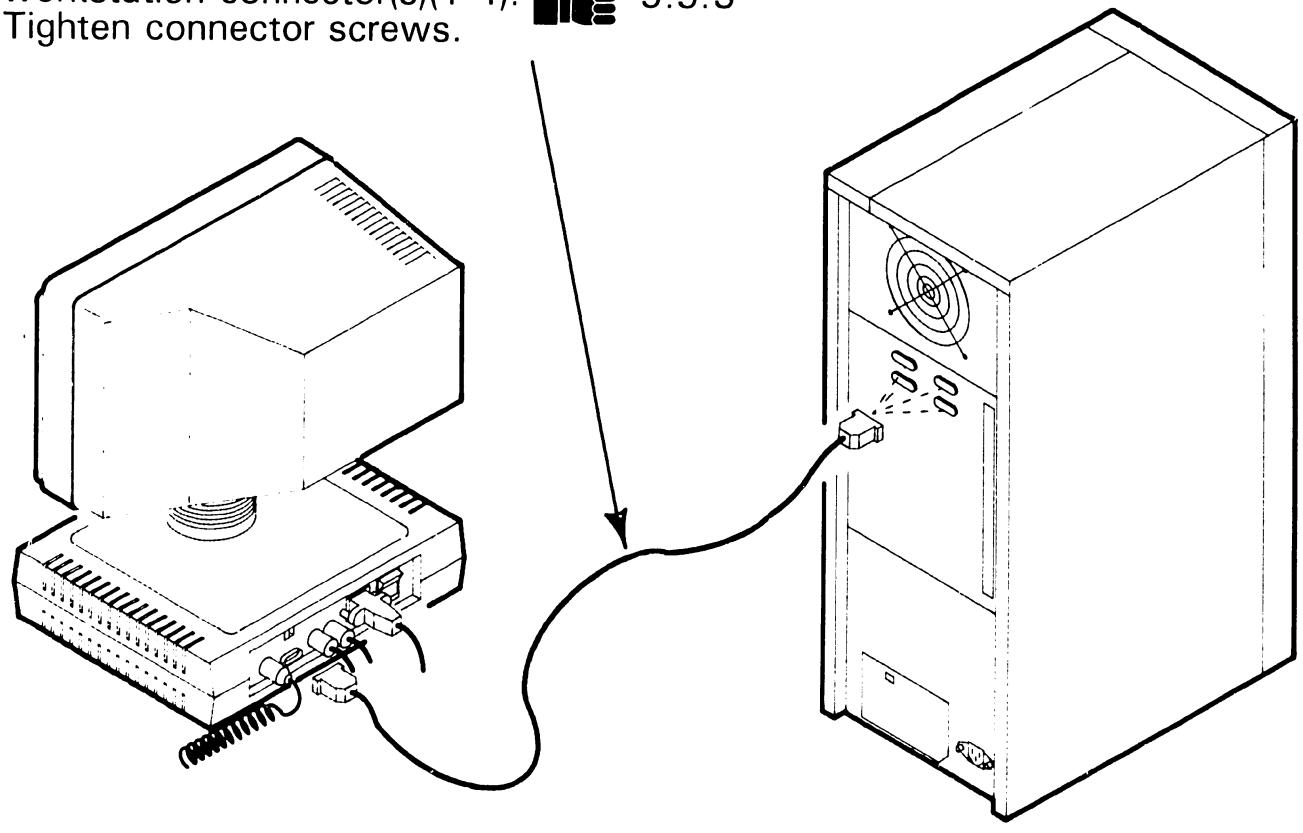


9.5.7 OIS-40B Printer Connection



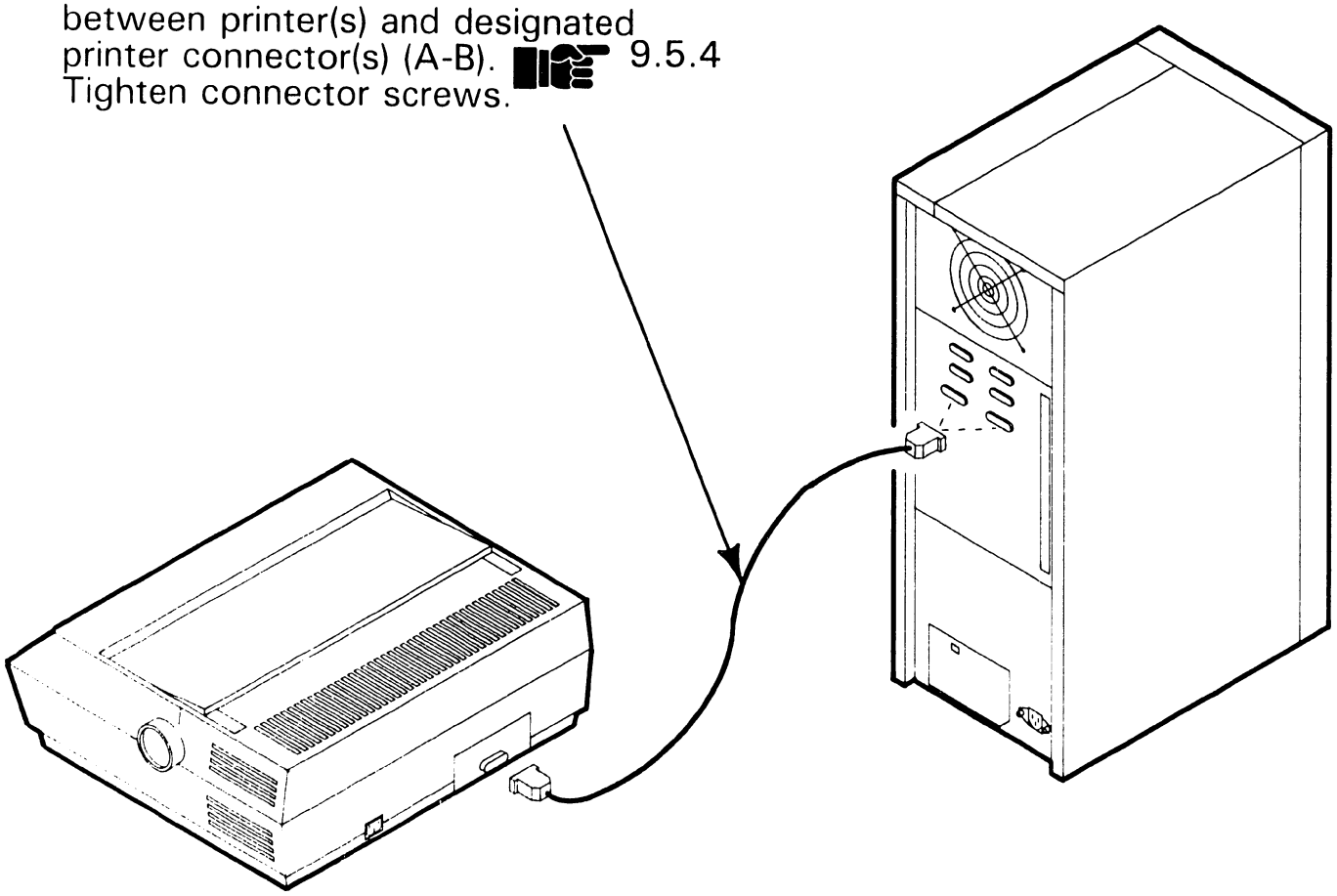
9.5.8 OIS-50/55/60/65/70 Workstation Connection

1. Secure monitor to power supply base (install screws in diagonal corners). 9.5.6
2. Connect keyboard cable to base keyboard connector. 9.5.6
3. Connect video and power cables between monitor base (match symbols for proper connection). 9.5.6
4. Connect ac power cord between base and wall outlet. Tighten connector screws. 9.5.6
5. Connect internal cable(s) between workstation(s) and designated workstation connector(s)(1-4). 9.5.3 Tighten connector screws.



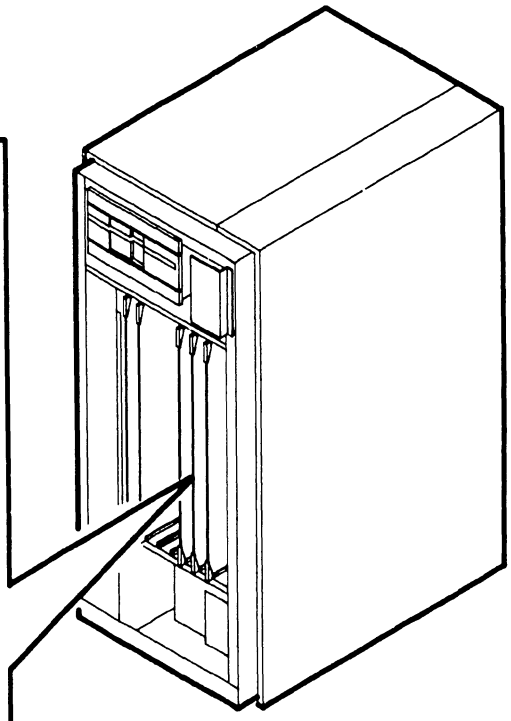
9.5.9 OIS-50/55/60/65/70 Printer Connection

1. Set ac power switch to off ("0"). 9.5.7
2. Connect ac power cord between printer and wall outlet. Tighten connector screws. 9.5.7
3. Connect Master-to-Printer cable(s) between printer(s) and designated printer connector(s) (A-B). 9.5.4 Tighten connector screws.

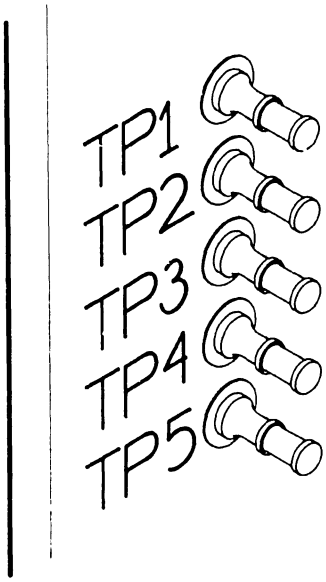


9.6.1 Master Unit DC Voltage, Ripple, and Noise Checks (Sheet 1 of 2)

1. Remove front panel. 7.2.1
2. Set ac power switch to "1". 3.1.1



3. Connect neg. lead of DVM to TP5 on RCU board.

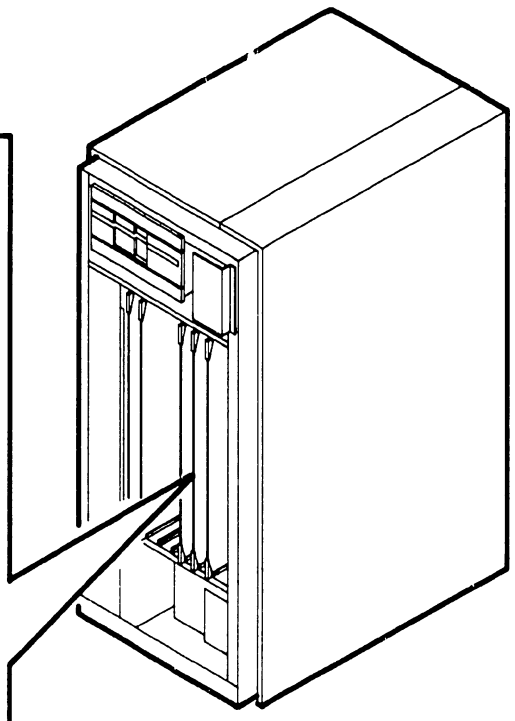


4. Connect pos. lead of DVM to TP1-TP4 on RCU board and verify dc voltage limits.

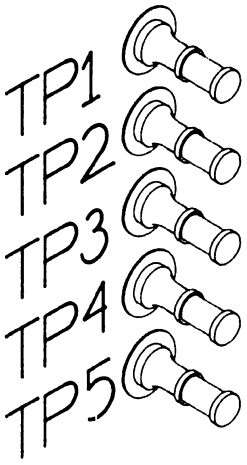
Test Point	*Voltage*	*Limits (Vdc)*	
TP1	-5V	-4.75	-5.25
TP2	-12V	-11.4	-12.6
TP3	+12V	+11.4	+12.6
TP4	+5V	+4.75	+5.25

NEXT

9.6.1 Master Unit DC Voltage, Ripple, and Noise Checks (Sheet 2 of 2)



5 Connect neg. scope lead to TP5 on RCU board.



6 Connect pos. scope lead to TP1-TP4 on RCU board and verify ripple and noise limits.

Test Point	*AC Limits (P-P)*	*Noise Limits (P-P)*
TP1	50 mv, Max.	100 mv, Max.
TP2	50 mv, Max.	100 mv, Max.
TP3	10 mv, Max.	100 mv, Max.
TP4	50 mv, Max.	100 mv, Max.

END

9.6 Voltage Checks

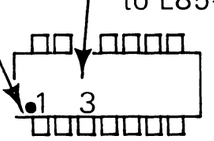
9.6.2 OIS 40/45/50/55/60-1 Master Unit VCO Timing and Voltage Check (PCB#210-8266-A, B)

NOTE

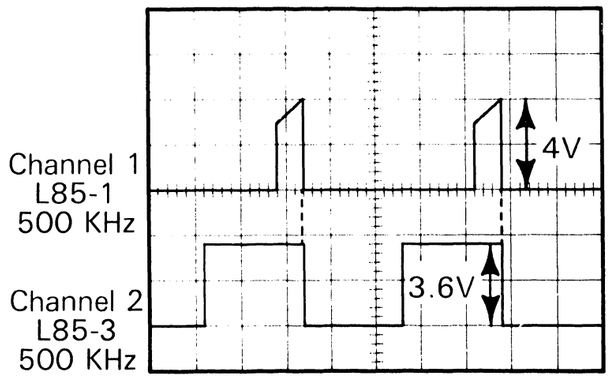
The VCO timing and amplitude signal parameters are not adjustable. If the signal(s) is incorrect, replace the RMU board and repeat the VCO check.

1. Remove front panel. 7.2.1
2. Remove side covers. 7.2.2
3. Power-up system. 4.1

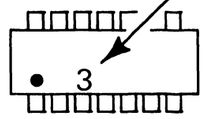
4. Connect channel 1 of scope to L85-1 on RMU board.
5. Connect channel 2 of scope to L85-3 on RMU board.



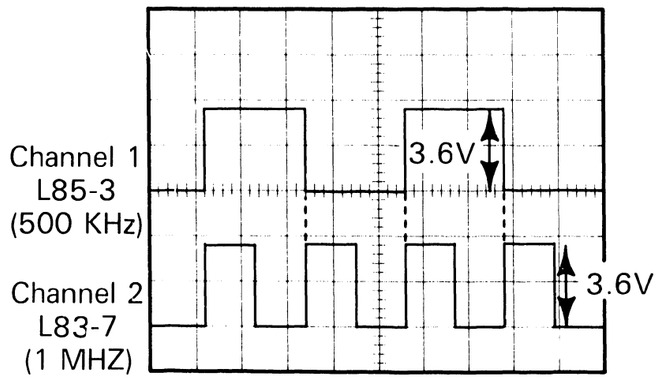
6. Verify amplitudes and trailing-edge coincidence of scope signals.

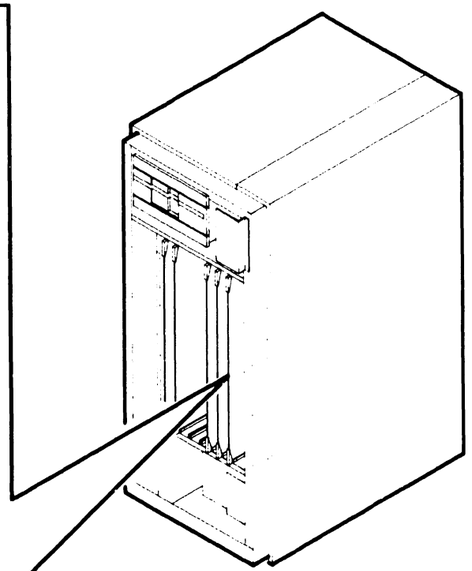


7. Transfer channel 1 of scope to L85-3 on RMU board.



8. Transfer channel 2 of scope to L83-7 and verify amplitudes, trailing-edge coincidence,and frequency of scope signals.



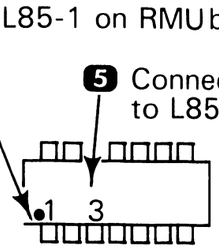


9.6 Voltage Checks

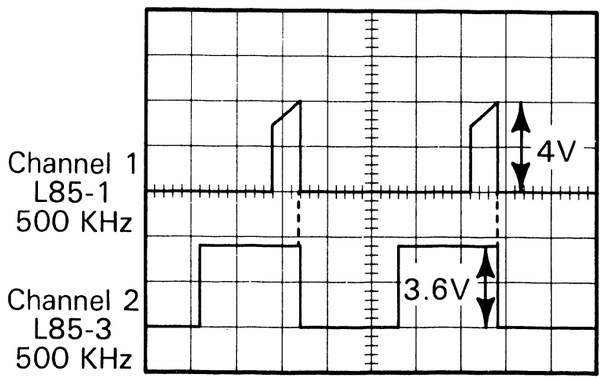
9.6.3 OIS 60/65/70 Master Unit VCO Timing and Voltage Check (PCB#210-8490-A)

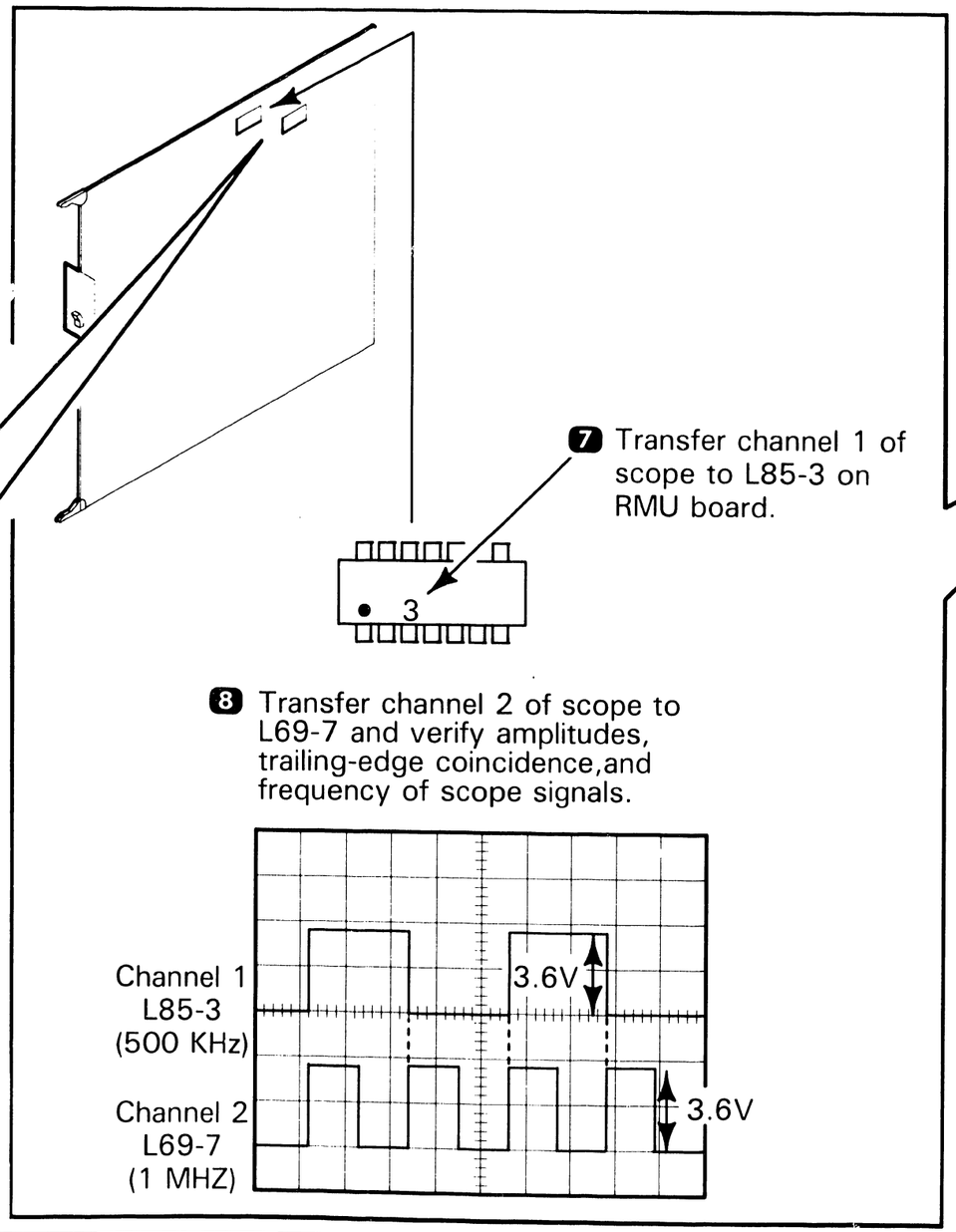
NOTE
The VCO timing and amplitude signal parameters are not adjustable. If the signal(s) is incorrect, replace the RMU board and repeat the VCO check.

1. Remove front panel. 7.2.1
2. Remove side covers. 7.2.2
3. Power-up system. 4.1
4. Connect channel 1 of scope to L85-1 on RMU board.
5. Connect channel 2 of scope to L85-3 on RMU board.

