MAINTENANCE AND SERVICE GUIDE

COMPAQ DESKPRO
Personal Computer

COMPAQ DESKPRO 286
Personal Computer

COMPAQ

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COMPAQ DESKPRO® PERSONAL COMPUTER
COMPAQ DESKPRO 286® PERSONAL COMPUTER
MAINTENANCE AND SERVICE GUIDE

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NOTICE

Compaq Computer Corporation requires that all peripheral devices be connected to COMPAQ personal computers via shielded cables with metal RFI/EMI connector hoods.

WIRE TYPE:	Multipaired overall shielded; Belden #98XX; Alpha #54XX; or equivalent.
CONNECTOR HOOD:	RFI/EMI metal shield; AMP #74517X-X; or equivalent.

It is important that the chassis groundstrap of the peripheral device be connected to the computer chassis. An Alpha #1221 flat-braided strap is sufficient. The strap is not necessary if a shielded cable connects the two chassis.

PREFACE

The **COMPAQ DESKPRO** and **COMPAQ DESKPRO 286 MAINTENANCE AND SERVICE GUIDE** is a troubleshooting maintenance and repair guide that can be used as a reference when servicing the COMPAQ DESKPRO and the COMPAQ DESKPRO 286 Personal Computers.

All troubleshooting and repair procedures are detailed to allow subassembly/module level repair only.

CAUTION

Because of the complexity of the individual boards and subassemblies, Compaq Computer Corporation strongly recommends that you do not attempt to make field repairs at the component level.

REQUIRED TOOLS AND SUPPLIES

To service the COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers, you need:

- ☐ Torx T-10 screwdriver
- ☐ Torx T-15 screwdriver
- ☐ Small, flat-bladed screwdriver
- ☐ COMPAQ Personal Computer ADVANCED DIAGNOSTICS diskette
- ☐ Formatted scratch diskette(s)
- ☐ 25-pin printer loopback plug (part no. 100755-001)
- ☐ 25-pin serial loopback plug (part no. 100754-001)
- ☐ 9-pin serial loopback plug (part no. 102999-001)

Optional tools are:

- ☐ Digital voltmeter
- ☐ Chip insertion tool
- ☐ Chip removal tool
- ☐ Diskette drive signal extension cable (part no. 100546-001)
- ☐ Diskette drive power extension cable (part no. 100545-001)

ADDITIONAL INFORMATION

The following documentation and related software are available to support the COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers.

Associated Documentation:

- ☐ *COMPAQ DESKPRO 286 PERSONAL COMPUTER OPERATIONS GUIDE* (part no. 102552-003)
- ☐ *COMPAQ DESKPRO PERSONAL COMPUTER OPERATIONS GUIDE* (part no. 101376-001)
- ☐ *80286-BASED PRODUCTS TECHNICAL REFERENCE GUIDE* (part no. 102786-001)
- ☐ *MS-DOS® VERSION 3.3 REFERENCE GUIDE* (part no. 106979-001)
- ☐ *BASIC VERSION 3.3 REFERENCE GUIDE* (part no. 106983-001)
- ☐ *SERVICE ADVISORIES*
- ☐ *SERVICE BULLETINS*
- ☐ *HOW TO DO BUSINESS WITH COMPAQ CUSTOMER SERVICE*
- ☐ *COMPAQ ENHANCED COLOR GRAPHICS BOARD OPERATIONS AND INSTALLATION GUIDE* (part no. 106396-001)
- ☐ *COMPAQ ENHANCED COLOR GRAPHICS BOARD TECHNICAL REFERENCE GUIDE* (part no. 106450-001)
- ☐ *COMPAQ SERVICE QUICK REFERENCE GUIDE* (part no. 107315)
- ☐ *COMPAQ VIDEO GRAPHICS CONTROLLER BOARD TECHNICAL REFERENCE GUIDE* (part no. 109188-001)

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Chapter 1
OPERATING AND PERFORMANCE SPECIFICATIONS

1.1 INTRODUCTION

This chapter provides operating and performance specifications for the COMPAQ DESKPRO® Personal Computer and the COMPAQ DESKPRO 286® Personal Computer.

COMPAQ DESKPRO Personal Computer:

- ☐ System Unit
- ☐ 83-Key Keyboard
- ☐ COMPAQ Enhanced Keyboard
- ☐ COMPAQ Dual-Mode Monitor
- ☐ COMPAQ Color Monitor
- ☐ VGA Monochrome Graphics Monitor
- ☐ VGA Color Graphics Monitor
- ☐ 5 1/4-Inch 360-Kbyte Diskette Drive
- ☐ 10-Megabyte Fixed Disk Drive
- ☐ 20-Megabyte Fixed Disk Drive
- ☐ 30-Megabyte Fixed Disk Drive
- ☐ 10-Megabyte Tape Backup

COMPAQ DESKPRO 286 Personal Computer:

- ☐ System Unit
- ☐ 84-Key Keyboard
- ☐ COMPAQ Enhanced Keyboard
- ☐ COMPAQ Dual-Mode Monitor
- ☐ COMPAQ Color Monitor
- ☐ VGA Monochrome Graphics Monitor
- ☐ VGA Color Graphics Monitor
- ☐ 5 1/4-Inch 360-Kbyte Diskette Drive
- ☐ 5 1/4-Inch 1.2-Megabyte Diskette Drive
- ☐ 3 1/2-Inch 1.44-Megabyte Diskette Drive (12-MHz)
- ☐ 20-Megabyte Fixed Disk Drive (8-MHz)
- ☐ 20-Megabyte Fixed Disk Drive (Integrated) (12-MHz)
- ☐ 30-Megabyte Fixed Disk Drive (8-MHz)
- ☐ 40-Megabyte Fixed Disk Drive (Integrated)
- ☐ 70-Megabyte Fixed Disk Drive
- ☐ 130-Megabyte Fixed Disk Drive (12-MHz)
- ☐ 10-Megabyte Tape Backup (8-MHz)
- ☐ 40-Megabyte Tape Backup (12-MHz)
- ☐ 135-Megabyte Tape Backup (12-MHz)

1.2 COMPAQ DESKPRO SPECIFICATIONS

Table 1-1. System Unit

Dimensions	
Height:	6.3 in. (16.3 cm)
Depth:	16.5 in. (42.0 cm)
Width:	19.8 in. (50.3 cm)
Weight	
Model 2:	38.6 lb (17.5 kg)
Environmental Requirements	
Temperature:	
Operating:	Not less than 50° F or more than 104° F (10° C to 40° C)
Nonoperating:	Not less than 50° F or more than 140° F (10° C to 60° C)
Shipping (adequately packed):	Not less than −22° F or more than 140°F (−30° C to 60° C)

Continued...

Table 1-1. System Unit *Continued*

Humidity		
Operating:	Not less than 20% or more than 80% (noncondensing)	
Nonoperating:	Not less than 5% or more than 90% (noncondensing)	
Heat Output	1229 BTU/hour (maximum) Varies according to options installed	
Shock	20 g, for 11 ms, half sine, nonoperating, not in shipping container	
Maximum Altitude		
Operating:	10,000 feet (3000 m)	
Shipping:	50,000 feet (15000 m)	
Vibration	1.0 g, 0 to peak sinusoidal from 5 Hz to 500 Hz, nonoperating (not in original shipping container)	
Power Requirements	**U.S.**	**International**
Nominal Line Voltage:	120 VAC, 60 Hz	230 VAC, 50 Hz
Range Line Voltage:	102 to 132 VAC	204 to 264 VAC
Line Frequency:	47 to 62 Hz	47 to 62 Hz
Power	160 watts (steady state)	
	U.S.	**International**
Current	3 A (fuse rating)	2.5 A (fuse rating)
	U.S.	**International**
Nominal Input Voltage	120 VAC/60 Hz	220/240 VAC/50 Hz

Table 1-2. 83-Key Keyboard

Dimensions	
Height:	1.40 in. (3.8 cm)
Depth:	7.06 in. (17.8 cm)
Width:	18.25 in. (46.3 cm)
Weight	3.5 lb (1.6 kg)
Power	
Volts:	5 VDC
Current:	200 mA maximum, 80 mA nominal
Cable	
Length:	22.75 in. (57.8 cm) retracted 6 ft (1.8 m) extended
Interface:	5-pin circular DIN-type connector (shell provides chassis ground)

Table 1-3. COMPAQ Enhanced Keyboard

Dimensions	
Height:	8.30 in. (21.1 cm)
Depth:	1.50 in. (3.8 cm)
Width:	19.25 in. (48.9 cm)
Weight	3.8 lb (1.7 kg)
Power	
Volts:	5 VDC
Current:	250 mA maximum
Number of Keys	101 (102 keys for international keyboards)
Cable	
Length:	45 in. (106.68 cm) retracted 98 in. (190 cm) extended
Interface:	5-pin circular DIN-type connector located on the system side (shell provides chassis ground) 6-pin SDL-type connector located on keyboard side (shell provides chassis ground)

Table 1-4. COMPAQ Dual-Mode Monitor

Dimensions	
Height:	10.25 in. (26.0 cm)
Depth:	13.75 in. (34.9 cm)
Width:	14.75 in. (37.5 cm)
Weight	18.2 lb (8.3 kg)

Display

- ☐ Integral implosion protection
- ☐ 12-Inch screen (diagonal)
- ☐ Radiation compliance with DDHS 21 CFR Subchapter J
- ☐ 90-Degree deflection
- ☐ Medium-persistence green or amber phosphor
- ☐ Dual-Mode monochrome
- ☐ 80/40 characters by 25 lines
- ☐ Etched screen surface to reduce glare

Signal Cable	
Length:	29 in. (73.7 cm)
Interface:	Shielded 9-pin subminiature male d-type connector

Continued...

Table 1-4. COMPAQ Dual-Mode Monitor *Continued*

Power Cable	
Type:	2-conductor with braided shield
Length:	29 in. (73.7 cm)
Gauge:	20 AWG
Interface:	Shielded 3-pin circular male DIN-type connector
Power	
Volts:	12 VDC nominal
Current:	2 A maximum, 1.5 nominal
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	50°F to 140°F (10°C to 60°C)
Humidity:	5% to 90% (noncondensing)
Altitude:	
Operating:	Mean sea level to 10000 ft (3000 m)
Nonoperating:	Mean sea level to 30000 ft (9000 m)

Table 1-5. COMPAQ Color Monitor

Dimensions	
Height:	11.8 in. (30.0 cm)
Depth:	15.0 in. (38.1 cm)
Width:	13.9 in. (35.3 cm)
Weight	27.5 lb (12.5 kg)
Display	
☐ 13-Inch diagonal screen	
☐ 90-Degree deflection	
☐ 640 or 320 pixels × 350 scan lines (16 colors from a palette of 64 colors)	
☐ 640 or 320 pixels × 200 scan lines (16 colors from a palette of 64 colors)	
☐ Dot pitch 0.41 mm	
Signal Cable	
Length:	58.5 in. (150 ± 2.5 cm)
Interface:	Shielded 9-pin subminiature male D-type connector

Continued...

Table 1-5. COMPAQ Color Monitor *Continued*

Power Cable	
Type:	2-conductor with ground
Length:	40 in. (1 m)
Interface:	NEMA 5 – 15P
Power	
Volts:	120 VAC, 60 Hz (North American units only) 220 to 240 VAC, 50 to 60 Hz (international units)
Wattage:	100 watts
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	50°F to 140°F (10°C to 60°C)
Humidity:	5% to 90% (noncondensing)
Altitude:	Sea level to 7000 ft (2100 m)*

*Reduced operating temperature above 7000 ft.

Table 1-6. VGA Monochrome Graphics Monitor

Dimensions	
Height:	10.2 in. (26.0 cm)
Depth:	12.6 in. (32.1 cm)
Width:	11.7 in. (29.8 cm)
Weight	13.0 lb (5.9 kg)
Display	
☐ 640 pixel × 480 line VGA-compatible graphics resolution	
☐ 640 pixel × 350 line EGA-compatible graphics resolution	
☐ 320 pixel × 200 line CGA-compatible graphics resolution	
☐ 720 pixel × 400 line text resolution	
☐ Up to 64 shades of gray	
☐ 70 Hz vertical scan rate (60 Hz for 640 × 480 mode)	
☐ 12-in. screen (diagonal) (30.5 cm)	
☐ Anti-glare screen	
Signal Cable	
Length:	72 in. (1.8 cm)
Interface:	Analog 15-pin video connector
Power	
Volts:	115 VAC (60 Hz) North American units 230 VAC (50 to 60 Hz) international units
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	14°F to 131°F (– 10°C to 55°C)
Humidity:	10% to 90% (noncondensing)
Altitude:	Sea level to 12000 ft (3658 m)

Table 1-7. VGA Color Graphics Monitor

Dimensions	
Height:	14.1 in. (35.7 cm)
Depth:	14.6 in. (37.0 cm)
Width:	13.8 in. (35.0 cm)
Weight	45.0 lb (20.5 kg)
Display	
☐ 640 pixel × 480 line VGA-compatible graphics resolution	
☐ 640 pixel × 350 line EGA-compatible graphics resolution	
☐ 320 pixel × 200 line CGA-compatible graphics resolution	
☐ 720 pixel × 400 line text resolution	
☐ Up to 256 colors out of a 262,144 color palette	
☐ .31 mm dot pitch	
☐ 70 Hz vertical scan rate (60 Hz for 640 × 480 mode)	
☐ 14-in. screen (diagonal) (35.6 cm)	
☐ Anti-glare screen	
Signal Cable	
Length:	72 in. (1.8 m)
Interface:	Analog 15-pin video connector
Power Cable	
Type:	NEMA 5-15P (parallel blade plug, North American units only)
Power	
Volts:	115 VAC (60 Hz) North American units 230 VAC (50 to 60 Hz) international units
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	14°F to 131°F (− 10°C to 55°C)
Humidity:	10% to 90% (noncondensing)
Altitude:	Sea level to 12000 ft (3658 m)

Table 1-8. 5 1/4-Inch 360-Kbyte Diskette Drive

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.75 in. (14.6 cm)
	(allow .375 in. (0.95 cm) for installing rails)
Weight	3.2 lb (1.4 kg)
Data Transfer Rate	250 Kbits per second
Media	5 1/4-inch dual-density, double-sided diskette
Tracks per Inch:	48
Tracks per Side:	40
Average Access Time	80 ms
Rotational Speed	300 rpm ± 1.5%
Motor Start Time	500 ms
Sectors per Track	9
Bytes per Sector	512

Table 1-9. 10-Megabyte Fixed Disk Drive

Dimensions	
Height:	1.69 in. (4.3 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.87 in. (14.9 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	3.5 lb (1.6 kg)
Drive Type (used in SETUP program)	1
Number of Data Heads	4
Number of Cylinders	306
Average Access Time	105 ms
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-10. 20-Megabyte Fixed Disk Drive

Dimensions	
Height:	1.69 in. (4.3 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.87 in. (14.9 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	3.5 lb (1.6 kg)
Drive Type (used in SETUP program)	2
Number of Data Heads	4
Number of Cylinders	615
Average Access Time	105 ms
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-11. 30-Megabyte Fixed Disk Drive

Dimensions	
Height:	3.38 in. (8.6 cm)
Depth:	8.00 in. (20.3 cm)
Width:	5.87 in. (14.9 cm)
	(allow .375 in. (0.95 cm) for installing rails)
Weight	7.5 lb (3.4 kg)
Drive Type	
(used in SETUP program:	6
Number of Data Heads	5
Number of Cylinders	697
Average Access Time	35 ms
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-12. 10-Megabyte Tape Backup

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.87 in. (14.9 cm)
	(allow .375 in. (0.95 cm) for installing rails)
Weight	1.7 lb (0.8 kg)
Media	DC 1000 read/write streaming cartridge (manufactured by the 3M Corporation) or equivalent
Head Positioning Time	
Adjacent Tracks:	250 ms
Move (worst case):	1 second
Tape Speed	
Read/Write:	39 in. per second
Rewind/Fast Forward:	70 in. per second
Tape End-to-End Positioning Time	
Read/Write:	57 seconds
Forward/Reverse:	31 seconds
Track Density	59 tpi
Number of Tracks	8
Blocks/Track	158
Data Sectors/Block	8
Bytes/Sector	1024

1.3 COMPAQ DESKPRO 286 SPECIFICATIONS

Table 1-13. System Unit

Dimensions	
Height:	6.4 in. (16.2 cm)
Depth:	16.5 in. (41.9 cm)
Width:	19.8 in. (50.3 cm)
Weight	
Model 1:	37 lb (16.7 kg) (8-MHz system)
Model 20:	42.4 lb (19.1 kg) (12-MHz system)
Model 40:	42.4 lb (19.1 kg) (12-MHz system)
Environmental Requirements	
Temperature:	
Operating:	Not less than 50°F or more than 104°F (10° C to 40°C)
Nonoperating:	Not less than 50°F or more than 140°F (10° C to 60°C)
Shipping (adequately packed):	−22°F to 140°F (−30°C to 60°C)

Continued...

Table 1-13. System Unit *Continued*

Humidity		
Operating:	Not less than 20% or more than 80% (noncondensing)	
Nonoperating:	Not less than 5% or more than 90% (noncondensing)	
Heat Output	1229 btu maximum Varies according to options installed	
Altitude		
Operating:	10,000 ft (3000 m)	
Shipping:	50,000 ft (15000 m)	
Power Requirements	**U.S.**	**International**
Nominal Line Voltage:	120 VAC, 60 Hz	220/240 VAC, 50 Hz
Range Line Voltage:	102 to 132 VAC	204 to 264 VAC
Line Frequency:	47 to 62 Hz	47 to 62 Hz
Power	192 watts (steady state)	
Fuse	**U.S.**	**International**
	5A	4A

Table 1-14. 84-Key Keyboard

Dimensions	
Height:	1.50 in. (3.8 cm)
Depth:	7.00 in. (17.7 cm)
Width:	18.25 in. (46.4 cm)
Weight	2.5 lb (1.1 kg)
Power	
Volts:	5 VDC
Current:	250 mA maximum
Cable	
Length:	38 in. (97.0 cm) retracted 75 in. (190.0 cm) extended
Interface:	5-pin circular DIN-type connector (shell provides chassis ground)

Table 1-15. COMPAQ Enhanced Keyboard

Dimensions	
Height:	8.30 in. (21.1 cm)
Depth:	1.50 in. (3.8 cm)
Width:	19.25 in. (48.9 cm)
Weight	3.8 lb (1.7 kg)
Power	
Volts:	5 VDC
Current:	250 mA maximum
Number of Keys	101 (102 keys for international keyboards)
Cable	
Length:	45 in. (106.68 cm) retracted 98 in. (190 cm) extended
Interface:	5-pin circular DIN-type connector located on the system side (shell provides chassis ground) 6-pin SDL-type connector located on keyboard side (shell provides chassis ground)

Table 1-16. COMPAQ Dual-Mode Monitor

Dimensions	
Height:	10.25 in. (26.0 cm)
Depth:	13.75 in. (34.9 cm)
Width:	14.75 in. (37.5 cm)
Weight	18.2 lb (8.3 kg)
Display	
☐ Integral implosion protection	
☐ 12-Inch screen (diagonal)	
☐ Radiation compliance with DDHS 21 CFR Subchapter J	
☐ 90-Degree deflection	
☐ Medium-persistence green or amber phosphor	
☐ Dual-Mode monochrome	
☐ 80/40 characters by 25 lines	
☐ Etched screen surface to reduce glare	
Signal Cable	
Length:	29 in. (73.7 cm)
Interface:	Shielded 9-pin subminiature male d-type connector

Continued...

Table 1-16. COMPAQ Dual-Mode Monitor *Continued*

Power Cable	
Type:	2-conductor with braided shield
Length:	29 in. (73.7 cm)
Gauge:	20 AWG
Interface:	Shielded 3-pin circular male DIN-type connector
Power	
Volts:	12 VDC nominal
Current:	2 A maximum, 1.5 nominal
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	50° to 140°F (10°C to 60°C)
Humidity:	5% to 90% (noncondensing)
Altitude:	
Operating:	Mean sea level to 10000 ft (3000 m)
Nonoperating:	Mean sea level to 30000 ft (9000 m)

Table 1-17. COMPAQ Color Monitor

Dimensions	
Height:	11.8 in. (30.0 cm)
Depth:	15.0 in. (38.1 cm)
Width:	13.9 in. (35.3 cm)
Weight	27.5 lb (12.5 kg)
Display	
☐ 13-Inch diagonal screen	
☐ 90-Degree deflection	
☐ 640 or 320 pixels × 350 scan lines (16 colors from a palette of 64 colors)	
☐ 640 or 320 pixels × 200 scan lines (16 colors from a palette of 64 colors)	
☐ Dot pitch 0.41 mm	
Signal Cable	
Length:	58.5 in. (150 ± 2.5 cm)
Interface:	Shielded 9-pin subminiature male D-type connector

Continued...

Table 1-17. COMPAQ Color Monitor *Continued*

Power Cable	
Type:	2-conductor with ground
Length:	40 in. (1 m)
Interface:	NEMA 5 – 15P
Power	
Volts:	120 VAC, 60 Hz (North American units only) 220 to 240 VAC, 50 to 60 Hz (international units)
Wattage:	100 watts
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	50°F to 140°F (10°C to 60°C)
Humidity:	5% to 90% (noncondensing)
Altitude:	Sea level to 7000 ft (2100 m)*

*Reduced operating temperature above 7000 ft.

Table 1-18. VGA Monochrome Graphics Monitor

Dimensions	
Height:	10.2 in. (26.0 cm)
Depth:	12.6 in. (32.1 cm)
Width:	11.7 in. (29.8 cm)
Weight	13.0 lb (5.9 kg)
Display	
☐ 640 pixel × 480 line VGA-compatible graphics resolution	
☐ 640 pixel × 350 line EGA-compatible graphics resolution	
☐ 320 pixel × 200 line CGA-compatible graphics resolution	
☐ 720 pixel × 400 line text resolution	
☐ Up to 64 shades of gray	
☐ 70 Hz vertical scan rate (60 Hz for 640 × 480 mode)	
☐ 12-in. screen (diagonal) (30.5 cm)	
☐ Anti-glare screen	
Signal Cable	
Length:	72 in. (1.8 cm)
Interface:	Analog 15-pin video connector
Power	
Volts:	115 VAC (60 Hz) North American units 230 VAC (50 to 60 Hz) international units
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	14°F to 131°F (−10°C to 55°C)
Humidity:	10% to 90% (noncondensing)
Altitude:	Sea level to 12000 ft (3658 m)

Table 1-19. VGA Color Graphics Monitor

Dimensions	
Height:	14.1 in. (35.7 cm)
Depth:	14.6 in. (37.0 cm)
Width:	13.8 in. (35.0 cm)
Weight	45.0 lb (20.5 kg)
Display	
☐ 640 pixel × 480 line VGA-compatible graphics resolution	
☐ 640 pixel × 350 line EGA-compatible graphics resolution	
☐ 320 pixel × 200 line CGA-compatible graphics resolution	
☐ 720 pixel × 400 line text resolution	
☐ Up to 256 colors out of a 262,144 color palette	
☐ .31 mm dot pitch	
☐ 70 Hz vertical scan rate (60 Hz for 640 × 480 mode)	
☐ 14-in. screen (diagonal) (35.6 cm)	
☐ Anti-glare screen	
Signal Cable	
Length:	72 in. (1.8 m)
Interface:	Analog 15-pin video connector
Power Cable	
Type:	NEMA 5-15P (parallel blade plug, North American units only)
Power	
Volts:	115 VAC (60 Hz) North American units 230 VAC (50 to 60 Hz) international units
Environmental Requirements	
Temperature:	
Operating:	50°F to 104°F (10°C to 40°C)
Nonoperating:	14°F to 131°F (−10°C to 55°C)
Humidity:	10% to 90% (noncondensing)
Altitude:	Sea level to 12000 ft (3658 m)

Table 1-20. 5 1/4-Inch 360-Kbyte Diskette Drive

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.75 in. (14.6 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	3.2 lb (1.4 kg)
Data Transfer Rate	250 Kbits per second
Media	5 1/4-inch dual-density, double-sided diskette
Tracks per Inch:	48
Tracks per Side:	40
Average Access Time	80 ms
Rotational Speed	300 rpm ± 1.5%
Motor Start Time	500 ms
Sectors per Track	9
Bytes per Sector	512

Table 1-21. 5 1/4-Inch 1.2-Megabyte Diskette Drive

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.75 in. (14.6 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	3.2 lb (1.4 kg)
Data Transfer Rate	300/500 Kbits per second
Media	5 1/4-inch dual-density, double-sided diskette and high density, double sided diskette
Tracks per Inch:	96 (1.2-megabyte mode)
Number of Tracks:	80 (1.2-megabyte mode) per side
Tracks per Inch:	48 (360-Kbyte mode)
Number of Tracks:	40 (360-Kbyte mode) per side
Average Access Time	79 ms
Rotational Speed	360 rpm
Motor Start Time	500 ms
Sectors per Track	
1.2-megabyte mode:	15
360-Kbyte mode:	9
Bytes per Sector	512

Table 1-22. 3 1/2-Inch 1.44-Megabyte Diskette Drive

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (20.9 cm)
Width:	6.12 in. (15.5 cm)
Weight	1.75 lb (0.79 kg)
Data Transfer Rate	250/500 kbits per second
Media	3 1/2-inch double-sided diskette dual-density (720-Kbyte mode) high-density (1.44-megabyte mode)
Tracks per Inch:	135
Number of Tracks:	80 per side
Average Access Time	80 ms
Rotational Speed	300 rpm
Motor Start Time	400 ms
Sectors per Track	9 (720-Kbyte mode) 18 (1.44-megabyte mode)
Bytes per Sector	512

Table 1-23. 20-Megabyte Fixed Disk Drive

Dimensions	
Height:	1.69 in. (4.3 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.87 in. (14.9 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	3.5 lb (1.6 kg)
Drive Type (used in SETUP program):	2
Number of Data Heads	4
Number of Cylinders	615
Average Access Time	
8-MHz (5 1/4"):	105 ms
12-MHz (3 1/2"):	Less than 30 ms
Data Transfer Rate	5 megabits per second

Table 1-24. 30-Megabyte Fixed Disk Drive

Dimensions	
Height:	3.38 in. (8.6 cm)
Depth:	8.00 in. (20.3 cm)
Width:	5.87 in. (14.9 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	7.5 lb (3.4 kg)
Drive Type (used in SETUP program):	6
Number of Data Heads	5
Number of Cylinders	697
Average Access Time	35
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-25. 40-Megabyte Fixed Disk Drive

Dimensions	
Height:	1.6 in. (4.1 cm)
Depth:	8.8 in. (22.4 cm)
Width:	5.8 in. (14.6 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	4.2 lb (1.9 kg)
Drive Type (used in SETUP program):	17
Number of Data Heads	5
Number of Cylinders	980
Average Access Time	Less than 30 ms
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-26. 70-Megabyte Fixed Disk Drive

Dimensions	
Height:	3.38 in. (8.6 cm)
Depth:	8.00 in. (20.3 cm)
Width:	5.87 in. (14.9 cm)
	(allow .375 in. (0.95 cm) for installing rails)
Weight	7.5 lb (3.4 kg)
Drive Type	
(used in SETUP program):	12
Number of Data Heads	9
Number of Cylinders	925
Average Access Time	30 ms
Data Transfer Rate	5 megabits per second
Sectors per Track	17

Table 1-27. 130-Megabyte Fixed Disk Drive

Dimensions	
Height:	3.38 in. (8.6 cm)
Depth:	8.00 in. (20.3 cm)
Width:	5.87 in. (14.9 cm)
	(allow .375 in. (0.95 cm) for installing rails)
Weight	7.5 lb (3.4 kg)
Drive Type (used in SETUP program):	35 or 25[1]
Number of Data Heads	8
Number of Cylinders	966
Average Access Time	Less than 20 ms (25 ms for international)
Data Transfer Rate	10 megabits per second
Sectors per Track	34
Interleave	1:1[2] or 3:1[3]

[1] MS-DOS 3.1 or earlier suggests drive type 25 only. Use drive type 25 if the application software suggests only 17 sectors per track.

[2] When used with ESDI Controller Board (assy. no. WD1007AWAH)

[3] When used with ESDI Controller Board (assy. no. WD1005WAH)

Table 1-28. 10-Megabyte Tape Backup

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.25 in. (21.0 cm)
Width:	5.87 in. (14.9 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	1.7 lb (0.8 kg)
Media	DC 1000 read/write streaming cartridge (manufactured by the 3M Corporation) or equivalent
Tape Speed	
Read/Write:	39 in. per second
Rewind/Fast Forward:	70 in. per second
Tape End-to-End Positioning Time	
Read/Write:	57 seconds
Forward/Reverse:	31 seconds
Track Density	59 tpi
Number of Tracks	8
Blocks/Track	158
Data Sectors/Block	8
Bytes/Sector	1024

Table 1-29. 40-Megabyte Tape Backup

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.00 in. (20.3 cm)
Width:	5.75 in. (14.6 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	1.7 lb (0.77 kg)
Media	DC 2000 streaming cartridge (manufactured by the 3M Corporation) or equivalent DC 1000 read/only streaming cartridge (manufactured by the 3M Corporation) or equivalent
Tape Speed	
Read/Write:	50 in. per second
Rewind/Fast Forward:	70 in. per second
Tape End-to-End Positioning Time	
Read/Write:	49 seconds
Forward/Reverse:	35 seconds
Track Density	83 tpi
Number of Tracks	20
Blocks/Track	124
Data Sectors/Block	16
Bytes/Sector	1024

Table 1-30. 135-Megabyte Tape Backup

Dimensions	
Height:	1.62 in. (4.1 cm)
Depth:	8.50 in. (21.6 cm)
Width:	5.75 in. (14.6 cm) (allow .375 in. (0.95 cm) for installing rails)
Weight	2.4 lb (1.1 kg)
Media	DC 600XTD read/write streaming cartridge (manufactured by the 3M Corporation) or equivalent
Tape Speed	
Read/Write:	72 in. per second
Rewind/Fast Forward:	90 in. per second
Tape End-to-End Positioning Time	
Read/Write:	100 seconds
Forward/Reverse:	80 seconds
Track Density	76 tpi
Number of Tracks	18
Bytes/Block	512
ECC Percentage	6.67

CONTENTS

Chapter 2
POWER-ON SELF-TEST (POST)/ PROBLEM ISOLATION

Chapter 2
POWER-ON SELF-TEST (POST)/PROBLEM ISOLATION

2.1 INTRODUCTION

This chapter provides a list of the subassemblies that are tested by the Power-On Self-Test (POST), a list of steps that you should perform prior to going through the problem isolation procedures, and a problem isolation flowchart for quick reference.

2.2 POWER-ON SELF-TEST (POST)

A series of diagnostic tests automatically run on every COMPAQ personal computer system when you turn on the system. These tests are called Power-On Self-Tests (POST).

POST checks the following subassemblies to see if the computer system is functioning properly:

- ☐ Power supply
- ☐ System board
- ☐ Memory
- ☐ Keyboard
- ☐ Controller boards

Turning on the computer automatically activates POST. If POST finds an error in the system, error codes (in the form of beeps) are heard or error codes (numbers) are visible on the monitor. See *Chapter 5*, **ERROR MESSAGES AND CODES**, for a definition of the error codes.

2.3 PRELIMINARY STEPS TO PROBLEM ISOLATION

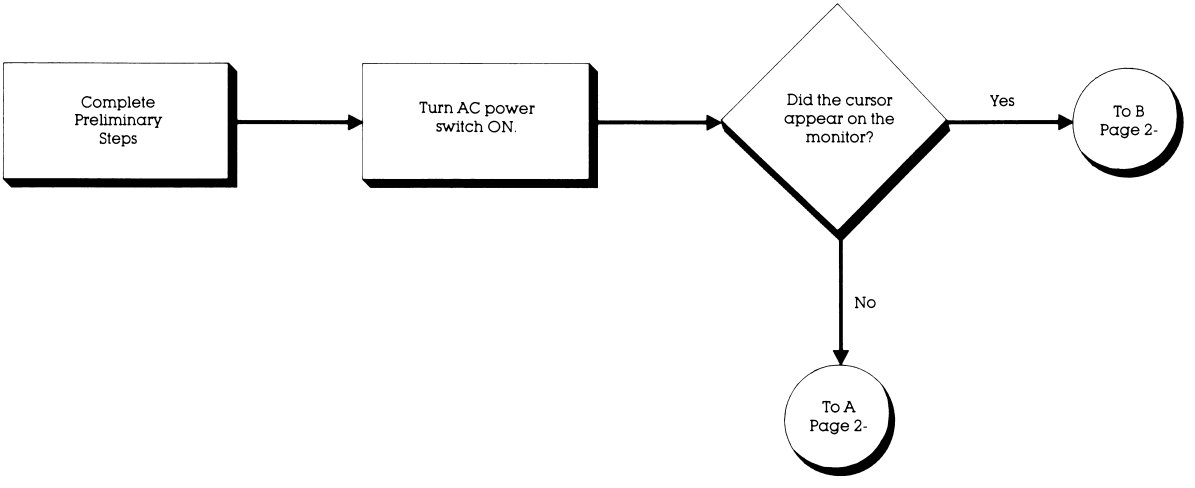
If you encounter an error condition, complete the following steps before starting the problem isolation procedures.