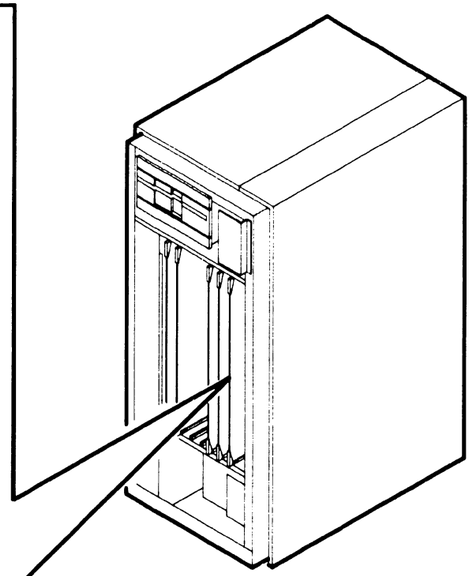


6. Verify amplitudes and trailing-edge coincidence of scope signals.





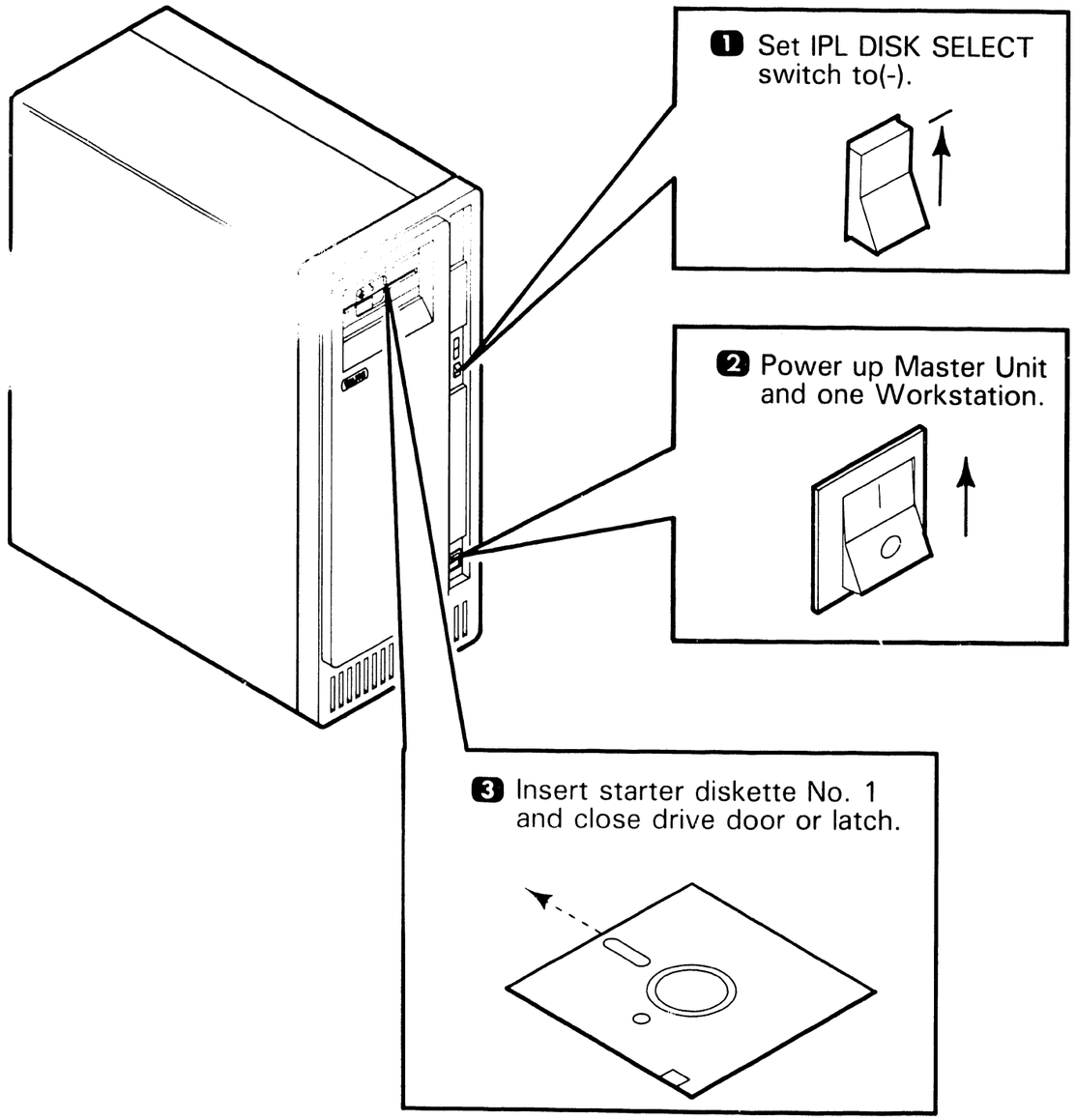
7. Transfer channel 1 of scope to L85-3 on RMU board.

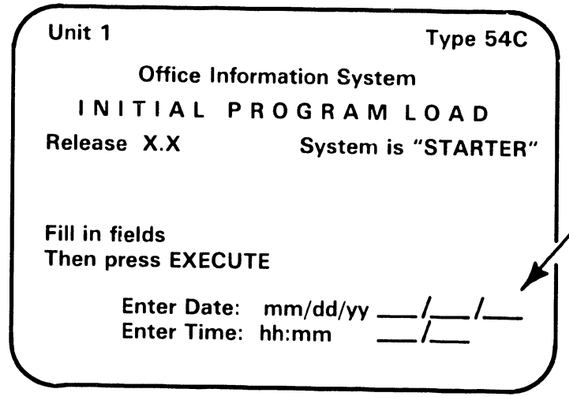


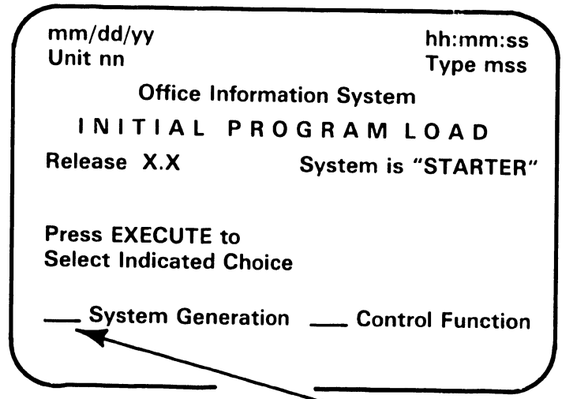
8. Transfer channel 2 of scope to L69-7 and verify amplitudes, trailing-edge coincidence,and frequency of scope signals.

9.7 Software Installation

9.7.1 Initializing System Disk (Sheet 1 of 2)





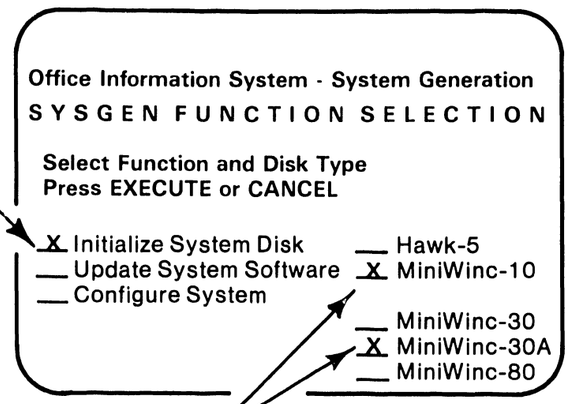


NEXT

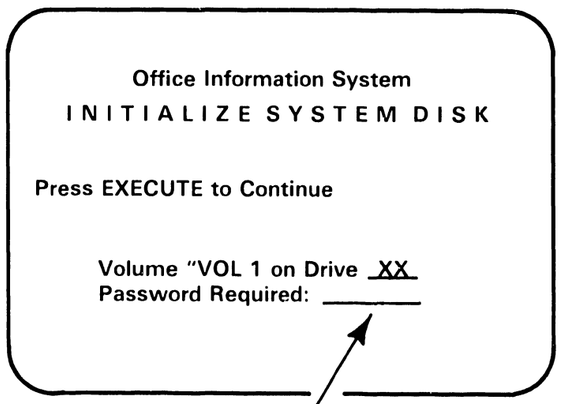
9.7 Software Installation

9.7.1 Initializing System Disk (Sheet 2 of 2)

6 Position acceptance block at "Initialize System Disk". Press RETURN.

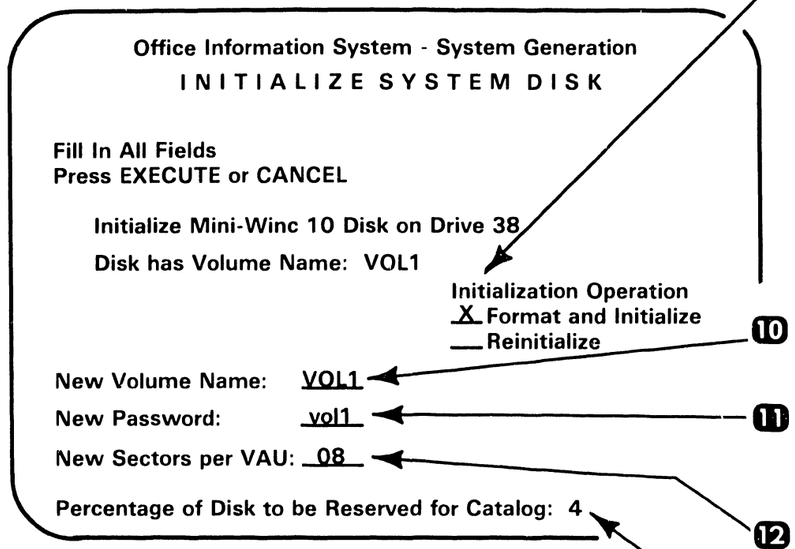


7 Position acceptance block at
8 MiniWinc-10 for OIS 40, OIS 45, or OIS 50. For OIS 60/60-1/65, position acceptance block at MiniWinc-30A. For OIS 70 position block at MiniWinc-80. Press EXECUTE.



Enter current password (8 characters max., uppercase or lower case). Press EXECUTE.

9 Select desired "Initialization Operation". Press RETURN.



10 Enter volume name (8 alphanumeric characters, max). Press RETURN.

11 Enter volume password (8 alphanumeric characters max). Press RETURN.

12 Enter new sectors per VAU (i.e. 8, 16, 32, 64). Press RETURN.

13 Enter desired catalog percentage. Press EXECUTE.

14 Prompt "Press EXECUTE to ***BEGIN INITILIZATION***" appears. If all specified information is correct, Press EXECUTE to continue.

15 When system prompts "Initilization Complete, Please Press Cancel" appears, press CANCEL twice. Sysgen Function menu should appear. Proceed to 9.7.2

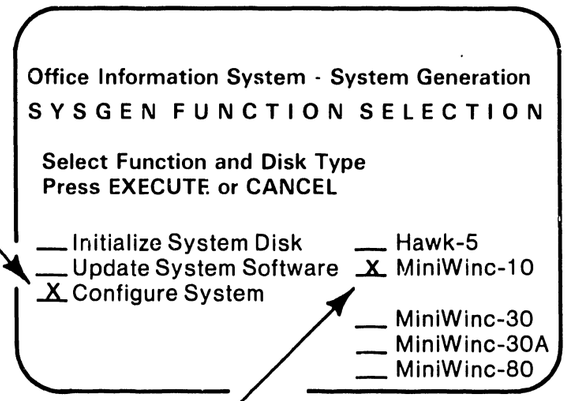
END

9.7 Software Installation

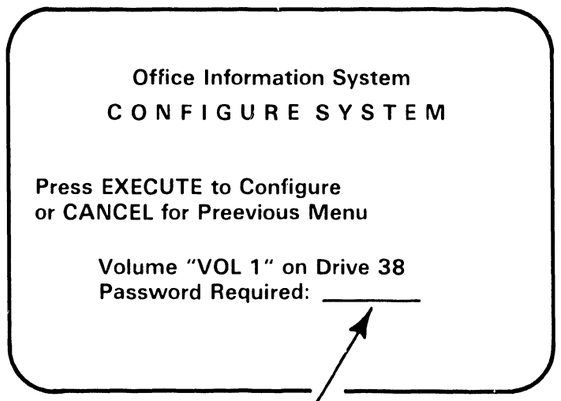
9.7.2 Configuring System (Sheet 1 of 2)

1. Select "System Generation" from IPL menu.

2. Select "Configure System" from Sysgen Function Selection menu. Press RETURN.



3. Select correct disk type for your system. Press EXECUTE.

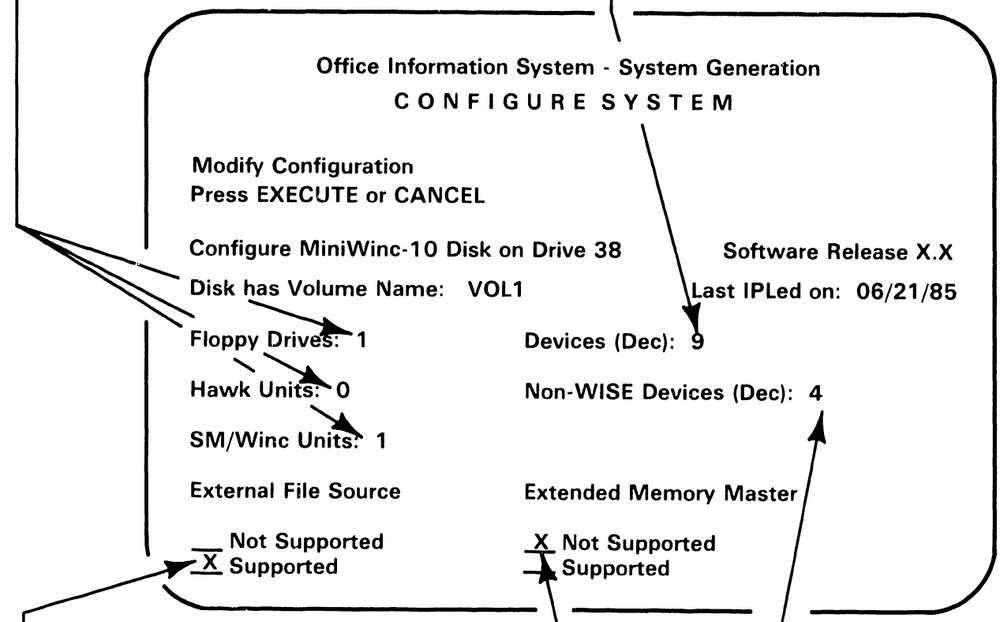


4. Enter password and press EXECUTE.
NOTE: Configure system menu assumes an OIS-50 configured with WISE, three workstations, and one WISE unit attached.

5. Enter number of each type of disk drive to be supported by system. (Press RETURN between selections).

Floppy drives: 1
Hawk Units: 0
SM/Winc Units: 1

7. Enter maximum number of peripherals that can be supported by system. OIS-40/45: 7, OIS-50/55: 9, OIS-60/65: 13, OIS-70: 17.
CAUTION: Ensure number does not exceed available ports or less than number of devices attached to system. Press RETURN.



6. Select "Supported" for "External File Source" if WISE, 3270 BSC Emulation, 3274 SNA Emulation, or Remote Wangnet is on system. If not, select "Not Supported". Press RETURN.

8. If host system, enter number of devices minus 5 (IWISE port). If remote system, enter number of devices minus 6 (first serial port). If system does not support IWISE, enter same number as step 7. Press Return

9. Ensure Extended Memory Master is "Not Supported".
NOTE: This choice does not apply to OIS-40/45 or 50.

NEXT

9.7.2 Configuring System (Sheet 2 of 2)

10. Press EXECUTE. Prompt "Press EXECUTE to WRITE TO DISK" appears. Check all entries. If correct, press EXECUTE to continue.

11. Press CANCEL to return to Sysgen Function Selection menu. Press CANCEL again to return to DOS menu.

12. Set Master Unit IPL DISK SELECT switch to (— — —).

13. Remove starter diskette.

14. Reset system by setting ac POWER switch OFF for a few seconds and back ON.

15. When IPL menu appears, enter current time and date and press EXECUTE twice.

16. Press EXECUTE. Select "Install Software Packages" from DOS menu. Press EXECUTE.

9.7.3

END

9.7.3 Installing Starter 2 Diskette

NOTE

After software is loaded, names of packages appear on menu in order they were installed. Advanced Functions and WP Utilities appear on WP menu. Peripherals does not appear on any menu but is required for printer operation.

1. Position acceptance block at "Control Functions" and press EXECUTE.
2. Position acceptance block at "Install Software Package" and press EXECUTE.
3. When prompt "Mount Installation Disk in Drive 03 and Press EXECUTE" appears, place starter diskette No. 2 into diskette drive and press EXECUTE.
4. System provides name of system volume specified during initialization. Press EXECUTE.
5. After disk is installed, remove starter 2 diskette and press SHIFT CANCEL.

9.7.4 Installing Software Packages (Sheet 1 of 2)

NOTE

When installing "Control Functions" in this section, error prompt "Error Opening Control, File Not Found, Press Cancel" will appear if SHIFT CANCEL is not performed. To correct, press SHIFT CANCEL and reinstall "Control Functions".

1. Position acceptance block at "Control Functions" and press EXECUTE.
2. Position acceptance block at "Install Software Package" and press EXECUTE.
3. When prompt "Mount Installation Disk in Drive 03 and Press EXECUTE" appears, insert software diskette into drive and press EXECUTE. Following screen should appear:

Office Information System
INSTALL SOFTWARE PACKAGE

Enter Name of Volume
that Package is to Reside on

Package ID: 000
Destination Volume: VOL1

4. Press EXECUTE and the second installed software screen should appear:

Office Information System
INSTALL SOFTWARE PACKAGE

Press EXECUTE to Continue

Package ID: 000

Destination Volume: VOL1
Installation Volume SS0000XX

5. Press EXECUTE. "Installation in Progress"menu should appear.

Office Information System
INSTALL SOFTWARE PACKAGE

Installation in Progress

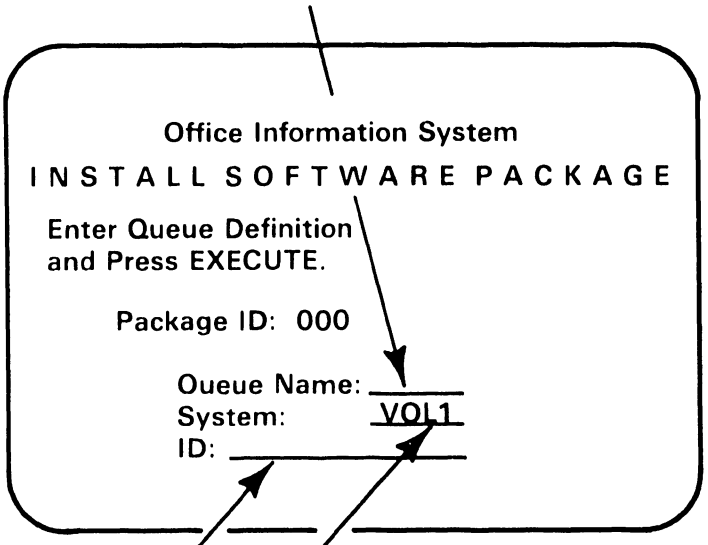
Destination Volume: VOL1
Package ID: 000

Installation Volume: SS000035

NEXT

9.7.4 Installing Software Packages (Sheet 2 of 2)

6 If installing "Control Functions" enter default printer device number. Press RETURN.



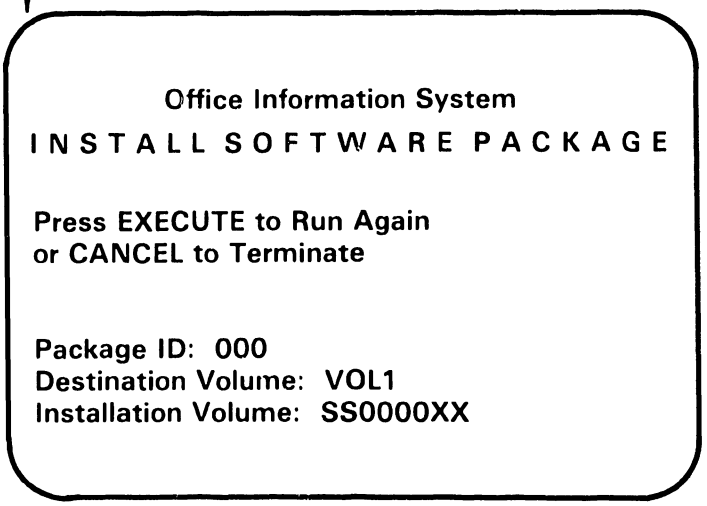
7 Enter system volume name. Press RETURN.

8 If installing "Control Functions", enter ID word of eight letters or less.

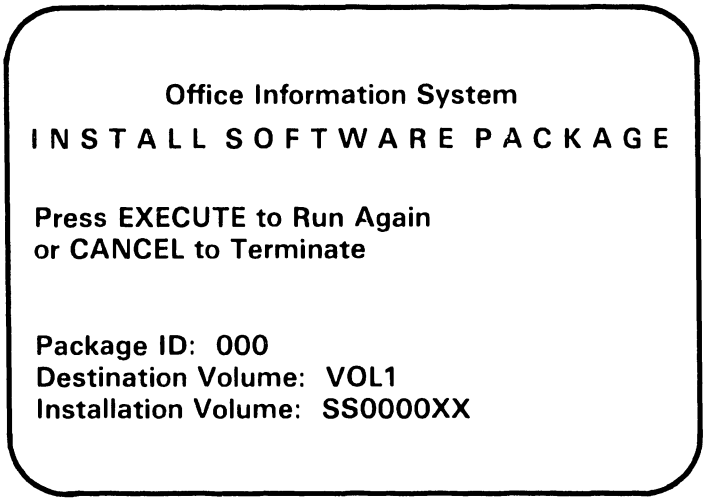
NOTE

If a supervisory function or utility menu appears and you want these utilities to be installed, press EXECUTE. If some utilities are not needed, remove the acceptance block from those utilities by pressing DELETE. To continue, press EXECUTE.

9 Press EXECUTE twice. Following menu should appear.



10 To install more software packages, press EXECUTE. Following screen appears: if software installation is complete, press CANCEL, remove diskette, and press SHIFT CANCEL. If not complete, proceed to step 11.

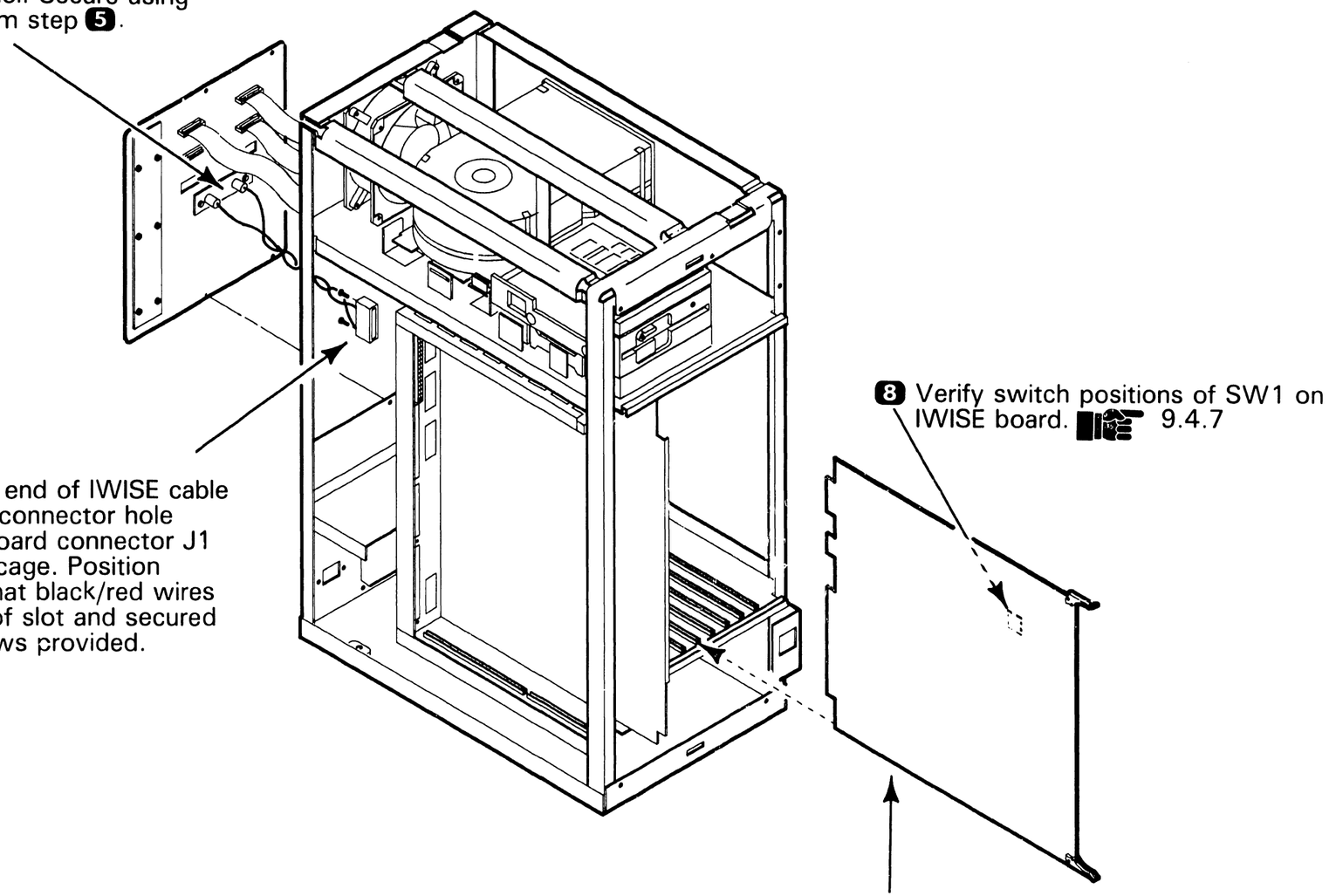


11 Remove software diskette and insert next software package to be installed. Return to step 3.

END

9.8.1 Installing IWISE (Sheet 1 of 2)

1. Power down the system and disconnect AC power cord.
2. Remove front panel from Master Unit. 7.2.1
3. Remove side covers from Master Unit. 7.2.2
4. Remove circuit boards from Master Unit. Note locations for replacement. 7.2.3
5. Remove IWISE patch panel from rear panel. Save screws.
6. Internally mount IWISE BNC/TNC connector plate to open connector slot on rear panel. Secure using two screws from step 5.
7. Route opposite end of IWISE cable through empty connector hole above motherboard connector J1 at rear of card cage. Position connector so that black/red wires are at bottom of slot and secured using two screws provided.
8. Verify switch positions of SW1 on IWISE board. 9.4.7
9. Install IWISE board into card cage assembly. 9.5.1, 9.5.2.



NEXT

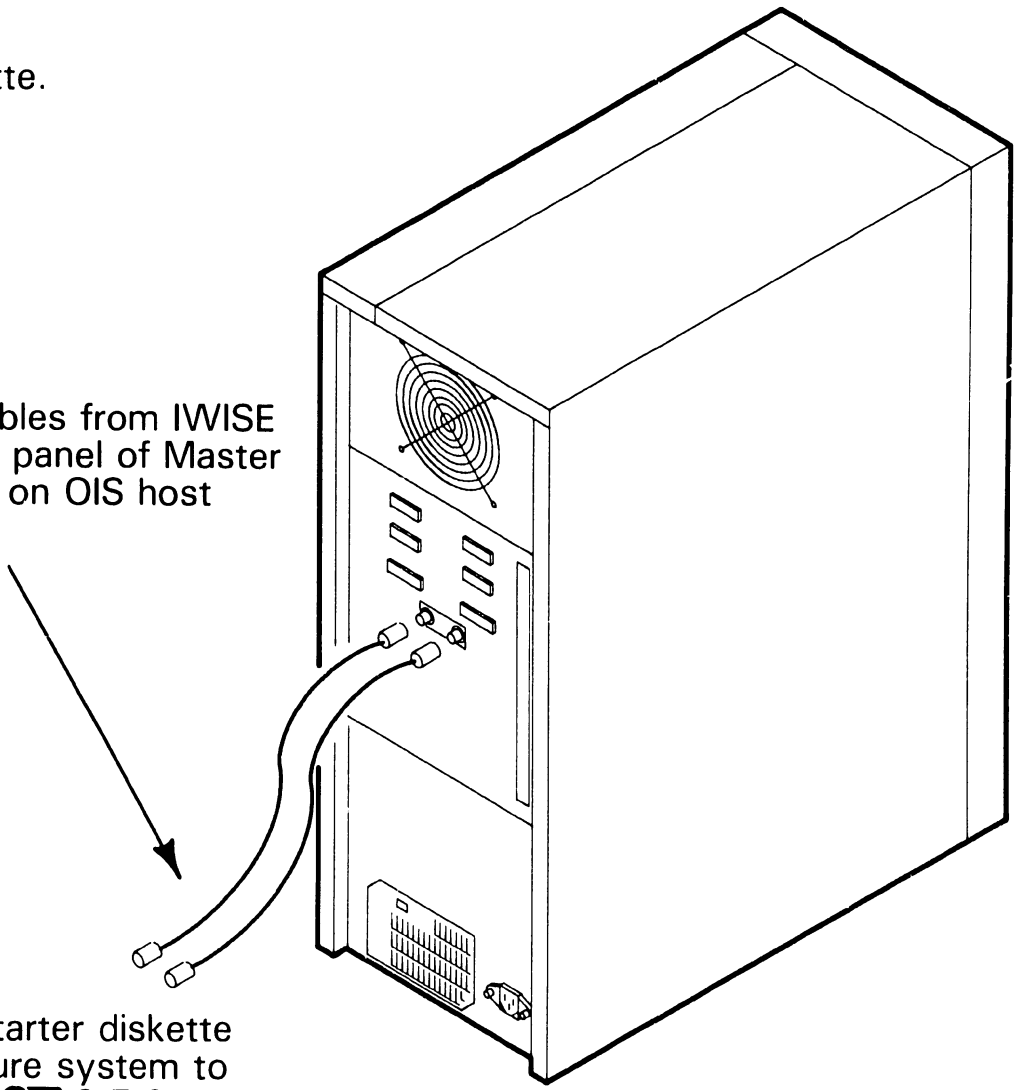
9.8.1 Installing IWISE (Sheet 2 of 2)

10 Replace side covers on Master Unit. 7.2.2.

11 Replace front panel on Master Unit. 7.2.1

12 Install IWISE diskette. 9.7.4

13 Connect coaxial cables from IWISE connectors on rear panel of Master Unit to serial ports on OIS host system.



14 IPL system from starter diskette No.1 and reconfigure system to support IWISE. 9.7.2

NOTE

Also configure remote system to support IWISE.

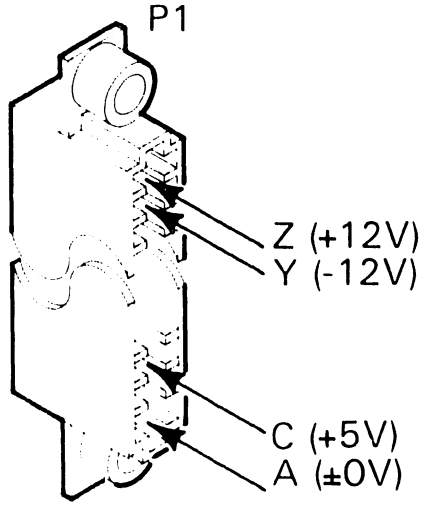
END

9.8.2 Installing Telecommunications (TC)

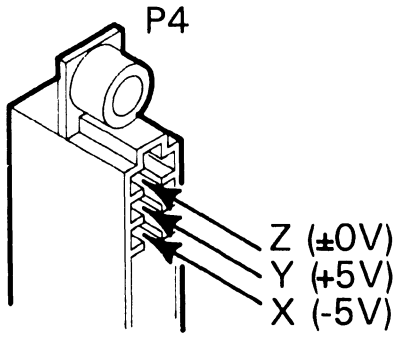
NOTE

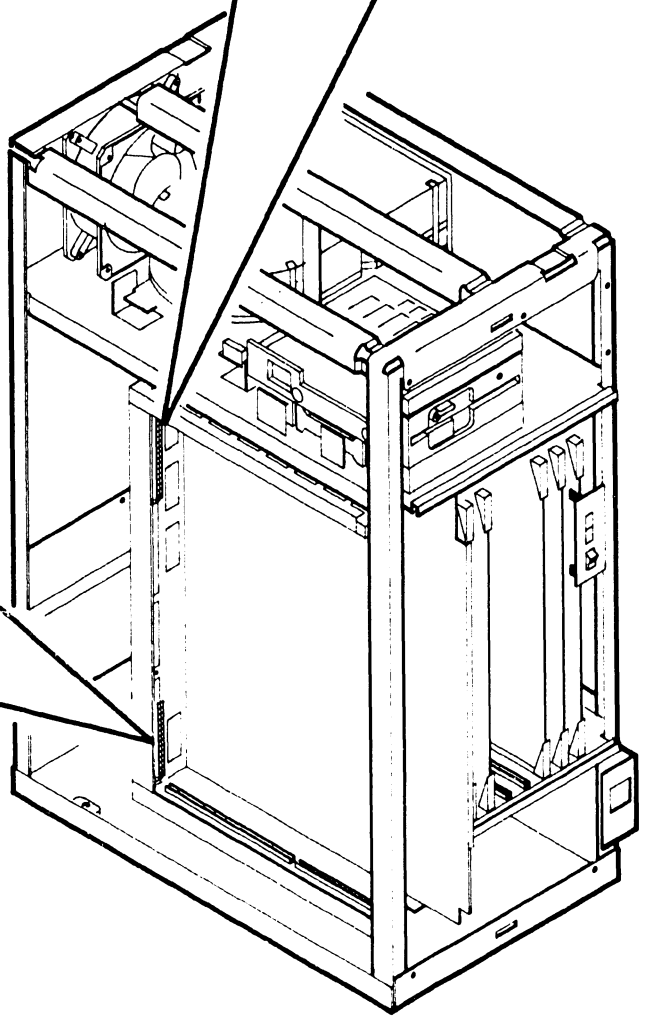
Installation of the TC option (DLP 64 and DLP 128 TC controllers) into the Master Unit is described in standard manual 729-0887-B. Before installing the TC option, check DC voltages at TC connectors P1 and P4 as follows:

1. Remove front panel from Master Unit. 7.2.1
2. Remove side covers from Master Unit. 7.2.2
3. Power-up Master Unit. 4.1
4. Verify dc voltages at connector P1 using a DVM.



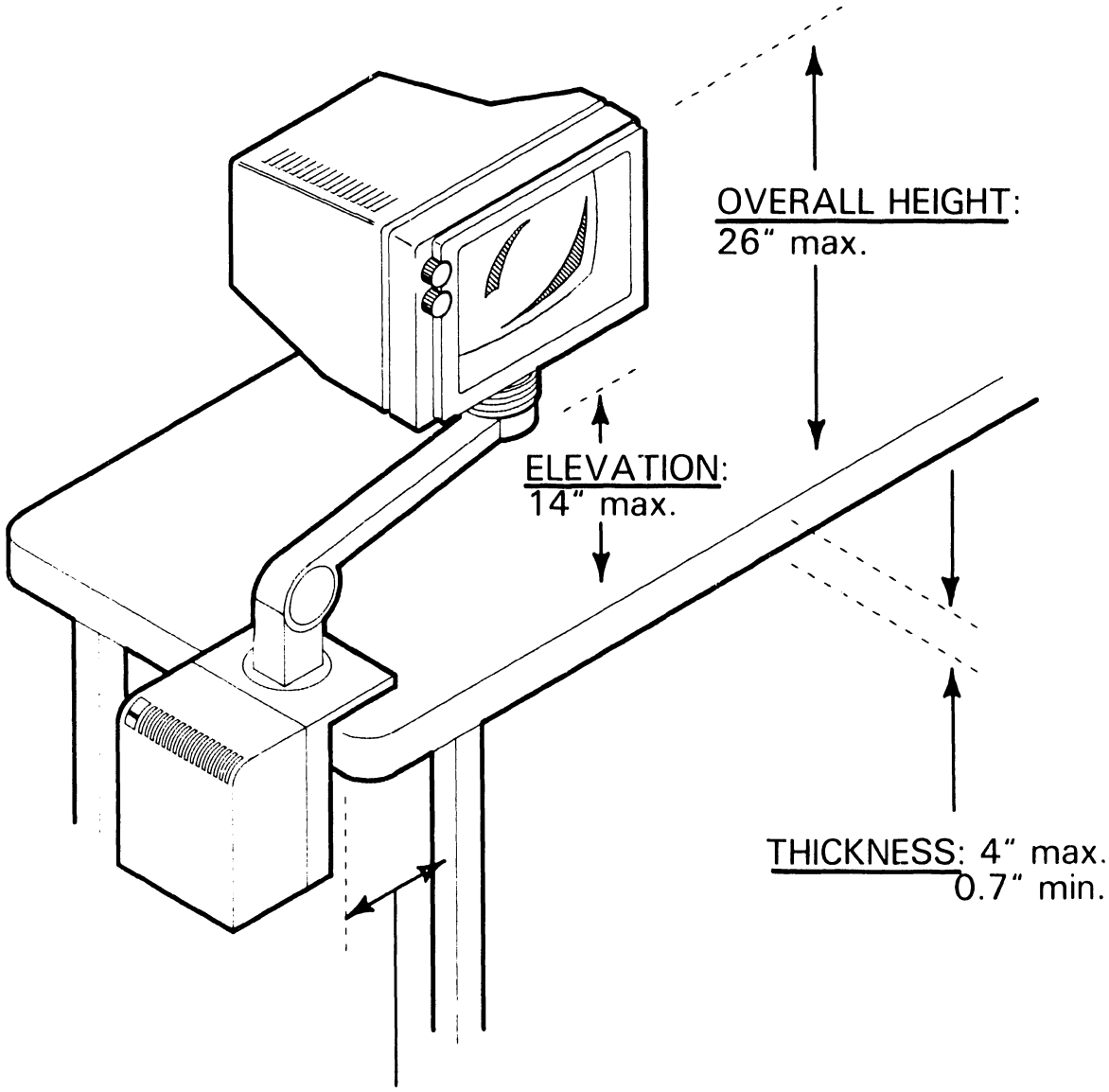
5. Verify dc voltages at connector P4 using a DVM.





9.8.3 OIS Monitor Arm (Sheet 1 of 3)

1. Ensure the mounting table or desk satisfies the following specifications.



OVERHANG: 0.87" max.

2. Power down workstation.

NEXT

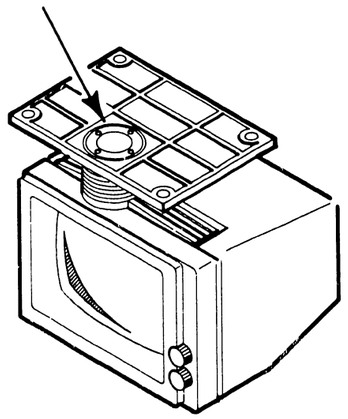
9.8 Installing Options

9.8.3 OIS Monitor Arm (Sheet 2 of 3)

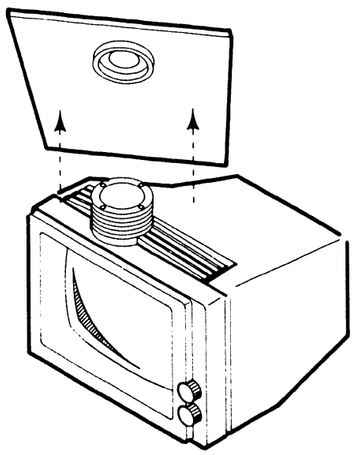
3. Disconnect cables from rear of monitor.

4. Separate monitor and pedestal from power supply by removing two screws at diagonal corners at bottom of power supply base.

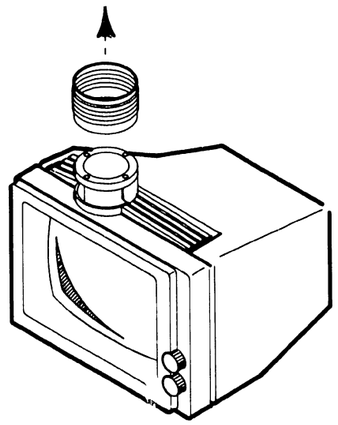
5. Remove and save four screws.



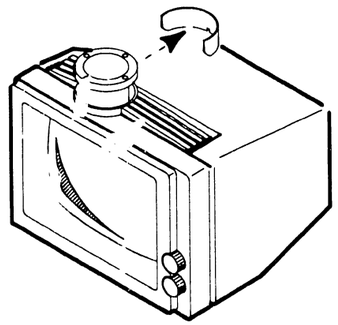
6. Remove pedestal.



7. Remove rubber bellows by compressing it and lifting straight up.

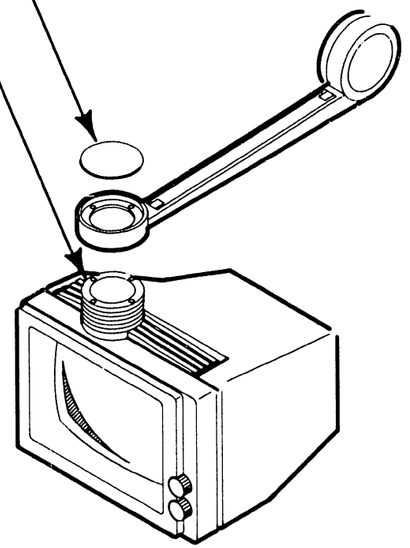


8. Remove restrictor band.

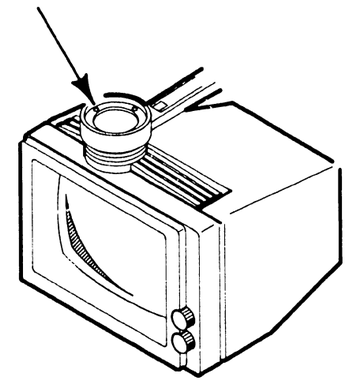


9. Replace rubber bellows.

10. Remove dust cap from monitor arm.

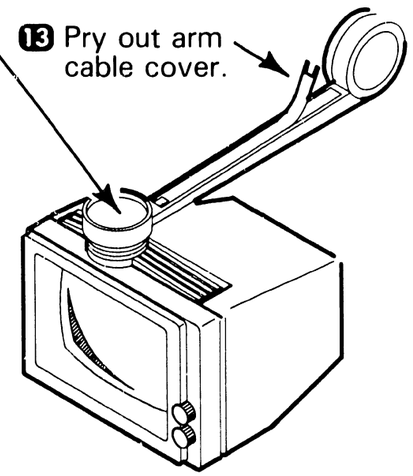


11. Place arm on monitor, line up screw holes,and secure using screws removed in step 5.



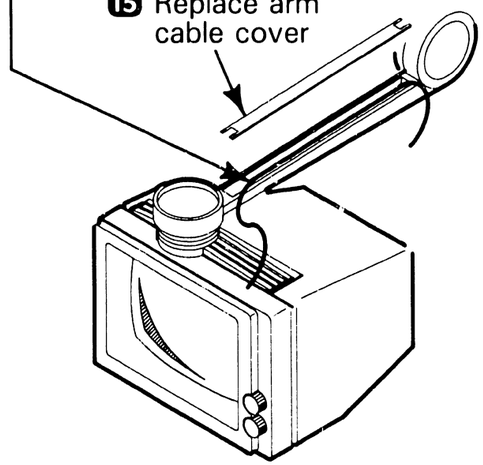
12. Replace dust cap on arm.