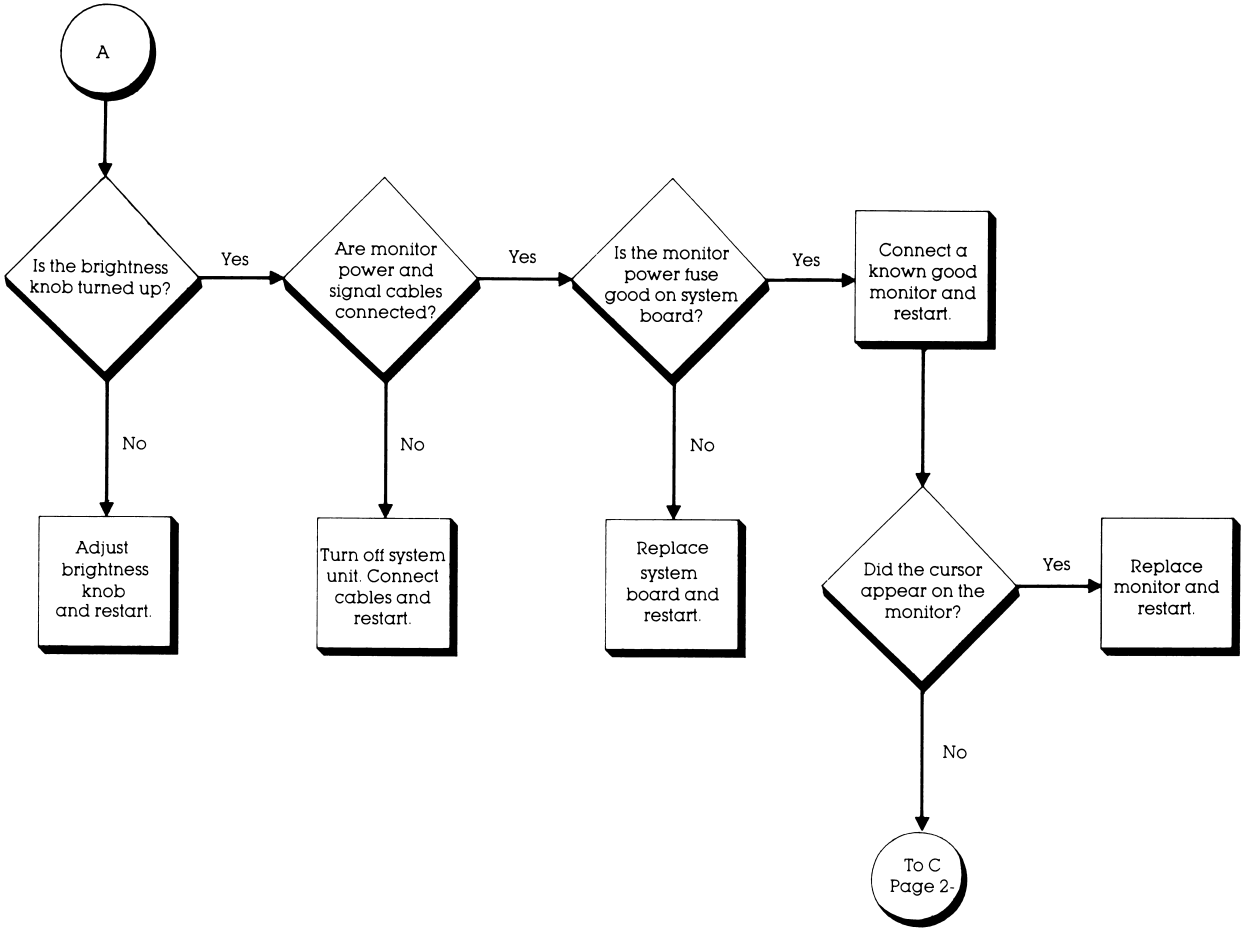
1. Turn off power to the system unit.
2. Disconnect any peripheral devices other than the keyboard and display. Do not disconnect the printer if you want to test the printer or use it to log error messages.
3. Install all appropriate loopback plugs and terminating plugs for complete testing.
4. Insert the ADVANCED DIAGNOSTICS diskette into Drive A.
5. Turn on the system unit.

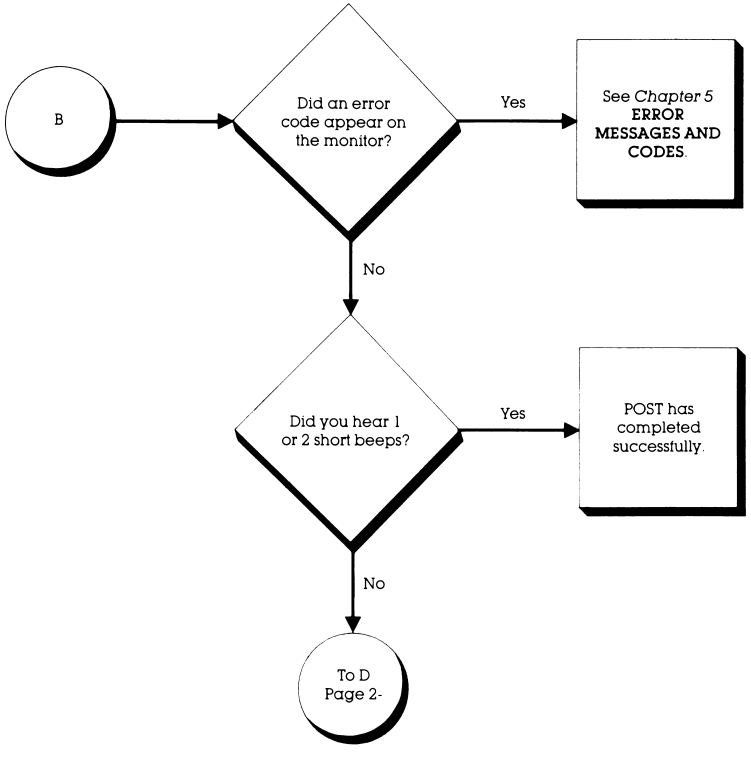
See *Chapter 4,* ADVANCED DIAGNOSTICS PROGRAM, for descriptions of the diagnostics tests.

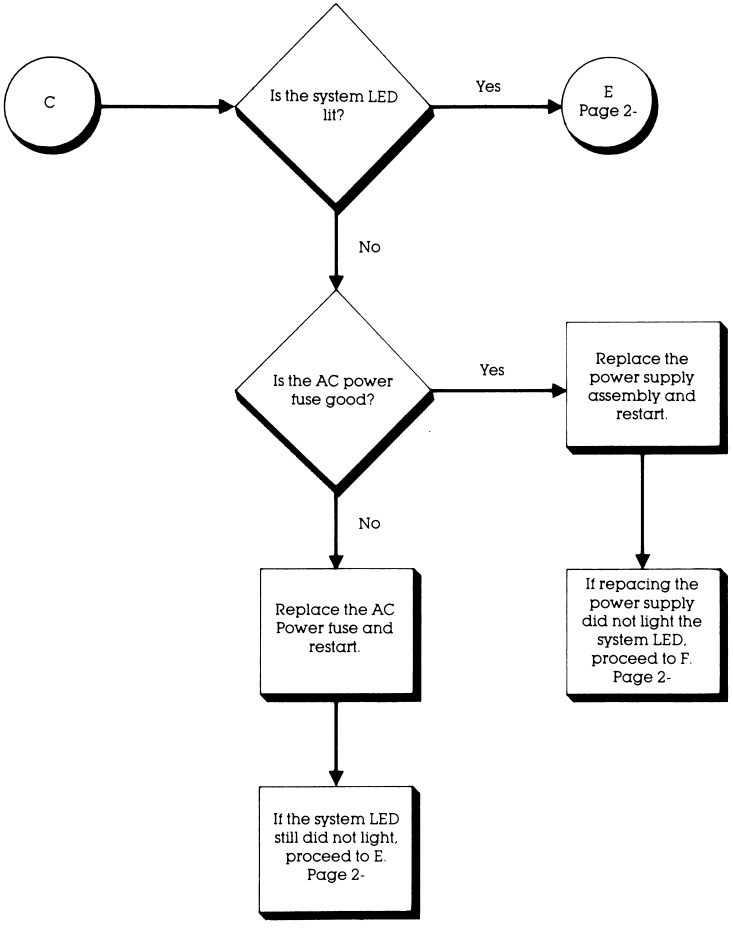
2.4 PROBLEM ISOLATION FLOWCHART

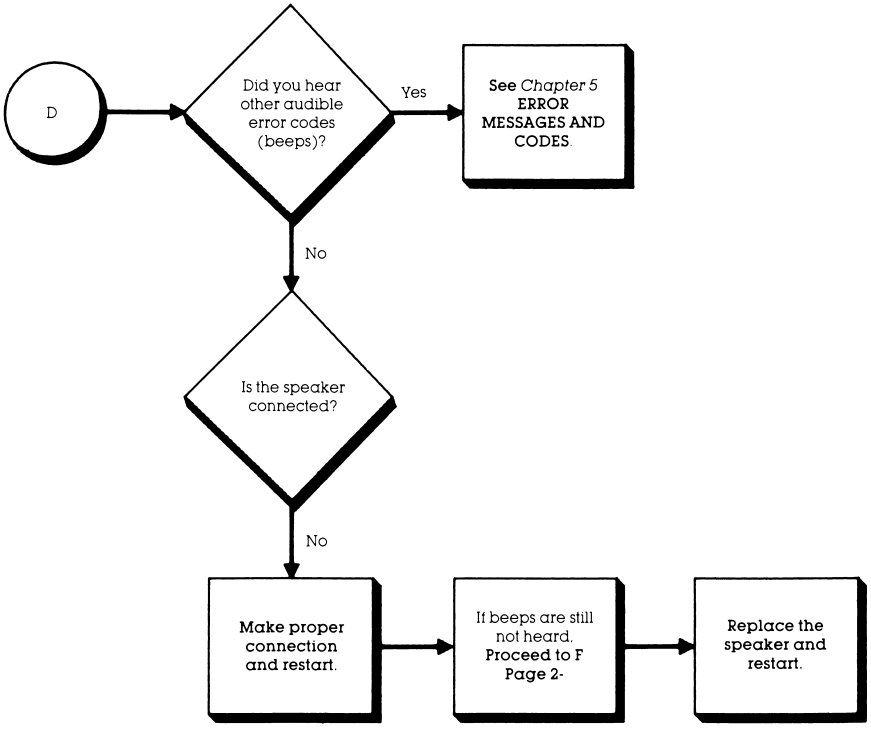
The problem isolation flowchart provides a quick reference for identifying and correcting possible error conditions that may occur during POST. It gives troubleshooting procedures for identifying malfunctions and replacing major subassemblies in the computer and directs you to *Chapter 4,* ADVANCED DIAGNOSTICS PROGRAM, and to *Chapter 5,* ERROR MESSAGES AND CODES, for more in-depth troubleshooting information.

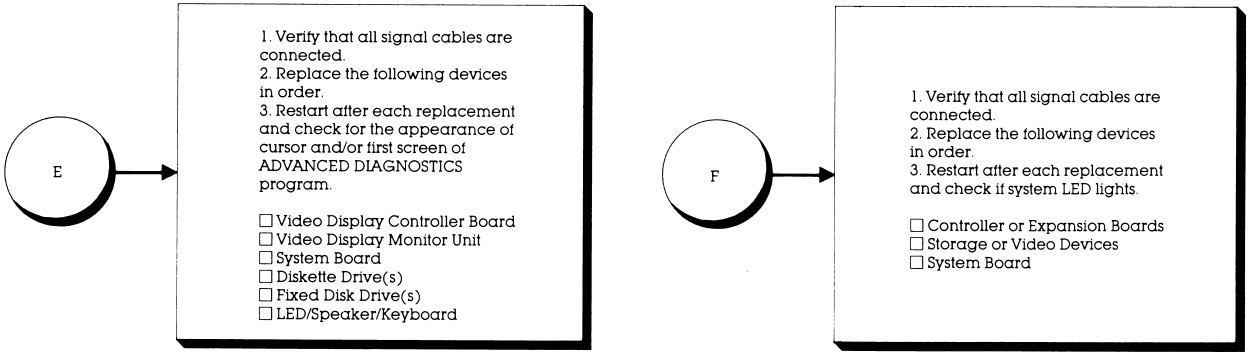

Complete Preliminary Steps
Turn AC power switch ON.
Did the cursor appear on the monitor?
Yes
To B Page 2-
No
To A Page 2-


A
Is the brightness knob turned up?
Yes
No
Adjust brightness knob and restart.
Are monitor power and signal cables connected?
Yes
No
Turn off system unit. Connect cables and restart.
Is the monitor power fuse good on system board?
Yes
No
Replace system board and restart.
Connect a known good monitor and restart.
Did the cursor appear on the monitor?
Yes
Replace monitor and restart.
No
To C Page 2-


B
Did an error code appear on the monitor?
Yes
See *Chapter 5* **ERROR MESSAGES AND CODES**.
No
Did you hear 1 or 2 short beeps?
Yes
POST has completed successfully.
No
To D
Page 2-


C
Is the system LED lit?
Yes
E
Page 2-
No
Is the AC power fuse good?
Yes
Replace the power supply assembly and restart.
No
Replace the AC Power fuse and restart.
If repacing the power supply did not light the system LED, proceed to F.
Page 2-
If the system LED still did not light, proceed to E.
Page 2-


D
Did you hear other audible error codes (beeps)?
Yes
See *Chapter 5* ERROR MESSAGES AND CODES.
No
Is the speaker connected?
No
Make proper connection and restart.
If beeps are still not heard, Proceed to F Page 2-
Replace the speaker and restart.


E
1. Verify that all signal cables are connected.
2. Replace the following devices in order.
3. Restart after each replacement and check for the appearance of cursor and/or first screen of ADVANCED DIAGNOSTICS program.
☐ Video Display Controller Board
☐ Video Display Monitor Unit
☐ System Board
☐ Diskette Drive(s)
☐ Fixed Disk Drive(s)
☐ LED/Speaker/Keyboard
F
1. Verify that all signal cables are connected.
2. Replace the following devices in order.
3. Restart after each replacement and check if system LED lights.
☐ Controller or Expansion Boards
☐ Storage or Video Devices
☐ System Board

CONTENTS

Chapter 3
SETUP PROGRAM

3.1 INTRODUCTION

The SETUP program is located on both the ADVANCED DIAGNOSTICS and the USER DIAGNOSTICS diskettes. SETUP is used to enter information necessary for the proper operation of the system into the configuration memory of your COMPAQ personal computer. The SETUP program is required only on COMPAQ 80286- and 80386-based personal computers.

The information handled by the SETUP program includes:

- ☐ Date and time
- ☐ Diskette drives
- ☐ Fixed disk drives (physical drives)
- ☐ Numeric coprocessor
- ☐ Memory
- ☐ Video

3.2 RUNNING SETUP

Your COMPAQ personal computer uses a memory device that stores the current date, time, and system configuration. The SETUP program included on your ADVANCED DIAGNOSTICS or USER DIAGNOSTICS diskettes enters this information into the memory device.

You need to run SETUP under the following conditions:

- ☐ When your COMPAQ personal computer is used for the first time.
- ☐ When the system configuration is changed (such as by adding memory).
- ☐ When certain options are added to your system. (The documentation that is packed with your option kit instructs you when it is necessary to run this program.)

- ☐ If the system board or battery is disconnected or replaced.
- ☐ If a system configuration error is detected during the Power-On Self-Test (POST). In this situation, the system prompts you to run SETUP so that you can enter the correct information before continuing.

To run SETUP, follow these instructions:

1. Insert either the ADVANCED DIAGNOSTICS diskette or the USER DIAGNOSTICS diskette into Drive A.
2. Turn on the computer, or reset the system by simultaneously pressing the **CTRL**, **ALT**, and **DEL** keys.
3. Execute the SETUP program from the Main Menu or by typing "SETUP" at the A> prompt.
4. The SETUP program sets the system configuration, prompting you for information as necessary.
5. Default values are presented in brackets at the selection prompts. You may accept the default by pressing the **ENTER** key.

CONTENTS

Chapter 4
ADVANCED DIAGNOSTICS PROGRAM

Continued...

4.5 TEST SELECTION MENU: *Continued*

Continued...

4.5 TEST SELECTION MENU: *Continued*

Continued...

4.5 TEST SELECTION MENU: *Continued*

Chapter 4
ADVANCED DIAGNOSTICS PROGRAM

4.1 INTRODUCTION

This chapter describes the ADVANCED DIAGNOSTICS program for all COMPAQ personal computers. These diagnostics verify the proper operation of your COMPAQ personal computer. The screens and the information displayed are appropriate for the specific system being tested. The COMPAQ ADVANCED DIAGNOSTICS have been specifically developed only for COMPAQ personal computers and COMPAQ options. Testing of third-party peripherals and third"party options should be conducted according to the third-party's published procedures.

NOTE: While running the program, be sure to record any error messages that are displayed during a test. This information helps you to determine defective parts or subassemblies. Refer to *Chapter 5*, ERROR MESSAGES AND CODES, for error descriptions and recommended actions.

4.2 PRELIMINARY STEPS

Before running the ADVANCED DIAGNOSTICS program, perform the following steps:

1. Turn off power to the system unit.
2. Disconnect any peripheral devices other than the keyboard and display. Do not disconnect the printer if you want to test the printer or use it to log error messages.
3. Install all appropriate loopback plugs and terminating plugs for complete testing.
4. Insert the ADVANCED DIAGNOSTICS diskette into Drive A.
5. Turn on the system unit.

Once the Power-On Self-Test (POST) completes successfully, your screen displays the Main Menu of the ADVANCED DIAGNOSTICS program.

4.3 MAIN MENU

The Main Menu allows you to select one of the following:

- ☐ Run the diagnostic tests
- ☐ Format a diskette (for diagnostic use only)
- ☐ Copy a diskette (for diagnostic use only)
- ☐ Prepare a desktop system for moving (for some fixed disk drive systems)
- ☐ Run the SETUP program (for 80286- and 80386-based products only)
- ☐ Display ROM versions

These selections are described in the following paragraphs.

Run the Diagnostic Tests

This selection causes the ADVANCED DIAGNOSTICS program to identify the system configuration being tested and to present the appropriate menu-selectable tests.

Format a Diskette (for diagnostic use only)

The ADVANCED DIAGNOSTICS program requires that a diskette be formatted for each diskette drive being tested. This utility is not the same as the MS-DOS FORMAT command. A diskette formatted for diagnostics can be used only for diagnostics, unless it is reformatted with MS-DOS.

NOTE: To fully test a diskette drive, you must format a blank diskette according to the appropriate capacity of the diskette drive.

Copy a Diag Diskette

You must use this utility to copy the entire contents of your ADVANCED DIAGNOSTICS diskette onto another diskette. This utility is not the same as the MS-DOS DISKCOPY command, because it creates an extra file for testing purposes. Place the original diskette in a safe place and use the copy for testing.

Prepare a Desktop System for Moving

You can use the program to prepare a desktop system for moving. This selection causes the fixed disk drive read/write heads to be parked in an unused area on the fixed disk drive to prevent damage.

Run the SETUP Program

This selection runs the SETUP program to enter all the system information into system configuration memory. For more information on the SETUP program, refer to *Chapter 3*, SETUP PROGRAM.

Display ROM Versions

This selection displays information about your processor type and the current version level of ROM on your system board. It also displays the version level of the fixed disk drive controller board ROM, the video display controller board ROM, and the keyboard controller ROM.

4.4 RUNNING THE ADVANCED DIAGNOSTICS

When you elect to run the diagnostic tests, the program provides the following:

- ☐ Installed Device List
- ☐ System Test Menu
- ☐ Error Logging Utilities Menu

The following paragraphs describe these items.

Installed Devices List

This lists the devices detected by the program as being installed in your computer. The display asks you to verify that the program has correctly detected your system devices.

Omission of an installed device from the list indicates that your computer is improperly configured. Check your switch settings, jumper positions, and cable connections. You may also need to run the SETUP program to provide your system with the correct configuration information.

System Test Menu

This selection allows you to determine how the diagnostic tests should run. Selections include:

- ☐ Running the tests once with operator intervention
- ☐ Running the tests multiple times in an unattended mode
- ☐ Invoking the error logging utilities menu

Error Logging Utilities Menu

To log detected errors, you MUST use either an MS-DOS formatted disk or a printer.

NOTE: Do not log errors on either the original MS-DOS diskette or the copy of the ADVANCED DIAGNOSTICS diskette.

Error logging utilities allow you to:

- ☐ Begin logging errors
- ☐ Select the device (disk drive or printer) on which to log errors
- ☐ Quit logging errors
- ☐ Display the error log
- ☐ Display the system time

4.5 TEST SELECTION MENU

Although the Test Selection Menu choices vary according to the configuration of the computer you are testing, the following paragraphs describe all of the diagnostic tests.

You can elect to run one test, a combination of tests, or all of the tests. When you run multiple tests, the program automatically proceeds from one test to the next until testing is successfully completed. When running the program in the unattended mode, tests that require operator intervention are not performed. For complete system checkout, each test should be run at least once in the attended mode.

The diagnostic tests and their corresponding selection numbers are as follows:

1–Processor
2–Memory
3–Keyboard
4–Parallel Printer Interface(s)
5–Video Display Unit
6–Diskette Drive(s)
8–Monochrome Video Board
11–Asynchronous Communications Interface(s)
12–Modem Communications
17–Fixed Disk Drive(s)
19–Fixed Disk Drive Backup
24–Enhanced Color Graphics or COMPAQ Video Graphics
51–Plasma Display Unit

NOTE: If error codes appear as you run the tests, refer to *Chapter 5*, **ERROR MESSAGES AND CODES**, for a list of error codes, their descriptions, and the recommended procedures for correcting the error condition.

The following paragraphs describe these tests.

1–Processor Test

The Processor Test verifies the main processor, numeric coprocessor (if installed), configuration (CMOS) memory (if applicable), processor support logic, and speaker.

2–Memory Test

The Memory Test verifies memory data patterns, memory addressing, and parity detection for all system memory.

3–Keyboard Test

The Keyboard Test verifies the keyboard interface, individual keys, LED indicators, the repeat action key mode, and the security lock (if applicable).

4–Parallel Printer Interface(s) Test

The Parallel Printer Interface(s) Test verifies interface data and control lines, internal loopback control circuitry, external loopback (if a loopback plug is attached), and a shifted pattern of standard printable characters (if a printer is attached).

5–Video Display Unit Test

Depending on which installed devices are in the computer you are testing, you can run one or more of the following:

5–Video Display Unit Test
8–Monochrome Video Board Test
24–Enhanced Color Graphics Test or COMPAQ Video Graphics Controller Test
51–Plasma Display Unit Test

Table 4-1 lists the possible tests for various system video configurations and indicates the screens that appear during the tests (assuming only one video board is installed).

NOTE: The screens that appear in this section are provided for reference only and may vary depending on the type of video controller or display you are using.

Table 4-1. Matrix of Possible Tests for Various System Video Configurations

	Video Controller/Display						
Video Test	**CGA**	**EGA W/DMM**	**EGA W/COLOR**	**PLASMA**	**MONO-CHROME**	**VGA COLOR**	**VGA MONO**
Video Controller	X	X	X	X	X	X	X
Display Characteristics	X	X	X	X		X	X
Character Set	X	X	X	X		X	X
40 × 25 Display	X	X	X	X		X	X
80 × 25 Display	X	X	X	X		X	X
320 × 200 Standard Graphics	X	X	X	X		X	X
640 × 200 Standard Graphics	X	X	X	X		X	
Lightpen	X	X	X				
Display Memory Pages	X	X	X	X		X	X
Gray Scale/Color	X	X	X			X	
Noise Pattern	X	X	X	X		X	X
Enhanced Display Characteristics			X			X	
640 × 200 Color Graphics		X	X				X
640 × 350 Color Graphics		X	X			X	
Monochrome Text		X	X	X		X	
640 × 350 Monochrome Graphics		X				X	
640 × 400 Graphics				X			
640 × 480 Graphics						X	
256 Color Mode Graphics Test						X	
Monitor Alignment	X	X	X				

CGA - Color Graphics Adapter
EGA - Enhanced Graphics Adapter
DMM - Dual-Mode Monitor
VGA - Video Graphics Adapter

The following paragraphs describe these selections.

Video Controller

The Video Controller selection verifies the functionality of the COMPAQ Video Display Controller Board, the COMPAQ Enhanced Color Graphics Board, the COMPAQ Video Graphics Controller Board, or the COMPAQ Plasma Display Controller Board.

Display Characteristics

The Display Characteristics selection verifies the ability of the video display controller board and the monitor to display the attributes of various intensities, blinking, and reverse video.

Character Set

The Character Set selection verifies that the system can display all of the available character patterns.

40 × 25 Display

The 40 × 25 Display selection verifies that the system can operate in the 40 × 25 low-resolution character display mode (8 × 8 character matrix). A display similar to Screen 1 appears.

Screen 1.

Screen 2.

80 × 25 Display

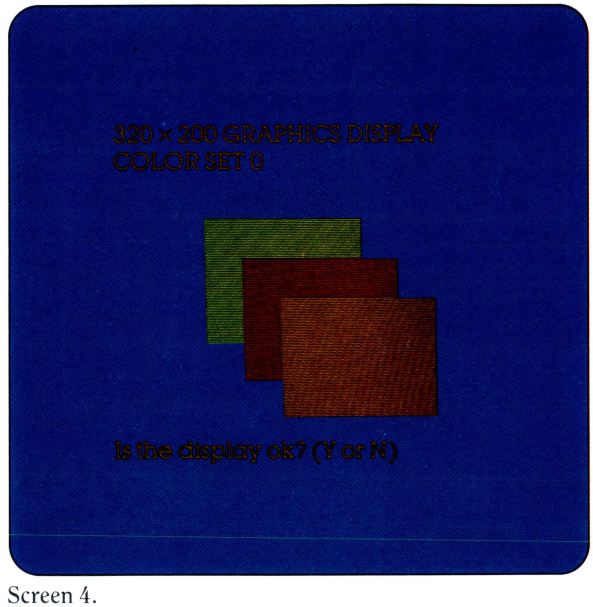
The 80 × 25 Display selection verifies that the system can operate in both the high-resolution and low-resolution modes. The screen for the 80 × 25 high-resolution text mode (9 × 14 character matrix) using inverted video mode will appear similar to Screen 2. The screen for the 80 × 25 low-resolution character display mode (8 × 8 character matrix) will appear similar to Screen 3.

Screen 3.

320 × 200 Standard Graphics

The 320 × 200 Standard Graphics selection verifies that the system can operate in the 320 × 200 color graphics mode with color sets 0 and 1. A display similar to Screen 4 appears for color sets.

NOTE: The display for this selection appears in shades of green or amber on the COMPAQ Dual-Mode Monitor and in orange on the COMPAQ Dual-Mode Plasma Display.



Screen 4.

640 × 200 Standard Graphics

The 640 × 200 Standard Graphics selection verifies that the system can operate in the 640 × 200 monochrome/graphics mode. A display similar to Screen 5 appears.

NOTE: The display for this selection appears in shades of green or amber on the COMPAQ Dual-Mode Monitor and in orange on the COMPAQ Dual-Mode Plasma Display.

Screen 5.

Lightpen

The Lightpen selection verifies that the lightpen is operating properly with your color monitor.

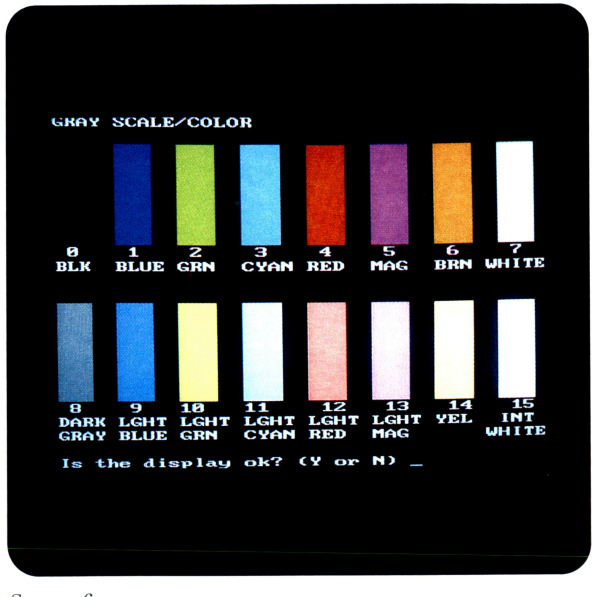
Display Memory Pages

The Display Memory Pages selection verifies that the system can address all eight pages (0 through 7) of the memory on the video display controller board.

Gray Scale/Color

The Gray Scale/Color selection verifies that the system can display as many as 16 shades of the gray scale and all 8 possible colors (at 2 intensities for each). A display similar to Screen 6 appears.

NOTE: The display for this selection appears in shades of green or amber on the COMPAQ Dual-Mode Monitor.



Screen 6.

Noise Pattern

The Noise Pattern selection checks the amount of electronic noise generated from the video display controller board and also tests the board's ability to communicate with the system board.

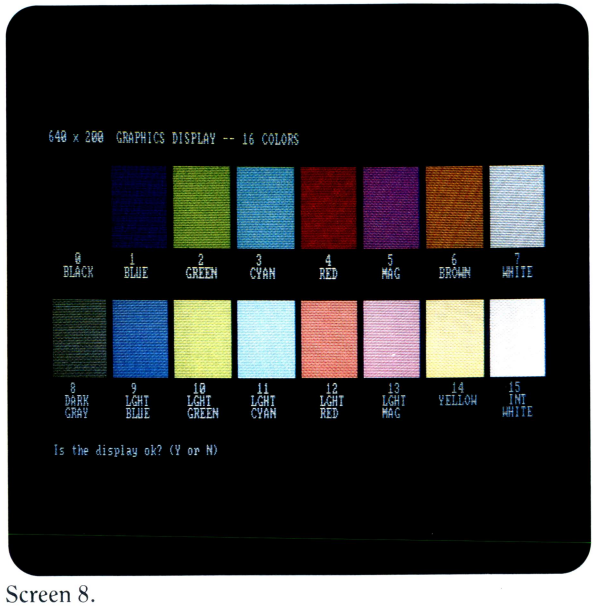
Enhanced Display Characteristics

The Enhanced Display Characteristics selection verifies the ability of the video display controller board and the monitor to display the attributes of normal and high intensities, blinking, inverted video, and the shades of red, blue, green, and gray. A display similar to Screen 7 appears.

Screen 7.

640 × 200 Color Graphics

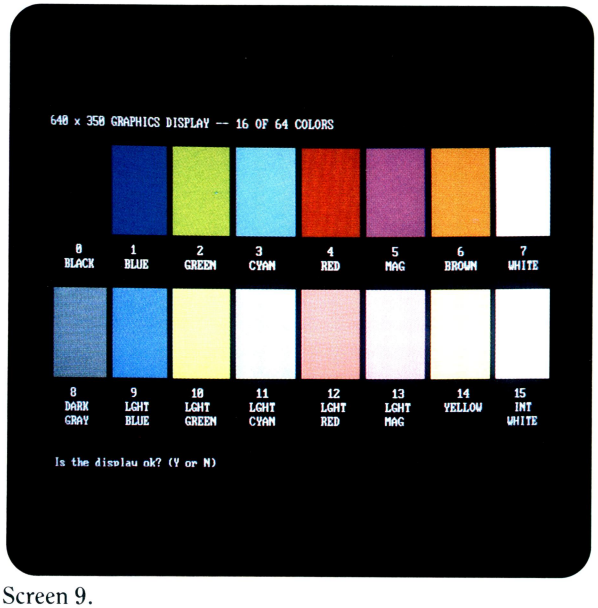
The 640 × 200 Color Graphics selection verifies that the system can operate in the 640 × 200 color graphics mode, displaying 16 different colors. A display similar to Screen 8 appears.



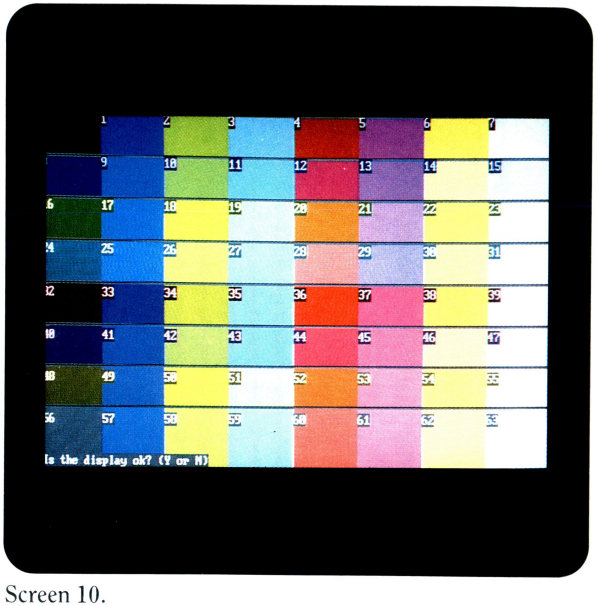
Screen 8.

640 × 350 Color Graphics

The 640 × 350 Color Graphics selection verifies that the system can operate in the 640 × 350 color graphics mode by first displaying 16 of 64 possible colors and then all 64 possible colors. Displays similar to Screens 9 and 10 appear.



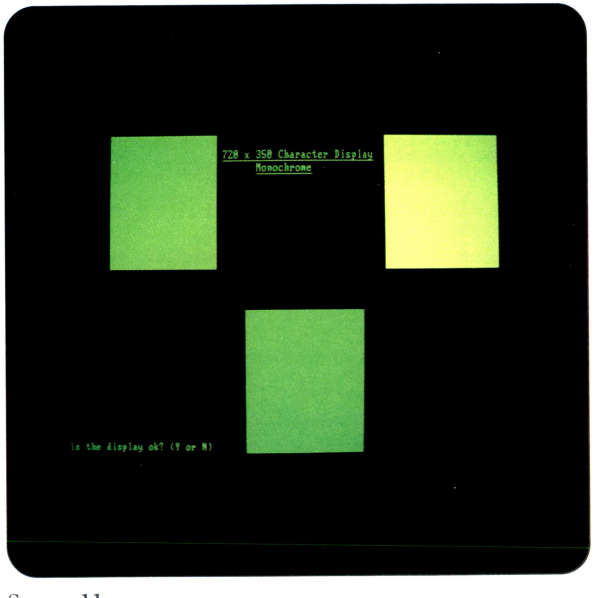
Screen 9.