13. Pry out arm cable cover.



14. Place 4-foot cable into arm assembly leaving 14 inches of cable extending for monitor connections.

15. Replace arm cable cover

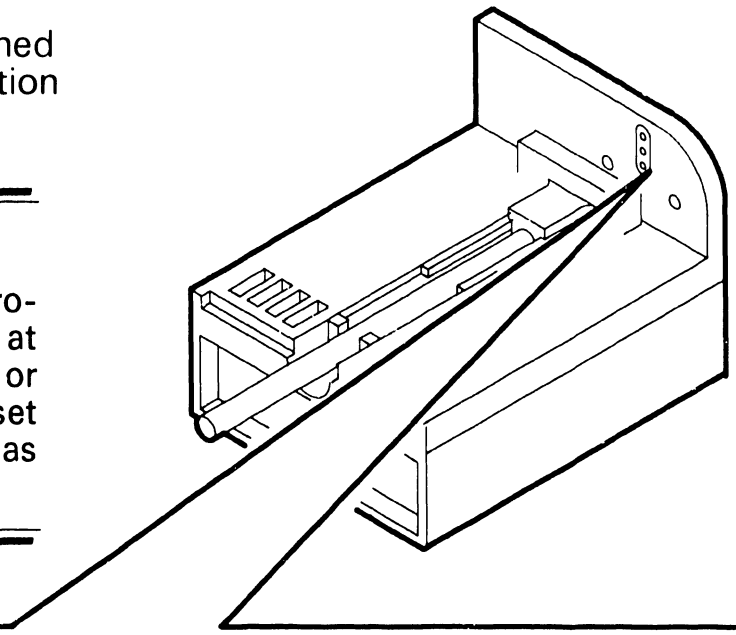


16. Connect cable to monitor by matching cable connector symbols with symbols at rear of monitor.

NEXT

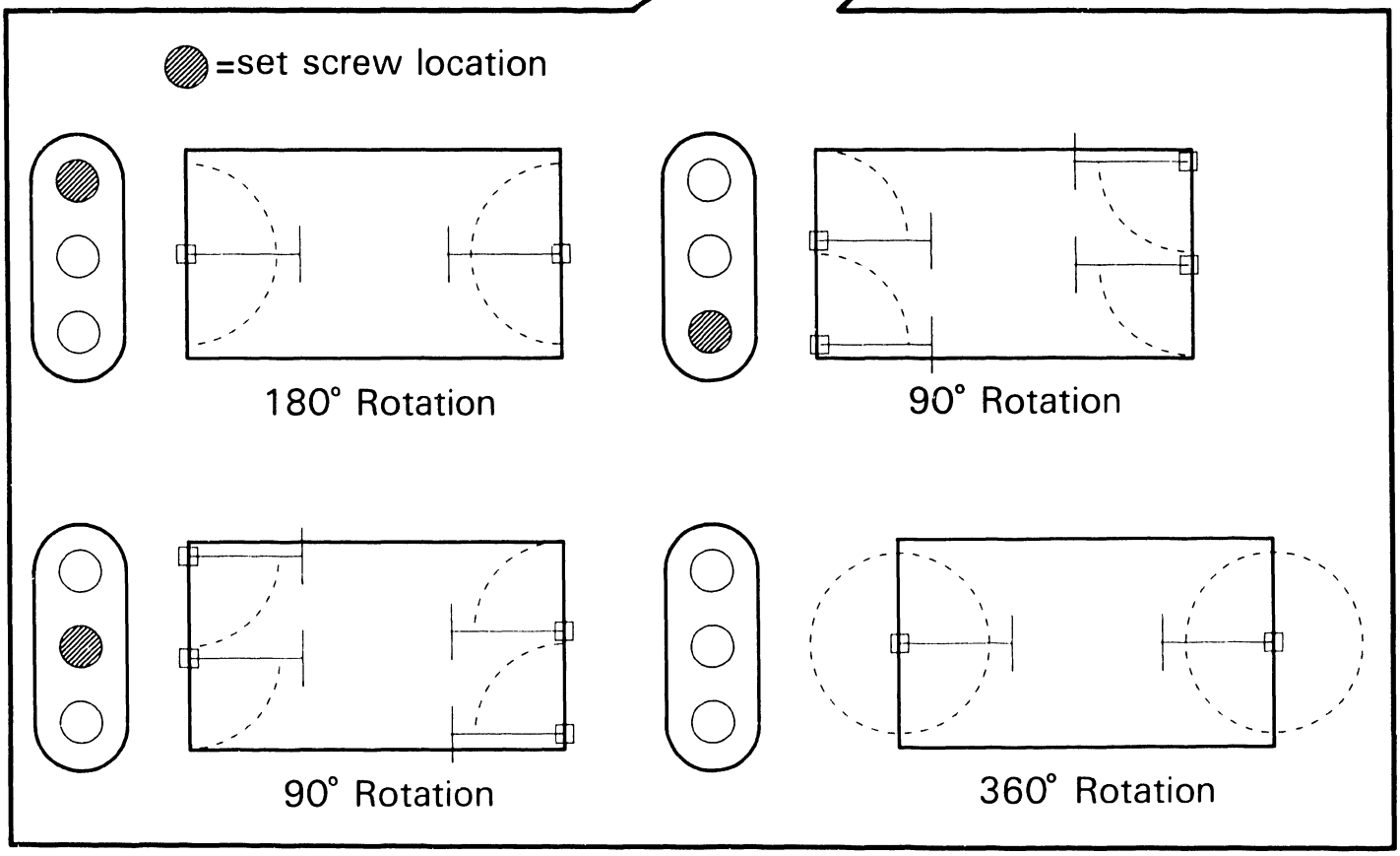
9.8.3 OIS Monitor Arm (Sheet 3 of 3)

Position Arm with monitor attached to gain access to horizontal rotation set screws on inside of clamp.



NOTE

The Arm was set for a 180° horizontal rotation setting at factory. It can be left at this setting or changed to obtain a 90° or 360° rotation pattern. Install clamp set screw to obtain desired rotation pattern as follows:



END

SECTION 10

FUNCTIONAL DESCRIPTION

SECTION 10 CONTENTS

SECTION 10
FUNCTIONAL DESCRIPTION

10 FUNCTIONAL DESCRIPTION

10.1 Introduction

The OIS-40/45/50/55/60/65/70 is a full function, ergonomically designed small clustered office system. Each model is a cost effective, multi-user word processor. The OIS-40/45 are stand alone office systems with complete OIS functionality for one user. The OIS-50/55 are capable of supporting up to four non-intelligent workstations, two printers, and four serial devices. The OIS-60/65 can support up to eight workstations, four non-intelligent and four intelligent, two printers, and four additional standard 928-type Serial Data Link ports, enabling the system to support a total of 12 peripheral devices. The OIS-70 has the same capability as the OIS-60/65 and in addition, can support 12 serial devices for a total of 17 peripheral devices. The following lists the major features of models OIS-40/45/50/55/60/65/70:

- A Z-80 based CPU with 64K bytes of RAM and 4K bytes of EPROM.
- One to four Internal Workstation Controllers supporting up to four OIS 40/50/60/70 workstations, each with 64K of RAM and two loadable fonts.
- Dual-Sided Double-Density 5 1/4'' mini-floppy disk drive.
- 10 Mbyte 5 1/4" Mini - Winchester disk drive for the OIS-50, a 33 Mbyte Mini- Winchester for the OIS-45/55/60, a 42 Mbyte Mini-Winchester for the OIS-65, and a 67 Mbyte Mini-Winchester for the OIS-70.
- Four standard 928-type Serial Data Link (SDL) ports in the OIS-50/55, eight standard 928-type SDL ports in the OIS-60/65, and twelve standard 928-type SDL ports in the OIS-70 to support any of the OIS serial peripheral devices.
- Fan cooled switching power supply.
- One or two optional Internal Printer Controllers (IPC) with RS232-C interface.
- Optional DLP-64 or DLP-128 Telecommunication Controller with 64K or 128K of memory, respectively.
- Optional 9332 TCB black box (external).
- Optional two-port WISE (Wang Inter-System Exchange) Controller to provide network capabilities.
- Optional adjustable monitor arm (with built-in power supply) for operator convenience.

10 FUNCTIONAL DESCRIPTION

10.1 Introduction

The OIS-40/45 contains the same processing logic, floppy and Winchester storage, and switching power supply as the OIS-50. The major features of the OIS-40/45 are:

- One internal workstation with 64K of RAM.
- Two optional 928-type serial data link port.
- Optional DLP-64 or DLP-128 TC controller with 64K or 128K of memory, respectively.
- An optional IWISE and IPC capability.

Model OIS-40B is identical to the OIS-40 except that it includes one IPC board with RS232-C interface and a 20 CPS Daisy Printer as part of the standard system.

10.2 FUNCTIONAL DESCRIPTION
System Configurations (Sheet 1 of 2)

Various models of the OIS 40/45/50/55/60/65/70 system can be enhanced by installing upgrade kits to the base configurations of the Master Unit. The Master Unit may be completely upgraded, or in part, depending on the options selected. The Master Unit base models, kit modification numbers, upgraded model numbers, and hardware descriptions are outlined below.

OIS 40/45/50/55/60/65/70 SYSTEM UPGRADES

Basic System	*Kit No.*	*New Model No.*	*Added System Capability*
OIS-40 (Dual Fan)	UJ-1292	OIS-60-1	4 Serial Ports, 33.5 MB Disk.
OIS-50 (Dual Fan)	UJ-1293	OIS-60-1	4 Serial Ports, 33.5 MB Disk.
OIS-40 (Single Fan)	UJ-1294	OIS-60	8 Serial Ports, 33.5 MB Disk.
OIS-50 (Single Fan)	UJ-1295	OIS-60	8 Serial Ports, 33.5 MB Disk.
OIS-50 (Single Fan)	UJ-1338	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-60 (Single Fan)	UJ-1339	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-60-1 (Single Fan)	UJ-1340	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-55 (Dual Fan)	UJ-1354	OIS-65	8 Serial Ports 42 MB Disk.
OIS-40 (Dual Fan)	UJ-1355	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-55 (Single Fan)	UJ-1356	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-55 (Dual Fan)	UJ-1357	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-60	UJ-1358	OIS-65	8 Serial Ports, 42 MB Disk.

OIS 40/45/50/55/60/65/70 SYSTEM UPGRADES (Cont.)

Basic System	*Kit No.*	*New Model No.*	*Added System Capability*
OIS-60-1 (Dual Fan)	UJ-1359	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-65 (Single Fan)	UJ-1360	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-45 (Dual Fan)	UJ-1361	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-40 (Dual Fan)	UJ-2173	OIS-60	8 Serial Ports, 33.5 MB Disk.
OIS-50 (Dual Fan)	UJ-2174	OIS-60	8 Serial Ports, 33.5 MB Disk.
OIS-50 (Dual Fan)	UJ-2184	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-60-1 (Dual Fan)	UJ-2185	OIS-70	12 Serial Ports, 67 MB Disk.
OIS-40 (Single/Dual Fan)	UJ-2201	OIS-55	4 Serial Ports, 33.5 MB Disk.
OIS-40 (Single/Dual Fan)	UJ-2202	OIS-45	2 Serial Ports, 33.5 MB Disk.
OIS-45 (Single/Dual Fan)	UJ-2203	OIS-55	4 Serial Ports, 33.5 MB Disk.
OIS-50 (Single/Dual Fan)	UJ-2204	OIS-55	4 Serial Ports, 33.5 MB Disk.
OIS-40 (Single Fan)	UJ-2205	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-45 (Single Fan)	UJ-2206	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-50 (Single Fan)	UJ-2207	OIS-65	8 Serial Ports, 42 MB Disk.
OIS-50 (Dual Fan)	UJ-2208	OIS-65	8 Serial Ports, 42 MB Disk.

10 FUNCTIONAL DESCRIPTION

10.3 System Block Diagram Description

This section discusses theory of operation for the OIS 40/45/50/55/60/65/70 at a functional block diagram level. It is intended to supply Customer Engineering personnel with the information necessary to obtain a basic understanding of the system design.

The OIS 50/55/60/65/70 is capable of supporting up to four non-intelligent workstations and one or two non-intelligent printers. The logic providing the intelligence for these peripherals resides within the OIS 50/55/60/65/70 Master Processor. In addition, the system will support OIS 928-type serial devices, including intelligent workstations, image printers, phototypesetters, and telecommunication devices. The OIS 50/55/60/65/70 may be connected in a network configuration to more powerful Office Information Systems through the use of a two-port IWISE or four-port external WISE (Wang Inter-System Exchange) unit. In this way, the OIS 50/55/60/65/70 may function as a small clustered system connected to a large, powerful office systems network.

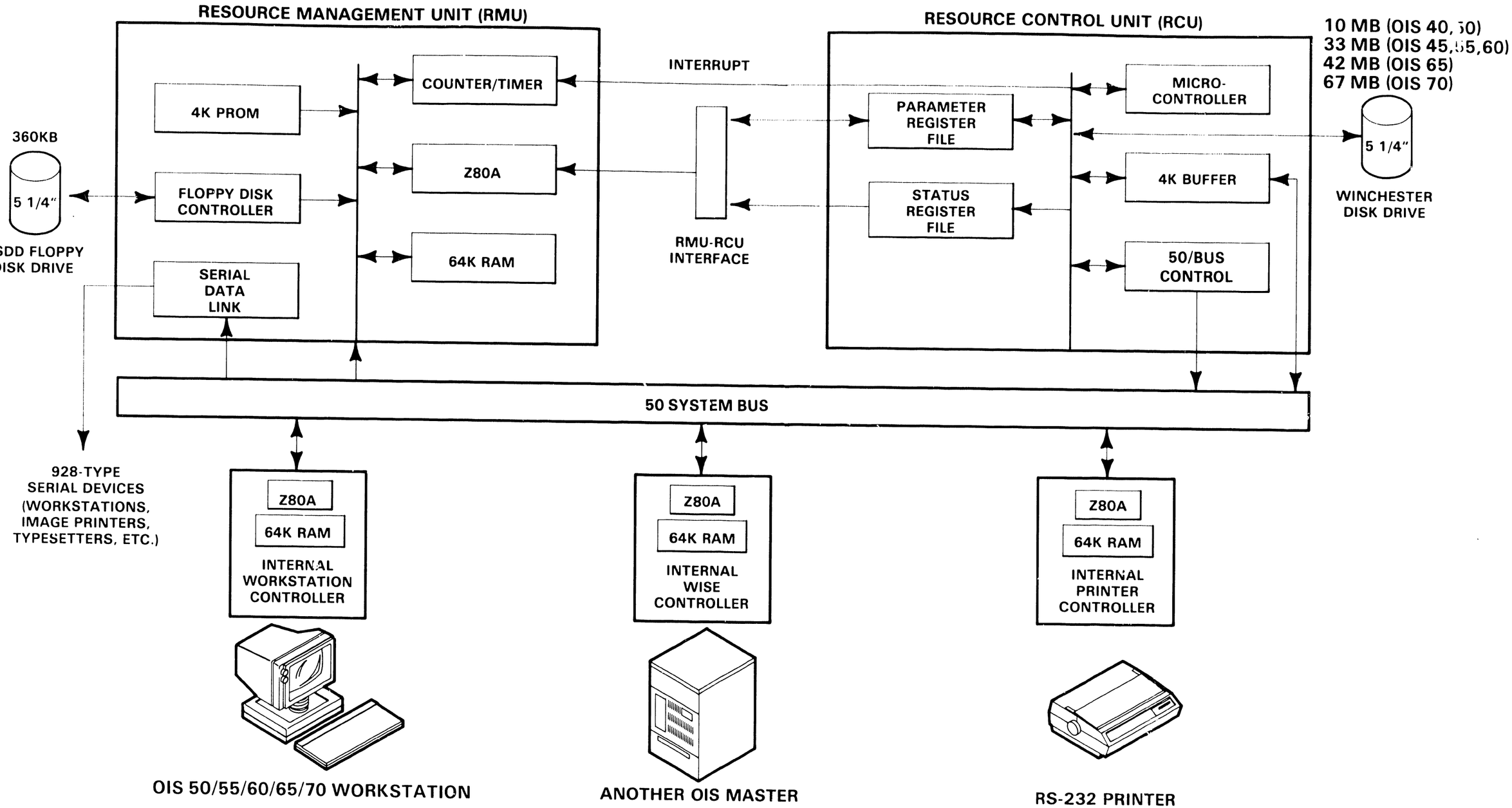
The OIS 40/45 is essentially a subset of the more versatile OIS 50/55/60/65/70. It was designed to be used as a stand-alone system capable of supporting one non-intelligent workstation along with one non-intelligent printer and two 928 serial-type devices. Like the OIS 50/55/60/65/70, it may be connected in an office systems network via a two-port IWISE interface or four-port external WISE, and has optional telecommunications capability.

Since the OIS 40/45 can be viewed as a subset of the OIS 50/55/60/65/70, the OIS 50/55/60/65/70 design will be the focus of the system block diagram description.

Six different types of printed circuit boards typically reside in an OIS 50/60/70 Master Processor. They are:

- Resource Management Unit (RMU)
- Resource Control Unit (RCU)
- Internal Workstation Controller (IWS)
- Internal Printer Controller (IPC)
- Internal WISE Controller (IWISE)
- OIS 50/55/60/65/70 Motherboard

The OIS 50/55/60/65/70 motherboard is designed to accommodate a total of seven printed circuit boards, two of which must be the RMU and RCU boards. These two boards contain all of the Central Processing Logic for the Master. The five remaining card cage channels accommodate the different peripheral controller boards in various combinations. Four of these channels may contain Internal Workstation Controllers (IWS), while the last may contain either an IWISE or Internal Printer Controller (IPC). Depending on system requirements, an additional IPC board may be substituted for one of the four IWS controllers.


RESOURCE MANAGEMENT UNIT (RMU)
4K PROM
COUNTER/TIMER
Z80A
64K RAM
FLOPPY DISK CONTROLLER
SERIAL DATA LINK
360KB
5 1/4"
DSDD FLOPPY DISK DRIVE
INTERRUPT
RMU-RCU INTERFACE
RESOURCE CONTROL UNIT (RCU)
PARAMETER REGISTER FILE
STATUS REGISTER FILE
MICRO-CONTROLLER
4K BUFFER
50/BUS CONTROL
10 MB (OIS 40, 50)
33 MB (OIS 45,55,60)
42 MB (OIS 65)
67 MB (OIS 70)
5 1/4"
WINCHESTER DISK DRIVE
50 SYSTEM BUS
928-TYPE SERIAL DEVICES (WORKSTATIONS, IMAGE PRINTERS, TYPESETTERS, ETC.)
Z80A
64K RAM
INTERNAL WORKSTATION CONTROLLER
OIS 50/55/60/65/70 WORKSTATION
Z80A
64K RAM
INTERNAL WISE CONTROLLER
ANOTHER OIS MASTER
Z80A
64K RAM
INTERNAL PRINTER CONTROLLER
RS-232 PRINTER

The flow of information between the various PC boards occurs on the 50BUS, the system's internal bus network comprised of 40 signals representing address, data, select, and control information. All of the Central Processing Logic for the OIS 50/55/60/65/70 is contained on two boards - - the Resource Management Unit (RMU) and the Resource Control Unit (RCU). The RMU, as its name implies, is responsible for the overall management of system operation. It runs the operating system code and contains the system's main memory. The RCU shares the processing burden by controlling some of the more cumbersome system tasks. In this way the RCU relieves the RMU of certain time-consuming tasks, thus freeing the RMU to concentrate on overall system management. The net result is a system that runs faster and more efficiently than single-processor systems.

The RMU board contains a Z80A microprocessor which executes the operating system code. It also contains 64K of RAM overlayed by 4K of PROM memory. The RAM functions as the system's main memory, while the PROM contains the power-up diagnostic bootstrap loader code. The upper 256 bytes of memory address space is reserved for Memory-Mapped I/O. A Z80 Counter/Timer Chip (CTC) handles the various system interrupts that the Z80A must respond to. The RMU board is also responsible for controlling all operations involving the system's mini-floppy disk drive. An LSI Floppy Disk Drive Controller chip (FDDC) resides on the RMU for this purpose. Finally, the RMU also contains all transmit and receive logic for the four-to-twelve external Serial Data Link (SDL) ports that connect the OIS 50/55/60/65/70 to 928-type serial peripherals. Although this SDL logic resides on the RMU board, the RCU is actually responsible for its control.

The RCU board is designed around a Signetics 8x305 microcontroller chip. It relieves the RMU's Z80A of a good deal of overhead by assuming the processing duties in four main areas. The RCU is responsible for:

- Control and execution of all operations involving the 5 1/4'' Winchester Disk Drive.
- Execution of all block data transfers.
- Control and arbitration of the 50BUS.
- Control and execution of the Serial Data Link (SDL).

The 8x305 microprocessor is the heart of the RCU board, and operates from instruction code stored in firmware. A 4K Data Buffer resides on the RCU, and is involved in any operation requiring the transfer of block data. The flow of information between the system's various PC boards occurs on the 50BUS, the system's internal bus network. Logic on the RCU board generates the command and control signals that govern the operation of the 50BUS. Finally, all Serial Data Link operations are under direct control of the 8x305 and additional support logic, even though the actual SDL transmit and receive circuitry resides on the RMU.

In a multi-processor system such as this, communication between the two microprocessors is an important aspect of the system design. The RMU's Z80A and the RCU's 8x305 communicate with one another through the use of shared memory and interrupt signals. Two special areas of memory are present on the RCU board. Both the Z80A and the 8x305 can access these memory areas. One area is called the Parameter Register File (PRF) while the other is labeled the Status Register File (SRF). When the Z80A, while running off the operating system code, encounters a task that is the responsibility of the RCU, it will instruct the RCU to perform that task. To do this, the RMU writes command and parameter information into the Parameter Register File. The RCU then reads the PRF, interprets the command, and executes the task. When the RCU completes its task, it writes status information into the Status Register File. The RMU then reads the SRF to determine the outcome of the operation. For lengthy RCU tasks such as a block data transfer, the RMU will attend to other management duties while the RCU performs the task. When the task is completed, the RCU will notify the RMU by means of an interrupt signal.

All information exchanged between the OIS 50/55/60/65/70 Central Processing Logic (RMU, RCU) and the various peripheral controllers (IWS, IPC, IWISE) travels via the 50BUS. The RCU board initiates and governs all 50BUS transactions. Via the 50BUS, the RCU is able to exchange information with a total of eight logical devices, called 50BUS Devices. Three of these logical devices reside on the RMU board:

- Main Memory
- Floppy Disk Drive Controller
- Serial Data Link transmit and receive logic

The remaining five logical devices correspond to the five motherboard slots which house the various peripheral controller boards (IWS, IPC, IWISE).

A typical 50BUS transaction between the RCU and a 50BUS Device usually involves the transfer of block data. Consider the following example: While running the operating system, the RMU decides it must read a portion of an Internal Workstation's memory. Since the operation involves use of the 50BUS, executing the task is the responsibility of the RCU board. The RMU instructs the RCU to perform the task and supplies particulars (which IWS, what portion of memory etc.) by writing to the PRF. The RMU then attends to other housekeeping duties while the RCU executes the task. Using the 50BUS, the RCU selects the desired slave, and puts the slave's Z80A in a Bus-Requested state so a DMA operation may be performed. Then, the RCU reads the desired contents of slave memory and transfers the data, byte-by-byte, to its 4K buffer via the 50BUS. When the operation is complete, the RCU notifies the RMU by means of an interrupt. The RMU will then read the SRF to determine the results of the operation. In a similar fashion, the data might then be transferred from the data buffer to main memory, again via the 50BUS.

Three types of peripheral controller boards may be included in an OIS 50/55/60/65/70 system. These are: the Internal Workstation controller (IWS), Internal Printer Controller (IPC), and Internal WISE Controller (IWISE). Each of these controller boards contains a Z80A microprocessor along with 64K of RAM used as slave memory. The following paragraphs contain brief descriptions of each board's functional responsibilities.

The Internal Workstation Controller

The OIS 50/55/60/65/70 Master is capable of supporting up to four OIS 40/45/50/55/60/65/70 non-intelligent display terminals. The workstation is termed non-intelligent because the hardware and software that control its logic functions reside within the Master, on an IWS Controller board. The IWS Controller is responsible for providing:

- The interface signals to the monitor electronics.
- Interface logic to the serial keyboard.
- The CRT, font, and main memory storage.
- Interface logic required to communicate with the 50BUS.

The Internal Printer Controller

The Internal Printer Controller (IPC) is designed to control a single RS-232C printer. The IPC receives commands and data from the RCU board via the 50BUS and communicates with the printer through an RS-232C serial interface. It is designed around a Z80A microprocessor running at 4 MHz, and contains:

- 50BUS interface logic.
- RS-232C interface logic.
- Printer control interface logic.
- 64K of Dynamic RAM.

The Internal WISE Controller

The Internal WISE board provides a high speed communication path between the OIS 50/55/60/65/70 and any other Wang system that employs the standard 928-type Serial Data Link. The IWISE enables the OIS 50/55/60/65/70 to be used as a clustered system, providing a communication link to a higher level Master Processor, such as the OIS 145 Master illustrated in the system block diagram. Like the other controller devices attached to the 50BUS, the IWISE board depends on a Z80A running at 4 MHz. In addition, it contains:

- Serial Data Link protocol logic.
- 50BUS protocol logic.
- 64K of Dynamic RAM and memory access arbitration logic.
- DMA logic.