Screen 10.

Monochrome Text

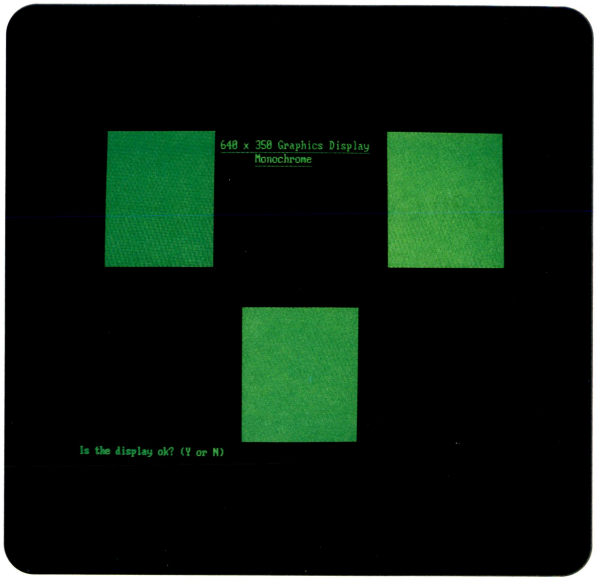
The Monochrome Text selection verifies that the system can operate in the monochrome text mode. A display similar to Screen 11 appears.



Screen 11.

640 × 350 Monochrome Graphics

The 640 × 350 Monochrome Graphics selection verifies that the system can operate in the 640 × 350 monochrome graphics mode. A display similar to Screen 12 appears.



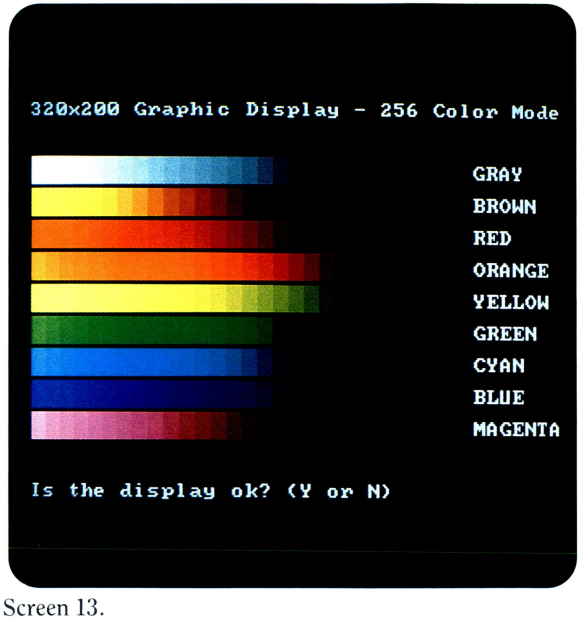
Screen 12.

640 × 400 Graphics

The 640 × 400 Graphics selection verifies that the system can operate in the 640 × 400 graphics mode.

640 × 480 Graphics

The 640 × 480 Graphics selection verifies that the system can operate in the 640 × 480 graphics mode.



Screen 13.

256 Color Mode Graphics

The 256 Color Mode Graphics selection verifies that the system can operate in the 256 color graphics mode by displaying various shades of nine colors.

Run All the Above Tests

The Run All the Above Tests selection causes all the appropriate Video Display Unit tests to run sequentially.

Monitor Alignment

The Monitor Alignment selection allows you to check the alignment and intensity of the video display unit.

6–Diskette Drive(s) Test

The Diskette Drive(s) Test allows the program to test and verify the diskette drive(s), the diskette drive controller, and cables. Depending on your computer configuration, a Diskette Drive Menu may be displayed.

Selections are:

- ☐ Write, Read, Compare
- ☐ Random Seek
- ☐ Verify Diskette
- ☐ Diskette Speed
- ☐ Diskette Change Line
- ☐ Format a Diskette (for diagnostic use only)

NOTE: You may be asked to insert a blank diagnostic formatted diskette during certain tests to avoid the destruction of stored data. To fully test a diskette drive, you must format a diskette for the capacity of the diskette drive that you have. Also, the diskette must NOT be write protected.

The following paragraphs describe these selections.

Write, Read, Compare

The Write, Read, Compare selection verifies that the diskette drive subsystem writes, reads, and compares data patterns, that the diskette drive controller board properly resets, and that the diskette drive controller buffers are valid.

Random Seek

The Random Seek selection verifies that the diskette drive and the diskette drive controller board randomly seek tracks across the diskette.

Verify Diskette

The Verify Diskette selection verifies the diskette drive by reading the contents of the entire diskette.

Diskette Speed

The Diskette Speed selection verifies that the diskette drive motor is spinning within the proper speed range.

Diskette Change Line (for 80286- and 80386-based products)

The Diskette Change Line selection verifies that the diskette drive change-line circuitry is functioning properly. You may be instructed to remove and reinsert the blank diagnostic formatted diskette.

Format a Diskette (for diagnostic use only)

The ADVANCED DIAGNOSTICS program requires that a diskette be formatted for each diskette drive being tested. This utility is not the same as the MS-DOS FORMAT. A diskette formatted for diagnostics can be used only for diagnostics, unless it is reformatted with MS-DOS.

NOTE: To fully test a diskette drive, you must format a blank diskette according to the appropriate capacity of the diskette drive.

8–Monochrome Video Board Test

For a description of this test, see "5–Video Display Unit Test" described previously.

11–Asynchronous Communications Interface(s) Test

The Asynchronous Communications Interface(s) Test verifies interface data and control lines, baud rate timing, internal loopback control circuitry, external loopback circuitry (if a loopback plug is attached), as well as clock and calendar functions (if applicable).

NOTE: This selection tests all asynchronous communications interfaces. Before selecting this test, be sure you know which device is jumpered to COM1, and which device is jumpered to COM2 to determine the proper applicability of any messages and error codes that may appear. Also, for more complete testing of an asynchronous communications interface, be sure that the loopback plug is properly installed.

12–Modem Communications Test

The Modem Communications Test runs a series of tests that verify the modem and interface cables. The following selections are available:

- ☐ Modem Internal Loopback
- ☐ Auto Originate Mode
- ☐ Auto Answer Mode
- ☐ Modem External Termination
- ☐ Modem Direct Connect

The following paragraphs describe these selections.

Modem Internal Loopback

The Modem Internal Loopback selection verifies the TIP/RING (two wire) loopback circuitry as well as the data transfer and bit error rate circuitry.

NOTE: Before selecting this test, be sure the modem is disconnected from the phone line.

Auto Originate Mode

The Auto Originate Mode selection verifies that the modem subassembly can dial a remote modem, establish the transmission line carrier, check the transmission line quality, perform data transfer, check bit error rate, and disconnect transmission carrier.

Auto Answer Mode

The Auto Answer Mode selection verifies that the modem subassembly can receive an incoming dial-up call, establish the transmission line carrier, check the transmission line quality, perform data transfer, check bit error rate, and disconnect transmission carrier.

Modem External Termination

The Modem External Termination selection verifies that the TIP/RING (two wire) lines are externally available.

NOTE: Before running this test, you must attach a Modem Terminating Plug.

Modem Direct Connect

The Modem Direct Connect selection verifies the modem data transfer and bit error rate circuitry, and also verifies that it can communicate with another modem. This test is performed with two modems in different computers directly connected by one phone cord.

17–Fixed Disk Drive(s) Test

The Fixed Disk Drive(s) Test runs a series of tests to verify that the fixed disk drive(s), the controllers, and cables are working properly. Depending on your computer configuration, a Fixed Disk Drive Menu may appear. Selections allow you to run any one or all of the tests on either physical Drive C or Drive D.

Selections are:

- ☐ Write, Read, Compare on Test Cylinder
- ☐ Seek
- ☐ Head Select
- ☐ Error Detection and Correction
- ☐ Run All the Above Tests
- ☐ Read Verify
- ☐ Format Menu

The following paragraphs describe these selections.

Write, Read, Compare on Test Cylinder

The Write, Read, Compare on Test Cylinder selection writes information from memory to the fixed disk drive(s) on the test cylinder, reads it back, and then compares it to what is in memory.

Seek

The Seek selection performs a sequential seek over the fixed disk drive and then performs a random seek to verify the ability of the head actuator to find randomly selected cylinders in a predetermined amount of time.

Head Select

The Head Select selection verifies that each head of the fixed disk drive(s) can be accessed and is functional.

Error Detection and Correction

The Error Detection and Correction selection verifies that the error detection circuitry in the fixed disk drive(s) can properly calculate the error correction code.

Run All the Above Tests

The Run All the Above Tests selection allows you to sequentially run all of the previously described selections of the Fixed Disk Drive Test.

Read Verify

The Read Verify selection verifies that the system can read each track of the fixed disk drive(s). The program reads the entire disk and reports the number of unusable tracks, if any.

Format Menu

CAUTION

The fixed disk drive(s) format selection destroys all data currently on the fixed disk drive. Before formatting, back up all data currently stored on the fixed disk drive.

The Format Menu selection provides two format program options and two formatting features that are to be used for special applications only. The Format Menu allows you to selectively run the following tests on either physical Drive C or Drive D.

The selections are:

- ☐ Conditional Format
- ☐ Unconditional Format
- ☐ Surface Analysis
- ☐ Change Interleave

Because these selections destroy all information on your fixed disk, you must reinitialize the fixed disk drive(s). If you have MS-DOS Version 3.1 or higher, you can use the DISKINIT utility to install MS-DOS on your fixed disk drive(s). For more information on the DISKINIT utility, refer to the ***MS-DOS REFERENCE GUIDE*** as published by Compaq. Otherwise, use the FDISK and FORMAT utilities.

The following paragraphs describe these selections.

Conditional Format

The Conditional Format selection formats or reformats the fixed disk drive. It reads and records the bad-track information from the fixed disk drive, formats it, and then writes the bad-track formatted information back to the fixed disk drive. It also performs a complete surface analysis and records any additional bad-track information encountered.

NOTE: It is necessary for the computer to be turned on for at least 20 minutes prior to formatting the fixed disk drive. It is very important to allow this test to run to completion once started, or bad-track information may be lost.

When the Conditional Format test completes successfully without error, repeat the Fixed Disk Drive(s) Test to verify that the fixed disk drive and the fixed disk drive controller board are functioning properly.

Unconditional Format

The Unconditional Format selection formats or reformats the fixed disk drive. Rather than reading the bad-track information from the fixed disk drive, as with Conditional Format, the Unconditional Format test prompts you to enter any bad-track information from the manufacturer's defect label (in a cylinder head format).

NOTE: The Unconditional Format test should be performed ONLY if you are sure that tracks that are marked bad on the fixed disk drive are NOT actually bad. Good tracks may be marked bad as a result of using a defective fixed disk drive controller board or controller cable. You MUST perform a Surface Analysis test after an Unconditional Format to identify any additional bad tracks that may exist on the fixed disk drive.

When the Unconditional Format test completes successfully without error, perform a Surface Analysis test, and then repeat the Fixed Disk Drive(s) Test to verify that the fixed disk drive and the fixed disk drive controller board are functioning properly.

Surface Analysis

The Surface Analysis selection performs a track-by-track analysis of the fixed disk drive. It writes to each track, reads what it wrote, then compares the two. If it encounters any bad tracks, it records them on the fixed disk drive(s). This selection is required only if an Unconditional Format test was performed.

Change Interleave

The Change Interleave selection permits you to change the interleave factor of your fixed disk drive(s).

CAUTION

Changing the interleave factor can drastically reduce the performance of the system.

The interleave factor is preset to achieve the maximum efficiency from your computer. Do not choose this selection unless you are required to do so, either by a software program or by an operating system other than MS-DOS. Changing the interleave factor requires that the drive(s) be reformatted to function properly.

19–Fixed Disk Drive Backup Test

The Fixed Disk Drive Backup Test verifies the fixed disk drive backup, the fixed disk drive controller, and cables. Depending on your computer configuration, the Fixed Disk Drive Backup Menu may appear. The menu allows you to selectively run the following tests:

- ☐ Format Fixed Disk Drive Backup Cartridge (for diagnostic use only)
- ☐ Fixed Disk Drive Backup
- ☐ Fixed Disk Drive Backup Media During each of these tests, the screen displays each track and block as it is checked.

The following paragraphs describe these selections.

CAUTION

This test destroys stored data. When prompted, be sure to insert a blank formatted tape cartridge to avoid losing data.

Format Fixed Disk Drive Backup Cartridge (for diagnostic use only)

This selection formats a fixed disk drive backup tape cartridge to be used during diagnostic testing. This selection tests the format and servo write circuitry.

The test goes through two stages of formatting: physical formatting and logical formatting. Each stage requires an extended period of time.

CAUTION

Do not interrupt in any manner the physical formatting process. An interruption can destroy the servo information on your tape cartridge, requiring erasure before it can be reformatted.

Fixed Disk Drive Backup

The Fixed Disk Drive Backup selection verifies that the system can identify the drive; the cartridge in place; write protect, beginning of tape (BOT), and end of tape (EOT) sensors; the drive motion and seek circuitry; drive indexing circuitry; and drive write and read circuitry on selected tracks of the tape cartridge.

Fixed Disk Drive Backup Media

The Fixed Disk Drive Backup Media selection verifies that the system can rewind the tape cartridge to the beginning of the tape (BOT) and the end of the tape (EOT), as well as write, read, and compare data to all blocks and tracks of the cartridge.

24–Enhanced Color Graphics Test or COMPAQ Video Graphics Controller Test

For a description of this test, see "5–Video Display Unit Test" described previously.

51-Plasma Display Unit Test

For a description of this test, see "5–Video Display Unit Test" described previously.

CONTENTS

Chapter 5
ERROR MESSAGES AND CODES

Chapter 5
ERROR MESSAGES AND CODES

5.1 INTRODUCTION

This chapter contains Power-On Self-Test messages, ADVANCED DIAGNOSTIC error codes, and memory error codes.

The messages and codes appear in tables. These tables include the message or error code, a description of the error, the probable cause and recommended action that should be taken to resolve the error condition.

5.2 POWER-ON SELF-TEST MESSAGES

An error message results if a problem is encountered during the Power-On Self-Test utility. This Power-On Self-Test utility runs automatically when the system is turned on.

Table 5-1 lists the messages, the audible (beep) message, probable cause, and recommended action.

Table 5-1. Power-On Self-Test Messages

Message	Beeps	Probable Cause	Recommended Action
101-ROM Error	1L[1], 1S[2]	System ROM	1. Ensure proper insertion of ROM 2. Verify the correct ROM. 3. Replace the ROM.
101-I/O ROM Error	1L[1], 1S[2]	Option ROM	1. Ensure proper insertion of ROM 2. Verify the correct ROM. 3. Replace the ROM.

[1]L = Long
[2]S = Short

Continued...

Table 5-1. Power-On Self-Test Error Messages *Continued*

Message	Beeps	Probable Cause	Recommended Action
102-System Board or System Memory Board Failure	None	System board or system memory board	Replace the system memory board or the system board.
162-System Options Not Set	2S[2]	System configuration incorrect	Run SETUP.
163-Time & Date Not Set	2S[2]	Invalid time or date	Run SETUP.
164-Memory Size Error	2S[2]	System configuration incorrect	Run SETUP.
XX000B YYZZ 201-Memory Error	None	RAM failure	Refer to *Section 5.4.*
203-Memory Address Error	None	RAM	Refer to *Section 5.4.*
301-Keyboard Error	None	Keyboard	1. Check the keyboard connection. 2. Check the keyboard connector. If the keyboard is unplugged, turn off the system unit and plug in the keyboard connector. 3. Replace the keyboard.
302-System Unit Security Lock is Locked - Unlock System Unit Security Lock	None	System lock	Unlock the system unit security lock.

[1]L = Long
[2]S = Short

Continued...

Table 5-1. Power-On Self-Test Error Messages *Continued*

Message	Beeps	Probable Cause	Recommended Action
303-Keyboard Controller Error	None	System board keyboard controller	Replace the system board.
304-Keyboard or System Unit Error	None	Keyboard	1. Replace the keyboard. 2. Replace the system board.
401-Printer Error	None	Printer controller	Check the multipurpose controller board, multipurpose fixed disk drive controller board, diskette/printer board
402-Monochrome Adapter Failure	1L[1], 2S[2]	System board or display controller board	Replace the monochrome display controller board or the system board.
501-Display Adapter Failure	1L[1], 2S[2]	Video display controller board	Replace the video board.
601-Diskette Controller Error	None	Diskette controller board	1. Replace the diskette/printer board. 2. Replace multipurpose controller board. 3. Replace multipurpose fixed disk drive controller board.

[1]L = Long
[2]S = Short

Continued...

Table 5-1. Power-On Self-Test Error Messages *continued*

Message	Beeps	Probable Cause	Recommended Action
602-Diskette Boot Record Error	None	Diskette in Drive A not bootable	Replace diskette.
1780-Disk 0 Failure	None	Fixed disk drive not ready	Run ADVANCED DIAGNOSTICS.
1781-Disk 1 Failure	None	Fixed disk drive 1 not ready	Run ADVANCED DIAGNOSTICS.
1782-Disk Controller Failure	None	Fixed disk drive does not respond	Run ADVANCED DIAGNOSTICS.
1790-Disk 0 Error	None	Fixed disk drive 0 access error	Run SETUP and ADVANCED DIAGNOSTICS.
1791-Disk 1 Error	None	Fixed disk drive 1 access error	Run SETUP and ADVANCED DIAGNOSTICS.
XX000B YYZZ Parity Check 2	None	Expansion RAM	Run ADVANCED DIAGNOSTICS.
Audible	1S[2]	Power-on successful	None.
Audible	2S[2]	Power-on successful	None.
(RESUME = "F1" KEY)	None	As indicated	Press **F1** key to continue.

[1]L = Long
[2]S = Short

5.3 ADVANCED DIAGNOSTICS ERROR CODES

ADVANCED DIAGNOSTICS error codes occur if the system recognizes a problem while running the ADVANCED DIAGNOSTICS Program. These error codes help identify possible defective subassemblies.

Tables 5-2 through 5-12 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

In each case, the Recommended Action column lists steps necessary to correct the problem. After completing each step, run the ADVANCED DIAGNOSTICS Program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the ADVANCED DIAGNOSTICS Program. Follow this procedure until the ADVANCED DIAGNOSTICS Program no longer detects an error condition.

For assistance in the removal and replacement of a particular subassembly, see *Chapter 7*, REMOVAL AND REPLACEMENT PROCEDURES.

Table 5-2. Advanced Diagnostics Error Codes

Error Range	Error Function	Recommended Action
Processor Test		
101-XX	Central Processing Unit	Replace the system board and retest for 101-XX error codes.
102-XX	Coprocessor	The following steps apply to 102-XX error codes. 1. Replace the numeric coprocessor and retest. 2. Replace the system board and retest.
103-XX	Direct Memory Access	
104-XX	Interrupt Controller	
105-XX	Port 61	
106-XX	Keyboard Controller	
107-XX	CMOS	
108-XX	CMOS	
109-XX	CMOS	
110-XX	Programmable Timer	
111-XX	Refresh Detect Test	
112-XX	Speed Test	
113-XX*	Protected Mode Test	Replace the system board and retest for error codes 103-XX through 113-XX.
114-XX	Speaker Test	1. Verify speaker connection. 2. Replace the speaker and retest. 3. Replace the system board and retest.

*80286-based COMPAQ personal computer products only

Table 5-3. Memory Error Codes (2xx-xx Range)

Error Range	Error Function	Recommended Action
201-XX	RAM/ROM	The following steps apply to error codes 201-XX through 202-XX: 1. Replace VDU controller board and retest. 2. Replace the system ROM and retest. 3. Replace system memory board* and retest. 4. Replace the system board and retest.
202-XX		
203-XX	Memory Write/Read	The following steps apply to error codes 203-XX through 205-XX: 1. Replace the defective memory chip if an error code is accompanied by an XX000 BYYZZ code** and retest. 2. Replace the system memory board or the system board.
204-XX	Memory Address	
205-XX	Walking 1/0	

*On earlier versions of the 8-MHz COMPAQ DESKPRO 286.

See *Section 5.4*, **MEMORY ERROR CODES, for location of the defective memory.

Table 5-4. Keyboard Error Codes (3xx-xx Range)

Error Range	Error Function	Recommended Action
301-XX 302-XX	Keyboard Short Test Keyboard Long Test	The following steps apply to error codes 301-XX through 303-XX:
303-XX	Keyboard LED Test	1. Check keyboard cable connector. If disconnected, turn off computer and connect keyboard. 2. Check internal keyboard connections to system board. 3. Replace the keyboard and retest. 4. Replace the system board and retest.
315-XX	Security Lock Test	The following steps apply to error codes 315-XX: 1. Verify the security lock cable. 2. Replace the security lock assembly and retest.

Table 5-5. Printer Error Codes (4xx-xx Range)

Error Range	Error Function	Recommended Action
401-XX	Printer Failed or Not Connected	The following steps apply to error codes 401-XX through 498-XX: 1. If a printer is connected, be sure it is turned ON and in the online mode. 2. Check the switch settings on the multipurpose fixed disk drive controller board, the multipurpose controller board, or the diskette/printer board (see *Chapter 8*, **JUMPER POSITIONS AND SWITCH SETTINGS**). 3. Replace the printer and/or the printer cable and retest. 4. Replace the multipurpose fixed disk drive controller board, the multipurpose controller board, or the diskette/printer board and retest. 5. Replace the system board and retest.
402-XX	Printer Date, Interrupt	
403-XX	Printer Pattern Test	
498-XX	Printer Failed or Not Connected	

Table 5-6. Video Display Unit Error Codes (5xx-xx Range)

Error Range	Error Function	Recommended Action
501-XX 502-XX 503-XX 504-XX 505-XX 506-XX 507-XX 508-XX 509-XX 510-XX 511-XX 512-XX 514-XX 516-XX	VDU Controller Test VDU Memory Test VDU Attribute Test VDU Character Set Test VDU 80 × 25 Mode 9 × 14 Character Cell Test VDU 80 × 25 Mode 8 × 8 Character Cell Test VDU 40 × 25 Mode Test VDU 320 × 200 Mode Color Set 0 Test VDU 320 × 200 Mode Color Set 1 Test VDU 640 × 200 Mode Test VDU Screen Memory Page Test VDU Gray Scale Test VDU White Screen Test VDU Noise Pattern Test	The following steps apply to error codes 501-XX through 516-XX: 1. Replace the video display controller board and retest. 2. Replace the monitor and retest. 3. Check the VDU fuse on the system board and retest. 4. Replace the system board and retest.
517-XX	Lightpen Test	The following steps apply for error code 517-XX: 1. Replace the lightpen and retest. 2. Replace the display controller board and retest. 3. Replace the system board and retest.

Table 5-7. Diskette Drive Error Codes (6xx-xx Range)

Error Range	Error Function	Recommended Action
600-XX	Diskette Drive ID Test	The following steps apply to error codes 600-XX through 610-XX: NOTE: If the COMPAQ Enhanced Color Graphics Board is installed, check the interrupt setting. 1. Replace the diskette and retest. 2. Check the switch and jumper settings on the multipurpose fixed disk controller board, the multipurpose controller board or the diskette/printer board. 3. Replace the diskette power and signal cables and retest. 4. Replace the multipurpose fixed disk drive controller board, multipurpose controller board, or diskette/printer controller board and retest. 5. Replace the diskette drive and retest. 6. Replace the system board and retest.
601-XX	Format	
602-XX	Read Test	
603-XX	Write/Read Compare Test	
604-XX	Random Seek	
605-XX	ID Media Test	
606-XX	Speed Test	
607-XX	Wrap Test	
608-XX	Write Protect Test	
609-XX	Reset Controller Test	
610-XX	Change Line Test*	

*The following applies to 80286-based computers:
For a 1.2-Megabyte drive, replace the diskette drive.
For a 360-Kbyte drive, a drive modification has not been performed. See Service Bulletin 25.

Continued..

Table 5-7. Diskette Drive Error Codes (6xx-xx Range) *Continued*

Error Range	Error Function	Recommended Action
694-XX	Un-cut Pin 34	See Service Bulletin 25.
697-xx	Diskette Type	1. Replace the diskette and retest. 2. Check the switch and jumper settings on the multipurpose fixed disk controller board, the multipurpose controller board, or the diskette/printer board. 3. Replace the diskette power and signal cables and retest. 4. Replace the multipurpose fixed disk drive controller board, multipurpose controller board, or Diskette Type diskette/printer controller board and retest. 5. Replace the diskette drive and retest. 6. Replace the system board and retest.
698-xx	Diskette Drive Speed Limits	
699-XX	Drive/Media ID	Rerun the SETUP Program.
Monochrome Video Error Codes (8XX-XX Range)		
802-XX	Monochrome Video Board Memory Test	The following steps apply to error codes 802-XX through 824-XX: 1. Replace the monochrome board and retest. 2. Replace the system board and retest. 3. Replace the monitor and retest.
824-XX	Monochrome Text Test	

Table 5-8. Asynchronous Communications Clock Error Codes (11xx-xx Range)

Error Range	Error Function	Recommended Action
1101-XX	Asynchronous Communications Interface Test	The following steps apply to error codes 1101-XX through 1109-XX: 1. Check jumper and switch settings on the asynchronous communications/parallel printer board, multipurpose fixed disk drive controller board, or the multipurpose controller board and retest. 2. Replace the asynchronous communications/parallel printer board, multipurpose fixed disk drive controller board, or multipurpose controller board and retest.
1109-XX	Asynchronous Communications/Clock Test	

Table 5-9. Modem Communications Test

Error Range	Error Function	Recommended Action
1201-XX	Modem Internal Loopback Test	The following apply to error codes 1201-XX through 1210-XX: 1. Refer to modem documentation for correct setup procedures. 2. Check the modem line. 3. Replace the modem and retest.
1202-XX	Modem Time-Out Test	
1203-XX	Modem External Termination Test	
1204-XX	Modem Auto Originate Test	
1205-XX	Modem Auto Answer Test	
1206-XX	Dial Multifrequency Tone Test	
1210-XX	Modem Direct Connect Test	

Table 5-10. Fixed Disk Drive Error Codes (17xx-xx Range)

Error Range	Error Function	Recommended Action
1700-XX	Drive ID Test	The following steps apply to 1700-XX through 1717-XX error codes: 1. Check switch and jumper settings on the fixed disk drive controller board, multipurpose fixed disk drive controller board, multipurpose controller board, or the ESDI controller board and retest. 2. Replace the fixed disk drive signal and power cables and retest. 3. Replace the fixed disk drive controller board, multipurpose fixed disk drive controller board, multipurpose controller board, or the ESDI controller board and retest. 4. Replace the fixed disk drive and retest. 5. Replace the system board and retest.
1701-XX	Format Test	
1702-XX	Read Test	
1703-XX	Write/Read Compare Test	
1704-XX	Random Seek Test	
1705-XX	Controller Test	
1706-XX	Ready Test	
1707-XX	Recalibrate Test	
1708-XX	Format Bad Track	
1709-XX	Reset Controller Test	
1710-XX	Park Head Test	
1714-XX	File Write Test	
1715-XX	Head Select Test	
1716-XX	Conditional Format Test	
1717-XX	ECC Test	

Table 5-11. Fixed Disk Drive Backup Error Codes (19XX-XX Range)

Error Range	Error Function	Recommended Action
1900-XX	Tape ID Test	The following steps apply to 1900-XX through 1906-XX error codes: 1. Replace the tape cartridge and retest. 2. Replace the signal cable and retest. 3. Replace the controller board or the Host Adapter board (for the 135-Megabyte Tape Backup) and retest. 4. Replace the fixed disk drive backup assembly and retest.
1901-XX	Tape Servo Write Test	
1902-XX	Tape Format Test	
1903-XX	Tape Drive Sensor Test	
1904-XX	Tape BOT/EOT Test	
1905-XX	Tape Read Test	
1906-XX	Tape Write,Read, Compare Test	

Table 5-12. COMPAQ Enhanced Color Graphics and Video Graphics Controller Board Error Codes (24xx-xx Range)

Error Range	Error Function	Recommended Action
2402-XX	VDU Memory Test	The following steps apply to to error codes 2402-XX through 2416-XX: 1. Verify the switch settings. 2. Replace the COMPAQ Enhanced Color Graphics Board ROM and retest. 3. Replace the COMPAQ Enhanced Color Graphics Board and retest. 4. Replace the system board and retest.
2403-XX	VDU Attribute Test	
2404-XX	VDU Character Set Test	
2405-XX	VDU 80 × 25 Mode 9 × 14 Character Cell Test	
2406-XX	VDU 80 × 25 Mode 8 × 8 Character Cell Test	

Continued..

Table 5-12. COMPAQ Enhanced Color Graphics and Video Graphics Controller Board Error Codes (24xx-xx Range) *Continued*

Error Range	Error Function	Recommended Action
2407-XX	VDU 40 × 25 Mode Test	
2408-XX	VDU 320 × 200 Mode Color Set 0 Test	
2409-XX	VDU 320 × 200 Mode Color Set 1 Test	
2410-XX	VDU 640 × 200 Mode Test	
2411-XX	VDU Screen Memory Page Test	
2412-XX	VDU Gray Scale Test	
2414-XX	VDU White Screen Test	
2416-XX	VDU Noise Pattern Test	
2417-XX	Lightpen Test	The following steps apply to 2417-XX error codes: 1. Replace the lightpen and retest. 2. Replace the COMPAQ Enhanced Color Graphics Board ROM and retest. 3. Replace the COMPAQ Enhanced Color Graphics Board and retest. 4. Replace the system board and retest.

Continued...

Table 5-12. COMPAQ Enhanced Color Graphics and Video Graphics Controller Board Error Codes (24xx-xx Range) *Continued*

Error Range	Error Function	Recommended Action
2418-XX	ECG/VGC Memory Test	The following steps apply to to error codes 2418-XX through 2425-XX: 1. Verify switch settings. 2. Replace the COMPAQ Enhanced Color Graphics Board ROM or the COMPAQ Video Graphics Controller Board and retest. 3. Replace the COMPAQ Enhanced Color Graphics Board and retest. 4. Replace the system board and retest.
2419-XX	ECG/VGC ROM Checksum Test	
2420-XX	ECG/VGC Attribute Test	
2421-XX	ECG/VGC 640 × 200 Graphics Mode Test	
2422-XX	ECG/VGC 640 × 350 16 Color Set Test	
2423-XX	ECG/VGC 640 × 350 64 Color Set Test	
2424-XX	ECG/VGC Monochrome Text Mode Test	
2425-XX	ECG/VGC Monochrome Graphics Mode Test	
2431-XX	VGC 640 × 480 Graphics Test	The following steps apply to error codes 2431-XX and 2432-XX: 1. Replace the COMPAQ Video Graphics Controller Board ROM. 2. Replace the COMPAQ Video Graphics Controller Board. 3. Replace the system board and retest.
2432-XX	VGC 320 × 200 Graphics (256 Color Mode Test)	

5.4 MEMORY ERROR CODES

This chapter contains memory error codes for the COMPAQ DESKPRO and COMPAQ DESKPRO 286.

Memory error codes result when the system detects a memory fault during the Power-On Self-Test or as a result of a diagnostic test. The test programs attempt to isolate the memory fault to a specific chip, then generate a memory error code that specifies which memory chip to replace. In some cases, replacing the memory chip does not solve the problem because:

1. The system may be unable to accurately determine which chip or chips are faulty.
2. The problem may be caused by a failure in the memory support circuitry, not the memory device.

The memory error code points to a specific memory address. The physical location of the memory address depends on the type of system, the number and type of memory boards installed, and the type of memory device used (64K × 1 DRAM, 64K × 4 DRAM or 256K × 1 DRAM).

COMPAQ DESKPRO MEMORY ERROR CODES

The following figures identify memory error codes for the COMPAQ DESKPRO Personal Computer.

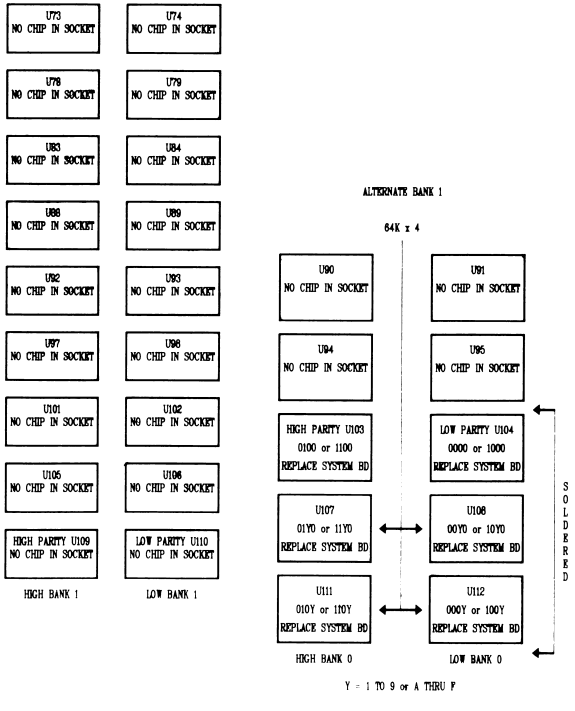


Figure 5-1. COMPAQ DESKPRO System Board Version 3 (assy. no. 000364) Memory Error Codes with 128 Kbytes.

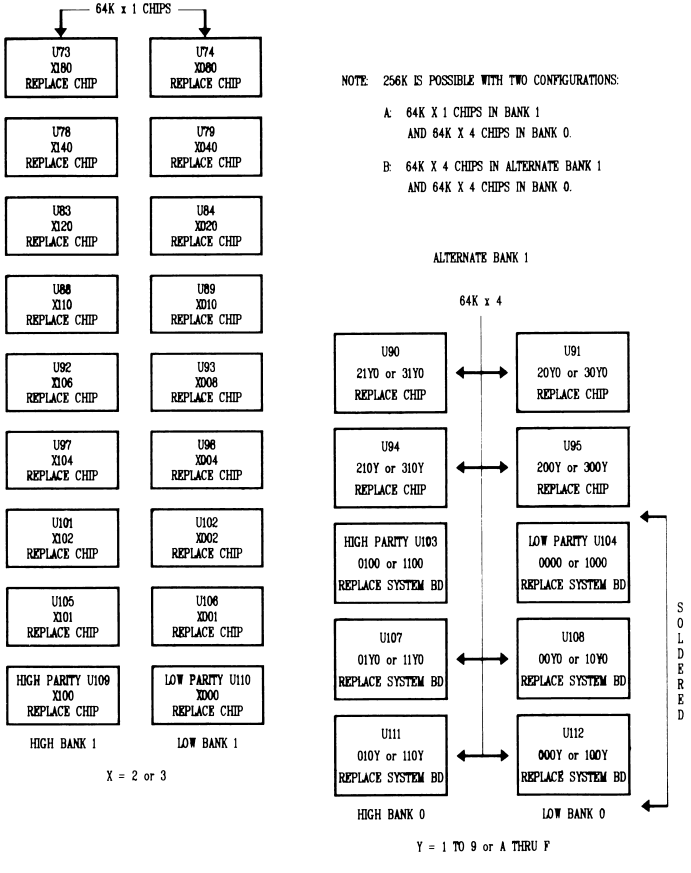


Figure 5-2. COMPAQ DESKPRO System Board Version 3 (assy. no. 000364) Memory Error Codes with 256 Kbytes.

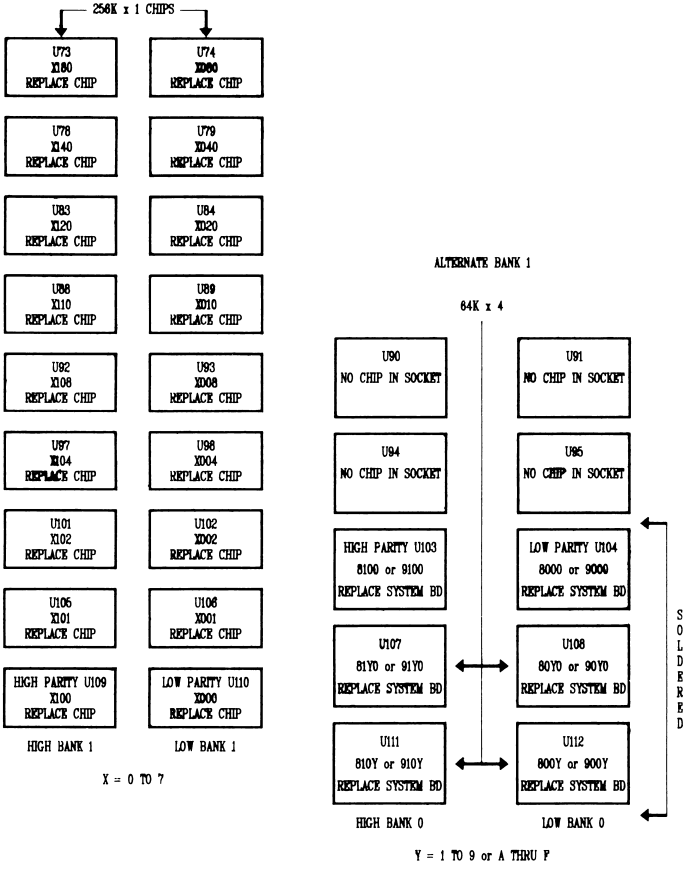


Figure 5-3. COMPAQ DESKPRO System Board Version 3 (assy. no. 000364) Memory Error Codes with 640 Kbytes.

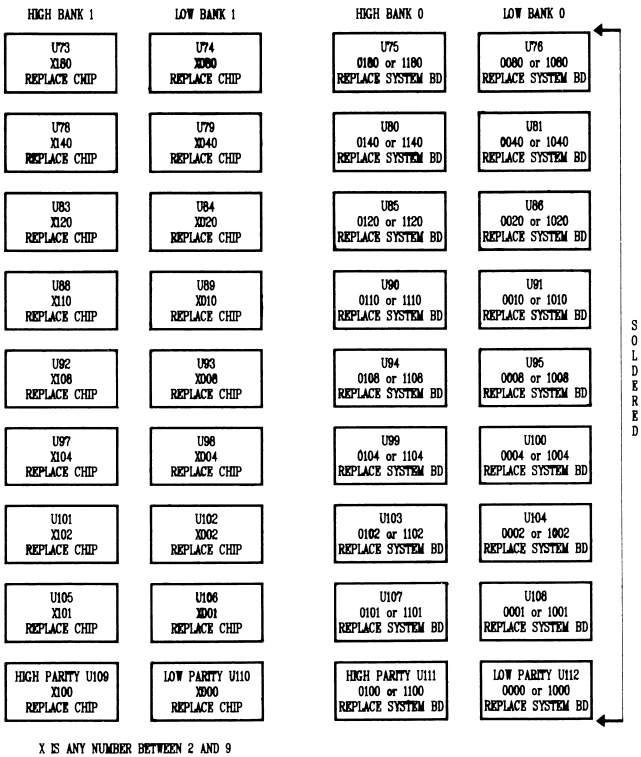


Figure 5-4. COMPAQ DESKPRO System Board Version 1 or 2 (assy. no. 000058 or 000315) Memory Error Codes.

COMPAQ DESKPRO 286 Memory Error Codes

Memory error codes are in the XX000B YYZZ format.

- ☐ Use XX to determine which bank of 18 chips the defective chip(s) is in.
- ☐ Use B to determine which byte the defective chip is in (B = 0, low byte, B = 1, high byte).
- ☐ Use YY or ZZ to identify which bit or individual chip is bad. See Table 5-13 for XX/YY references.
- ☐ Replace the defective chip and reset the system.

For example, assume error code 040001 0010 appears on the monitor. First, determine which table to reference (see Table 5-14). Next, determine which bank to reference and which byte, high or low. Finally determine the defective-chip row location. In this example, error code 040001-0010 specifies chip U24 in Table 5-15.

Table 5-13. Defective Memory Chip Isolation for COMPAQ DESKPRO 286 Version 2 (assy. no. 000361) and Version 3 (assy. no. 000555) System Boards

NOTE: COMPAQ DESKPRO 286 Version 1 (assy. no. 000094) system boards are not affected by this table. Use the same formula as defined on page 5-23 , (XX000 BYYZZ).
If XX = 08 or 09, replace the system board, otherwise, use the following table.

64K Chips	XX = 06,07		XX = 04,05		XX = 02,03		XX = 00,01	
256K Chips	XX = 20-27		XX = 18-1F		XX = 10-17		XX = 00-07	
	Bank 4		Bank 3		Bank 2		Bank 1	
Data Bit	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1
YY or ZZ	Low	High	Low	High	Low	High	Low	High
80	U27	U40	U52	U66	U82	U93	U107	U124
40	U28	U41	U53	U67	U83	U94	U108	U125
20	U29	U42	U54	U68	U84	U95	U109	U126
10	U30	U43	U55	U69	U85	U96	U110	U127
08	U31	U44	U56	U70	U86	U97	U111	U128
04	U32	U45	U57	U71	U87	U98	U112	U129
02	U33	U46	U58	U72	U88	U99	U113	U130
01	U34	U47	U59	U73	U89	U100	U114	U131
00	U35	U48	U60	U74	U90	U101	U115	U132

Refer to Figure 5-5 for chip location.

Table 5-14. COMPAQ DESKPRO 286 Memory Configurations

RAM Type	Error Code XX Value	Memory Device Location	Table
64K	00 to 08 (0 to 64 KB)	System Memory Board	5-15
256K	00 to 26 (0 to 640 KB 1 to 2.5 MB)	System Memory Board	5-16
2.5 to 4.5 MB	28 to 46 (256 KB)	Memory Expansion Board	5-17
4.5 to 6.5 MB	48 to 66 (256 KB)	Memory Expansion Board	5-18
6.5 to 8.5 MB	68 to 86 (256 KB)	Memory Expansion Board	5-19

Table 5-15. Defective Memory Chip Isolation for the COMPAQ DESKPRO 286 System Memory Board Using 64 Kbytes of RAM (0 to 640 Kbytes)

	XX = 00		XX = 02		XX = 04		XX = 06		XX = 08	
	Bank 0		Bank 1		Bank 2		Bank 3		Bank 4	
Data Bit	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0
YY or ZZ	High	Low	High	Low	High	Low	High	Low	High	Low
80	U1	U2	U3	U12	U21	U30	U39	U48	U57	U66
40	U4	U13	U22	U31	U40	U49	U58	U67		
20			U5	U14	U23	U32	U41	U50	U59	U68
10	U6	U15	U24	U33	U42	U51	U60	U69		
08	U7	U16	U25	U34	U43	U52	U61	U70		
04	U8	U17	U26	U35	U44	U53	U62	U71		
02	U9	U18	U27	U36	U45	U54	U63	U72		
01	U10	U19	U28	U37	U46	U55	U64	U73		
00	U11	U20	U29	U38	U47	U56	U65	U74		

Refer to Figures 5-6 and 5-7 for chip location.

Table 5-16. Defective Memory Chip Isolation for the COMPAQ DESKPRO 286 System Memory Board Using 256 Kbytes of RAM (0 to 640 Kbytes, 1 to 2.5 Megabytes)

	XX = 00		XX = 02,04, 06,08		XX = 10,12, 14,16		XX = 18,1A, 1C, 1E		XX = 20,22, 24,26	
	Bank 0		Bank 1		Bank 2		Bank 3		Bank 4	
Data Bit	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0
YY or ZZ	High	Low	High	Low	High	Low	High	Low	High	Low
80	U1	U2	U3	U12	U21	U30	U39	U48	U57	U66
40			U4	U13	U22	U31	U40	U49	U58	U67
20			U5	U14	U23	U32	U41	U50	U59	U68
10			U6	U15	U24	U33	U42	U51	U60	U69
08			U7	U16	U25	U34	U43	U52	U61	U70
04			U8	U17	U26	U35	U44	U53	U62	U71
02			U9	U18	U27	U36	U45	U54	U63	U72
01			U10	U19	U28	U37	U46	U55	U64	U73
00			U11	U20	U29	U38	U47	U56	U65	U74

Refer to Figures 5-6 and 5-7 for chip locations.

Table 5-17. Defective Memory Chip Isolation for a COMPAQ DESKPRO 286 Memory Expansion Board Mapped into the 2.5 to 4.5 Megabyte Memory Space (256K × 1 DRAM)

	XX = 28,2A, 2C,2E		XX = 30,32, 34,36		XX = 38,3A, 3C,3E		XX = 40,42, 44,46	
	Bank 1		Bank 2		Bank 3		Bank 4	
Data Bit	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0
YY or ZZ	High	Low	High	Low	High	Low	High	Low
80	U3	U12	U21	U30	U39	U48	U57	U66
40	U4	U13	U22	U31	U40	U49	U58	U67
20	U5	U14	U23	U32	U41	U50	U59	U68
10	U6	U15	U24	U33	U42	U51	U60	U69
08	U7	U16	U25	U34	U43	U52	U61	U70
04	U8	U17	U26	U35	U44	U53	U62	U71
02	U9	U18	U27	U36	U45	U54	U63	U72
01	U10	U19	U28	U37	U46	U55	U64	U73
00	U11	U20	U29	U38	U47	U56	U65	U74

Refer to Figure 5-8 for chip locations.

Table 5-18. Defective Memory Chip Isolation for a COMPAQ DESKPRO 286 Memory Expansion Board Mapped into the 4.5 to 6.5 Megabyte Memory Space (256K × 1 DRAM)

	XX = 48,4A, 4C,4E		XX = 50,52, 54,56		XX = 58,5A, 5C,5E		XX = 60,62, 64,66	
	Bank 1		Bank 2		Bank 3		Bank 4	
Data Bit	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0
YY or ZZ	High	Low	High	Low	High	Low	High	Low
80	U3	U12	U21	U30	U39	U48	U57	U66
40	U4	U13	U22	U31	U40	U49	U58	U67
20	U5	U14	U23	U32	U41	U50	U59	U68
10	U6	U15	U24	U33	U42	U51	U60	U69
08	U7	U16	U25	U34	U43	U52	U61	U70
04	U8	U17	U26	U35	U44	U53	U62	U71
02	U9	U18	U27	U36	U45	U54	U63	U72
01	U10	U19	U28	U37	U46	U55	U64	U73
00	U11	U20	U29	U38	U47	U56	U65	U74

Refer to Figure 5-8 for chip location.

Table 5-19. Defective Memory Chip Isolation for a COMPAQ DESKPRO 286 Memory Expansion Board Mapped into the 6.5 to 8.5 Megabyte Memory Space (256K × 1 DRAM)

	XX = 68,6A, 6C,6E		XX = 70,72, 74,76		XX = 78,7A, 7C,7E		XX = 80,82, 84,86	
	Bank 1		Bank 2		Bank 3		Bank 4	
Data Bit	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0	B = 1	B = 0
YY or ZZ	High	Low	High	Low	High	Low	High	Low
80	U3	U12	U21	U30	U39	U48	U57	U66
40	U4	U13	U22	U31	U40	U49	U58	U67
20	U5	U14	U23	U32	U41	U50	U59	U68
10	U6	U15	U24	U33	U42	U51	U60	U69
08	U7	U16	U25	U34	U43	U52	U61	U70
04	U8	U17	U26	U35	U44	U53	U62	U71
02	U9	U18	U27	U36	U45	U54	U63	U72
01	U10	U19	U28	U37	U46	U55	U64	U73
00	U11	U20	U29	U38	U47	U56	U65	U74

Refer to Figure 5-8 for chip locations.

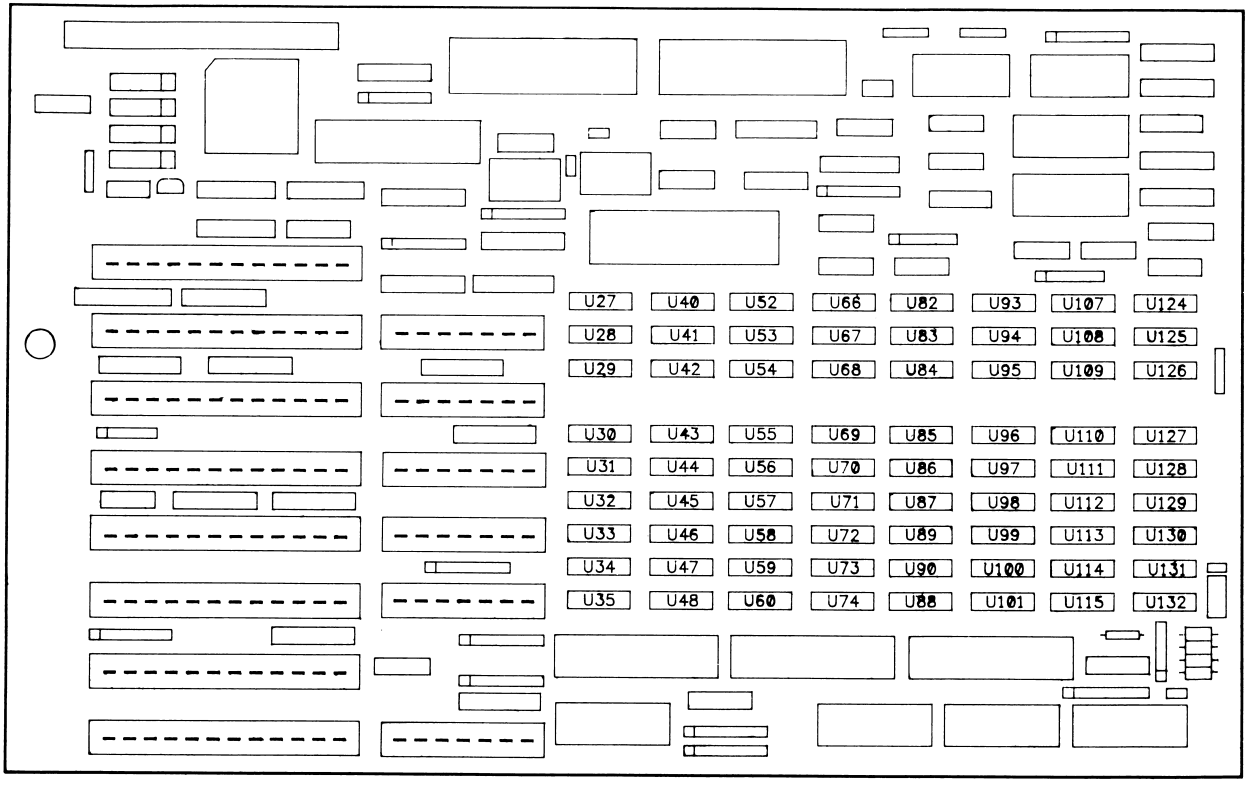


Figure 5-5. COMPAQ DESKPRO 286 System Board (Version 2 & 3) Memory Chip Location.

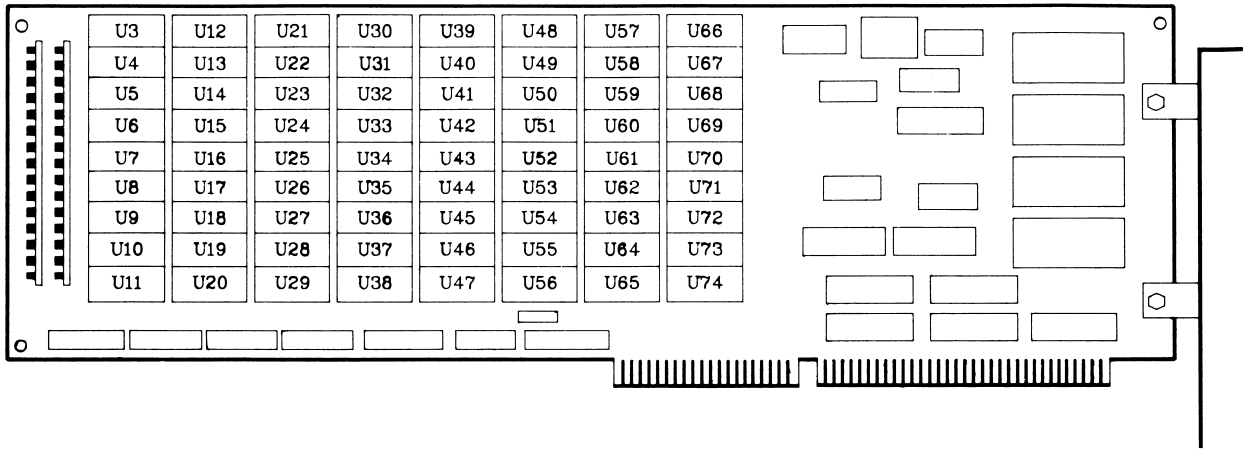


Figure 5-6. COMPAQ DESKPRO 286 Version 1 (assy. no. 000130) System Memory Board.

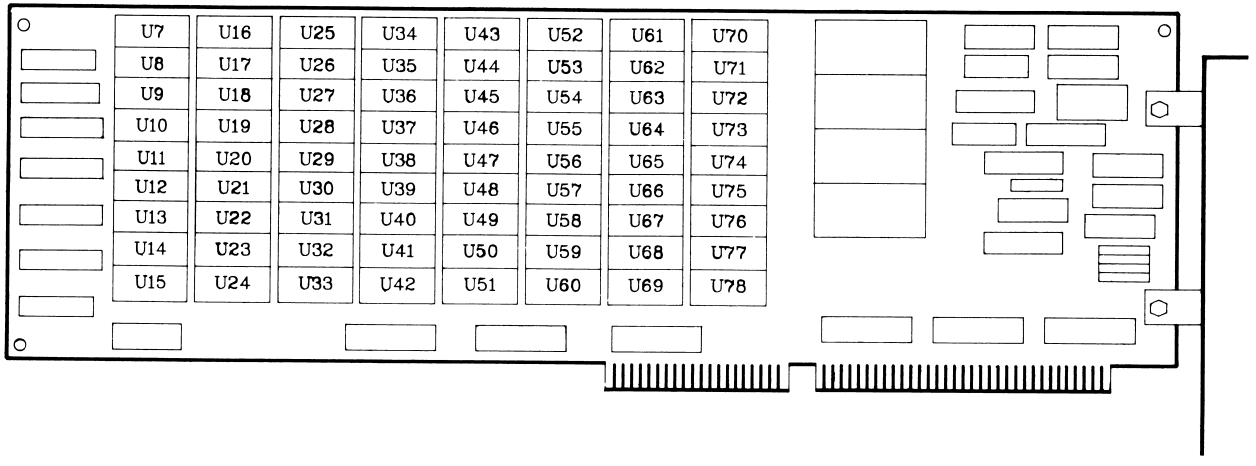


Figure 5-7. COMPAQ DESKPRO 286 Version 2 (assy. no. 000178 or 000382) System Memory Board.

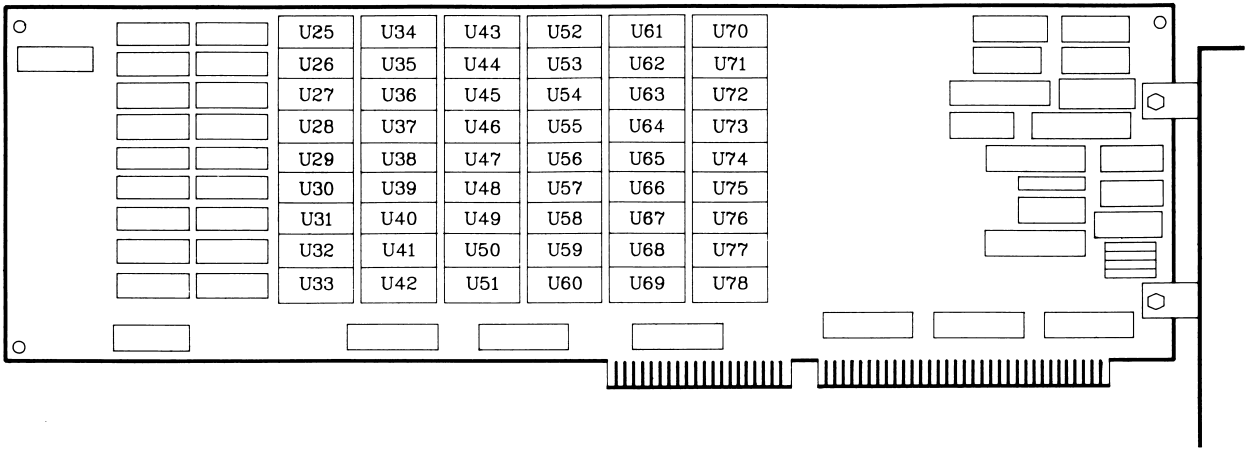


Figure 5-8. COMPAQ DESKPRO 286 Memory Expansion Board.

CONTENTS

Chapter 6
ILLUSTRATED PARTS CATALOG

Chapter 6
ILLUSTRATED PARTS CATALOG

6.1 INTRODUCTION

This chapter provides a reference for spare parts for the COMPAQ DESKPRO Personal Computer and COMPAQ DESKPRO 286 Personal Computer.

Each section contains a parts list that consists of:

- ☐ Description–the name of the particular part or parts kit
- ☐ Part Number–the number to use when ordering parts from Compaq Computer Corporation

6.2 COMPAQ DESKPRO SPARE PARTS LIST, U.S.

Table 6-1. Spare Parts List, U.S.

Description	Part Number
System Unit	
1. Power Cord	101155-001
2. Power Supply Assembly	102927-001
3. Speaker Assembly	101062-001
4. Fuse Kit	102930-001
Boards	
5. System Board–256K (assy. no. 000058)	101339-001
6. System Board–256K (assy. no. 000315)	105191-001
7. System Board, (assy. no. 000364-001)	106374-001

Continued...

Table 6-1. Spare Parts List, U.S. *Continued*

Description	Part Number
8. Video Display Controller Board	101340-001
9. COMPAQ Enhanced Color Graphics Board (Version 1)	106373-001
10. COMPAQ Enhanced Color Graphics Board (Version 2)	109196-001
11. Asynchronous Communications/Clock Board	101440-001
12. Diskette/Printer Controller Board (assy. no. 000043 or 000181-011)	101341-001
13. Fixed Disk Drive Controller Board	101672-001
Mass Storage Devices	
14. 5 1/4-Inch 360-Kbyte Diskette Drive	102928-001
15. 10-Megabyte Fixed Disk Drive	101437-001
16. 20-Megabyte Fixed Disk Drive	102777-001
17. 30-Megabyte Fixed Disk Drive	101664-001
18. 10-Megabyte Fixed Disk Drive Backup	101438-001
19. Diskette Drive Signal Cable	101380-002
20. Fixed Disk Drive Signal Cables (Set)	100641-002
21. Universal Drive Power Cable	101137-001
Keyboards	
22. 83-Key Keyboard	101397-001
23. COMPAQ Enhanced Keyboard	108067-001
24. COMPAQ Enhanced Keyboard Cable	108095-001

Continued...

Table 6-1. Spare Parts List, U.S. *Continued*

Description	Part Number
Monitors	
25. Monitor Assembly–Dual-Mode Amber	101439-002
26. Monitor Assembly–Dual-Mode Green	101439-001
27. Monitor Assembly–Color	106568-001
Miscellaneous Spare Parts	
28. ***MS-DOS VERSION 3.3 REFERENCE GUIDE***	106979-001
29. ***BASIC VERSION 3.3 REFERENCE GUIDE***	106983-001
30. ***COMPAQ DESKPRO PERSONAL COMPUTER OPERATIONS GUIDE***	101432-001
31. ***COMPAQ DESKPRO PERSONAL COMPUTER MAINTENANCE AND SERVICE GUIDE*** (with ADVANCED DIAGNOSTICS AND TEST CABLES)	102978-001
32. ADVANCED DIAGNOSTICS diskette	108137-00X
33. USER PROGRAMS Kit	108289-001
34. 8087-2 Coprocessor	101619-001
35. System ROM	100699-001
36. ***COMPAQ SERVICE QUICK REFERENCE GUIDE*** (Qty 5)	106854-001
37. ***COMPAQ SERVICE QUICK REFERENCE GUIDE*** (Qty 5 with covers)	106786-001

6.3 COMPAQ DESKPRO SPARE PARTS LIST, INTERNATIONAL

Table 6-2. Spare Parts List, International

Description	Part Number
1. Monitor Assembly–Color	106162-002*
2. Power Supply Assembly	102342-001*
3. 83-Key Keyboard, U.K.	102681-001*
4. 83-Key Keyboard, German	102682-001*
5. 83-Key Keyboard, French	102683-001*
6. Dual-Mode Monitor, Amber	105584-001*
7. Dual-Mode Monitor, Green	105549-001*

*Gray bezel (plastics)

6.4 COMPAQ DESKPRO PARTS LIST

Table 6-3. System Unit

Description	Part Number
1. System Unit Cover	101065-001
a. Bezel assembly	101066-001
b. System unit hood	101070-001
2. AC Power Cord	101155-001
3. Cable Shield	106554-001

Continued...

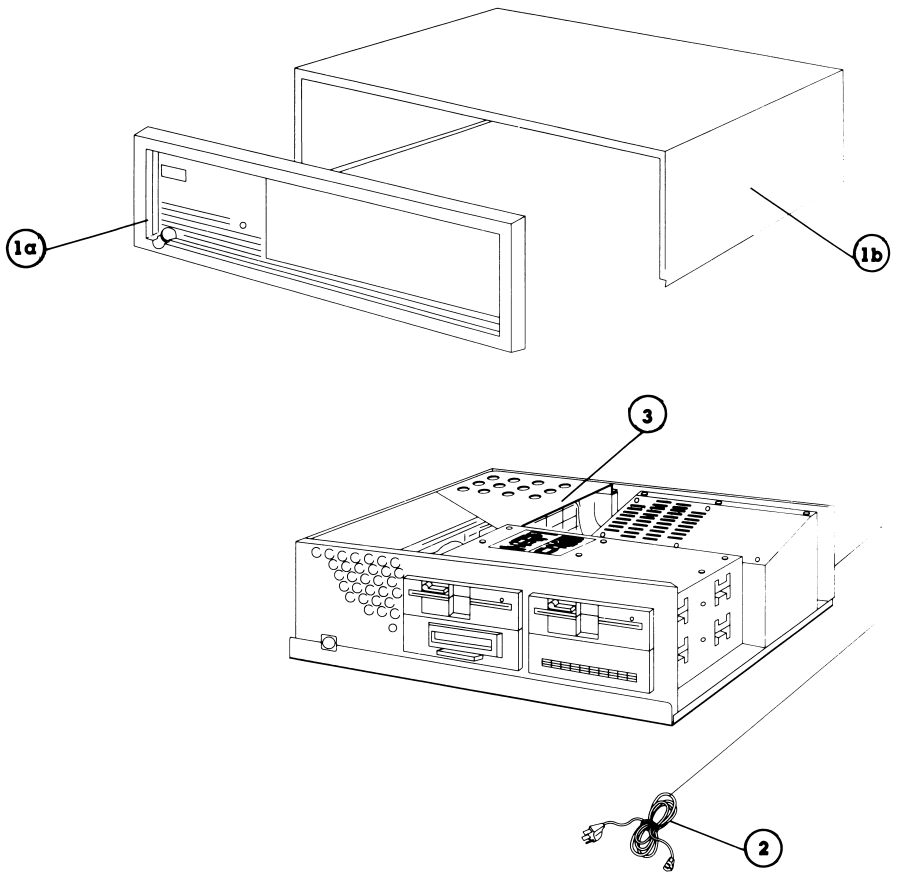


Figure 6-1. System Unit (A).

Table 6-3. System Unit *Continued*

Description	Part Number
4. Speaker Assembly	101062-001
5. Speaker/Card Guide Bracket	102770-001*
6. Mode Indicator LED	101143-001*
7. Drive Housing	101055-001
8. AC Power Fuse	*
9. Power Supply Assembly	102927-001
10. System Unit Chassis	101053-001
11. System Unit Foot	*
12. a. System Board Version 1 (256K)	101339-001
b. System Board Version 2 (256K)	105191-001
c. System Board Version 3 (256K)	106374-001
13. Keyboard/Monitor Power Fuses	*
14. RAM Spare Kit	
a. 64K × 1 DRAM Chip–Qty 1 (150 ns)	105152-001
b. 256K × 1 DRAM Chip–Qty 1 (150 ns)	105151-001

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

Continued...

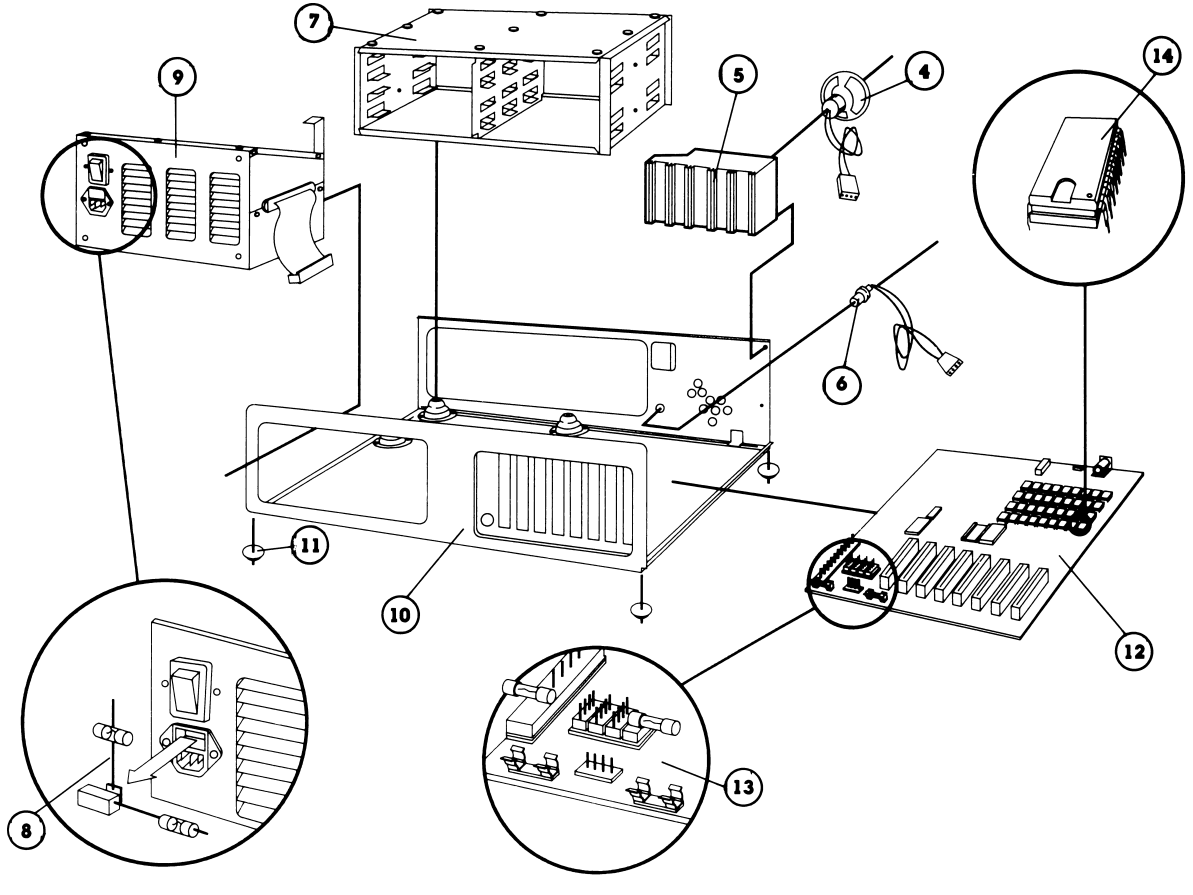


Figure 6-2. System Unit (B).