SECTION
11
SPECIFICATIONS

SECTION 11 CONTENTS

SECTION 11
SPECIFICATIONS

11.1 Hardware

SPECIFICATIONS

Master Unit Dimensions

Height: 26.8 inches (68.0 cm.)
Width: 11.0 inches (28.0 cm.)
Depth: 21.2 inches (53.8 cm.)

Master Unit Weight

70 pounds (31.8 kg.)

Master Unit Installation Requirements:

Rear Clearance:
12 inches (30.5 cm), min.
Position:
Upright Only

Power Requirements

Master Unit:
90-130 Vac (115 Vac, nominal)
180-262 Vac (230 Vac, nominal)
47-63 Hz (60 Hz, normal)
5.0 Amps (6.0 A peak on power-up)
2.75 Amps (Operating)
NEMA Receptacle 5-15G

Workstation or
Option Arm Power Supply:
90-130 Vac (115 Vac nominal)
180-262 Vac (230 Vac, nominal)
47-63 Hz (60 Hz, normal)
3.0 Amps (Peak on power-up)
1.0 Amps (Operating)
NEMA Receptacle 5-15G

Power Circuits:

Separate, noise free, 3 wire,
20A dedicated lines

Environmental Requirements:

Relative Humidity:
20%-60% (non-condensing)
Ambient Temperature:
60°-95°F (16°-35°C)
Max Temp Gradient:
12°F/Hr (-11°C/Hr)
Max Wet Bulb Temp:
75°F (24°C)
Max Altitude:
10,000 Ft (3.048 Km)
Heat Dissipation:
965 BTU/Hr (Master Unit)
119 BTU/Hr (Workstation)

SECTION 12
ILLUSTRATED
PARTS

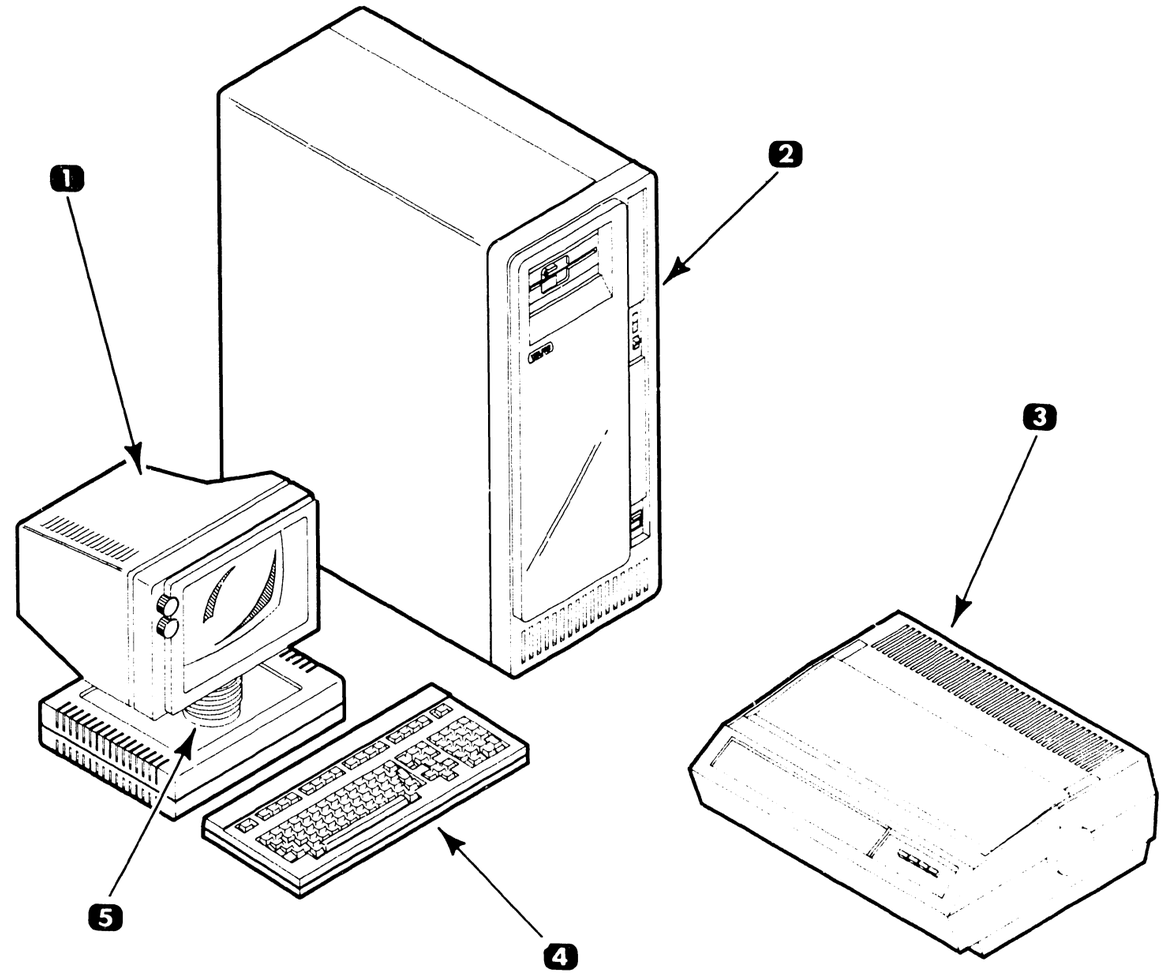
SECTION 12 CONTENTS

SECTION 12
ILLUSTRATED PARTS

12.1 Major Assemblies

12.1.1 System Components

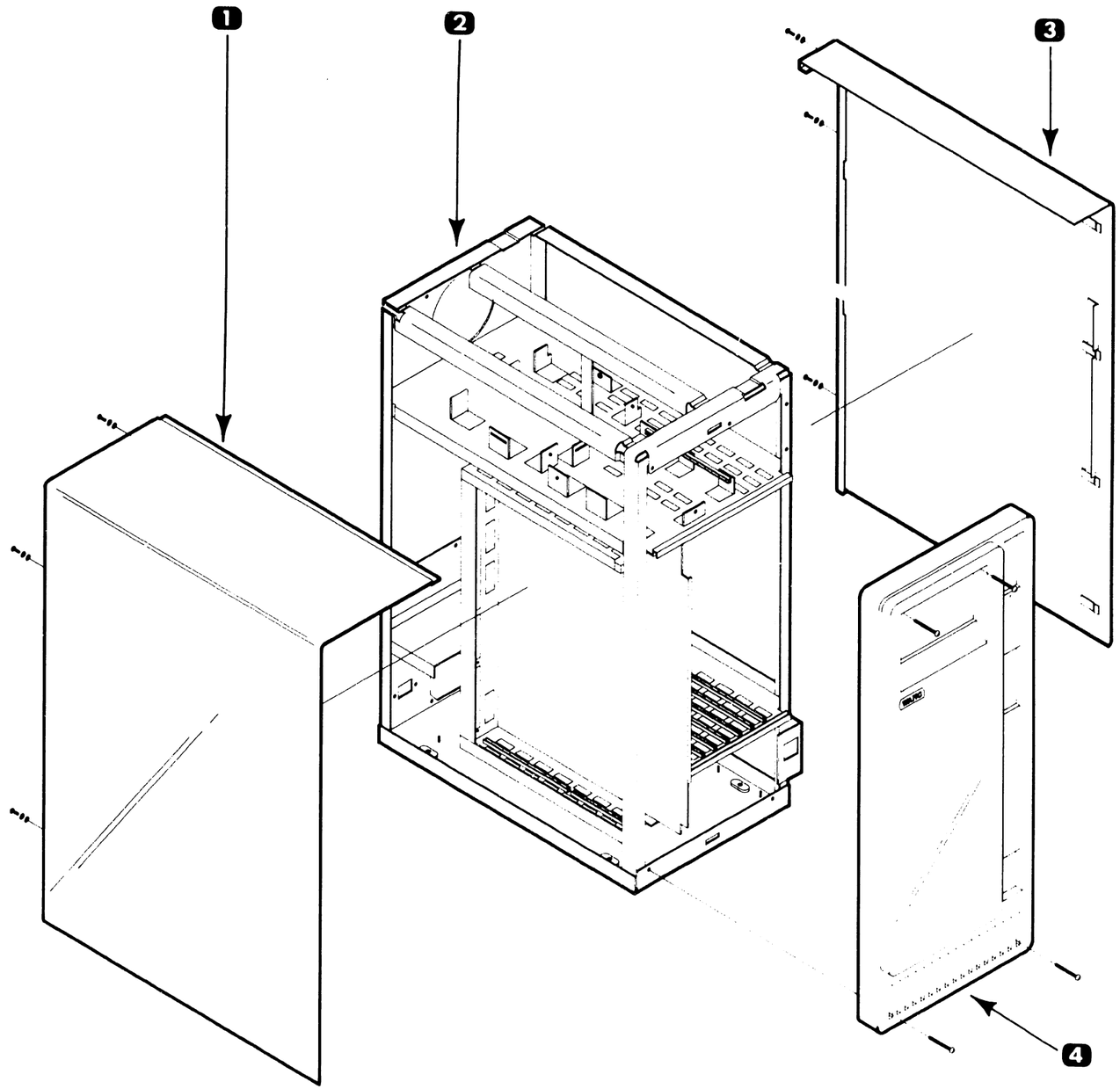
Item	Part Number	Description
1	279-0574	OIS Workstation Monitor Assy, Model PM-004
	279-0659	OIS Workstation Monitor Assy, Model PM-004L
2	187-9561	OIS 40 Master Unit
	187-9562	OIS 50 Master Unit
	187-9564	OIS 60 Master Unit
	187-9576	OIS 70 Master Unit
	187-9583	OIS 45 Master Unit
	187-9584	OIS 55 Master Unit
	187-9585	OIS 65 Master Unit
3	177-9560	Diablo 620 Daisy Printer
	177-9558	Juki PM015 Daisy Printer
4	279-2042	Universal Low-Profile Keyboard
	279-2044	International Low-Profile Keyboard
5	279-1037-A	Base Extension Unit



12.2 Subassemblies

12.2.1 Master Unit Covers (Dual and Single Fan Chassis)

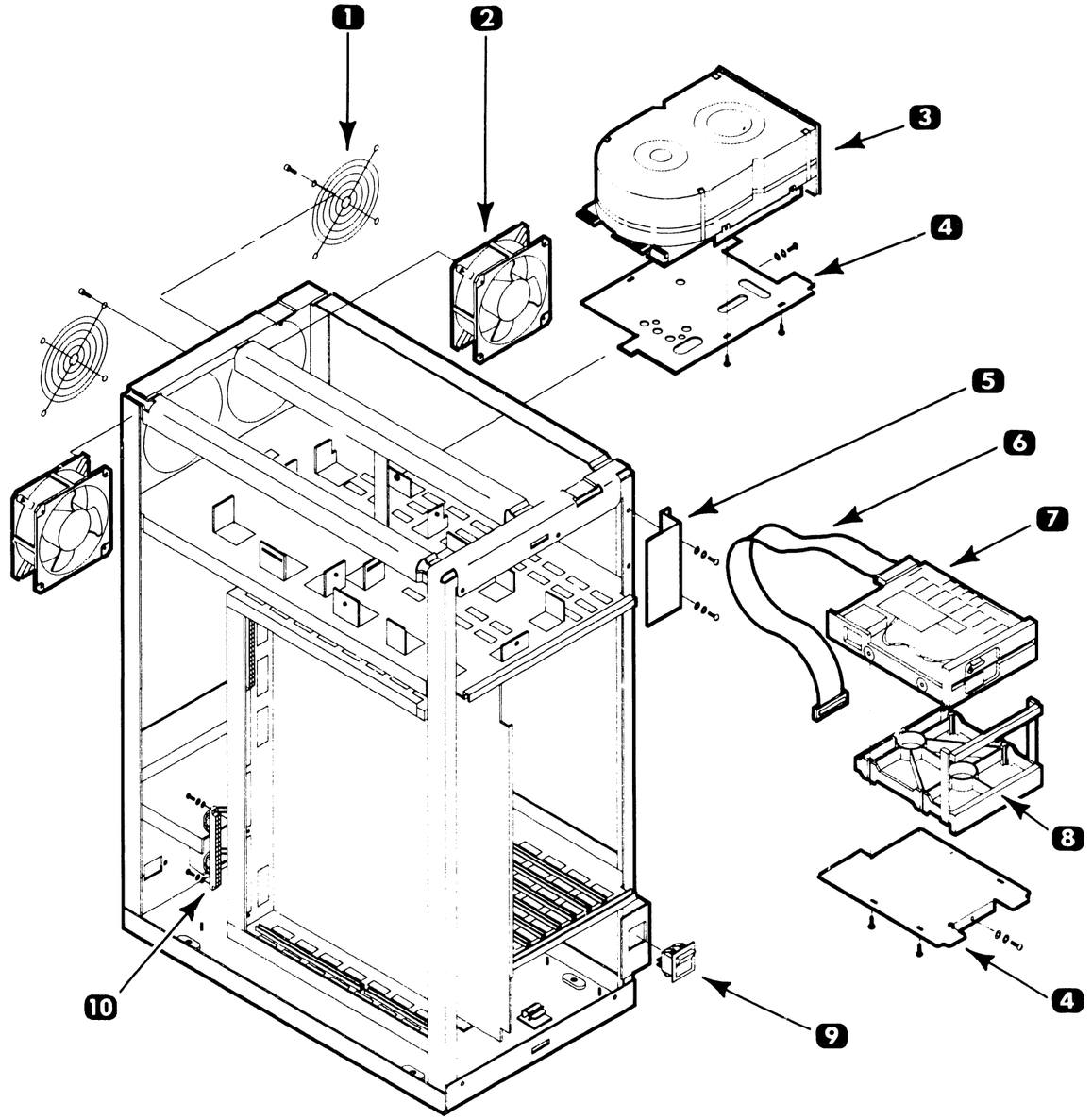
Item	*Part Number*	*Description*
1	458-3074	Cover, L. H. Weld
2	270-0846	Chassis Structure Assy.
3	458-3073	Cover, R. H. Weld
4	270-0845	Front Bezel Assy.



12.2.2 Master Unit Dual Fan Chassis (Sheet 1 of 2)

Item	Part Number	Description
1	400-9016	Fan Guard
2*	400-1001-1	Muffin Fan 53/57 CFM
3*		5 1/4'' Winchester Drive
	278-4030	OIS 40/50 (10 MB)
	278-4034	OIS 60-1 (33.5 MB)
	278-4069	OIS 45/55 (33.5 MB)
4	452-0284	Drive Mounting Plate
5	451-3181	TCP Front Panel Blank
6*	220-3292	Floppy I/O Cable
7*		5 1/4'' Floppy Drive
	278-4026	Full Height
	278-4033	Half Height
8	449-0837	Half Height Floppy Panel
9*	325-0082	AC Power Switch (DPST)
10	270-3302	TC Power Harness

* Recommended Spare Part

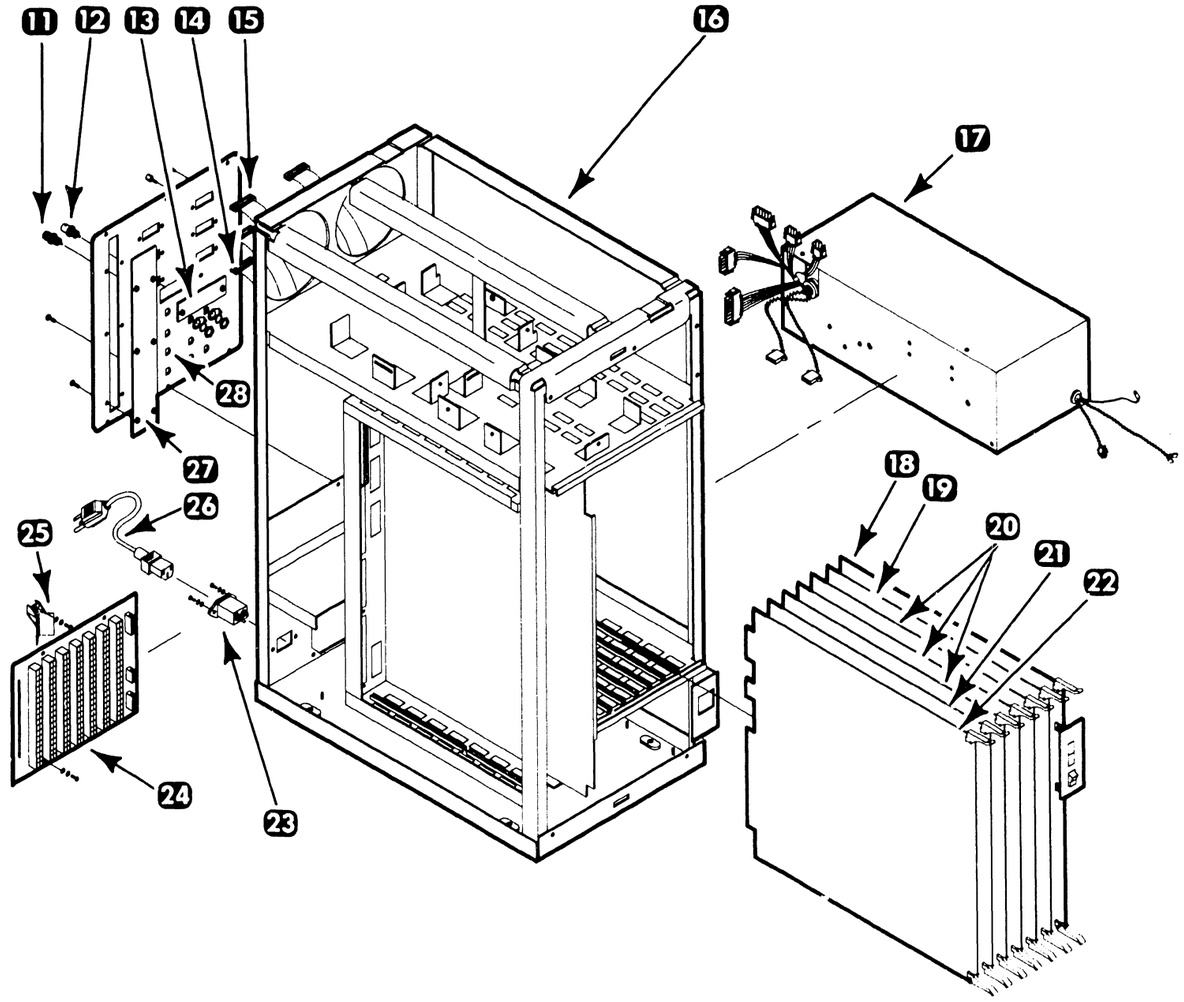


12.2 Subassemblies

12.2.2 Master Unit Dual Fan Chassis (Sheet 2 of 2)

Item	Part Number	Description
11	350-2078	TNC Bulkhead Connector (F)
12	350-1036	BNC Socket Connector (F)
13	451-3193	IWISE Rear Panel Blank
14*	220-3296	IPC Rear Panel Cable (Dual)
	220-3297	IPC Rear Panel Cable (Single)
15*	220-3295	IWS Back Panel Cable
16	270-0846	Chassis Structure Assy.
17*	728-2818	Switching Power Supply
18*		RMU M/L PCB
	210-8266-A	OIS 40/50
	210-8266-B	OIS 45/55/60-1
19*		RCU M/L PCB
	210-8267-A	OIS 40/50
	210-8267-B	OIS 45/55/60-1
20*	210-8274-A	IWS PCB
21*	210-8280-A	IPC PCB
22*	210-8270-A	IWISE PCB
23*	270-3429	AC Filter Assy.
24*	210-8269	Mother Board Assy.
25	449-0254	PC Card Guide
26*	420-2019	AC Power Cord
27	451-3182	TCP Rear Panel Blank
28	270-0869	OIS 40 45 Rear Panel Assy.
	270-0847	OIS 50 55 60-1 Rear Panel Assy.