Table 6-3. System Unit *Continued*

Description	Part Number
15. Video Display Controller Board	101340-001
16. a. COMPAQ Enhanced Color Graphics Board Version 1	106373-001**
b. COMPAQ Enhanced Color Graphics Board Version 2	109196-001
17. Fixed Disk Drive Controller Board	101672-001
18. Diskette/Printer Controller Board	101341-001
19. Asynchronous Communications/Clock Board	101440-001
20. Battery	101260-001
21. Option Slot Cover (Board)	101144-001
22. Fixed Disk Drive Signal Cables (Set)	100641-002
23. Fixed Disk Drive Cable, Dual (34-position)	101554-001**
24. Fixed Disk Drive Cable, (20-position)	100625-004
25. Fixed Disk Drive Cable, Single (34-position)	100625-003
26. Universal Drive Power Cable	101137-001
27. Diskette Drive Signal Cable	101380-002
28. Diskette Drive	102928-001
29. 10-Megabyte Fixed Disk Drive	101437-001
30. 20-Megabyte Fixed Disk Drive	102777-001
31. 30-Megabyte Fixed Disk Drive	101664-001**
32. 10-Megabyte Fixed Disk Drive Backup	101438-001
33. DC 1000 Tape Cartridge (Qty. 1)	101383-001
34. a. Drive Blank Panel Subassembly (upper)	101135-001
b. Drive Blank Panel Subassembly (lower)	101135-002**

**Not shown

Continued...

Table 6-3. System Unit *Continued*

Description	Part Number
35. System ROM	100699-001**
36. Miscellaneous Hardware Kit PCB Retainer (Qty 4) PCB Standoff (Qty 5) Brightness Knob (Qty 5) Push Button Mount Fastener (Qty 5) Ty-wrap (Qty 100) PCB Card Guide (Qty 5) Keyboard Feet (Rubber) (Qty 10) Monitor Feet (Cork) (Qty 5) System Feet (Rubber) (Qty 5) Fuse, AC Line, 2 Ampere (Qty 10) Fuse, AC Line, 3 Ampere (Qty 10) Fuse, AC Line, 4 Ampere (Qty 10) Nut, Hex Self-Locking (Qty 5) Screw, 8-32 × 3/8 (Qty 50) Screw, 6-32 × 3/8 (Qty 50) Screw, 6-32 × 1/2 (Qty 50) Screw, 4-40 × 1/4 (Qty 10) Screw, 6-32 × 5/8 (Qty 50) Screw, 6-32 × 7/8 (Qty 2) Insulator (Qty 6) Security Lock Switch (Qty 2) Bracket, Speaker/Card Guide (Qty 1 LED Cable Assembly (Qty 1)	102709-001**

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)
**Not shown

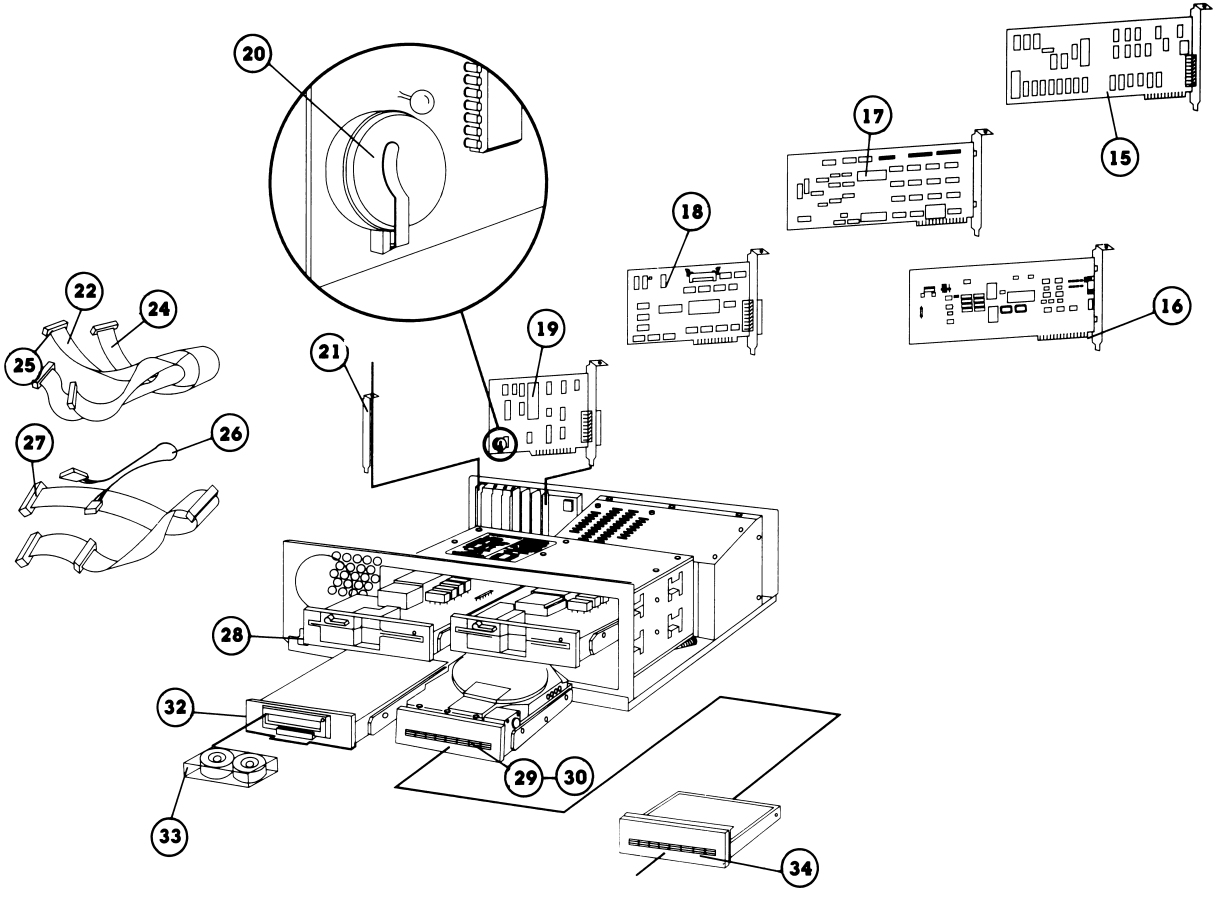


Figure 6-3. System Unit (C).

Table 6-4. 83-Key Keyboard

Description	Part Number
1. Keyboard Assembly	101397-001
2. Keyboard Feet (rubber)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

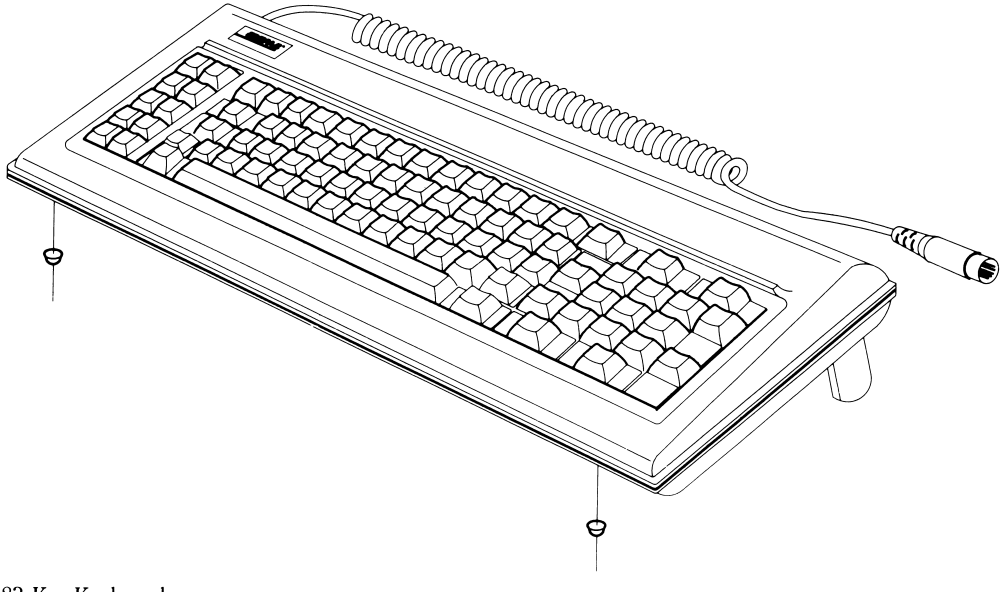


Figure 6-4. 83-Key Keyboard.

Table 6-5. COMPAQ Enhanced Keyboard

Description	Part Number
1. Keyboard Assembly (with cable)	108067-001
2. Keyboard Cable	108095-001
3. Keyboard Feet (rubber)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

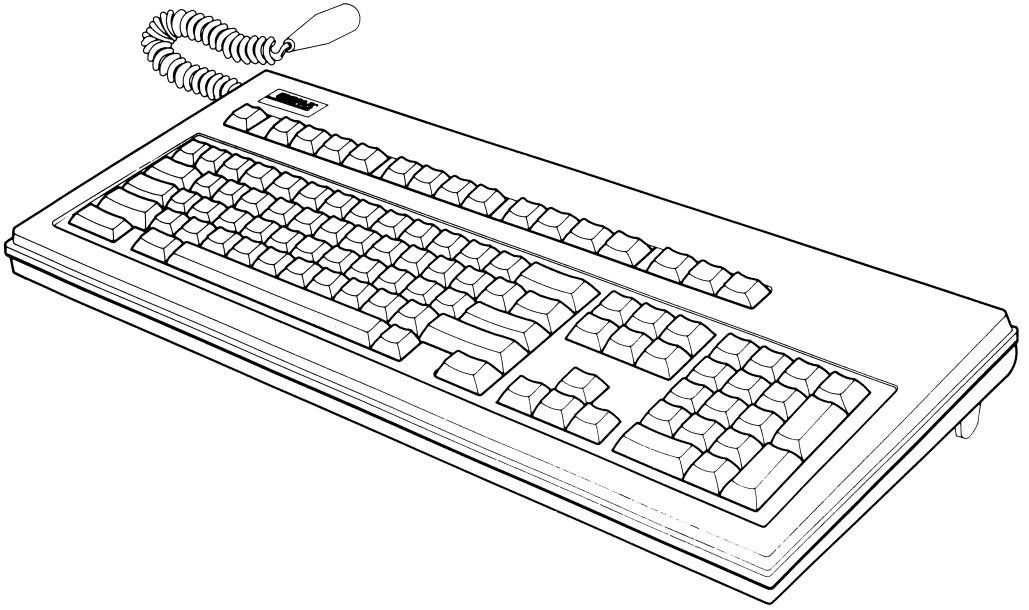


Figure 6-5. COMPAQ Enhanced Keyboard.

Table 6-6. COMPAQ Dual-Mode Monitor

Description	Part Number
1. Monitor Assembly	
a. Green	101439-001
b. Amber	101439-002
2. Brightness Control Knob	*
3. Monitor Feet (cork)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

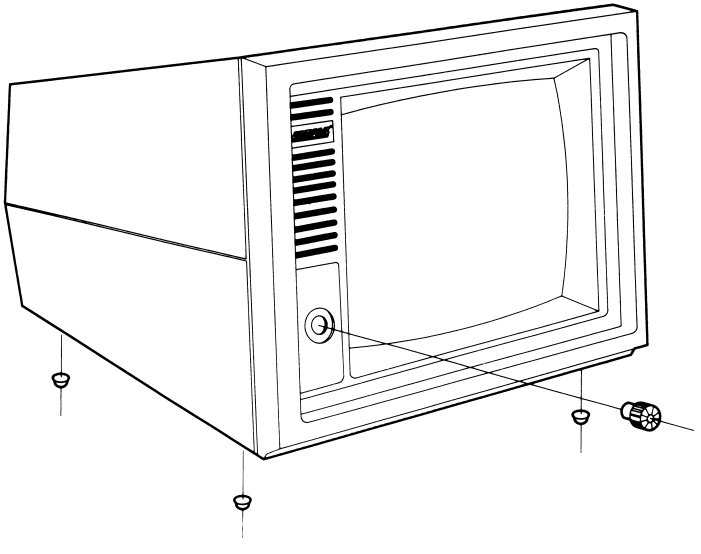


Figure 6-6. COMPAQ Dual-Mode Monitor.

Table 6-7. COMPAQ Color Monitor

Description	Part Number
1. Monitor Assembly	106162-001

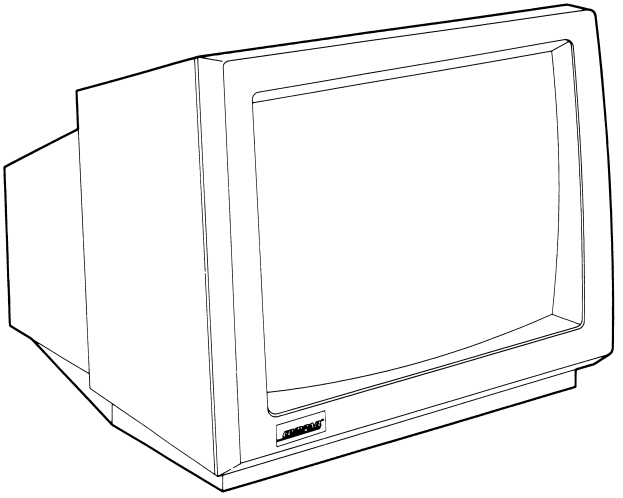


Figure 6-7. COMPAQ Color Monitor.

Table 6-8. Video Graphics Monochrome Monitor

Description	Part Number
1. Monitor Assembly	109254-001

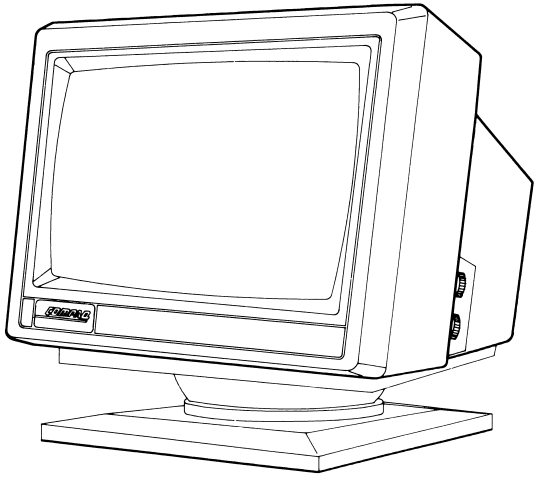


Figure 6-8. Video Graphics Monochrome Monitor.

Table 6-9. Video Graphics Color Monitor

Description	Part Number
1. Monitor Assembly	109255-001

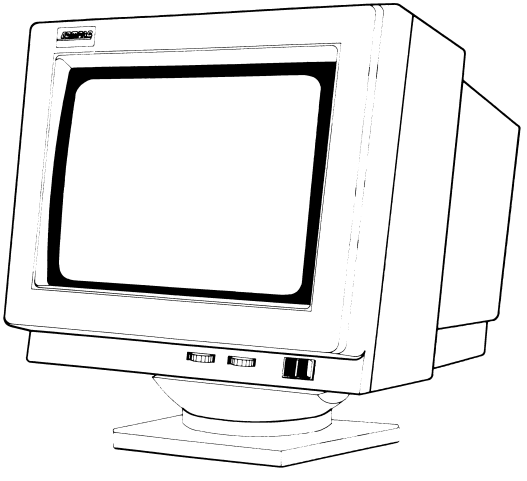


Figure 6-9. Video Graphics Color Monitor.

6.5 COMPAQ DESKPRO 286 SPARE PARTS LIST, U.S.

Table 6-10. Spare Parts List, U.S.

Description	Part Number
System Unit	
1. Power Supply (8-MHz system)	102927-001
2. Power Supply (12-MHz system)	108065-001
3. Fuse Kit	102930-001
4. Speaker Assembly	101062-001
5. Power Cord	101155-001
Boards	
6. 8-MHz System Board (Version 1) (assy. no. 000094-001)	102774-001
7. 8-MHz System Board (Version 2) (assy. no. 000361-001)	106434-001
8. 12-MHz System Board	106707-001
9. System Memory Board (8-MHz System)	102710-001
10. Video Display Controller Board	101340-001
11. Multipurpose Controller Board	102705-001
12. COMPAQ Enhanced Color Graphics Board Version 1	106373-001
13. COMPAQ Enhanced Color Graphics Board Version 2	109196-001
14. Video Graphics Controller Board	109253-001

Continued...

Table 6-10. Spare Parts List, U.S. *Continued*

Description	Part Number
15. Multipurpose Fixed Disk Drive Controller Board	104174-001
16. Fixed Disk Drive Controller Board	102778-001
17. Asynchronous Communications/Parallel Printer Board	106886-001
18. ESDI Fixed Disk Drive Controller Board	108140-001
19. Host Adapter Board (135-MB Tape) (12-MHz System)	113259-001
20. 512/2048 Memory Expansion Board	105033-001
Mass Storage Devices	
21. 5 1/4-Inch 1.2-Megabyte Diskette Drive	102775-001
22. 5 1/4-Inch 360-Kbyte Diskette Drive	102928-001
23. 3 1/2-Inch 1.44-Megabyte Diskette Drive	113263-001
24. 20-Megabyte Fixed Disk Drive (8-MHz system)	102777-001
25. 20-Megabyte Fixed Disk Drive (12-MHz system)	113016-001
26. 30-Megabyte Fixed Disk Drive (8-MHz system)	101664-001
27. 40-Megabyte Fixed Disk Drive	108058-001
28. 70-Megabyte Fixed Disk Drive	102932-001
29. 130-Megabyte Fixed Disk Drive	108080-001
30. 10-Megabyte Fixed Disk Drive Backup (8-MHz system)	101438-001
31. 40-Megabyte Fixed Disk Drive Backup	108081-001
32. 135-Megabyte Fixed Disk Drive Backup (12-MHz System)	113218-001
33. Fixed Disk Drive Controller Cable (32-pin)	100641-002

Continued...

Table 6-10. Spare Parts List, U.S. *Continued*

Description	Part Number
34. Fixed Disk Drive Controller Cable (40-pin)	108145-001
35. Fixed Disk Drive Cable	108086-001
36. Diskette Drive Signal Cable	101380-002
37. Diskette Drive Cable	100048-003
38. ESDI Fixed Disk Drive Cable (Set)	108249-001
39. Fixed Disk Drive Backup Cable (135-Mb)	113198-001
40. Second Fixed Disk Drive Controller Cables (32-pin)	100641-002
41. Second Fixed Disk Drive Controller Cables (40-pin)	108087-001
42. DC 1000 Tape Cartridge	101488-001
43. DC 2000 Tape Cartridge	108142-001
Keyboards	
44. 84-Key Keyboard	102776-001
45. 84-Key Keyboard Cable	102654-001
46. COMPAQ Enhanced Keyboard	108067-001
47. COMPAQ Enhanced Keyboard Cable	108095-001
Monitors	
48. Video Graphics Monochrome Monitor	109254-001
49. Video Graphics Color Monitor	109255-001
50. Monitor Assembly–Color	106568-001
51. Monitor Assembly–Dual-Mode Green	101439-001
52. Monitor Assembly–Dual-Mode Amber	101439-002

Continued...

Table 6-10. Spare Parts List, U.S. *Continued*

Description	Part Number
Miscellaneous	
53. 64K DRAM Chip–Qty 1 100 ns	106864-001
54. 64K × 1 DRAM Chip–Qty 1 150 ns (8-MHz system)	105152-001
55. 256K × 1 DRAM Chip–Qty 1 150 ns (8-MHz system)	105151-001
56. 256K × 1 DRAM Chip–Qty 1 100 ns (12-MHz system)	113017-001
57. Universal Drive Power Cable	101137-001
58. Cable Kit (Combined Cable Kit)	102934-001
59. Miscellaneous Hardware Kit	102709-001
60. Logo Set	102780-001
61. Control Board Standoff (8-MHz system)	101145-001
62. Chassis (8-MHz system)	102543-001
63. Chassis (12-MHz system)	108267-001
64. Upper Blank Drive Panel	101135-001
65. Lower Blank Drive Panel	101135-002
66. System Unit Bezel Assembly (with key hole)	106225-001
67. Monitor Foot	101306-001
68. ***COMPAQ DESKPRO 286 PERSONAL COMPUTER MAINTENANCE AND SERVICE GUIDE*** (with ADVANCED DIAGNOSTICS and Tools)	102978-001
69. Shock Mount	*
70. Foot (rubber)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

Continued...

Table 6-10. Spare Parts List, U.S. *Continued*

Description	Part Number
71. Brightness Knob	100105-001
72. ***MS-DOS VERSION 3.3 REFERENCE GUIDE***	106979-001
73. ***BASIC VERSION 3.3 REFERENCE GUIDE***	106983-001
74. ***COMPAQ DESKPRO 286 OPERATIONS GUIDE***	102551-003
75. ADVANCED DIAGNOSTICS Diskette	108137-00X
76. USER PROGRAMS Diskette	108289-00X
77. Security Lock Assembly with Keys	105036-001
78. System Unit Cover	102560-001
79. Mass Storage Device Subassembly Housing	108266-001
80. 80287-2 Coprocessor (8-MHz)	106558-001
81. Blank Input/Output Access Plate	101144-001
82. System ROM Kit–Qty 2	105035-001
83. Lithium Battery	102929-001
84. Brace	101352-001
85. Cable Shield	106554-001
86. Card Guide	100030-001
87. RF Shield (12-MHz)	108264-001
88. ***COMPAQ SERVICE QUICK REFERENCE GUIDE***, (Qty 5)	106865-001
89. ***COMPAQ SERVICE QUICK REFERENCE GUIDE***, with Binders, (Qty 5)	106786-001
90. ***COMPAQ DESKPRO 286 TECHNICAL REFERENCE GUIDE***	106732-001
91. ***COMPAQ ENHANCED COLOR GRAPHICS BOARD TECHNICAL REFERENCE GUIDE***	106733-001

6.6 COMPAQ DESKPRO 286 SPARE PARTS LIST, INTERNATIONAL

Table 6-11. Spare Parts List, International

Description	Part Number
1. Power Supply (8-MHz system)	102342-001
2. Power Supply (12-MHz system)	120161-100
3. Monitor Assembly–Color	106568-002
4. Video Graphics Color Monitor	
Northern Hemisphere	109337-001
Southern Hemisphere	109336-001
5. Video Graphics Monochrome Monitor	109335-001

6.7 COMPAQ DESKPRO 286 PARTS LIST

Table 6-12. System Unit

Description	Part Number
1. Security Lock Assembly with Keys	105036-001
2. System Unit Bezel	102769-001
3. System Unit Cover	102546-001
4. AC Power Cord	101155-001
5. Cable Shield- Qty 10	106554-001

Continued...

Table 6-12. System Unit *Continued*

Description	Part Number
6. Card Guide/Speaker Enclosure	*
7. Speaker Assembly	101062-001
8. Security Lock Contact Switch	102767-001
9. Drive Housing Assembly	101055-001
10. Fuse Kit	102930-001
11. a. Power Supply Assembly (8-MHz system)	102927-001
b. Power Supply Assembly (12-MHz system)	108065-001**
12. a. System Unit Chassis (8-MHz system)	102543-001
b. System Unit Chassis (12-MHz system)	108267-001**
13. a. 8-MHz System Board (Version 1) (assy. no. 000094)	102774-001
b. 8-MHz System Board (Version 2) (assy. no. 000361)	106434-001**
c. 12-MHz System Board (Version 1 & 2) (assy. no. 000555 and 000700)	106707-001**
14. RF Shield (12-MHz only)	108264-001
15. Brace	101352-001

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)
**Not Shown

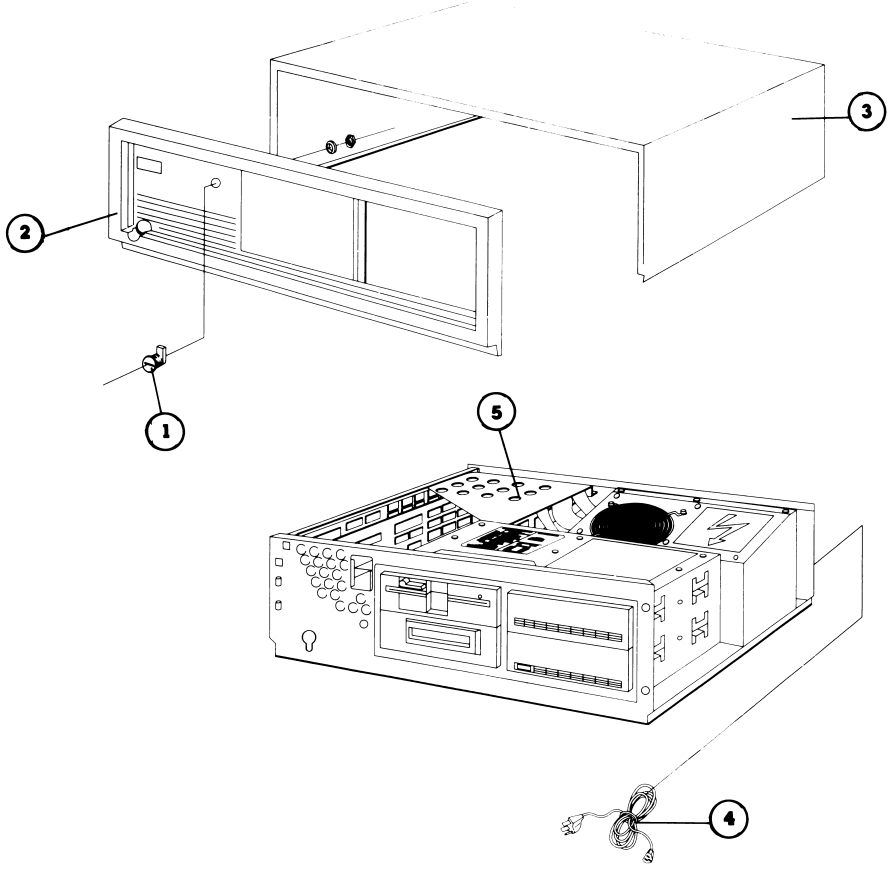


Figure 6-10. System Unit (A).

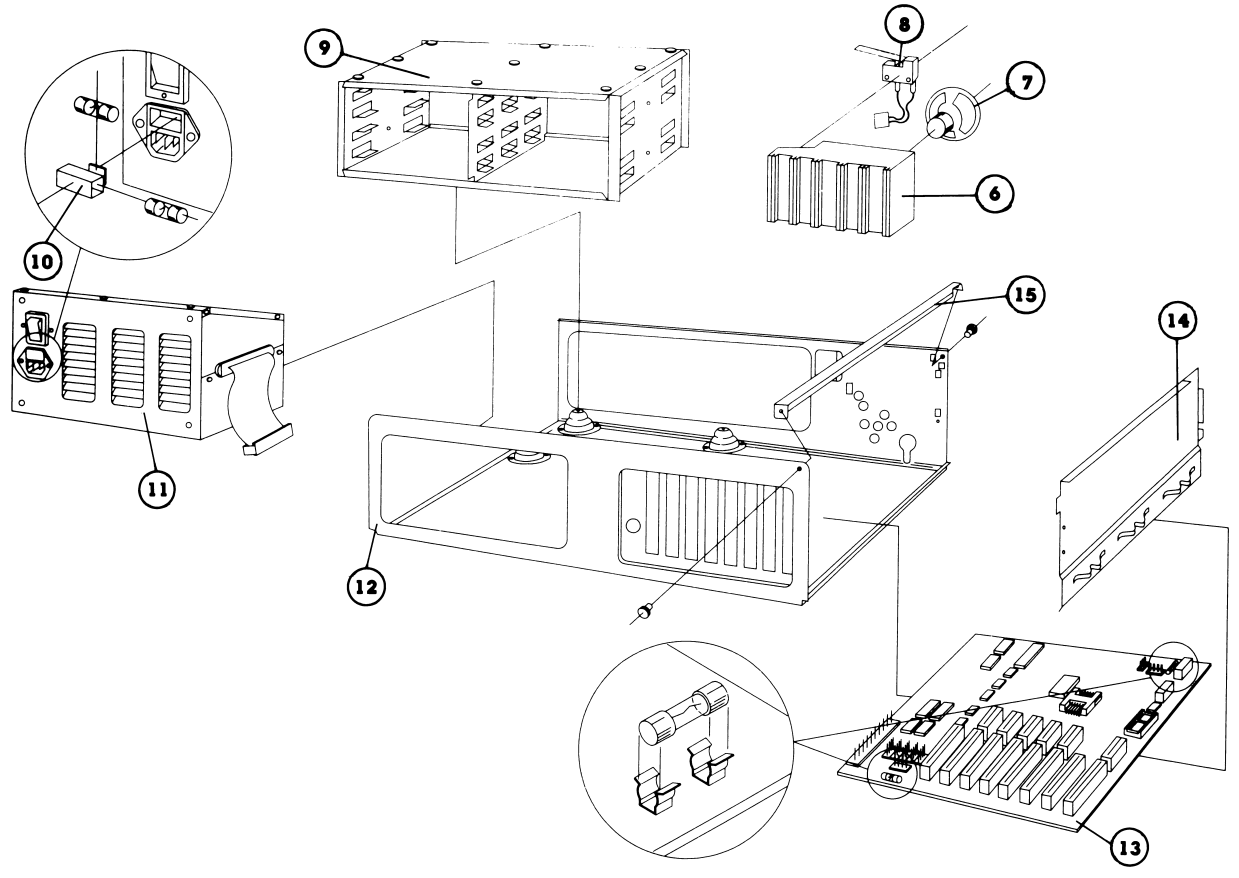


Figure 6-11. System Unit (B).

Table 6-12. System Unit *Continued*

Description	Part Number
16. System Memory Board	102710-001**
17. Video Display Controller Board	101340-001
18. Multipurpose Controller Board	102705-001**
19. Multipurpose Fixed Disk Drive Controller Board	102778-001
20. a. COMPAQ Enhanced Color Graphics Board Version 1 b. COMPAQ Enhanced Color Graphics Board Version 2	106373-001 109196-001
21. Asynchronous Communications/Parallel Printer Board	106886-001
22. ESDI Fixed Disk Drive Controller Board	108140-001
23. Host Adapter Board	113259-001
24. Fixed Disk Drive Controller Cables	100641-002
25. Diskette Drive Controller Cables	101380-001
26. Mass Storage Device Power Cable	101137-001
27. Fixed Disk Drive Controller Cable	108086-001
28. Diskette Drive Cable	100048-003
29. ESDI Cable Set	108249-001
30. Fixed Disk Drive Backup Cable (135-Mb)	113198-001
31. a. 64K × 1 DRAM Chip–Qty 1 150 ns b. 256K × 1 DRAM Chip–Qty 1 150 ns c. 256K × 1 DRAM Chip–Qty 1 100 ns d. 64K DRAM Chip–Qty 1 100 ns	105152-001** 105151-001** 113017-001** 106864-001**
32. Option Slot Cover (Board)	101144-001
33. 5 1/4" 1.2-Megabyte Diskette Drive	102775-001

**Not shown

Continued...

Table 6-12. System Unit *Continued*

Description	Part Number
34. 5 1/4" 360-Kbyte Diskette Drive	102928-001
35. 3 1/2" 1.44-Megabyte Diskette Drive	113263-001
36. a. 20-Megabyte Fixed Disk Drive (8-MHz) b. 20-Megabyte Fixed Disk Drive (12-MHz)	102777-001 113016-001**
37. 30-Megabyte Fixed Disk Drive (8-MHz)	101664-001
38. 40-Megabyte Fixed Disk Drive (Integrated)	102931-001
39. 70-Megabyte Fixed Disk Drive	102932-001
40. 130-Megabyte Fixed Disk Drive (12-MHz)	108080-001
41. 10-Megabyte Fixed Disk Drive Backup (8-MHz)	101438-001
42. 40-Megabyte Fixed Disk Drive Backup (12-MHz)	108081-001
43. 135-Megabyte Fixed Disk Drive Backup (12-MHz)	113218-001
44. DC 1000 Tape Cartridge	101488-001
45. DC 2000 Tape Cartridge	108142-001
46. Drive Blank Panel Subassembly (Upper)	101135-001
47. Drive Blank Panel Subassembly (Lower)	101135-002

**Not shown

Continued...