* Recommended Spare Part

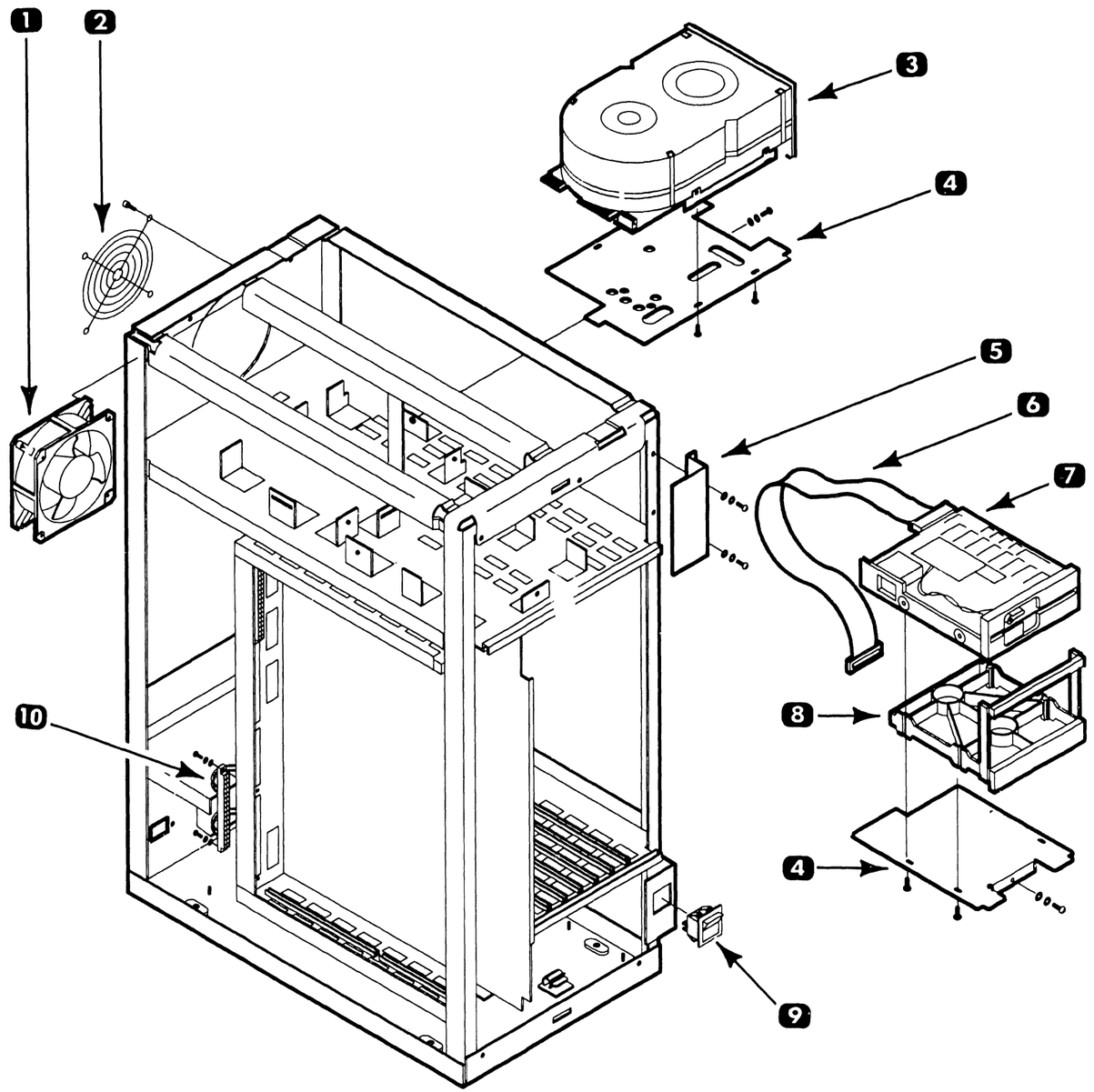


12.2 Subassemblies

12.2.3 Master Unit Single Fan Chassis (Sheet 1 of 2)

Item	Part Number	Description
1*	400-1001-1	Muffin Fan 50/55 CFM
	220-2076	Fan Cord
2	400-9016	Fan Guard
3*		5 1/4'' Winchester Drive
	278-4030	OIS 40/50 (10 MB)
	278-1069	OIS 45/55 (33.5MB)
	278-4034	OIS 60/60-1 (33.5 MB)
	278-4070	OIS 65 (42 MB)
	278-4054	OIS 70 (67 MB)
4	452-0284	Drive Mounting Plate
5	451-3181	TCP Front Panel Blank
6	220-3292	Floppy I/O Cable
7*		5 1/4'' Floppy Drive
	278-4026	Full Height
	278-4033	Half Height
	728-5001	Half Height Adapter Kit
8	449-0837	Half Height Floppy Panel
9*	325-0082	AC Power Switch (DPST)
10	270-3302	TC Power Harness

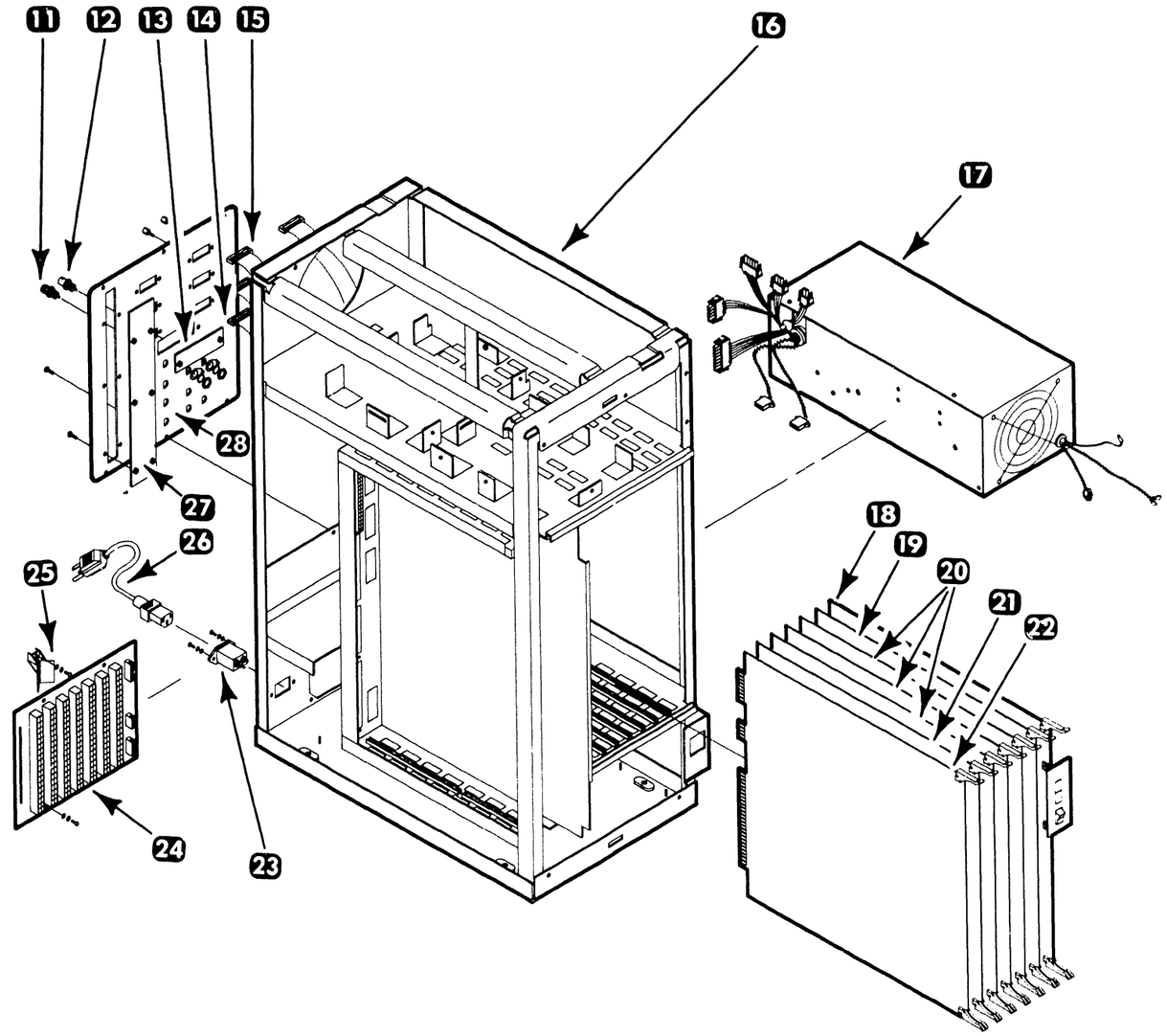
* Recommended Spare Part



12.2.3 Master Unit Single Fan Chassis (Sheet 2 of 2)

Item	Part Number	Description
11*	350-2078	TNC Bulkhead Connector (F)
12	350-1036	BNC Socket Connector (F)
13	451-3193	IWISE Rear Panel Blank
14*	220-3296	IPC Rear Panel Cable (Dual)
	220-3297	IPC Rear Panel Cable (Single)
15*	220-3295	IWS Back Panel Cable
16	270-0934	Chassis Structure Assy.
17*	725-2818	Switching Power Supply (OIS 40/50/60)
	270-0980	Switching Power Supply (OIS 45/55/65/70)
18*	210-8266-A	RMU M/L PCB (OIS 40/50)
	210-8266-B	RMU M/L PCB (OIS 60-1)
	210-8490-A	RMU M/L PCB (OIS-60/70)
19*	210-8267-A	RCU M/L PCB (OIS 40/50)
	210-8267-B	RCU M/L PCB (OIS-60/60-1/70)
20*	210-8274-A	IWS PCB
21*	210-8280-A	IPC PCB
22*	210-8270-A	IWISE PCB
23*	270-3429	AC Filter Assv. (OIS 40/45/50/55/60/65/70)
24*	210-8269	Mother Board Assy.
25	449-0254	PC Card Guide
26*	420-2019	AC Power Cord
27	451-3182	TCP Rear Panel Blank
28	270-0936	OIS 40/45 Rear Panel Assy.
	270-0937	OIS 50/55 Rear Panel Assy.
	270-0935	OIS 60/65 Rear Panel Assy.
	270-1056	OIS 70 Rear Panel Assy.

* Recommended Spare Part

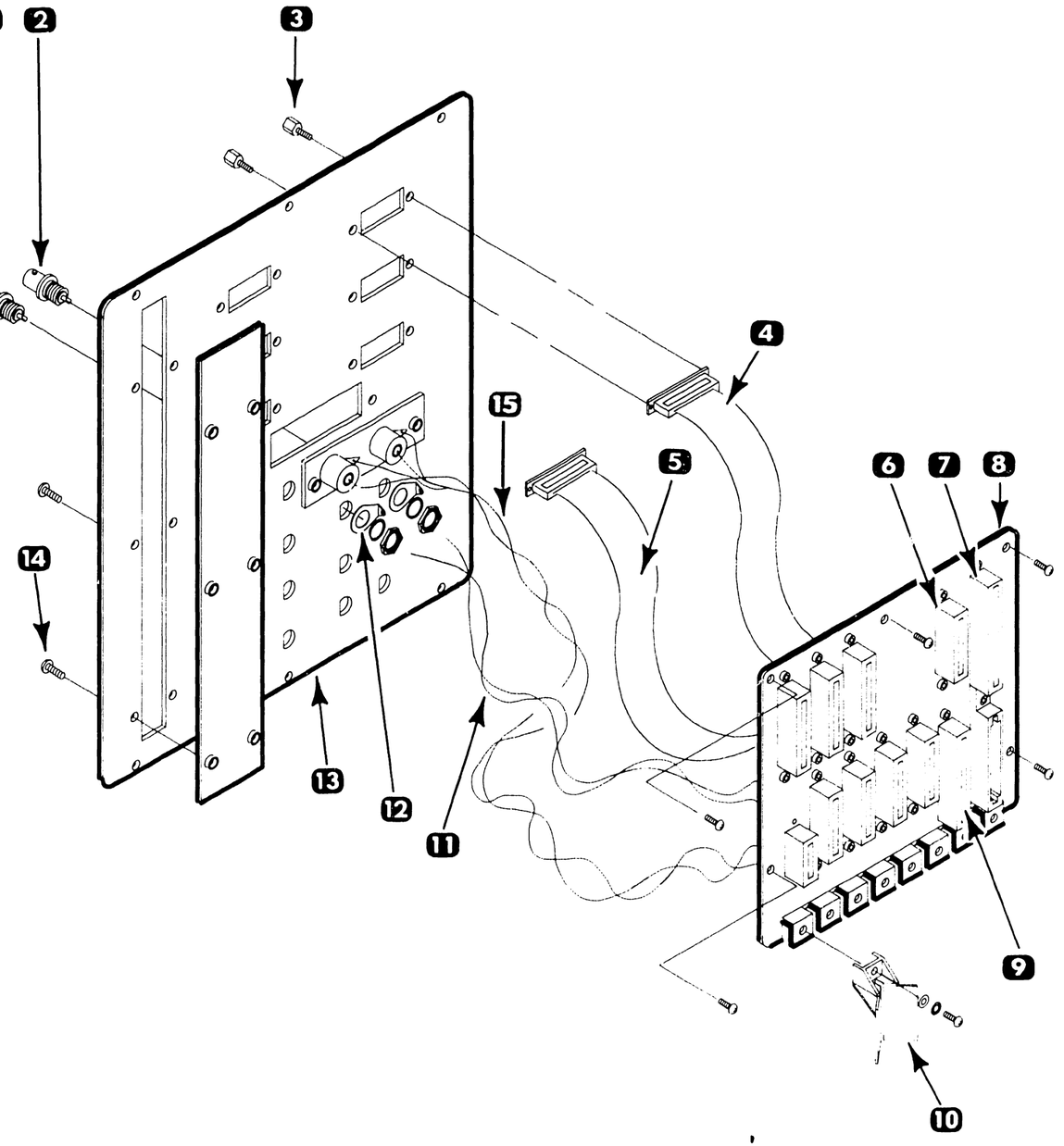


12.2 Subassemblies

12.2.4 Master Unit Rear I/O Connector Panel

Item	Part Number	Description
1	350-2078	TNC Bulkhead Connector (F)
2	350-1036	BNC Socket Connector (F)
3	478-0835	Standoff M/F Hex
4*	220-3295	IWS Rear Panel Cable
5*	220-3296	IPC Rear Panel Cable (Dual)
	220-3297	IPC Rear Panel Cable (Single)
6*	220-3294	Winchester 20-Pin Cable
7*	220-3292	Floppy I/O Cable
8	451-3667	Connector Panel
9*	220-3293	Winchester 34-Pin Cable
10	449-0254	Card Guide
11*		RMU Rear Panel Cable
	220-2001	OIS 40/45
	220-1981	OIS 50/55
	220-2071	OIS 60/65
	220-2092	OIS 70
12	654-1011	Groundlug
13	452-4625	Rear Panel
14	650-3080	Screw, Phillips Head
15*	220-1982	IWISE Internal Cable

* Recommended Spare Part

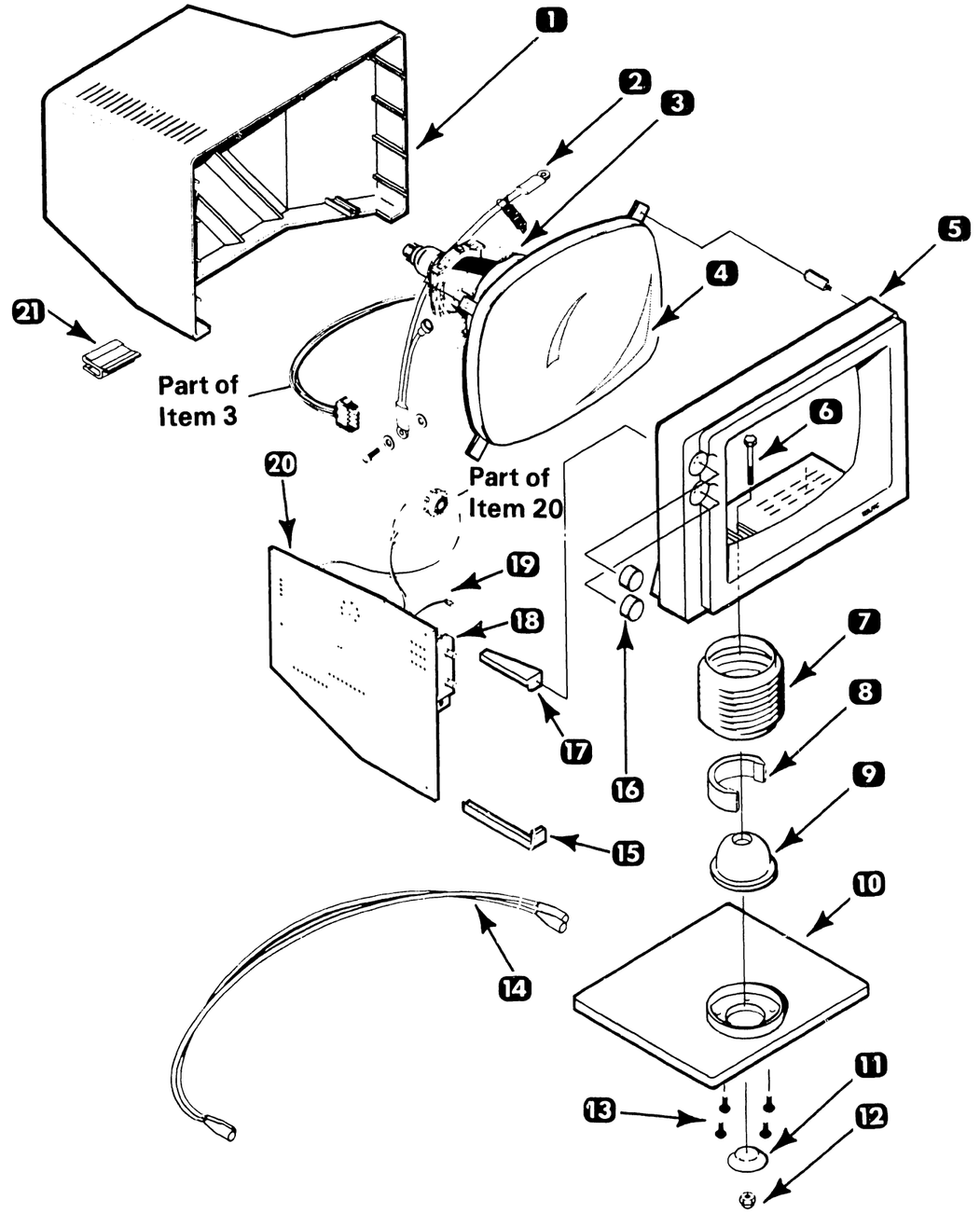


12.2 Subassemblies

12.2.5 CRT Monitor Assembly

Item	*Part Number*	*Description*
1	449-0630	Monitor Cover
2	465-1805	5 1/2 in. Grounding Spring
3	270-3289	Yoke Assy. (Less Magnets)
4	340-0111	Tube, C/R 12 in. (Less Yoke Assy.)
5	449-0631	Monitor Bezel
6	650-9077	1/4 - 28 x 1 3/4 Hex Screw
7	449-0635	Sleeve Bellow
8	449-0626	Ball Joint Collar
9	478-0805	Ball Joint
10	449-0627	Monitor Base
11	449-0625	Cap Spring
12	652-0064	1/4 - 28 Stop Nut
13	650-3160	6-32 x 1/2 Pan HD Phil Screw
14*	421-0002 220-0491	I/O Cable Assy, 16 Inches (Model PM-004) I/O Cable Assy, 4 Feet (Model PM-004L)
15	449-0628	PCB Lower Holder
16	449-0569	Knob
17	449-0629	PCB Upper Holder
18	451-4985	Bracket (Included with Item 20)
19	220-1263	Wire, Lug Assy (Included with 20)
20*	210-8344 210-8514	Monitor PCA (PM-004) Monitor PCA (PM-004L)
21	449-1129	Monitor Clip (FCO#1153, WLI 728-0172)

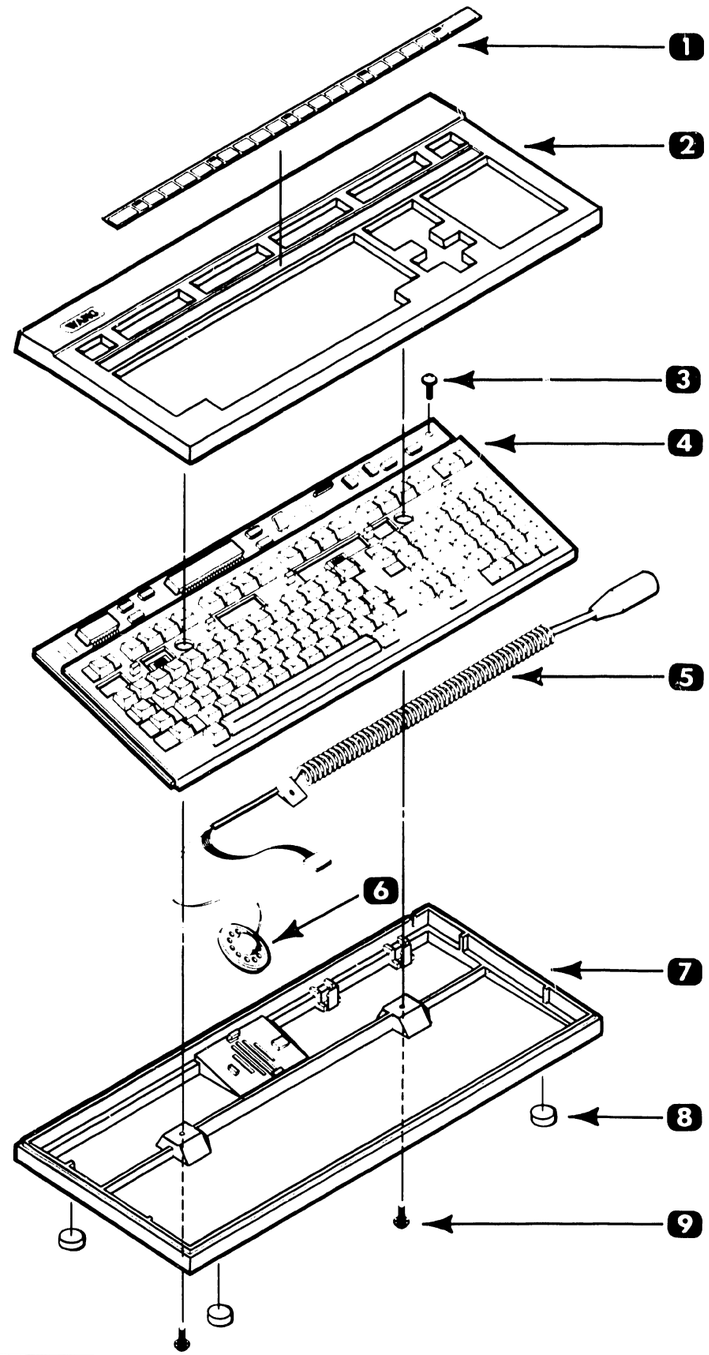
* Recommended Spare Part



12.2.6 Low Profile Keyboard

Item	*Part Number*	*Description*
	279-2044	Expanded Low Profile (Int'l) Keyboard
	279-2042	Non-Expanded Low Profile Keyboard
1	615-1870	Function Strip
2	449-0608	Top Cover (Non-Expanded)
	449-0611	Top Cover (Expanded)
3	650-4120	8-32 x 3/8 Pan HD Phil Screw
4	725-2738	Universal Keyboard KTC L. P.
	725-2739	Universal Keyboard Exp. KTC LP
5	220-0305	Cable Assembly
6	320-0306	2 in. Speaker, 8 Ohm LP
7	449-0607	Keyboard Base
8	655-0286	5/8 x 1/8 Self Adhesive Foot
	655-0291	5/8 x 1/16 Self Adhesive Foot
9	650-4160	8-32 x 1/2 Pan HD Phil Screw

* Recommended Spare Part

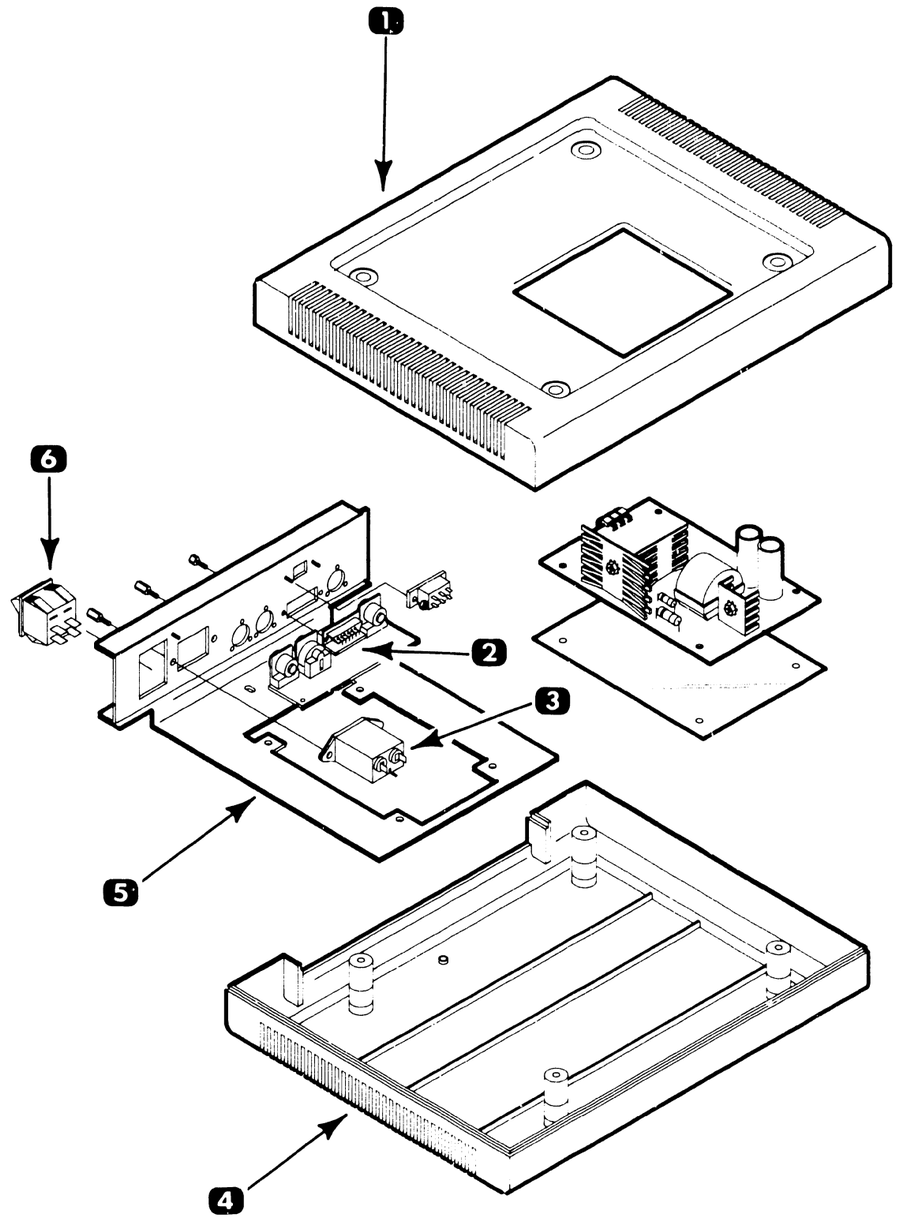


12.2 Subassemblies

12.2.7 Base Extension Unit

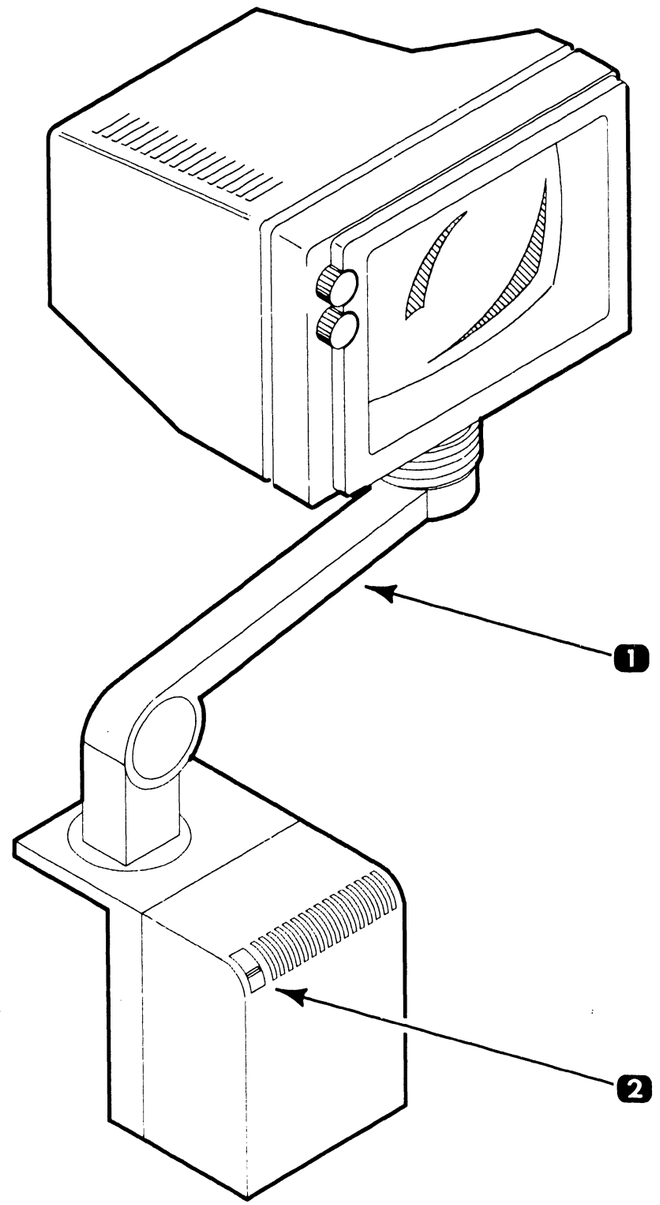
Item	*Part Number*	*Description*
1	449-0667	Top Cover
2	210-8237	Base Extension Panel PCB
3	270-3291	AC Filter Assy.
4	449-0668	Bottom Cover
5*	270-0851	Power Supply/Panel Assy.
6	325-0082	AC Power Switch

* Recommended Spare Part



12.2.8 OIS-IWS-Option Arm (289-0273 Less Monitor Assy)

Item	*Part Number*	*Description*
1	279-1044	Arm Assembly (Less clamp)
2	449-0760	AC Switch Actuator

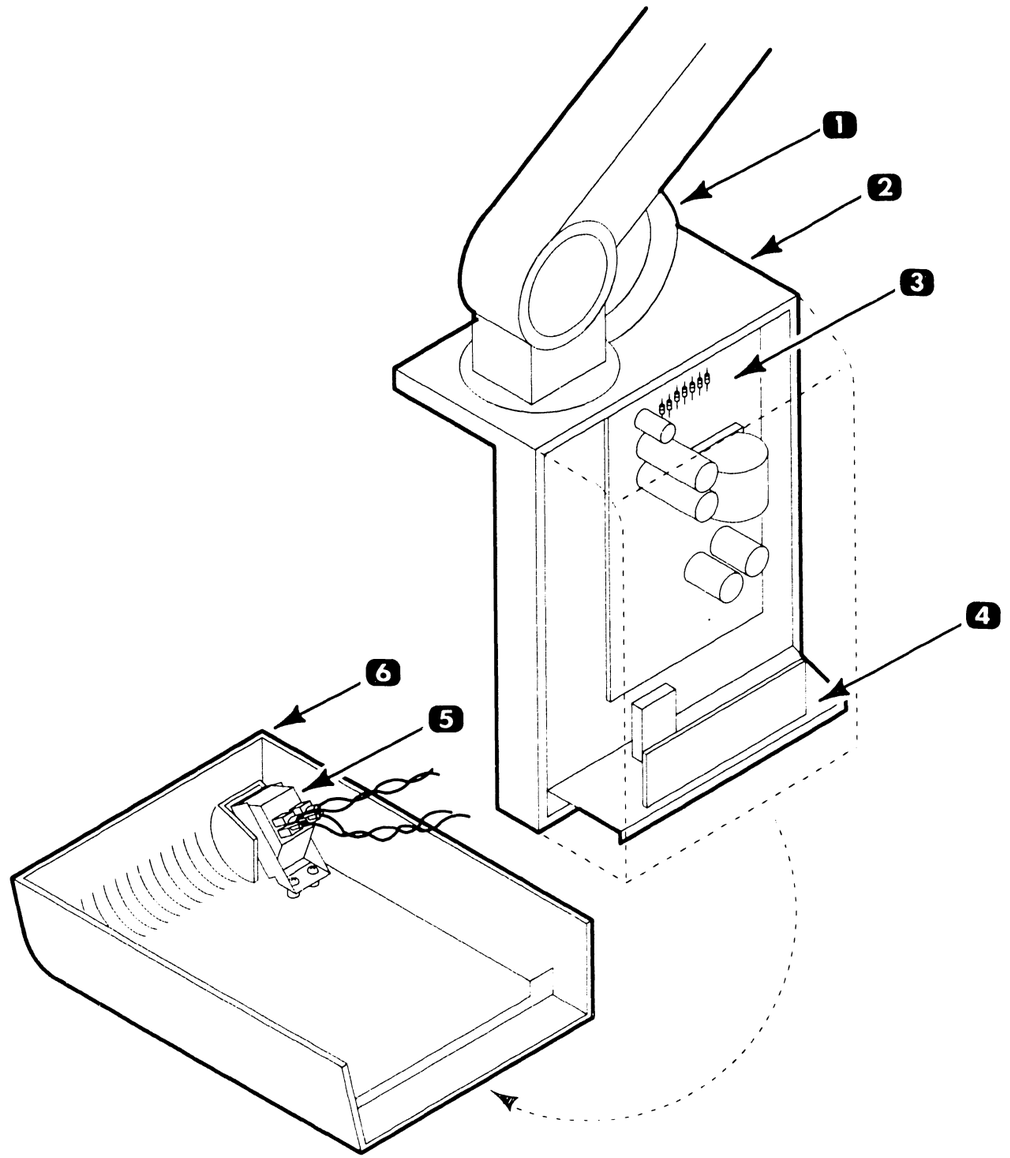


12.2 Subassemblies

12.2.9 OIS-IWS-Option Arm Power Supply

Item	*Part Number*	*Description*
1	421-0019	Molded Cable (4 foot)
2	450-0163	Clamp Housing
3*	725-2753	Switching Power Supply PCB
4	289-0368	Base Extension End Panel Assy.
5	325-0059	AC Voltage Switch
6	449-0758	Molded Cover

* Recommended Spare Part



12.3.1 OIS Workstation Serial Cables (PVC)

PVC CABLE Length (feet)	(m)	Part Number	PVC CABLE Length (feet)	(m)	Part Number
50	15.2	120-2300-1	1550	472	120-2303-31
100	30.5	120-2300-2	1600	478	120-2303-32
150	45.7	120-2300-3	1650	503	120-2303-33
200	60.9	120-2300-4	1700	518	120-2303-34
250	76.2	120-2303-5	1750	533	120-2303-35
300	91.4	120-2303-6	1800	548	120-2303-36
350	106	120-2303-7	1850	564	120-2303-37
400	120	120-2303-8	1900	579	120-2303-38
450	137	120-2303-9	1950	594	120-2303-39
500	152	120-2303-10	2000	609	120-2303-40
550	167	120-2303-11			
600	183	120-2303-12			
650	198	120-2303-13			
700	213	120-2303-14			
750	228	120-2303-15			
800	244	120-2303-16			
850	259	120-2303-17			
900	274	120-2303-18			
950	289	120-2303-19			
1000	305	120-2303-20			
1050	320	120-2303-21			
1100	335	120-2303-22			
1150	350	120-2303-23			
1200	365	120-2303-24			
1250	381	120-2303-25			
1300	396	120-2303-26			
1350	411	120-2303-27			
1400	426	120-2303-28			
1450	442	120-2303-29			
1500	457	120-2303-30			

12.3 Cable Assemblies

12.3.2 OIS Workstation Serial Cables (Teflon)

TEFLON CABLE Length (feet)	(m)	Part Number
50	15.2	120-2303-01
100	30.5	120-2303-02
200	60.9	120-2303-04
300	91.4	120-2303-06
400	120	120-2303-08
500	152	120-2303-10
600	183	120-2303-12
700	213	120-2303-14
800	244	120-2303-16
900	274	120-2303-18
1000	305	120-2303-20
1100	335	120-2303-22
1200	365	120-2303-24
1300	396	120-2303-26
1400	426	120-2303-28
1500	457	120-2303-30
1600	478	120-2303-32
1700	518	120-2303-34
1800	548	120-2303-36
1900	579	120-2303-38
2000	609	120-2303-40

12.3 Cable Assemblies

12.3.3 OIS Internal Workstation Cables

Length (feet)	Length (m)	Part Number
25	7.6	120-2340-25
50	15.2	120-2430-50
100	30.5	120-2430-01
200	60.9	120-2430-02

12.3 Cable Assemblies

12.3.4 Internal Printer Cables

Length (feet)	Length (m)	Part Number	Express Products Part Number
25	7.6	421-0029-25	120-2380-12
50	15.2		120-2380-50

APPENDIX
A

APPENDIX A

UPGRADE JOB (UJ) KITS

INSTALLATION INSTRUCTIONS

INTRODUCTION

This appendix contains instructions for installing Upgrade Job (UJ) kits on OIS-40-70 systems at customer sites. The upgrades consist of modifying an existing base configuration to a system design that meets or exceeds the additional requirements of the user. The standard maintenance manual 741-1267-B may be used for reference when installing the UJ kits. No special tools are required to install the upgrade kits; the installations can be accomplished using the standard Wang CE tool kit.

UJ-2202 and UJ-2204 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single or dual fan OIS-40 to OIS-45 (UJ-2202) and the single or dual fan OIS-50 to OIS-55 (UJ-2204).

A. Power off. Remove ac from unit.

B. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

C. Remove the right side cover as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

D. Locate the Winchester drive on the right side of the unit and remove as follows.

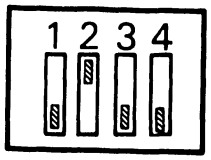
1. Remove the mounting screw from underneath the drive and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove the drive from unit.
4. Remove the four (4) screws securing the drive to the mounting plate. Save screws and mounting plate for installation on the new drive.

E. Install the new 725-0254 disk drive in the system as follows.

1. Secure the mounting plate removed in step D to the new drive.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

F. Remove the 210-8267-A RCU PCB from the unit by pulling lever clamps away from board and sliding it forward on the guide rails. Set aside for return.

G. Verify that SW1 on the new 210-8267-B RCU PCB is set for 33.5 MB. Install the board in the unit.



OIS-45/55

0 X 0 0

0 = Open Contacts
X = Closed Contacts

H. Remove the 210-8266-A RMU PCB from the unit by pulling the lever clamps away from board and sliding it forward on the guide rails.

I. Check the PROM at L47 on the 210-8266-A PCB. If it is not Rev B or higher, replace it with the PROM (marked 9064) provided.

J. Replace the 210-8266-B RMU PCB in the unit.

K. Replace right side cover and front cover by reversing steps B and C.

L. Place new labels on unit.

1. Remove the backing from the OIS-45 or OIS-55 label and place over the OIS-40 or OIS-50 label.
2. Remove the backing from the UJ-2202 or UJ-2204 label and place above the serial number label.

M. Run appropriate diagnostics.

N. Install minimum operating system release 10.J or higher.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-2202 Kit #289-0834 (Single or Dual Fan OIS-40 to OIS-45)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
378-9064-RB	1	PROM
725-0254	1	33.5 MB Disk Drive Assembly
615-3379	1	OIS-45 Label
615-3467	1	UJ-2202 Label
291-0554-A	1	Software Release 10.J

UJ-2204 Kit #289-0836 (Single or Dual Fan OIS-50 to OIS-55)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
378-9064-RB	1	PROM
725-0254	1	33.5 MB Disk Drive Assembly
615-3469	1	UJ-2204 Label
615-3380	1	OIS-55 Label
291-0554-A	1	Software Release 10.J

UJ-2201 and UJ-2203 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single or dual fan OIS-40 to OIS-55 (UJ-2201) or the single or dual fan OIS-45 to OIS-55 (UJ-2203).

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows:

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

Note: If installing UJ-2201, perform step F. If installing UJ-2203, go to step G.

F. Remove the Winchester drive as follows.

1. Remove the mounting screw from underneath the drive and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove the drive from the unit.
4. Remove the four (4) phillips screws securing the drive to the mounting plate. Save mounting plate and screws for installation on the new drive.

G. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save screws to install new rear panel.

Note: If the system contains an IWISE option, perform step H. If the system contains a TC option, perform step I. If not, go on to next Note.

H. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel. Save screws and washers.

I. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear I/O connector panel.

Note: If upgrading a dual fan system, perform steps J through M. If upgrading a single fan system, proceed to next Note.

J. Using a magnetic phillips screwdriver, remove the workstation, printer, and serial I/O cable (twisted pair) connectors from the inner I/O panel. Save screws and washers.

K. Unhinge and remove the rear panel and cables. Set aside for return.

L. Remove connectors from new inner I/O panel. Set new inner panel aside for return.

M. Install the new rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Feed the I/O channel serial cable assembly connector through the bottom connector hole of slot 7 in the card cage assembly I/O panel. Orient the connector so that the red wire is at the top and secure the connector to the I/O panel from inside the card cage.
3. Install workstation ribbon cable connectors 1 through 4 from the rear I/O panel to the bottom connector holes of card cage slots 5 through 2 respectively. Position the connectors so that the red stripe is at the top of the connector and secure.
4. Install Printer A ribbon cable connector pair from the rear I/O panel to the top connector holes of card cage slots 1 and 2 respectively. Position the connectors so that the red stripe on the cable is at the top of the connectors and secure.
5. Install Printer B ribbon cable connector from the rear I/O panel to the top connector hole of card cage slot 3. Position the connector so that the red stripe on the cable is at the top of the connector hole and secure.
6. Go to Note above step S.

Note: If upgrading a single fan system, perform steps N through R.

N. Remove the disk cable connectors (A, B, and floppy) from the inner I/O panel. Save screws and washers.

Note: If system contains an IWISE option, perform step O. If not, go on to step P.

O. Remove IWISE connector from the inner I/O panel. Save screws and washers.

P. Remove the five (5) screws securing the inner I/O panel. Save screws and washers.

Q. Unhinge the rear panel and remove the inner I/O panel. Set aside for return.

R. Install the 270-0937 rear panel as follows:

1. Mount the rear panel on the hinges.
2. Install the inner panel using the screws and washers removed in step P.
3. Install the floppy and Winchester cables on the inner I/O panel. Position cables so that red stripes are on top. (Floppy connector is located above serial I/O connector.)

Note: If system being upgraded has IWISE, perform step 4. If not, proceed to next Note.

4. Secure the IWISE connector to the inner I/O panel at J1 using the screws and washers removed in step O. Position connector so that the black/red wires are at the bottom of the slot.

Note: If the system being upgraded contains the IWISE option, perform step 5. If the system contains the TC option, perform step 6. If not, go on to step 7.

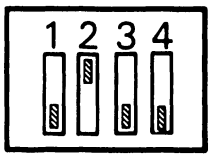
5. Remove the small dummy patch panel in the center of the new connector panel. Install the BNC/TNC connector end of the IWISE cable assembly at the patch panel hole and secure.
6. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel.
7. Unhinge the rear I/O connector panel and secure to the base unit.

Note: If installing UJ-2201, perform step S. If installing UJ-2203, go on to step V.

S. Install the 725-0254 33.5 MB disk drive assembly as follows.

1. Secure mounting plate removed in step F to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

T. Verify that SW1 on the new 210-8267-B PCB is set for 33.5 MB. Install PCB in unit.



OIS-55

O X O O

O = Open Contacts
X = Closed Contacts

U. Check PROM at L47 on 210-8266-B PCB. If it is not rev B or higher, replace it with the PROM (marked 9064) provided. Replace the PCB in the unit.

V. Replace all PCBs in their appropriate slots in the card cage assembly.

W. Replace side covers and front cover by reversing procedures in steps C and D.

X. Place new labels on unit.

1. Remove the backing from the OIS-55 label and place it over the OIS-40 or OIS-45 label on the rear panel.
2. Remove the backing from the UJ-2201 or UJ-2203 label and place above the serial number label.

Y. Run appropriate diagnostics

Z. Install minimum operating system 10.J or higher.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-2201 Kit #289-0833 (Single or Dual Fan OIS-40 to OIS-55)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
378-9064-RB	1	PROM
725-0254	1	33.5 MB Disk Drive Assembly
270-0937	1	Rear Panel Assembly
615-3380	1	OIS-50 Label
615-3466	1	UJ-2201 Label
291-0554-A	1	Software Release 10.J

UJ-2203 Kit #289-0835 (Single or Dual Fan OIS-45 to OIS-55)

Item	Qty	Item Description
270-0937	1	Rear Panel Assembly
615-3380	1	OIS-55 Label
615-3466	1	UJ-2203 Label
291-0554-A	1	Software Release 10.J

UJ-1354, UJ-1355, UJ-1357, UJ-1359, UJ-1361, AND UJ-2208 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the dual fan systems OIS-55 to OIS-65 (UJ-1354), OIS-40 to OIS-65 (UJ-1355), OIS-55 to OIS-70 (UJ-1357), OIS-60-1 to OIS-65 (UJ-1359), OIS-45A to OIS-65 (UJ-1361), or OIS-50 to OIS-65 (UJ-2208).

A. Power off. Remove ac from unit.

B. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

C. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

D. Remove the option boards from card cage (TC, IWS, IPC, and IWISE) as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

Note: If the system contains an IWISE or TC option, perform step E. If not, go on to step M.

E. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save screws and washers.

Note: If the system contains an IWISE option, perform step F. If not, go on to next Note.

F. Using a magnetic phillips screwdriver, remove the IWISE connectors from the inner and outer rear panels. Save screws and washers.

Note: If the system contains a TC option, perform step G. If not, go on to step H.

G. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear I/O connector panel. Disconnect TC cable from inner TC panel. Save screws and washers.

H. Unhinge rear panel and secure to frame. Set aside unit for return.

I. Remove the rear panel of the new unit as described in step E.

Note: If system being upgraded contains the IWISE option, perform step J. If not, go on to next Note.

J. Remove the small dummy patch panel in the center of the new rear connector panel. Install the BNC/TNC connector end of the IWISE cable assembly to the patch panel hole on the rear panel and secure. Using the screws and washers removed in step F, secure the other end to the inner panel at J1. Position connector so that black/red wires are at the bottom of the slot.

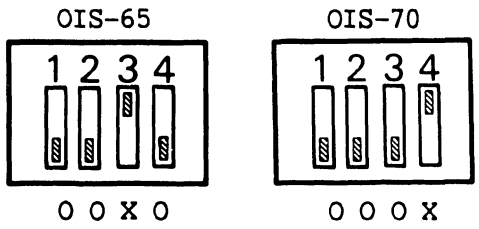
Note: If the system being upgraded contains the TC option, perform step K. If not, go on to step L.

K. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel. Route the other end of the TC cables through the opening in the inner TC panel.

L. Unhinge the rear I/O connector panel and secure to the base unit.

M. Install the option boards (TC, IWISE, IWS, AND IPC) by reversing the procedure described in step D.

N. Verify that SW1 on the 210-8267-B PCB is set for 42 MB (if upgrading to OIS-65) or 67 MB (if upgrading to OIS-70).



0 = Open Contacts
X = Closed Contacts

O. Install board in unit.

P. Replace side covers and front cover by reversing steps B and C.

Q. Remove backing from UJ-1354, UJ-1355, UJ-1357, UJ-1359, UJ-1361, or UJ-2208 label and place above serial number label.