Table 6-12. System Unit *Continued*

Description	Part Number
48. Battery	102929-001
49. ROM Kit–Qty 2	105035-001**
50. Miscellaneous Hardware Kit PCB Retainer (Qty 4) PCB Standoff (Qty 5) Brightness Knob (Qty 5) Push Button Mount Fastener (Qty 5) Ty-wrap (Qty 100) PCB Card Guide (Qty 5) Keyboard Feet (Rubber) (Qty 10) Monitor Feet (Cork) (Qty 5) System Feet (Rubber) (Qty 5) Fuse, AC Line, 2 Ampere (Qty 10) Fuse, AC Line, 3 Ampere (Qty 10) Fuse, AC Line, 4 Ampere (Qty 10) Nut, Hex Self-Locking (Qty 5) Screw, 8-32 × 3/8 (Qty 50) Screw, 6-32 × 3/8 (Qty 50) Screw, 6-32 × 1/2 (Qty 50) Screw, 4-40 × 1/4 (Qty 10) Screw, 6-32 × 5/8 (Qty 50) Screw, 6-32 × 7/8 (Qty 2) Insulator (Qty 6) Switch (Qty 2) Bracket, Speaker/Card Guide (Qty 1 LED Cable Assembly (Qty 1)	102709-001**

**Not Shown

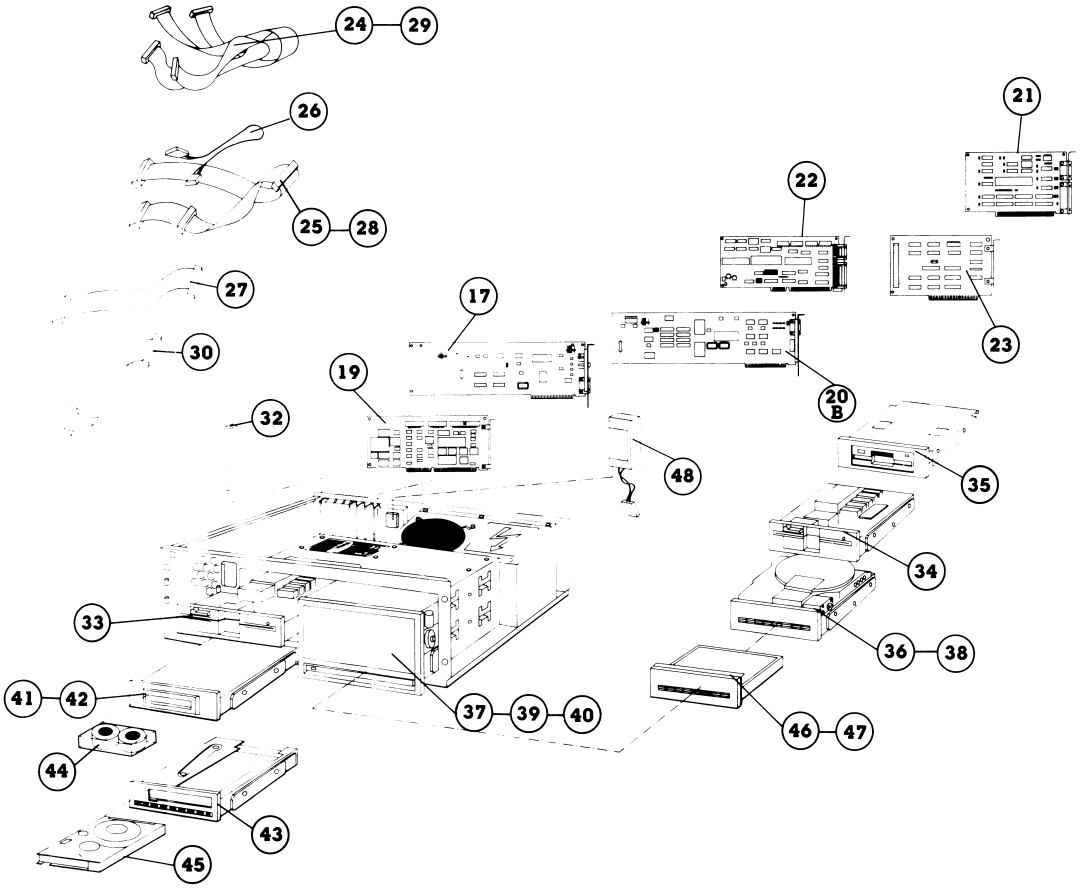


Figure 6-12. System Unit (C).

Table 6-13. 84-Key Keyboard

Description	Part Number
1. Keyboard Assembly	102776-001
2. Keyboard Feet (rubber)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

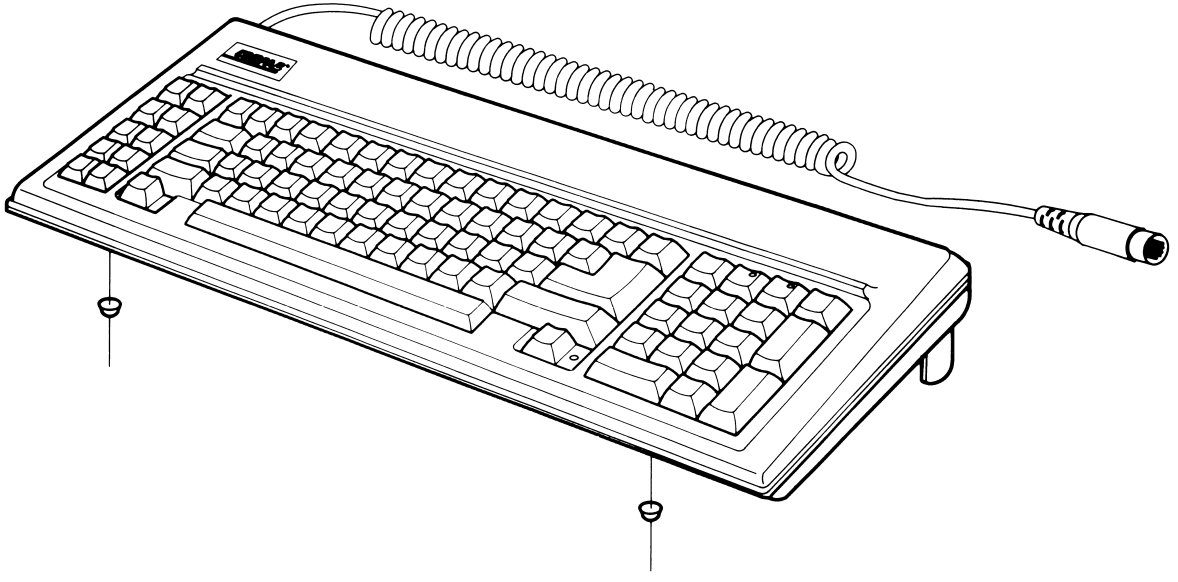


Figure 6-13. 84-Key Keyboard.

Table 6-14. COMPAQ Enhanced Keyboard

Description	Part Number
1. Keyboard Assembly (with cable)	108067-001
2. Keyboard Cable	108095-001
3. Keyboard Feet (rubber)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

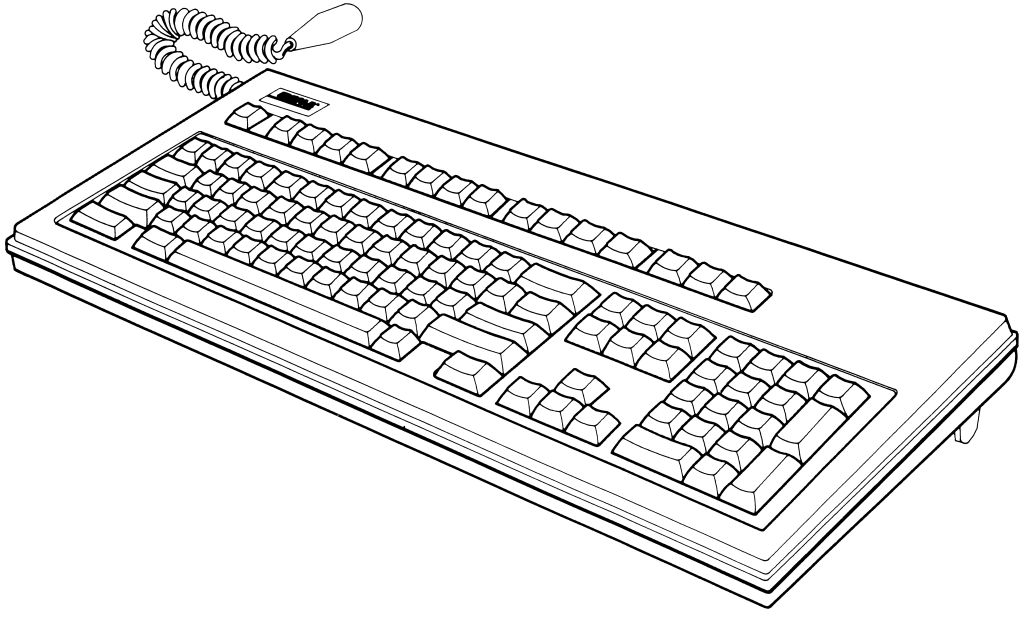


Figure 6-14. COMPAQ Enhanced Keyboard.

Table 6-15. COMPAQ Dual-Mode Monitor

Description	Part Number
1. Monitor Assembly	
a. Green	101439-001
b. Amber	101439-002
2. Brightness Control Knob	*
3. Monitor Feet (cork)	*

*Contained in Miscellaneous Hardware Kit (part no. 102709-001)

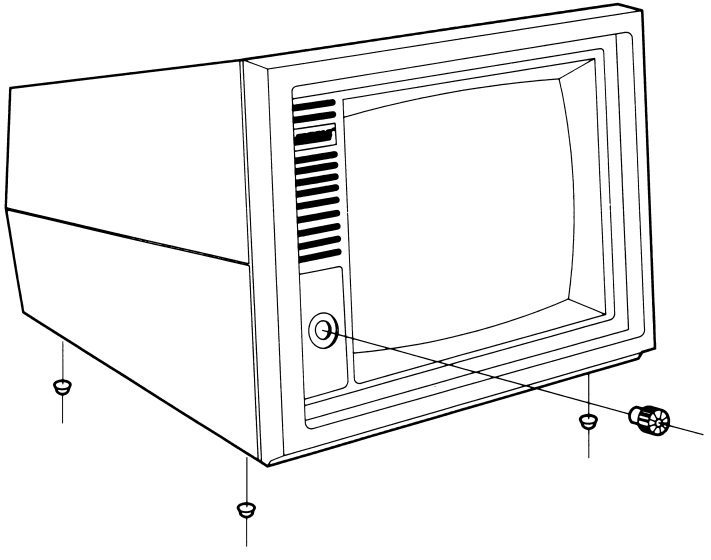


Figure 6-15. COMPAQ Dual-Mode Monitor.

Table 6-16. COMPAQ Color Monitor

Description	Part Number
1. Monitor Assembly	106162-001

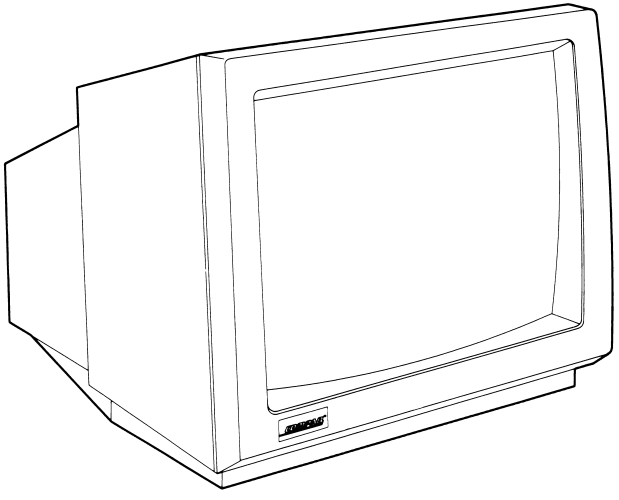


Figure 6-16. COMPAQ Color Monitor.

Table 6-17. Video Graphics Monochrome Monitor

Description	Part Number
1. Monitor Assembly	109254-001

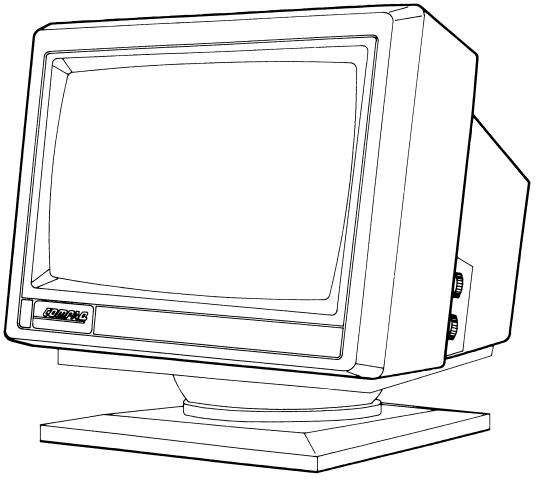


Figure 6-17. Video Graphics Monochrome Monitor.

Table 6-18. Video Graphics Color Monitor

Description	Part Number
1. Monitor Assembly	109255-001

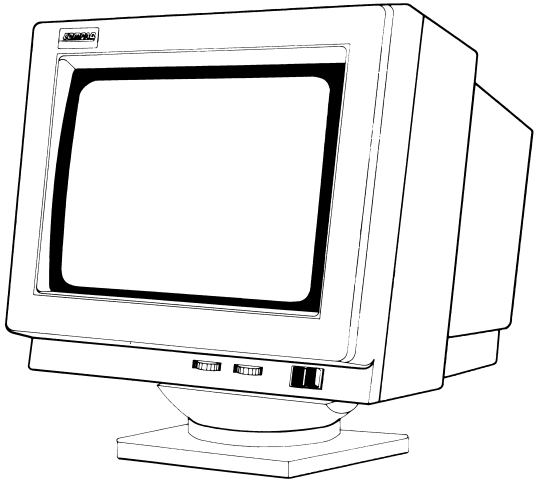


Figure 6-18. Video Graphics Color Monitor.

CONTENTS

Chapter 7
REMOVAL AND REPLACEMENT PROCEDURES

Chapter 7
REMOVAL AND REPLACEMENT PROCEDURES

7.1 INTRODUCTION

This chapter contains module-level removal and replacement procedures for the COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers.

The procedures in this section describe the removal and replacement of the following:

- ☐ Video Monitor
- ☐ Keyboard
- ☐ System Unit Cover
- ☐ Power Supply
- ☐ Power Fuse
- ☐ Expansion and Controller Board(s)
- ☐ Battery/Clock Battery
- ☐ Security Lock
- ☐ Speaker Assembly and Security Lock Switch
- ☐ System Board
- ☐ Mass Storage Device(s)

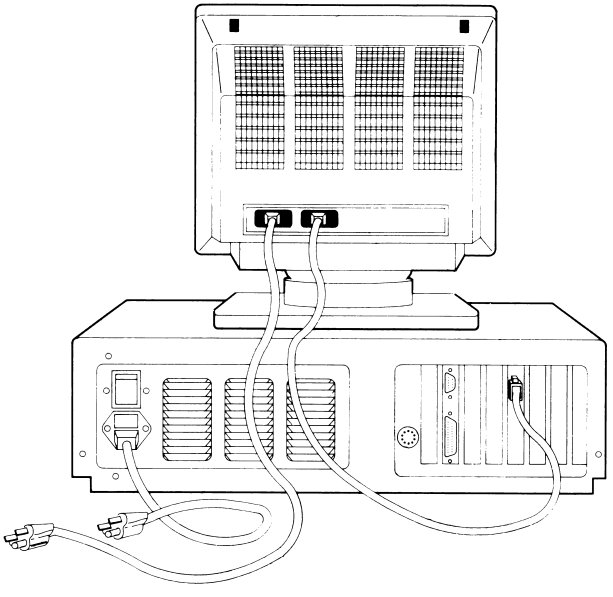


Figure 7-1. Rear View of a COMPAQ DESKPRO 286 Personal Computer with a Video Graphics Color Monitor Installed.

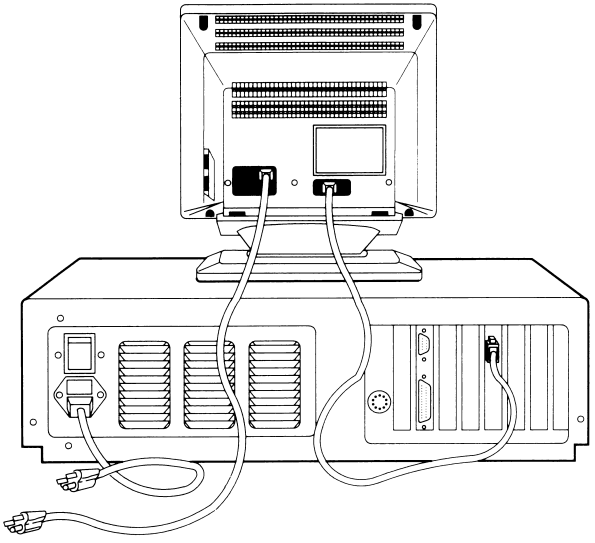


Figure 7-2. Rear View of a COMPAQ DESKPRO Personal Computer with a Video Graphics Monochrome Monitor Installed.

7.2 MONITORS

To remove the Video Graphic Color Monitor, Video Graphics Monochrome Monitor, COMPAQ Dual-Mode Monitor or COMPAQ Color Monitor:

1. Turn OFF the computer.

CAUTION

The system unit power must be OFF prior to connecting or disconnecting the monitor cables.

2. Place the color monitor ON/OFF switch, located on the right side of the monitor, in the OFF position.
3. Disconnect the monitor power cable and the monitor signal cable (Figures 7-1, 7-2, and 7-3).

CAUTION

A. When removing a COMPAQ Dual-Mode Monitor, both the power and signal cables must be disconnected from the back of the system unit.

B. When removing the Video Graphics Color Monitor, the Video Graphics Monochrome Monitor, or the COMPAQ Color Monitor, disconnect the signal cable from the back of the system unit and disconnect the power cable from the AC outlet.

4. Remove the monitor and set it aside.

To replace the monitor, reverse Steps 1 through 4.

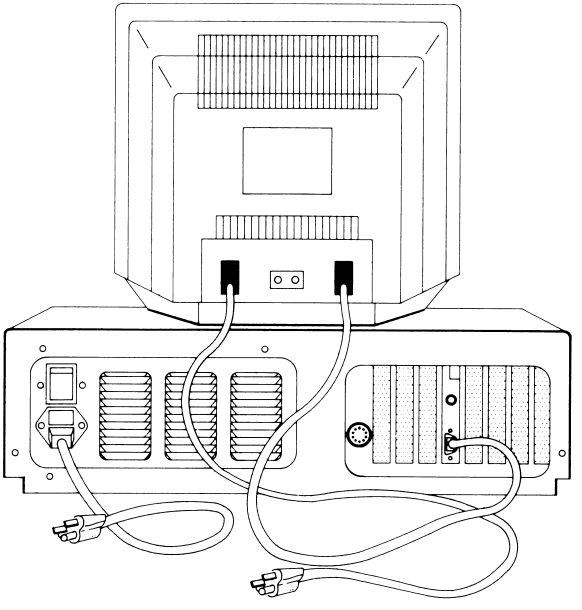


Figure 7-3. Rear View of a COMPAQ DESKPRO 286 Personal Computer with a COMPAQ Color Monitor Installed.

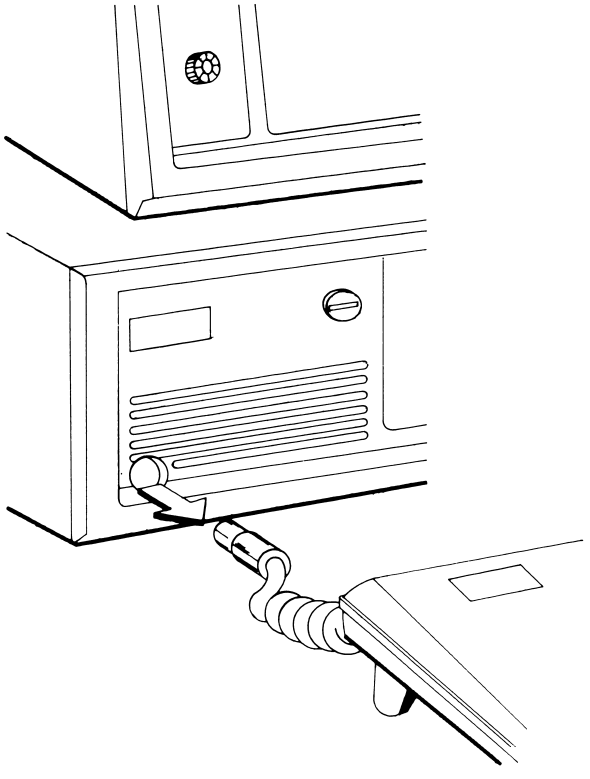


Figure 7-4. Removing the Keyboard.

7.3 KEYBOARD

To remove the keyboard:

1. Turn OFF the computer.

CAUTION

The system unit power must be OFF prior to connecting or disconnecting the keyboard cable.

2. Disconnect the keyboard by gently pulling the keyboard connector from the connector on the front of the system unit (Figure 7-4).
3. Set the keyboard aside.

To replace the keyboard, reconnect the keyboard connector to the receptacle on the front of the system unit.

7.4 SYSTEM UNIT COVER

WARNING

Before removing the cover, be sure that the ON/OFF switch is in the OFF position and the power cord is disconnected from the AC outlet.

To remove the system unit cover:

1. Turn OFF the computer.
2. Disconnect any peripheral devices (printers, modems, etc.) from the computer.
3. Disconnect the AC power cord from the AC outlet and from the system unit.
4. Remove the monitor and set it aside (see Section 7.2).
5. Remove the keyboard and set it aside (see Section 7.3).
6. Disconnect any external cables attached to the system unit.

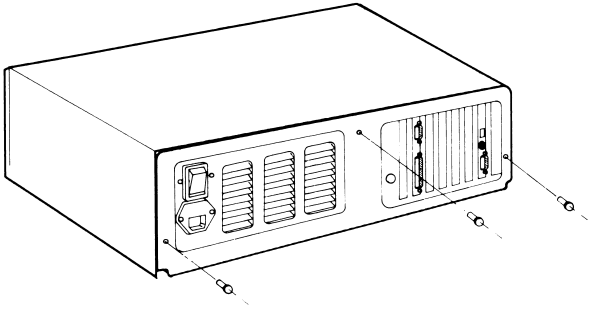


Figure 7-5. Removing the System Unit Cover.

7. Place the system unit on a level surface, such as a table or workbench, with the front of the unit facing you.

NOTE: If you have an early model COMPAQ DESKPRO Personal Computer, there are two screws on the rear of the system unit. If you have a late model COMPAQ DESKPRO or if you have a COMPAQ DESKPRO 286 Personal Computer, there are three screws on the rear of the system unit (Figure 7-5).

8. Remove the screws that are on the back of the system unit (Figure 7-5).
9. Unlock the security lock (COMPAQ DESKPRO 286 only).
10. Slide the system unit cover toward the front of the unit until you feel the cover stop.
11. Lift the cover straight up and off of the system unit (Figure 7-5).

To replace the system unit cover, reverse Steps 1 through 11.

7.5 POWER SUPPLY

WARNING

Before removing the system unit cover, be sure that the ON/OFF switch, located on the back of the system unit, is in the OFF position and the AC power cord is disconnected from the AC outlet.

To remove the power supply:

1. Turn OFF the computer.
2. Remove the system unit cover (see Section 7.4). The power supply assembly is now exposed (Figure 7-6).
3. Remove the four screws that secure the power supply assembly to the chassis (Figure 7-7).

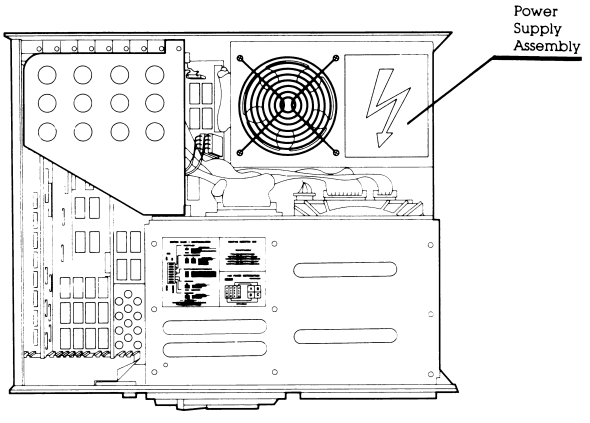


Figure 7-6. Power Supply Assembly Location.

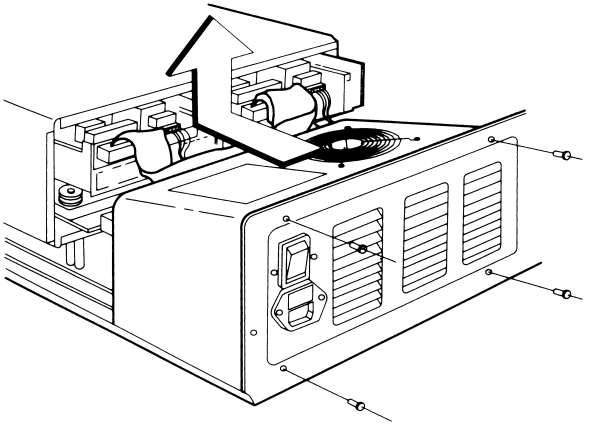


Figure 7-7. Removing the Power Supply Assembly.

4. Slide the power supply 1/2 inch to 1 inch toward the drive housing (Figure 7-7). Be sure to clear the tabs on the bottom of the chassis. These tabs hold the power supply assembly in place.
5. Shift the power supply slightly toward the edge of the chassis (away from the system board) to allow access to the power supply connector on the system board.
6. Disconnect the power supply connector from the system board and lift the power supply assembly out of the chassis.

To replace the power supply assembly, reverse Steps 1 through 6.

7.6 POWER FUSE

WARNING

Before removing the power fuse, be sure that the ON/OFF switch, located on the back of the system unit, is in the OFF position and the AC power cord is disconnected from the AC outlet.

To remove the power fuse:

1. Turn OFF the computer.
2. Insert a flat-bladed screwdriver along the bottom edge of the fuse holder and pry outward with enough pressure to pop the fuse holder out of the casing (Figure 7-8). New fuses are available in the fuse kit (part no. 102930-001).

NOTE: Some COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers contain a spare fuse in a holding area behind the installed fuse.

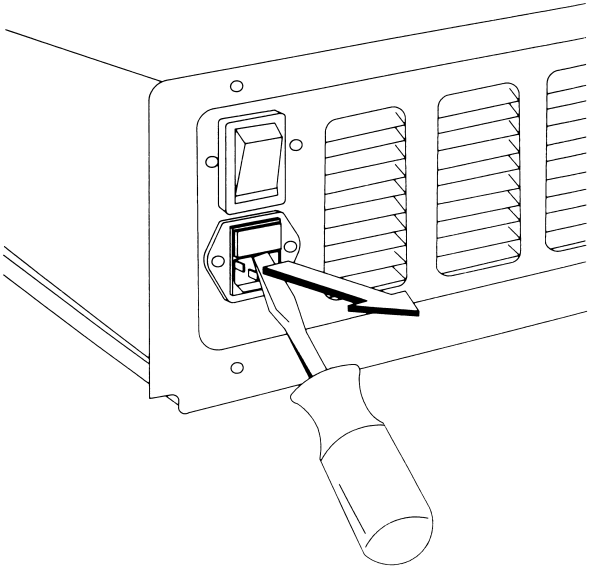


Figure 7-8. Removing the Fuse Holder.

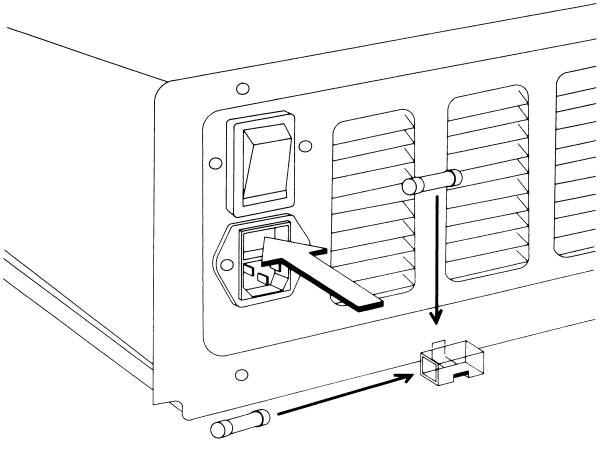


Figure 7-9. Replacing the Power Fuse.

3. To replace the fuse holder, set the fuse holder back into position, and press in on the holder until you feel it snap into place (Figure 7-9).

CAUTION

Be sure that the fuse clips fit tightly to ensure a good electrical connection.

7.7 PRELIMINARY STEPS TO INTERNAL REMOVAL AND REPLACEMENT PROCEDURES

WARNING

Before removing the system unit cover, be sure that the ON/OFF switch, located on the back of the system unit is in the OFF position and the AC power cord is disconnected from the AC outlet.

Before beginning the following removal and replacement procedures, complete the following steps:

1. Turn OFF the computer.
2. Remove the system unit cover (see Section 7.4). The internal unit is now visible.
3. Become familiar with the arrangement of the parts in the computer before beginning the following removal and replacement procedures (see Figures 7-10 and 7-11).

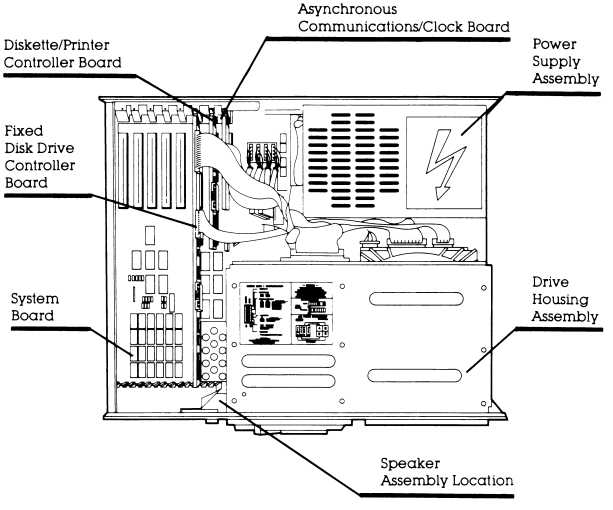


Figure 7-10. Overhead View of the COMPAQ DESKPRO Personal Computer with the System Unit Cover Removed.

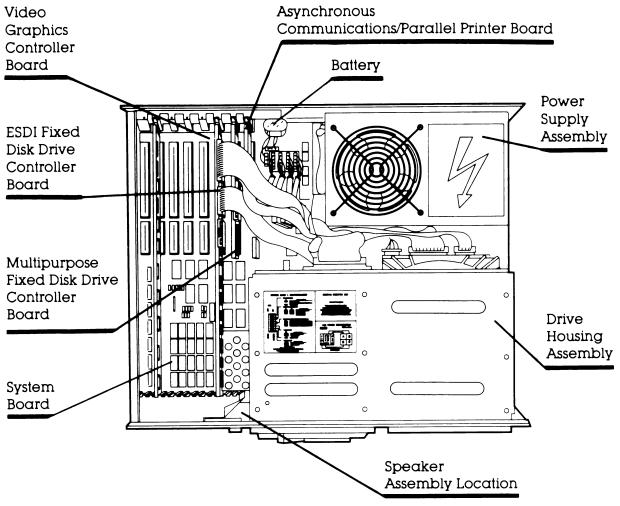


Figure 7-11. Overhead View of the COMPAQ DESKPRO 286 Personal Computer with the System Unit Cover Removed.

CAUTION

Many of the components on the system board and expansion boards are sensitive to static electricity. Be sure that you are discharged of static electricity by briefly touching a grounded metal object, such as the frame of the computer.

7.8 EXPANSION AND CONTROLLER BOARD(S)

To remove expansion or controller boards:

1. Complete the preliminary steps in Section 7.7.
2. Remove the reinforcement brace (COMPAQ DESKPRO 286) (Figure 7-12).

NOTE: Remove the rear screw first so the brace will not rotate.

3. Remove the RF shield (COMPAQ DESKPRO 286) (Figure 7-13).

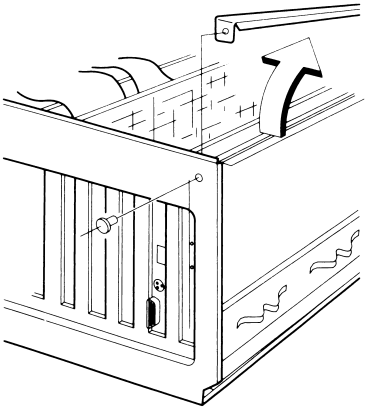


Figure 7-12. Reinforcement Brace.

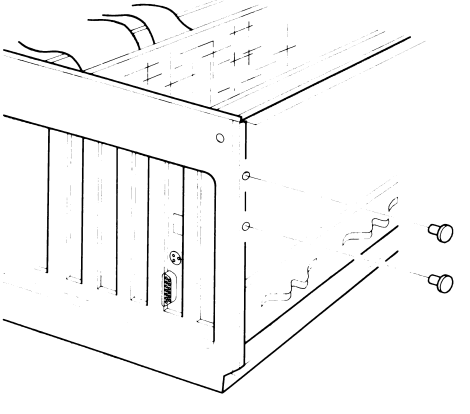


Figure 7-13. RF Shield.

4. Remove the cable cover (Figure 7-14).
5. Remove the retaining screw that secures the expansion or controller board(s) to the chassis.

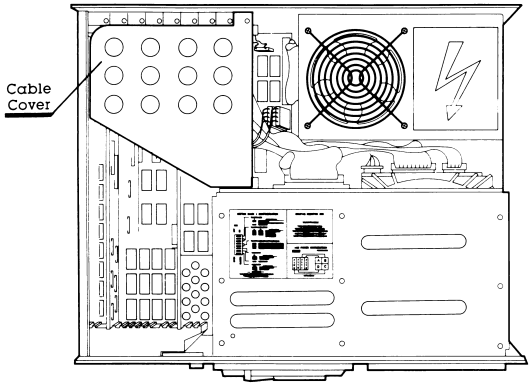


Figure 7-14. Cable Cover.

6. Disconnect any signal cables attached to the expansion or controller board(s) (Figures 7-15 through 7-20).

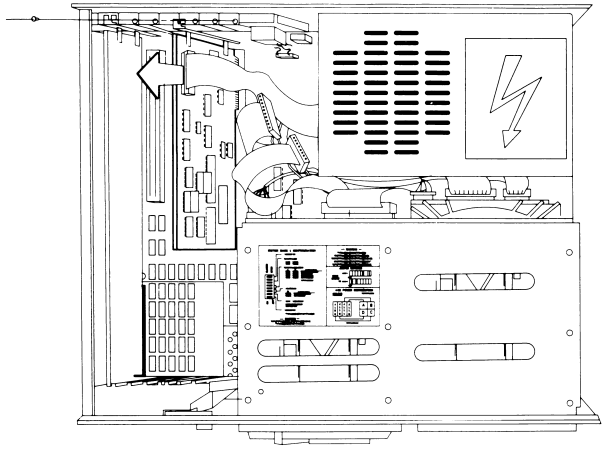


Figure 7-15. Removing the Diskette/Printer Controller Board Signal Cable.

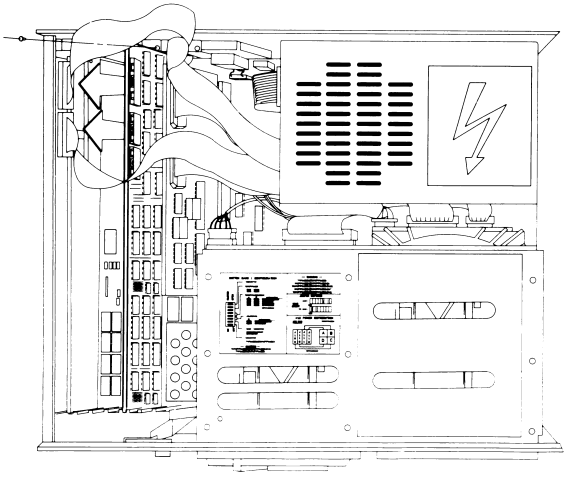


Figure 7-16. Removing the Fixed Disk Drive Controller Board Signal Cables.

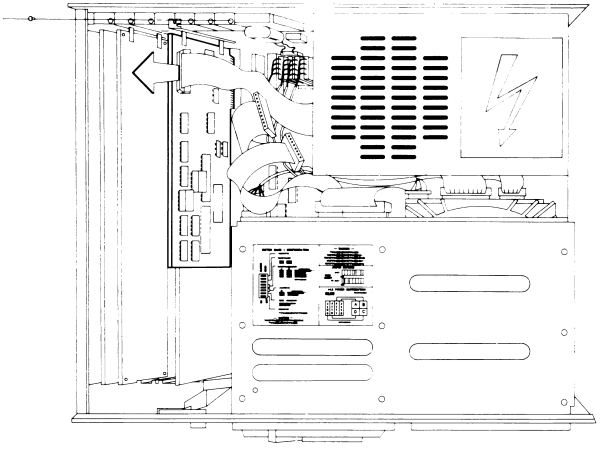


Figure 7-17. Removing the Multipurpose Controller Board Signal Cable.

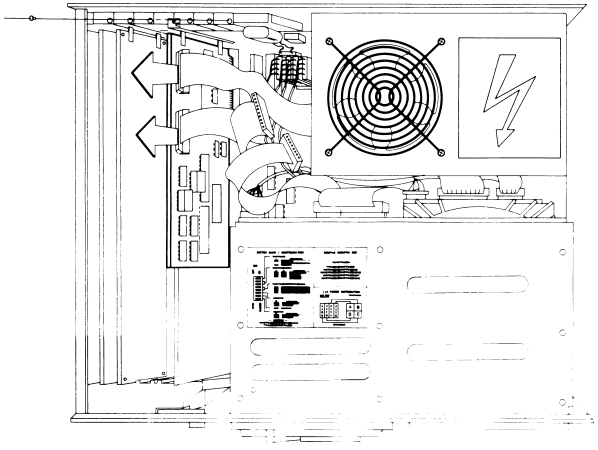


Figure 7-18. Removing the Multipurpose Fixed Disk Drive Controller Board Signal Cables.

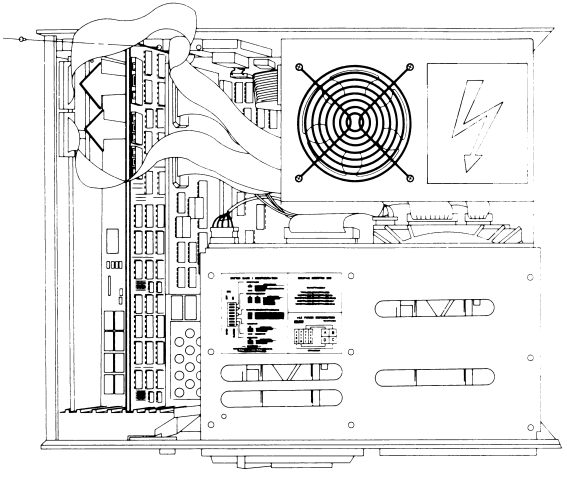


Figure 7-19. Removing the ESDI Fixed Disk Drive Controller Board Signal Cables.

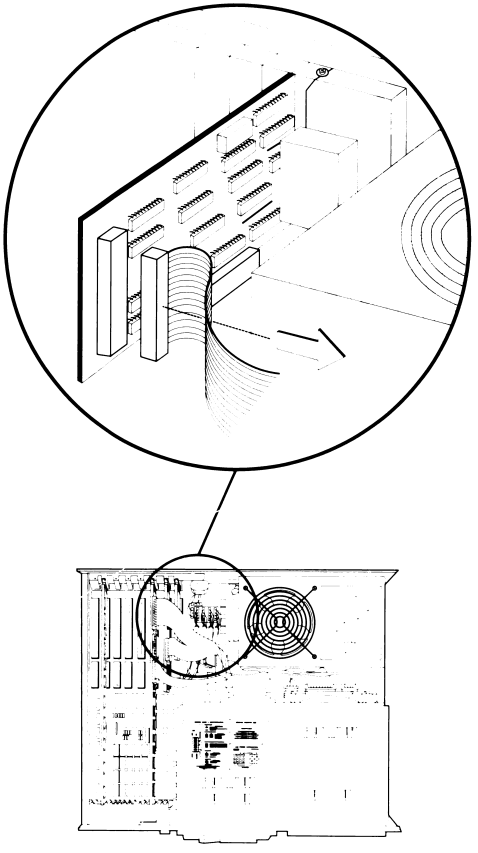


Figure 7-20. Removing the Host Adapter Controller Board Signal Cable.

7. Gently pull the board(s) out of the connector(s) on the system board (Figure 7-21).

To replace the expansion board(s), reverse Steps 1 through 7.

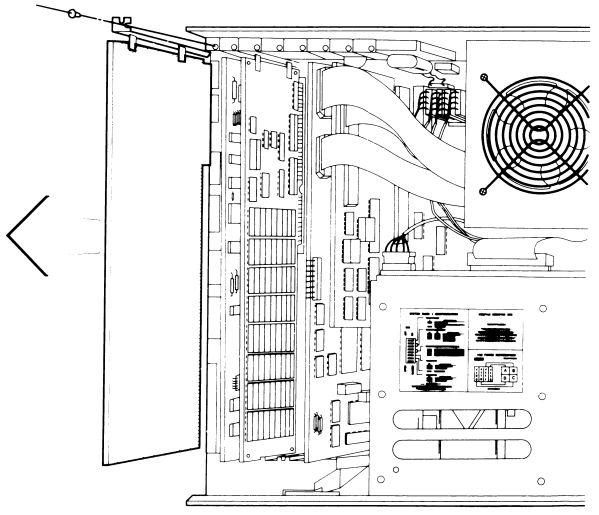


Figure 7-21. Removing an Expansion or Controller Board.

7.9 BATTERY

The following procedure describes how to remove the clock battery on the COMPAQ DESKPRO Personal Computer.

WARNING

This procedure is to be performed by Authorized COMPAQ Computer Dealers only.

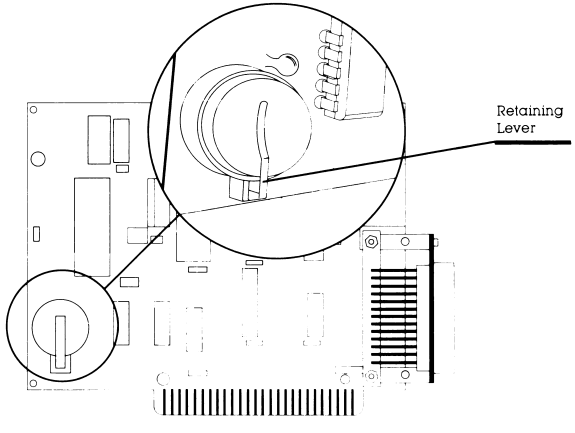


Figure 7-22. Location of the Battery on the Asynchronous Communications/Clock Board.

1. Complete the preliminary steps in Section 7.7.
2. Remove the Asynchronous Communications/ Clock Board.

CAUTION

Do not place the board on any conductive surface.

Be sure not to damage the spring clip when removing or replacing the clock battery. If the battery is not making good contact, the clock functions incorrectly.

3. Locate the clock battery on the board as shown in Figure 7-22.
4. Lift the retaining lever and remove the battery (Figure 7-22).
5. To dispose of the battery properly, see Service Bulletin 46.
6. To install the new battery, slide the new battery in place. Be sure the positive (+) side is facing upward.

The following procedure describes how to remove the clock battery on the COMPAQ DESKPRO 286 Personal Computer.

WARNING

This procedure is to be performed by Authorized COMPAQ Computer Dealers only.

1. Complete the preliminary steps in Section 7.7.
2. Locate the battery (Figure 7-23).

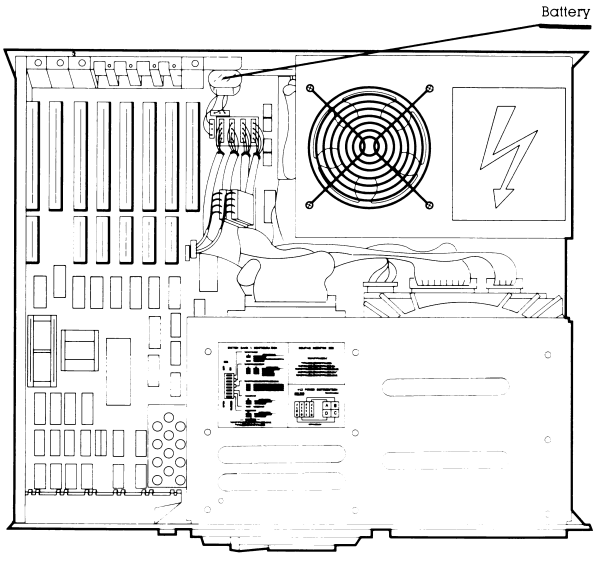


Figure 7-23. Location of the Battery.

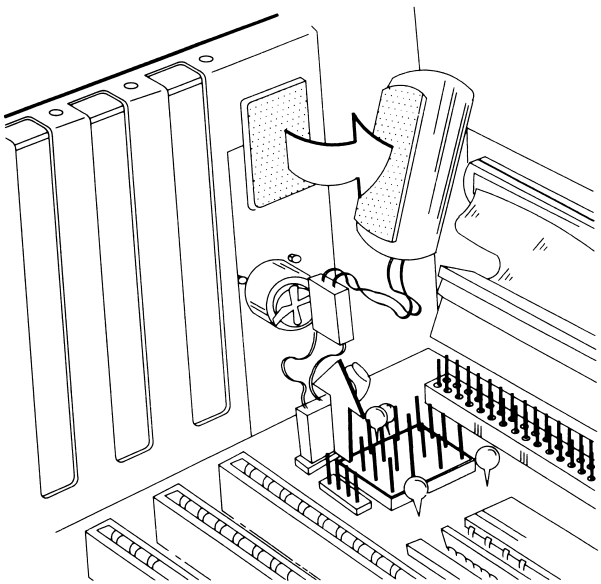


Figure 7-24. Removing the Battery.

3. Remove the battery connector from the system board (Figure 7-24).
4. Remove the battery from the system unit (Figure 7-24).

NOTE: The battery is secured to the system chassis with a VELCRO strip.

5. To dispose of the battery properly, see Service Bulletin 46.

To replace the battery, reverse Steps 1 through 4.

NOTE: Whenever you replace the battery on the COMPAQ DESKPRO 286, you must run the SETUP program.

7.10 SECURITY LOCK

The following procedure describes how to remove the security lock from the COMPAQ DESKPRO 286 Personal Computer.

1. Complete the preliminary steps in Section 7.7.
2. Be sure the security lock is unlocked. After unlocking the security lock, remove the key.
3. Remove the security lock from the system unit cover by removing the screw and clip that secures the entire assembly to the system unit cover (Figure 7-25).

To replace the security lock, reverse Steps 1 through 3.

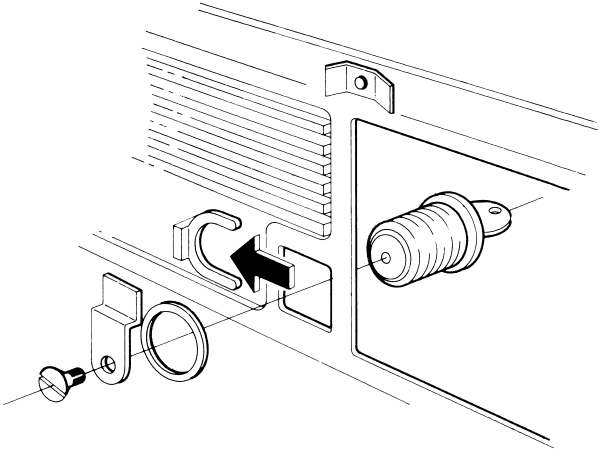


Figure 7-25. Removing the Security Lock.

7.11 REPLACEMENT OF LOST KEYS

If the keys for a COMPAQ DESKPRO 286 Personal Computer are lost, the Authorized COMPAQ Computer Dealer has the following options:

1. If the system is locked, obtain the security lock ID number and vendor name, which is recorded on a tag provided with each key, from the user. Order new keys from the lock vendor.
2. If the lock ID number is unknown and the system is unlocked, replace the security lock assembly by ordering a replacement security lock (part no. 105036-001).
3. If the system is locked and the lock ID number is unknown, have a locksmith open the unit.

7.12 SPEAKER ASSEMBLY AND SECURITY LOCK SWITCH

To remove the speaker assembly:

1. Complete the preliminary steps in Section 7.7. The speaker assembly is now visible (Figure 7-26).
2. Remove the controller or expansion boards that are secured by the speaker/board guide assembly (see Sections 7.8 and 7.9).
3. Remove the speaker/board guide assembly by pushing the plastic catch on the right front of the chassis and rotating the assembly away from the chassis (Figure 7-27).

NOTE: Early COMPAQ DESKPRO models have the speaker mounted in a mounting bracket. In this case, simply disconnect the speaker connection on the system board, remove the screw on the mounting bracket, and slide the speaker out of the mounting bracket.

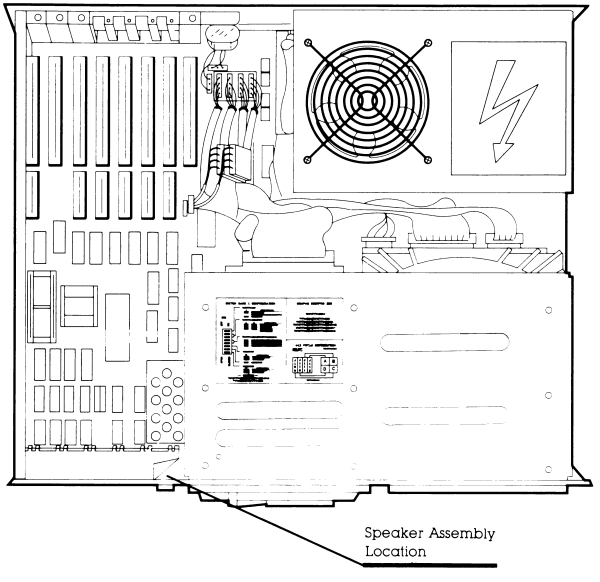


Figure 7-26. Location of the Speaker/Board Guide Assembly.

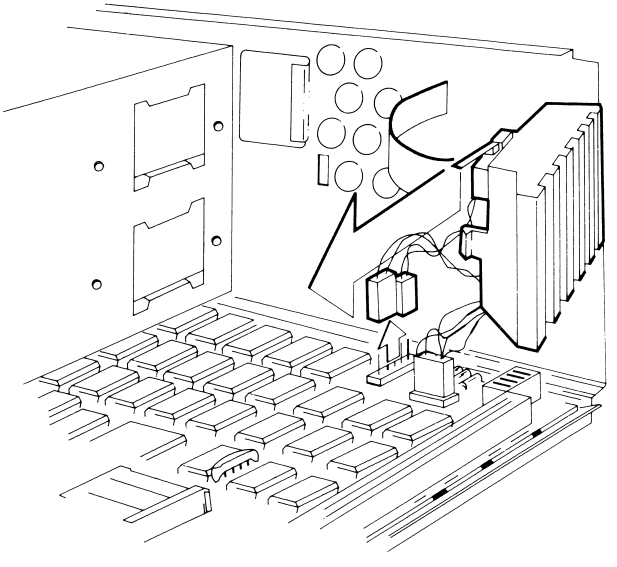


Figure 7-27. Removing the Speaker/Board Guide Assembly.

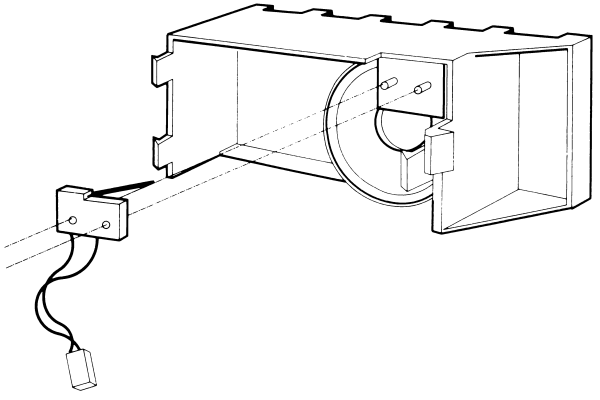


Figure 7-28. Removing the Security Lock Switch.

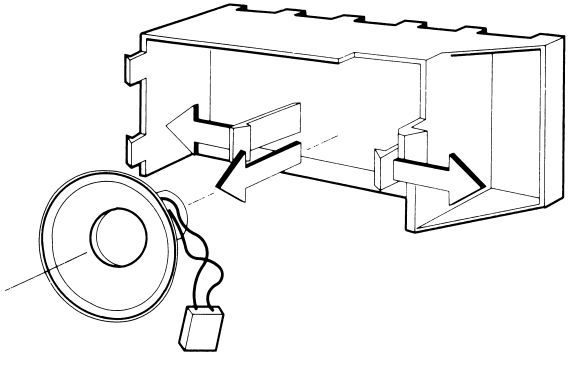


Figure 7-29. Removing the Speaker Assembly.

4. Disconnect the speaker connector and security lock switch connector (COMPAQ DESKPRO 286) from the system board (see Figure 7-28).
5. To remove the security lock switch (COMPAQ DESKPRO 286), gently pull the switch assembly away from the card guide/speaker enclosure (Figure 7-28).
6. Carefully disconnect the switch connector and speaker connector (COMPAQ DESKPRO 286) and remove the speaker assembly (Figure 7-29).

To replace the speaker assembly in the COMPAQ DESKPRO, reverse Steps 1 through 3; in the COMPAQ DESKPRO 286, reverse steps 1 through 6.

7.13 SYSTEM BOARD

To remove the system board:

1. Complete the preliminary steps in Section 7.7.
2. Remove the cable cover.
3. Remove all installed controller, option, and expansion boards (see Section 7.8).
4. Disconnect the following connectors from the system board (Figures 7-30, 7-31, and 7-32):

☐ Battery

☐ Universal power cables

☐ Keyboard

☐ Speaker

☐ Security lock

☐ Power supply

☐ Monitor power

Figure 7-30. COMPAQ DESKPRO System Boards (assy. no. 000058, 000315, and 000364).

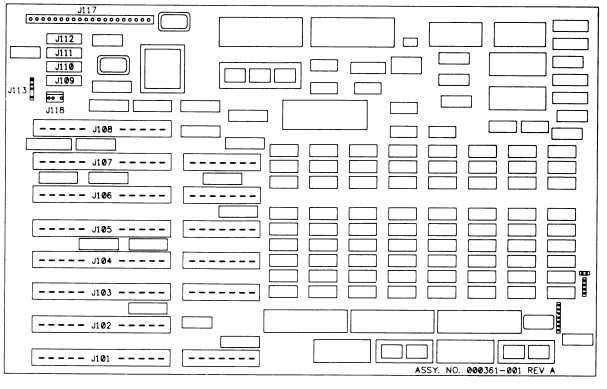


Figure 7-31. 8-MHz COMPAQ DESKPRO 286 System Boards (assy. no. 000094, and 000361).

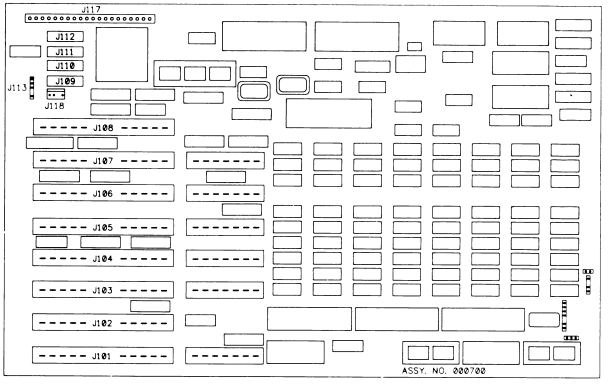


Figure 7-32. 12-MHz COMPAQ DESKPRO 286 System Boards (assy. no. 000555, and 000700).

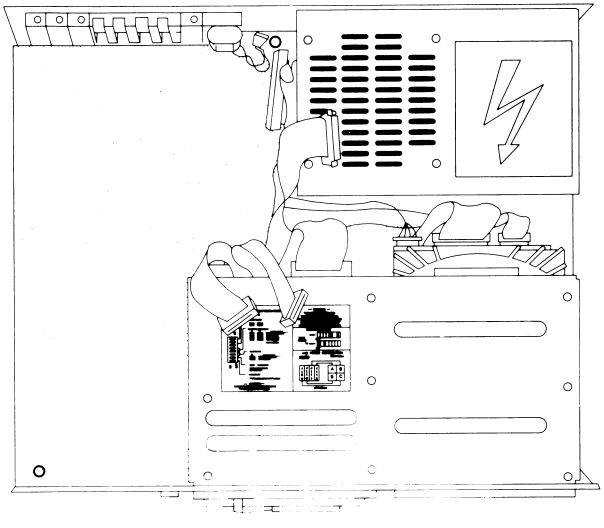


Figure 7-33. Placement of Retaining Screws on the COMPAQ DESKPRO System Board.

5. Remove the speaker component and security lock switch (COMPAQ DESKPRO 286) (see Section 7.12).

6. Remove the retaining screws that secure the system board to the chassis (Figures 7-33, 7-34, and 7-35).

NOTE: The number of retaining screws may vary with the version number of the system board.

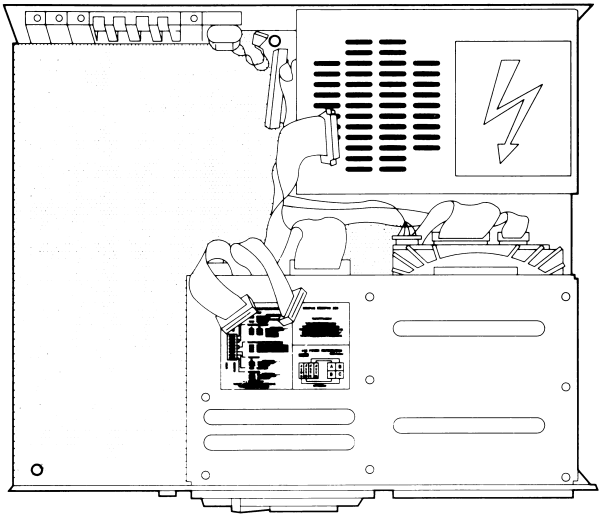


Figure 7-34. Placement of Retaining Screws on the 8-MHz COMPAQ DESKPRO 286 System Board.

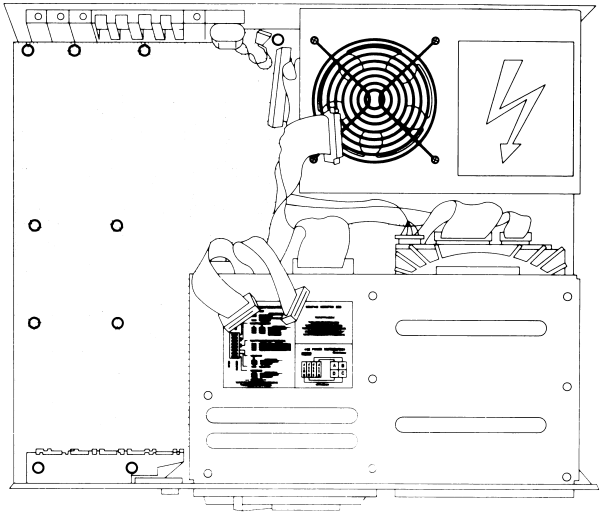


Figure 7-35. Placement of Retaining Screws on the 12-MHz COMPAQ DESKPRO 286 System Board.

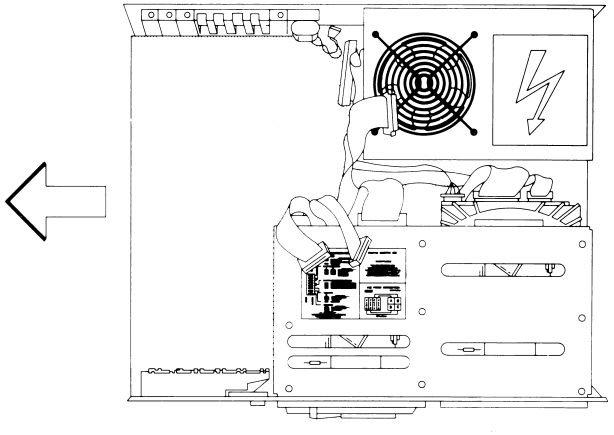


Figure 7-36. Removing the System Board.

7. Carefully remove the system board from the chassis (Figure 7-36).

NOTE: The COMPAQ DESKPRO 286 system board has nylon standoffs attached to the bottom of the board. Slide the board forward so that the nylon standoffs clear the mounting holes, then lift the board.

To replace the system board, reverse Steps 1 through 7.

NOTE: Be sure to tighten the mounting screws. They provide proper grounding for the system.

NOTE: Whenever the system board is removed or the battery is disconnected, you must run the SETUP program (COMPAQ DESKPRO 286 only).

7.14 KEYBOARD OR MONITOR POWER FUSE

NOTE: On newer versions of COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers, the keyboard fuse is soldered to the system board and cannot be removed. If there is a problem with the keyboard power fuse, replace the system board.

To remove the keyboard or monitor power fuse:

1. Complete the Preliminary steps in Section 7.7.
2. Remove all expansion and controller boards (see Section 7.8).
3. To replace the keyboard or monitor power fuse, lift the fuse out and replace it with a good fuse (Figures 7-37 and 7-38).

To reassemble the system unit, reverse Steps 1 and 2.

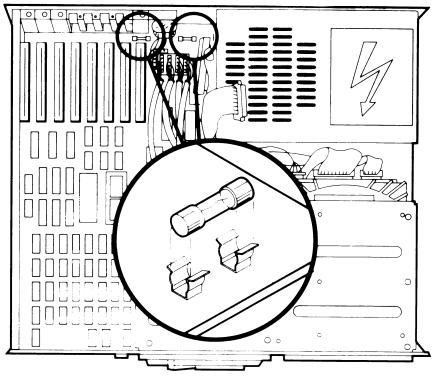


Figure 7-37. Location of the Keyboard and Monitor Power Fuse on the COMPAQ DESKPRO Personal Computer.

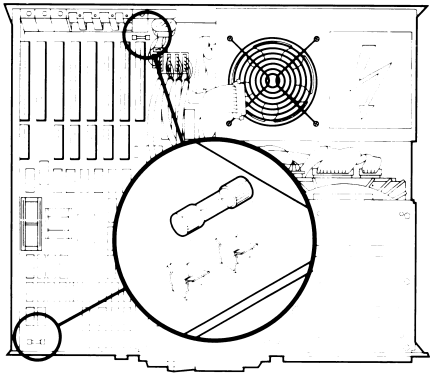


Figure 7-38. Location of the Keyboard and Monitor Power Fuse on the COMPAQ DESKPRO 286 Personal Computer.

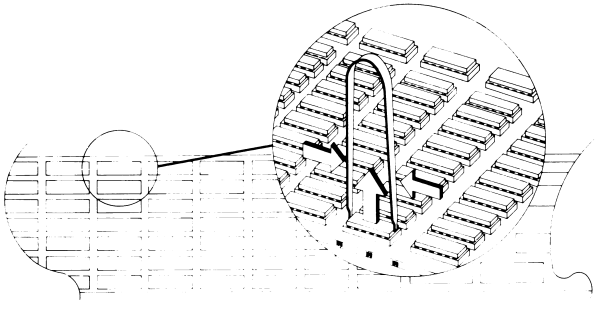


Figure 7-39. Removing a Memory Chip.

7.15 MEMORY CHIP

CAUTION

The memory chips are sensitive to static electricity and are shipped on conductive foam to protect them from accidental electrostatic discharge. Do not remove them from the conductive shipping foam until you are ready to install them.

1. Complete the Preliminary steps in Section 7.7.
2. Remove all expansion and controller boards (see Section 7.8).
3. Remove the system board (see Section 7.13).
4. Lay the system board on a flat surface, such as a work table.
5. Using an IC removal tool, remove the (defective) memory chip (Figure 7-39).

NOTE: The defective memory chip(s) is detected by Power-On Self-Tests (see *Chapter 2,* POWER-ON SELF-TEST (POST)/ PROBLEM ISOLATION).

CAUTION

The pins on the chips bend easily. Carefully line up the pins in the socket before pressing the chips into place. The notch, or Pin 1 locator dot on the chip should be inserted so that it is toward the I/O connectors on the board. After inserting the chips, check carefully that all the pins are in the socket, and that none are bent or outside the socket.

6. Using an IC insertion tool, insert the replacement memory chip (Figure 7-40).

To reassemble the system unit, reverse Steps 1 through 3.

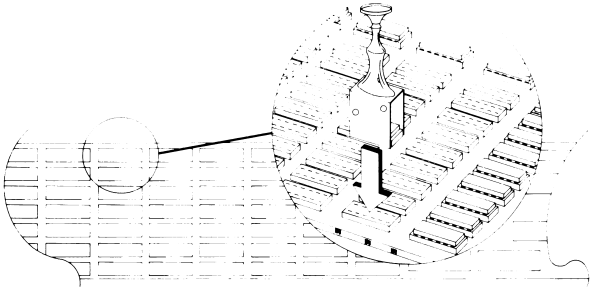


Figure 7-40. Inserting a Memory Chip.

7.16 MASS STORAGE DEVICE(S)

NOTE: Before beginning this removal and replacement procedure become familiar with the location of mass storage devices A, B, C, and D (Figure 7-41). The suggested placement of mass storage devices in either the COMPAQ DESKPRO or COMPAQ DESKPRO 286 Personal Computers are:

Drive A	Drive B	Drive C	Drive D
Diskette Drive	360-KB Diskette Drive 1.2-MB Diskette Drive 1.44-MB Diskette Drive Full Height Fixed Disk Drive (taking up drive positions B and C)	Half Height Fixed Disk Drive Full Height Fixed Disk Drive (taking up drive positions B and C)	Half Height Drive

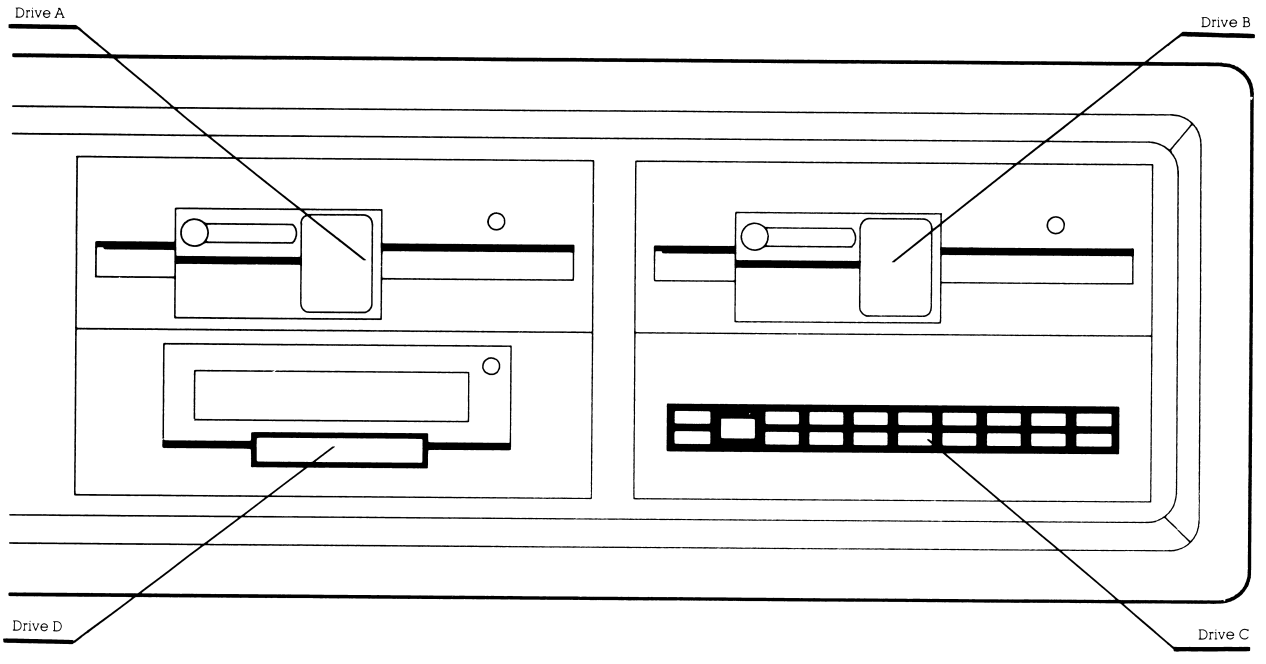


Figure 7-41. Location of Mass Storage Devices in both the COMPAQ DESKPRO and COMPAQ DESKPRO 286 Personal Computers.