R. Run appropriate diagnostics.

S. Install minimum operating system release 10.J or higher.

Note: For UJ-1357, install operating system 10.H.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1355 Kit #289-0825 (Dual Fan OIS-40 to OIS-65)

Item	Qty	Item Description
187-9585	1	OIS-65 Master 42 MB Drive
615-3458	1	UJ-1355 Label
291-0554-A	1	Software Release 10.J

UJ-1359 Kit #289-0829 (Dual Fan OIS-60-1 to OIS-65)

Item	Qty	Item Description
187-9585	1	OIS-65 Master 42 MB Drive
615-3462	1	UJ-1359 Label
291-0554-A	1	Software Release 10.J

UJ-2208 Kit #289-0840 (Dual Fan OIS-50 to OIS-65)

Item	Qty	Item Description
187-9585	1	OIS-65 Master 42 MB Drive
615-3473	1	UJ-2208 Label
291-0554-A	1	Software Release 10.J

UJ-1354 Kit #289-0824 (Dual Fan OIS-55 to OIS-65)

Item	Qty	Item Description
187-9585	1	OIS-65 Master 42 MB Drive
615-3457	1	UJ-1354 Label
291-0554-A	1	Software Release 10.J

UJ-1357 Kit #289-0827 (Dual Fan OIS-55 to OIS-70)

Item	Qty	Item Description
187-9576	1	OIS-70 Master 67 MB Drive
615-3457	1	UJ-1357 Label
291-0439	1	Software Release 10.H

UJ-1361 Kit #289-0831 (Dual Fan OIS-45A to OIS-65)

Item	Qty	Item Description
187-9585	1	OIS-65 Master 42 MB Drive
615-3457	1	UJ-1361 Label
291-0554-A	1	Software Release 10.J

UJ-1358, UJ-1362, UJ-2205, UJ-2206, UJ-2207 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single fan OIS-40 to OIS-65 (UJ-2205), OIS-45 to OIS-65 (UJ-2206), OIS-50 to OIS-65 (UJ-2207), OIS-55 to OIS-65 (UJ-1362), and OIS-60 to OIS-65 (UJ-1358).

A. Power off. Remove ac from unit.

Note: If installing UJ-1358, go to step C.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right side cover as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

If installing UJ-1358, go on to step G.

E. Use the procedure described in step D to remove the left side cover.

F. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

G. Remove the Winchester drive as follows.

1. Remove the mounting screw securing the drive to the base unit from underneath the drive, and slide the drive forward.
2. Disconnect the power cable and the A and B data cables.
3. Remove drive from unit.
4. Remove four (4) screws securing the drive to the mounting plate. Save mounting plate and screws for connection to the new disk drive.

Note: If installing UJ-1358, go to step O.

H. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save hardware to install new rear panel.

NOTE: If the system contains an IWISE option, perform step I. If the system contains a TC option, perform step J. If not, go on to step K.

I. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel and disconnect from inner I/O panel. Save screws and washers.

J. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear connector panel.

K. Remove disk cable connectors (A, B and floppy) from the inner I/O panel. Save screws and washers.

L. Remove five (5) screws from the inner panel. (These screws are accessed through card cage.)

M. Unhinge and remove the the rear panel.

N. Install the new 270-0935 rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Install the inner panel using screws and washers removed in step L.

NOTE: If the system being upgraded contains the IWISE option, perform step 3. If the system being upgraded contains the TC option, perform step 4. If not, proceed to step 5.

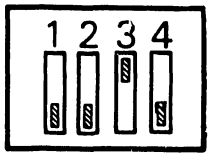
3. Remove the small dummy patch panel in the center of the new rear connector panel. Install the BNC/TNC connector end of the IWISE cable assembly to the patch panel hole and secure. Secure the other end so that the black/red wires are at the bottom of the slot.
4. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel. Route the other end of the cable through the opening in the inner TC panel.
5. Install the floppy and Winchester cables on the inner I/O panel so that the red stripe is on top. (Floppy connector is located above serial I/O connector.)
6. Unhinge the rear I/O connector panel and secure to the base unit.

O. Install the 725-0255 42 MB disk drive assembly as follows.

1. Secure the mounting plate removed in step G to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

If installing UJ-2205 or UJ-2207, perform step P. If installing UJ-2206 or UJ-1362, go on to step Q. If installing UJ-1358 go on to step S.

P. Verify that SW1 on the new 210-8267-B RCU PCB is set for 42 MB.



OIS-65

O O X O

O = Open Contacts
X = Closed Contacts

Q. Install the new 210-8490-A PCB in the unit.

R. Replace all other PCBs in their appropriate slots in the card cage.

S. Replace side covers and front cover by reversing steps B - D.

T. Place new labels on unit.

1. Remove the backing from the OIS-65 label and place it over the OIS-40, OIS-45, OIS-50, OIS-55, or OIS-60 label on the rear panel.
2. Remove the backing from the UJ label and place above the serial number label.

U. Run appropriate diagnostics.

V. Install minimum operating system release 10.J.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1358 Kit #289-0828 (Single Fan OIS-60 to OIS-65)

Item	Qty	Item Description
725-0255	1	42 MB Disk Drive Assembly
615-3381	1	OIS-65 Label
615-3461	1	UJ-1358 Label
291-0554-A	1	Software Release 10.J

UJ-1362 Kit #289-0832 (Single Fan OIS-55 to OIS-65)

Item	Qty	Item Description
210-8490-A	1	RMU PCB
270-0935	1	Rear Panel Assembly
725-0255	1	42 MB Disk Drive Assembly
615-3465	1	UJ-1362 Label
615-3381	1	OIS-65 Label
291-0554-A	1	Software Release 10.J

UJ-2205 Kit #289-0837 (Single Fan OIS-40 to OIS-65)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
210-8490-A	1	RMU PCB
270-0935	1	Rear Panel Assembly
725-0255	1	42 MB Disk Drive Assembly
615-3381	1	OIS-65 Label
615-3466	1	UJ-2205 Label
291-0554-A	1	Software Release 10.J

UJ-2206 Kit #289-0838 (Single Fan OIS-45 to OIS-65)

Item	Qty	Item Description
210-8490-A	1	RMU PCB
270-0935	1	Rear Panel Assembly
725-0255	1	42 MB Disk Drive Assembly
615-3381	1	OIS-65 Label
615-3471	1	UJ-2206 Label

UJ-2207 Kit #289-0839 (Single Fan OIS-50 to OIS-65)

Item	Qty	Item Description
210-8490-A	1	RMU PCB
210-8267-B	1	RCU PCB
270-0935	1	Rear Panel Assembly
725-0255	1	42 MB Disk Drive Assembly
615-3381	1	OIS-65 Label
615-3472	1	UJ-2207 Label
291-0554-A	1	Software Release 10.J

UJ-1356 AND UJ-1360 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single fan OIS-55 to OIS-70 (UJ-1356) and the single fan OIS-65 to OIS-70 (UJ-1360).

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on the guide rail.

F. Remove the Winchester drive as follows.

1. Remove the mounting screw securing the drive to the base unit from underneath the drive, and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove drive from unit.
4. Remove four (4) screws securing the drive to the mounting plate. Save mounting plate and screws for installation on new disk drive.

G. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save hardware to install new rear panel.

Note: If the system contains an IWISE option, perform step H. If the system contains a TC option, perform step I. If not, go on to step J.

H. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel and disconnect from inner I/O panel. Save screws and washers.

I. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear I/O connector panel. Save screws and washers.

J. Using a magnetic phillips screwdriver, remove the disk cable connectors (A, B, and floppy) from the I/O panel. Save screws and washers.

K. Remove five (5) screws from the inner panel. (These screws are accessed through card cage.)

L. Unhinge and remove the rear panel, and remove the inner I/O panel.

M. Install the new 270-1056 rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Install the new inner panel using the screws and washers removed in step K.

Note: If the system being upgraded contains the IWISE option, perform step 3. If not, go on to next Note.

3. Remove the small dummy patch panel in the center of the new rear connector panel. Install the BNC/TNC connector end of the IWISE cable assembly at the patch panel hole and secure. Using hardware removed in step H, secure the other end to the inner panel at J1. Position connector so that black/red wires are at the bottom of the slot.

Note: If the system being upgraded contains the TC option, perform step 4. If not, go on to step 5.

4. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel.
5. Install the floppy and Winchester cables on the inner I/O panel so that the red stripe is on the top. (Floppy is located above the serial I/O connector.)
6. Unhinge the rear I/O connector panel and secure to the base unit.

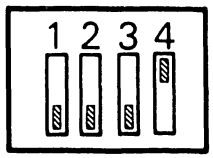
N. Install the 278-4054 67 MB disk drive assembly as follows.

1. Secure the mounting plate removed in step F to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

If installing UJ-1356, perform the following step. If installing UJ-1360, go on to step P.

O. Install the new 210-8490-A PCB in the unit.

P. Verify that SW1 on the 210-8267-B RCU PCB is set for 67 MB. Install board in unit.



OIS-70

O O O X

O = Open Contacts
X = Closed Contacts

Q. Replace all other PCBs in their appropriate slots in the card cage.

R. Replace side covers and front cover by reversing steps B and C.

S. Remove the backing from the UJ-1356 or UJ-1360 label and place above the serial number label.

T. Run appropriate diagnostics.

U. Install minimum operating system release 10.H.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ-1356 Kit #289-0826 (Single Fan OIS-55 to OIS-70)

Item	Qty	Item Description
210-8490-A	1	RMU PCB
270-1056	1	Rear Panel Assembly
278-4054	1	67 MB Disk Drive Assembly
615-3459	1	UJ-1356 Label
291-0439	1	Software Release 10.H

UJ-1360 Kit #289-0830 (Single Fan OIS-65 to OIS-70)

Item	Qty	Item Description
270-1056	1	Rear Panel Assembly
278-4054	1	Disk Drive Assembly
615-3463	1	UJ-1360 Label
291-0439	1	Software Release 10.H

UJ-1292 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the dual fan OIS-40 to OIS-60-1.

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

F. Remove the Winchester drive as follows.

1. Remove the mounting screw from underneath the drive and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove the drive from the unit.
4. Remove the mounting plate from the drive by removing the four (4) phillips screws securing it. Save mounting plate and screws to install on new disk drive.

G. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save screws to install new rear panel.

Note: If the system contains an IWISE option, perform step H. If the system contains a TC option, perform step I. If not, go on to step J.

H. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel. Save screws and washers.

I. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear I/O connector panel.

J. Using a magnetic phillips screwdriver, remove the printer ribbon cable connector from the top connector of slot 3 of the card cage I/O panel. Save screws and washers. Save screws and washers.

K. Using a magnetic phillips screwdriver, remove the workstation ribbon cable connector from slot 5 of the card cage I/O panel. Save screws and washers.

L. Using a magnetic phillips screwdriver, remove the printer/TC cable connector (bottom connector of slot 7 of the card cage assembly I/O panel). Save screws and washers.

M. Unhinge and remove the rear I/O connector panel. Set aside for return.

N. Install the new rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Feed the I/O channel serial cable assembly connector through the bottom connector hole of slot 7 in the card cage assembly I/O panel. Orient the connector so that the red wire is at the top and secure the connector to the I/O panel from inside the card cage.
3. Install workstation ribbon cable connectors 1 through 4 from the rear I/O panel to the bottom connector holes of card cage slots 5 through 2 respectively. Position the connectors so that the red stripe is at the top of the connector and secure.
4. Install Printer A ribbon cable connector pair from the rear I/O panel to the top connector holes of card cage slots 1 and 2 respectively. Position the connectors so that the red stripe on the cable is at the top of the connectors and secure.
5. Install Printer B ribbon cable connector from the rear I/O panel to the top connector hole of card cage slot 3. Position the connector so that the red stripe on the cable is at the top of the connector hole and secure.

Note: If system contains IWISE option, perform step O. If not, go on to next Note.

O. Remove the small dummy patch panel from the center of the new connector panel and install the BNC/TNC connector end of the IWISE cable assembly to the patch panel hole and secure with two phillips screws.

Note: If the system contains TC option, perform step P. If not, go on to step Q.

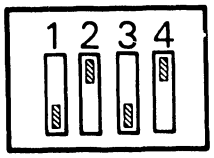
P. Remove the long dummy patch panel from the right side of the new rear panel and install the TC panel removed in step I.

Q. Unhinge the rear panel and secure to the master unit.

R. Install the 278-4034 33.5 MB disk drive assembly as follows.

1. Secure mounting plate removed in step F to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

S. Verify that SW1 on the new 210-8267-B PCB is set for 33.5 MB. Install PCB in unit.



OIS-60-1

O X O X

O = Open Contacts
X = Closed Contacts

T. Replace PROM at L47 on 210-8266 PCB with PROM (marked 9064) provided. Scribe a "-B" on the PCB. Replace the PCB.

U. Replace all PCBs in their appropriate slots in the card cage assembly.

V. Replace side covers and front cover by reversing procedures in steps C and D.

W. Place new labels on unit.

1. Remove the backing from the OIS-60-1 label and place it over the OIS-40 label on the rear panel.
2. Remove the backing from the UJ-1292 label and place above the serial number label.

X. Run appropriate diagnostics.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1292 Kit #289-0314 (Dual Fan OIS-40 to OIS-60-1)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
378-9064	1	PROM
278-4034	1	33.5 MB Disk Drive Assembly
270-0847	1	Rear Panel Assembly
615-2389	1	OIS-60-1 Label
615-2390	1	UJ-1292 Label
650-2160	10	4-40 1/2 Phillips Screws
653-2390	10	No. 4 Flat Washers

UJ-1293 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the dual fan OIS-50 to OIS-60-1.

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of th base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove the Winchester drive as follows.

1. Remove the mounting screw from underneath the drive and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove the drive from the unit.
4. Remove the mounting plate from the drive by removing the four (4) phillips screws securing it. Save mounting plate and screws for installation on the new disk drive.

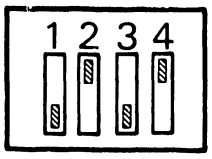
F. Remove the RMU and the RCU PCBs from the master unit as follows:

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

G. Install the 278-4034 33.5 MB disk drive assembly as follows.

1. Secure mounting plate removed in step E to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

H. Verify that SW1 on the new 210-8267-B PCB is set for 33.5 MB. Install PCB in unit.



OIS-60-1

O X O X

O = Open Contacts
X = Closed Contacts

I. Replace PROM at L47 on 210-8266 PCB with PROM (marked 9064) provided. Scribe a "-B" on the PCB. Replace the PCB in the unit.

J. Replace side covers and front cover by reversing procedures in steps C and D.

K. Place new labels on unit.

1. Remove the backing from the OIS-60-1 label and place it over the OIS-50 label on the rear panel.
2. Remove the backing from the UJ-1293 label and place above the serial number label.

L. Run appropriate diagnostics.

M. Install minimum operating system release 9.E2.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1293 Kit #289-0316 (Dual Fan OIS-50 to OIS-60-1)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
378-9064	1	PROM
278-4034	1	33.5 MB Disk Drive Assembly
615-2389	1	OIS-60-1 Label
615-2391	1	UJ-1292 Label

UJ-1294 AND UJ-1295 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single fan OIS-40 or OIS 50 to OIS-60.

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on the guide rail.

F. Remove the Winchester drive as follows.

1. Remove the mounting screw securing the drive to the base unit from underneath the drive, and slide the drive forward.
2. Disconnect the power cable and A and B data cables.
3. Remove drive from unit.
4. Remove four (4) screws securing the drive to the mounting plate. Save mounting plate and screws for installation on new disk drive.

G. Disconnect the I/O ribbon cable at the floppy drive.

H. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save hardware to install new rear panel.

I. Carefully route the ribbon cables disconnected from the disk drives through the cable openings in the drive section of the master unit. Note cable routing.

NOTE: If the system contains an IWISE option, perform step J. If the system contains a TC option, perform step K. If not, go on to step L.

J. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel and disconnect from inner I/O panel. Save screws and washers.

K. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear I/O connector panel. Save screws and washers.

L. Using a magnetic phillips screwdriver, remove the disk cable connectors (A, B, and floppy) from the I/O panel. Save screws and washers.

M. Remove five (5) screws from the inner panel. (These screws are accessed through card cage.)

N. Unhinge and remove the rear panel, and remove the inner I/O panel.

O. Install the new 270-0935 rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Install the new inner panel using the screws and washers removed in step L.

NOTE: If the system being upgraded contains the IWISE option, perform step 3. If not, go on to next Note.

3. Remove the small dummy patch panel in the center of the new rear connector panel. Install the BNC/TNC connector end of the IWISE cable assembly at the patch panel hole and secure. Using hardware removed in step H, secure the other end to the inner panel at J1. Position connector so that black/red wires are at the bottom of the slot.

NOTE: If the system being upgraded contains the TC option, perform step 4. If not, go on to step 5.

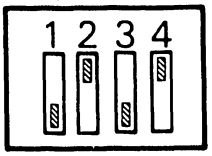
4. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel.
5. Install the floppy and Winchester cables on the inner I/O panel so that the red stripe is on the top. (Floppy is located above the serial I/O connector.)
6. Unhinge the rear I/O connector panel and secure to the base unit.

P. Install the 278-4034 33.5 MB disk drive assembly as follows.

1. Secure the mounting plate removed in step F to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

Q. Install the new 210-8490-A RMU PCB in the unit.

R. Verify that SW1 on the 210-8267-B RCU PCB is set for 33.5 MB. Install board in unit.



OIS-60

O X O X

O = Open Contacts
X = Closed Contacts

S. Replace all other PCBs in their appropriate slots in the card cage.

T. Replace side covers and front cover by reversing steps B and C.

U. Place new labels on unit.
   1. Remove the backing from the OIS-60 label and place it over the OIS-40 or OIS-50 label on the rear panel.
   2. Remove the backing from the UJ-1294 or UJ-1295 label and place above the serial number label.

V. Run appropriate diagnostics.

W. Install minimum operating system release 9.2E.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1294/UJ-1295 Kit #289-0315 (Single Fan OIS-40 to OIS-60 and Single Fan OIS-50 to OIS-60

Item	Qty	Item Description
210-8267-B	1	RCU PCB
210-8490-A	1	RMU PCB
270-0935	1	Rear Panel Assembly
278-4034	1	33.5 MB Disk Drive Assembly
615-2392	1	UJ-1294 Label
615-2393	1	UJ-1295 Label

UJ-1338 and UJ-1339 INSTALLATION PROCEDURE

The following instructions provide the information necessary to upgrade the single fan OIS-50 to OIS-70 (UJ-1338) and the single fan OIS-60 to OIS-70 (UJ-1339).

A. Power off. Remove ac from unit.

B. Disconnect all external cables from the rear panel and mark each one for correct reconnection.

C. Remove the front cover of the base unit as follows.

1. Lift flap above floppy drive and remove two (2) screws.
2. Remove screws from bottom corners.
3. Pull cover forward and off. Set aside.

D. Remove the right and left side covers as follows:

1. Remove three (3) phillips screws.
2. Slide cover to rear and lift off. Set aside.

E. Remove all PCBs from the unit as follows: **DO NOT STACK BOARDS**

1. Pull lever clamps away from board.
2. Slide board forward on guide rail.

F. Remove the Winchester drive as follows.

1. Remove the mounting screw securing the drive to the base unit from underneath the drive, and slide the drive forward.
2. Disconnect the power cable and the A and B data cables.
3. Remove drive from unit.
4. Remove four (4) screws securing the drive to the mounting plate. Save mounting plate and screws for installation on the new drive.

G. Remove the eight (8) phillips screws securing the rear I/O connector panel and mount the rear panel onto its hinges. Save hardware to install new rear panel.

NOTE: If the system contains an IWISE option, perform step H. If the system contains a TC option, perform step I. If not, go on to step J.

H. Using a magnetic phillips screwdriver, remove the IWISE connector panel from the rear panel and disconnect from inner I/O panel. Save screws and washers.

I. Using a magnetic phillips screwdriver, carefully remove the TC panel, with connectors, from the rear connector panel.

J. Remove disk cable connectors (A, B and floppy) from the inner I/O panel. Save screws and washers.

K. Remove five (5) screws from the inner panel. (These screws are accessed through card cage.)

L. Unhinge and remove the rear panel.

M. Install the new 270-1056 rear panel as follows.

1. Mount the new rear panel on the hinges.
2. Install the inner panel using screws and washers removed in step L.

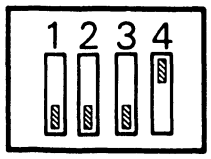
NOTE: If the system being upgraded contains the IWISE option, perform step 3. If the system being upgraded contains the TC option, perform step 4. If not, proceed to step 5.

3. Remove the small dummy patch panel in the center of the new rear connector panel. Install the BNC/TNC connector end of the IWISE cable assembly at the patch panel hole and secure. Secure the other end so that the black/red wires are at the bottom of slot 1.
4. Remove the dummy patch panel from the right side of the new rear panel and install the TC panel.
5. Install the floppy and Winchester cables on the inner I/O panel so that the red stripe is on top. (Floppy connector is located above serial I/O connector.)
6. Unhinge the rear I/O connector panel and secure to the base unit.

N. Install the 278-4054 67 MB disk drive assembly as follows.

1. Secure the mounting plate removed in step G to the disk drive assembly.
2. Connect the power cable and the data cables.
3. Ensuring that cables are not crushed, carefully slide the drive back into the unit.
4. Replace mounting screw.

O. Verify that SW1 on the new 210-8267-B RCU PCB is set for 67 MB.



OIS-70

O O O X

O = Open Contacts
X = Closed Contacts

P. Install the new board in unit.

Q. Install the new 210-8490-A PCB in the unit.

R. Replace all other PCBs in their appropriate slots in the card cage assembly.

S. Replace side covers and front cover by reversing steps B - D.

T. Run appropriate diagnostics.

U. Install minimum operating system release 10.H.

Removed Parts Disposition

Return removed parts to your Field Service Center (FSC).

UJ Kit Parts Listing

UJ-1338 Kit #289-0549 (Single Fan OIS-50 to OIS-70)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
210-8490-A	1	RMU PCB
270-1056	1	Rear Panel Assembly
278-4054	1	67 MB Disk Drive
291-0439	1	Software Release 10.H

UJ-1339 Kit #289-0550 (Single Fan OIS-60 to OIS-70)

Item	Qty	Item Description
210-8267-B	1	RCU PCB
210-8490-A	1	RMU PCB
270-1056	1	Rear Panel Assembly
278-4054	1	67 MB Disk Drive
291-0439	1	Software Release 10.H

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