To remove mass storage device A or D:

1. Complete the Preliminary Steps in Section 7.7.
2. Remove all installed controller and expansion boards (see Section 7.8).
3. Disconnect the signal cable and the power cable from the back of device A or D (Figure 7-42).

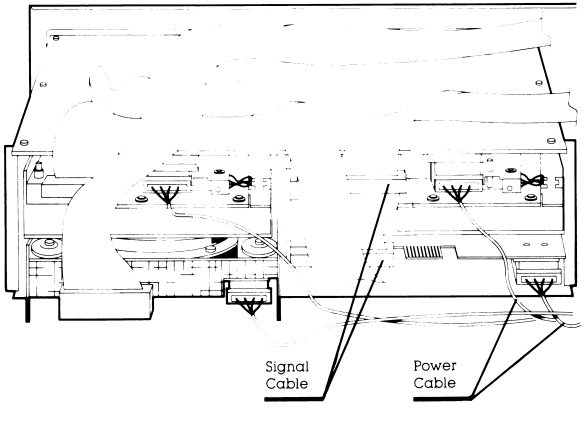


Figure 7-42. Disconnecting Cables from Mass Storage Device A or D.

4. Remove the speaker/board guide (see Section 7.13).
5. Remove the mounting screws on the left side of the appropriate device housing.
6. Slide out the drive (Figures 7-43 and 7-44).

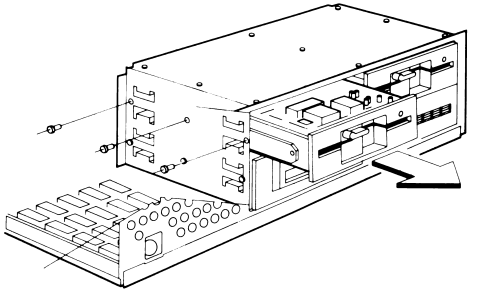


Figure 7-43. Removing Mass Storage Device A.

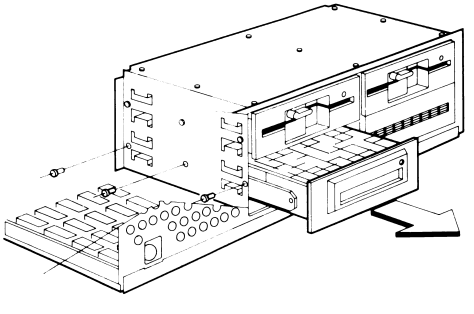


Figure 7-44. Removing Mass Storage Device D.

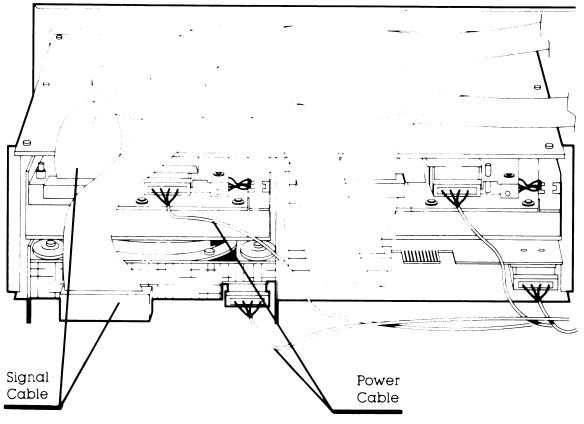


Figure 7-45. Disconnecting Cables from Mass Storage Device B or C.

To replace mass storage device A or D, reverse Steps 1 through 6.

NOTE: The power cable connects to J112 on the system board for drive A. For drive D, the power cable connects to J111 if it is a diskette drive, and J110 if it is a fixed disk drive or tape backup.

To remove mass storage device B or C:

1. Complete the Preliminary Steps in Section 7.7.
2. Remove all installed controller and expansion boards (see Section 7.8).
3. Disconnect the signal cable and the power cable from the back of mass storage device B or C (Figure 7-45).

4. Remove the mounting screws on the side of the drive housing.
5. Slide the mass storage device out of its housing (Figures 46 and 47).

To replace mass storage device B or C, reverse Steps 1 through 5.

NOTE: The power cable connects to J111 on the system board for drive B and J109 on the system board for drive C.

NOTE: The 130-Megabyte Fixed Disk Drive is formatted for a specific ESDI Controller Board. Examine the label on the drive to determine if the controller board is the correct one. If it is NOT the board for which the drive was formatted, you must reformat the drive. Use the UNCONDITIONAL FORMAT in *Chapter 4*, **ADVANCED DIAGNOSTICS PROGRAM**. After performing an UNCONDITIONAL FORMAT, you must do a SURFACE ANALYSIS.

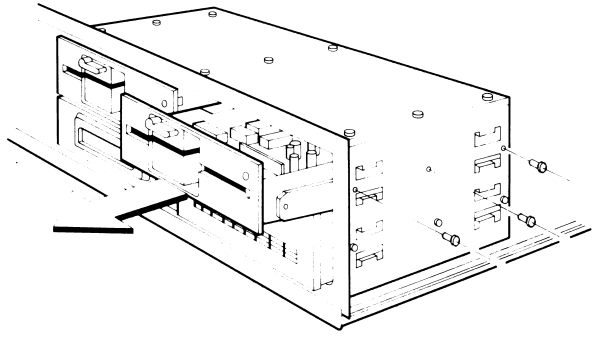


Figure 7-46. Removing Mass Storage Device B.

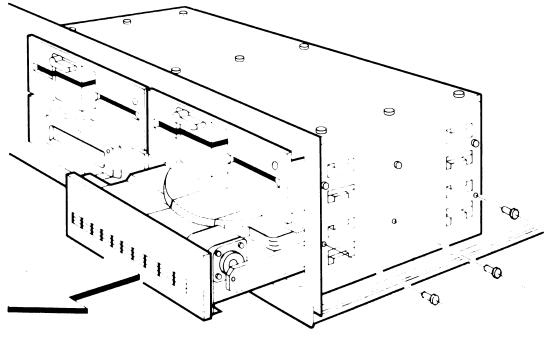


Figure 7-47. Removing Mass Storage Device C.

CONTENTS

Chapter 8
JUMPER POSITIONS AND SWITCH SETTINGS

Continued...

Chapter 8
JUMPER POSITIONS AND SWITCH SETTINGS

8.1 INTRODUCTION

This chapter shows the jumper positions and switch settings on the following:

- ☐ System Board
- ☐ System Memory Board
- ☐ 512/2048-Kbyte Memory Expansion Board
- ☐ ESDI Fixed Disk Drive Controller Board
- ☐ Multipurpose Controller Boards
- ☐ Fixed Disk Drive Controller Boards
- ☐ Host Adapter Board
- ☐ Diskette/Printer Board
- ☐ COMPAQ® Enhanced Color Graphics Board
- ☐ Video Display Controller Board
- ☐ Video Graphics Controller Board
- ☐ Asynchronous Communications/Clock Board
- ☐ Asynchronous Communications/Parallel Printer Board

8.2 SYSTEM BOARD SWITCH SETTINGS

COMPAQ DESKPRO System Boards.

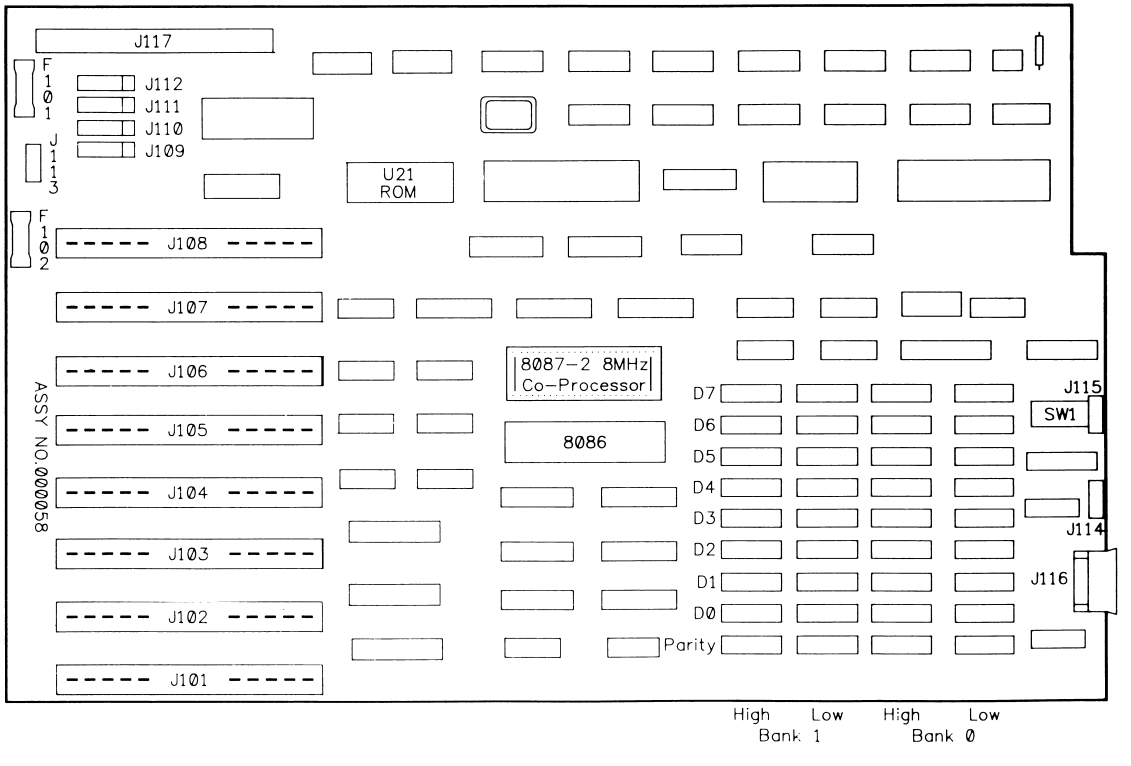


Figure 8-1. COMPAQ DESKPRO System Board Version 1 (assy. no. 000058).

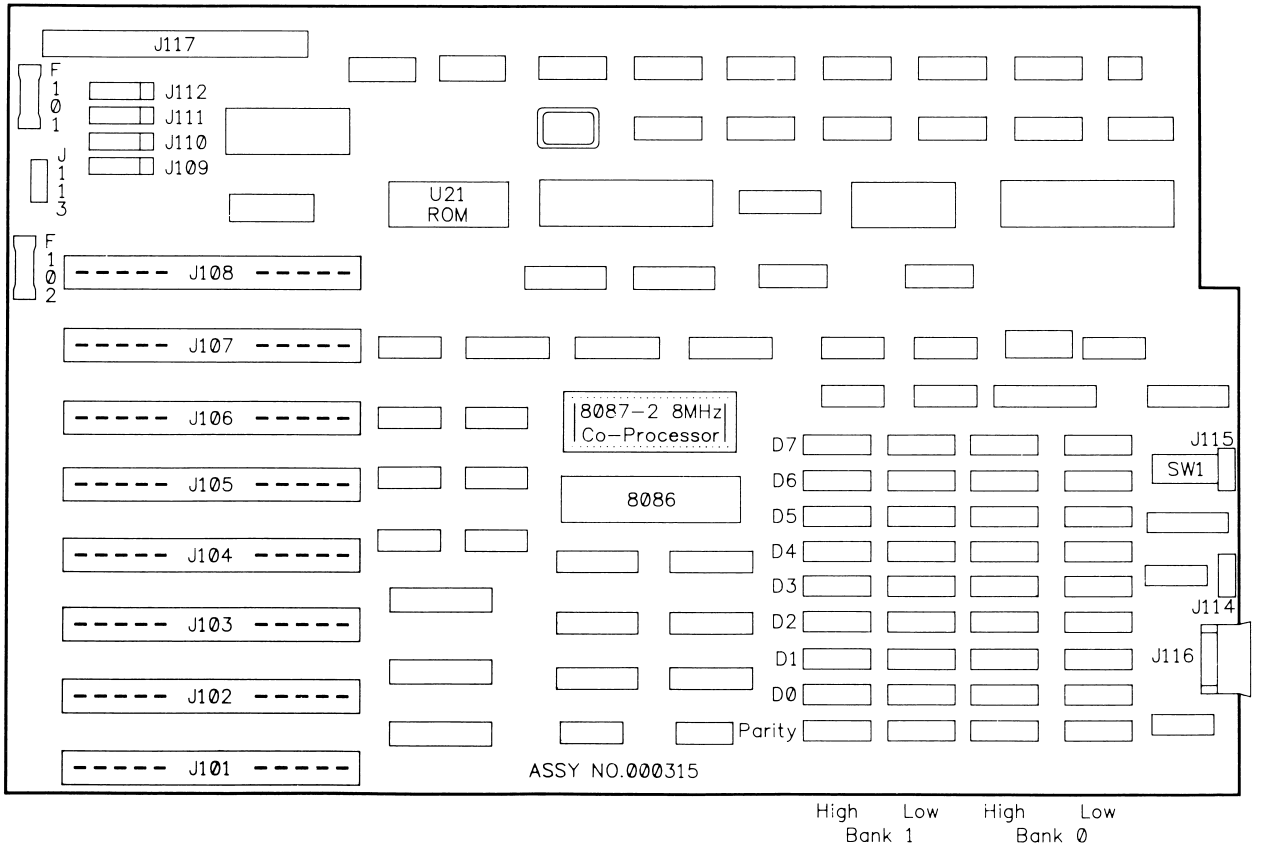


Figure 8-2. COMPAQ DESKPRO System Board Version 2 (assy. no. 000315).

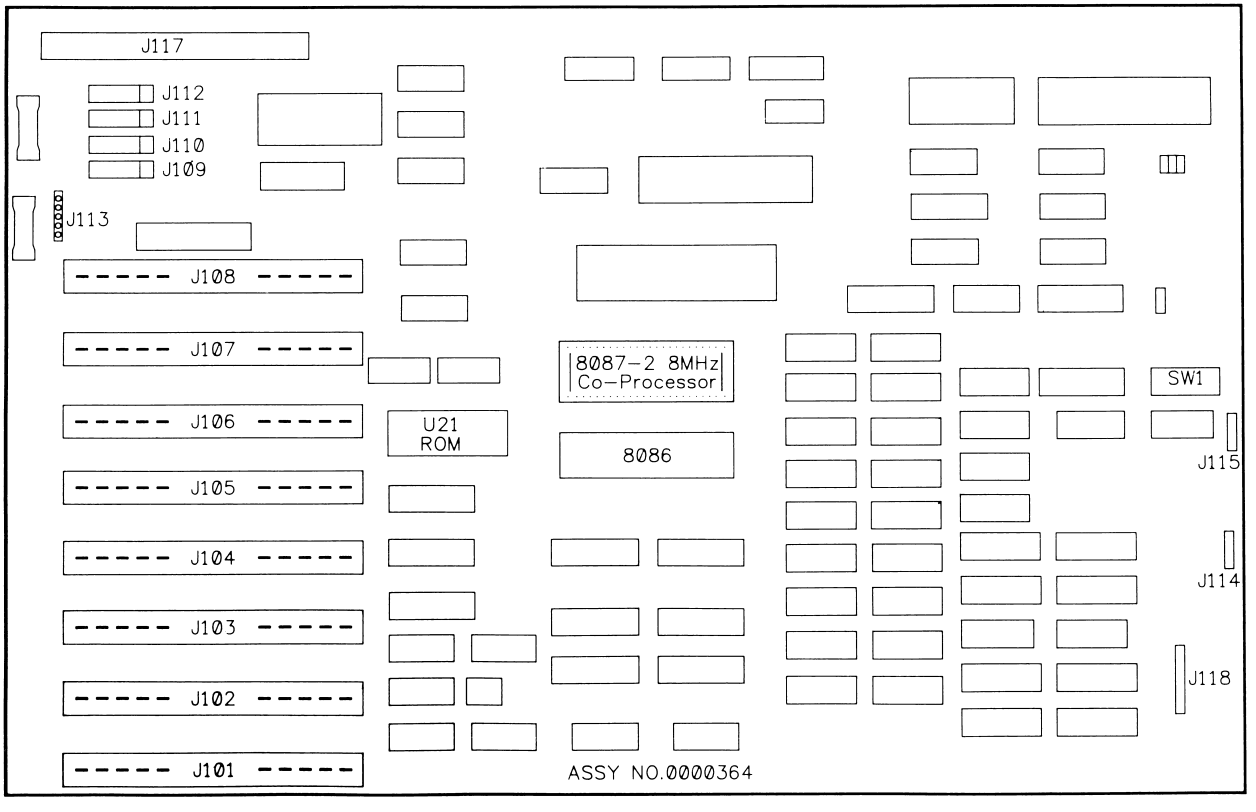


Figure 8-3. COMPAQ DESKPRO System Board Version 3 (assy. no. 000364).

Table 8-1. COMPAQ DESKPRO System Board Switch Settings.

Switch	Function	Position		
1		Reserved	Always OFF	
2		8-MHz 8087-2 Coprocessor	ON = Not installed (default) OFF = Installed	
3 & 4		**SYSTEM MEMORY**	**Switch 3**	**Switch 4**
		128-Kbytes	ON	OFF
		256-Kbytes	OFF	OFF
		512-Kbytes	OFF	ON
		640-Kbytes	ON	ON
5 & 6			**Switch 5**	**Switch 6**
	80 × 25	EGA, or RGBI–Primary	ON	ON
	40 × 25*	COMPAQ VDU–Primary	OFF	ON
	80 × 25	COMPAQ VDU–Primary	ON	OFF
	720 × 350	Monochrome–Primary	OFF	OFF
7		Diskette Drives	ON = ONE	OFF = TWO
8		Reserved	Always ON	

*Applicable with a Rev F or later system ROM.

COMPAQ DESKPRO 286 System Boards

On system boards with assy. no. 000094, no jumpers or switches are installed on the board for system memory configuration since all memory is contained on the system memory board that plugs into the system board.

NOTE: For system ROM E and F, ES selects boot speed between COMMON and FAST. Rev G system ROM selects between COMMON and HIGH (8-MHz/8"MHz). Rev H system ROM selects between FAST and HIGH for other 80286-based products.

If the speed select jumper is changed to the 6-MHz speed (pin 2 to pin 3), the system operates only at a 6-MHz clock speed and does not respond to speed change requests from the keyboard by pressing the CTRL and ALT keys.

If both a monochrome video display controller (with external monochrome display) and a COMPAQ Video Display Controller Board are installed, the monochrome video display is active during power-on if the display select jumper (ED) is set on pin 1 to pin 2.

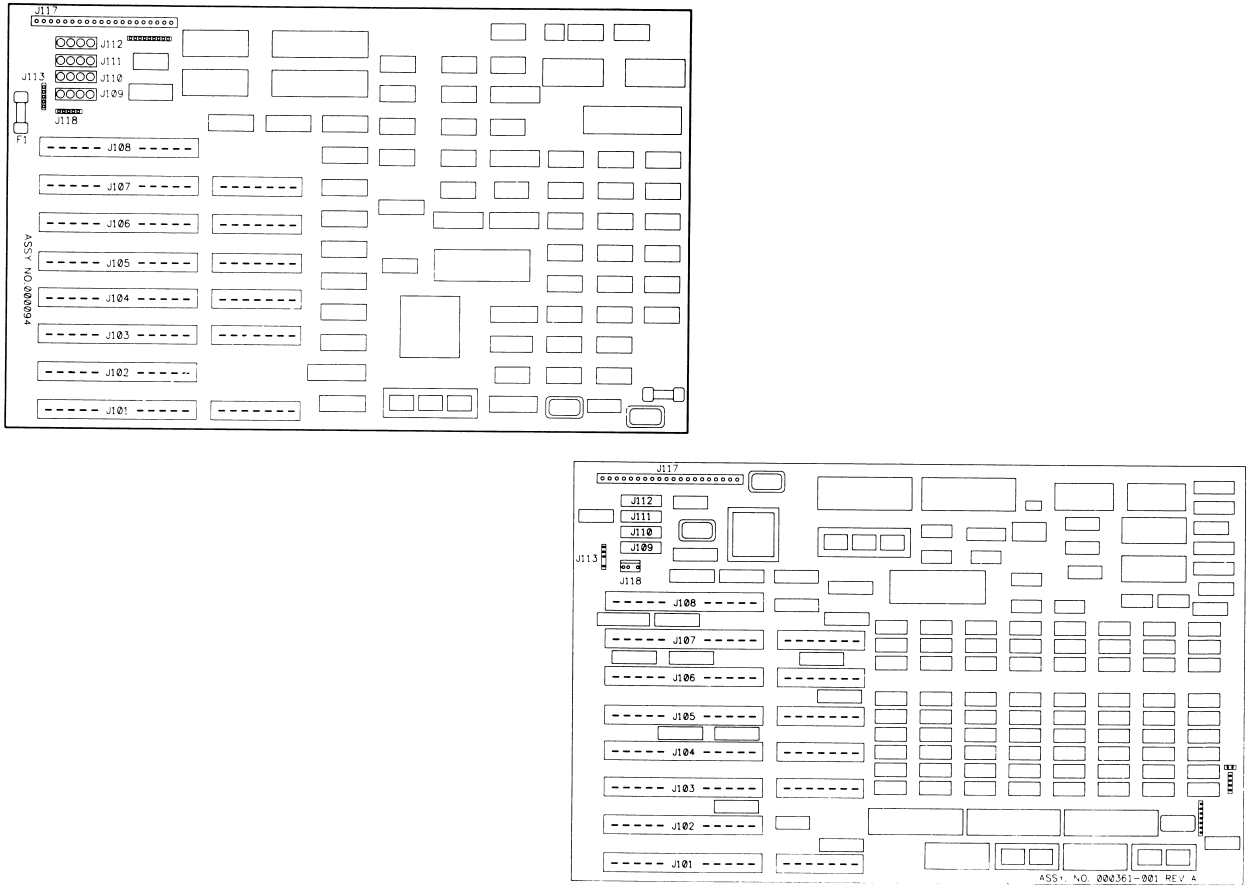


Figure 8-4. 8-MHz COMPAQ DESKPRO 286 System Boards (assy. no. 000094 and 000361).

Table 8-2. 8-MHz COMPAQ DESKPRO 286 System Board Version 1 (assy. no. 000094) Jumper Positions

Jumper Location	Function	Pin 1 to Pin 2	Pin 2 to Pin 3
ED	Display select	Monochrome monitor adapter	COMPAQ Video Display controller, third-party extended graphics adapter, third-party RGB adapters (default setting)
ES	I/O Speed/RAM speed	6-MHz/8-MHz (fast) (default setting)	6-MHz/6-MHz (common)
EM	Reserved		

Table 8-3. 8-MHz COMPAQ DESKPRO 286 System Board Version 2 (assy. no. 000361) Switch Settings

SW1 Settings								
1	2	3	4	5	6	7	8	Function
ON								When using 64K × 1 DRAM chips
OFF								When using 256K × 1 DRAM chips
	ON	ON						Disable RAM and ROM
	ON	OFF						Limit base memory to 256 Kbytes
	OFF	ON						Limit base memory to 512 Kbytes
	OFF	OFF						Enable all base memory
			OFF	OFF				When using 64K × 1 DRAM chips
	150-ns 256K × 1 chips only		ON	ON				256K × 1 DRAM chips. No extended memory
			ON	OFF				Enable bank 2 for 1.0 to 1.5 MB of memory
			OFF	ON				Enable bank 2 & 3 for 1.0 to 2.0 MB of memory
			OFF	OFF				Enable all banks for 1.0 to 2.5 MB of memory
					OFF			8-/6-MHz (default)
					ON			Always 6-MHz
						OFF		Reserved
							ON	COMPAQ VDU, COMPAQ ECG, compatible EGA or RGBI
							OFF	Monochrome

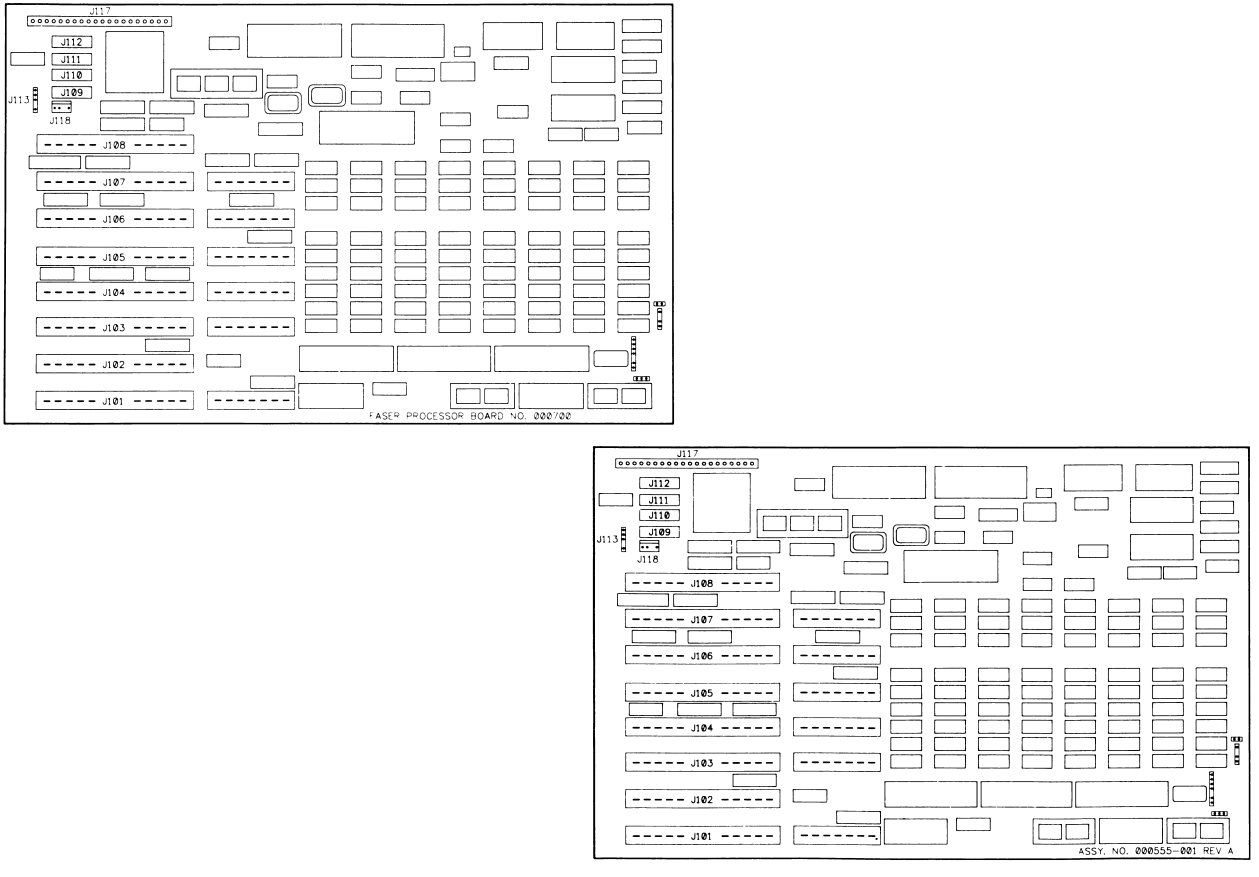


Figure 8-5. 12-MHz COMPAQ DESKPRO 286 System Boards (assy. no. 000555 and 000700).

Table 8-4. 12-MHz COMPAQ DESKPRO 286 System Boards (assy. no. 000555 and 000700) Switch Settings and Jumper Positions.

SW1 Settings 1	2	3	4	5	6	7	8	Function
ON								When using 64K × 1 DRAM chips
OFF								When using 256K × 1 DRAM chips (default)
	ON	ON						Disable RAM and ROM
ON	OFF							Limit base memory to 256 Kbytes
	OFF	ON						Limit base memory to 512 Kbytes
	OFF	OFF						Enable all base memory (default)
			OFF	OFF				When using 64K × 1 DRAM chips
	100-ns 256K × 1 chips only		ON	ON				256K × 1 DRAM chips. No extended memory (default)
			ON	OFF				Enable bank 2 for 1.0 to 1.5 MB of memory
			OFF	ON				Enable bank 2 & 3 for 1.0 to 2.0 MB of memory
			OFF	OFF				Enable all banks for 1.0 to 2.5 MB of memory
					OFF			Software selectable 12-/8-MHz (default)
					ON			Always 8-MHz
						OFF		Reserved
							ON	COMPAQ VDU, COMPAQ ECG, Compatible EGA or RGBI
							OFF	Monochrome
Jumper E5								Disable processor slowdown with diskette access
1-2								
2-3								Enable processor slowdown with diskette access

8.3 SYSTEM MEMORY BOARD

Version 1 contains soldered-in SIPs (single in-line packages) in Bank 0. The jumpers in Version 1 consist of a row of six jumpers labeled E1 through E6.

For Version 2, four 64K × 4 soldered-in DIPs (dual inline packages) and two 64K × 1 DIPs (for parity bits) replace the SIPs used in Version 1 (Figure 8-6).

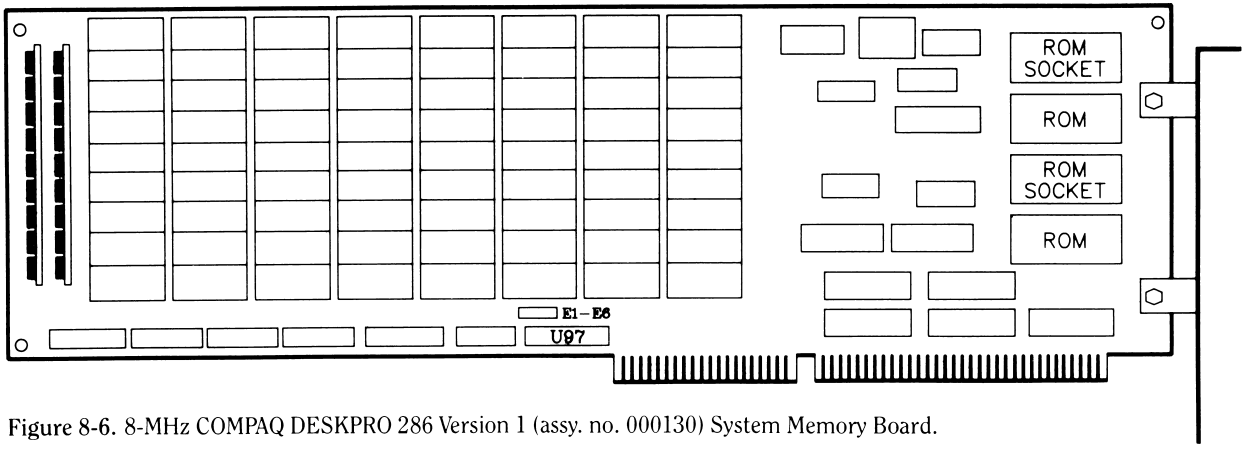


Figure 8-6. 8-MHz COMPAQ DESKPRO 286 Version 1 (assy. no. 000130) System Memory Board.

Table 8-5. E1 Jumper Positions on 8-MHz COMPAQ DESKPRO 286 System Memory Board (assy. no. 000130)[1]

Bank 1-4 Filled with:	Jumper Position:	Address Range Enabled:
64K × 1 chips	E1 to E2 E5 to E6	0 to 640K (Base memory)
64K × 1 chips	E2 to E3 E4 to E5	0 to 512K (Base memory)[2]
256K × 1 chips	E2 to E3 E5 to E6	0 to 640K (Base memory)[3] 1 to 2.5 MB (Extended memory)
256K × 1 chips	E2 to E3 E4 to E5	0 to 640K (Base memory)

[1]Not PAL dependent
[2]For software packages requiring a maximum memory of 512-Kbytes.
[3]640K to 1MB Reserved

In Version 2, all six jumpers are labeled E1, but the six pins correspond to E1 through E6 on Version 1.

If Version 1 and 2 boards were shipped after November 1985, they contain a new memory configuration PAL chip (part no. 105615-001). The chip is in location U97 on Version 1 and U90 on Version 2.

Tables 8-5 and 8-6 give the E1 jumper settings for the configuration with the new PAL chip.

Tables 8-7 and 8-8 give the jumper settings for 64K × 1 and 256K × 1 DRAM memory chips.

When adding RAM, you must fill the banks in order; that is, Banks 1 and 2 must be filled before filling Bank 3.

CAUTION

To prevent possible problems when installing or replacing memory chips:

1. **DO NOT mix 64K × 1 and 256K × 1 DRAM memory chips on the system memory board or on any expansion memory board.**
2. **Do not mix different manufacturer's memory chips on system memory board or any expansion memory board.**

Table 8-6. E1 Jumper Positions on 8-MHz COMPAQ DESKPRO 286 System Memory Board (Assy. No. 000382[1] & 000178[2])

PAL in U90 Bank 1-4 Filled with:	E1 Jumper Position:	Address Range Enabled:
64K × 1 chips	1 to 2 5 to 6	0 to 640K (Base memory
64K × 1 chips	1 to 2 4 to 5	0 to 512K (Base memory)
64K × 1 chips[1]	2 to 3 4 to 5	0 to 256K (Base memory)
256K × 1 chips	2 to 3 5 to 6	0 to 640K 3 (Base memory) 1.25MB (Extended memory)
256K × 1 chips[1]	2 to 3 4 to 5	0 to 640K

[1]Only valid with 105615 PAL
[2]Only valid with 102665 PAL
[3]640 to 1MB Reserved

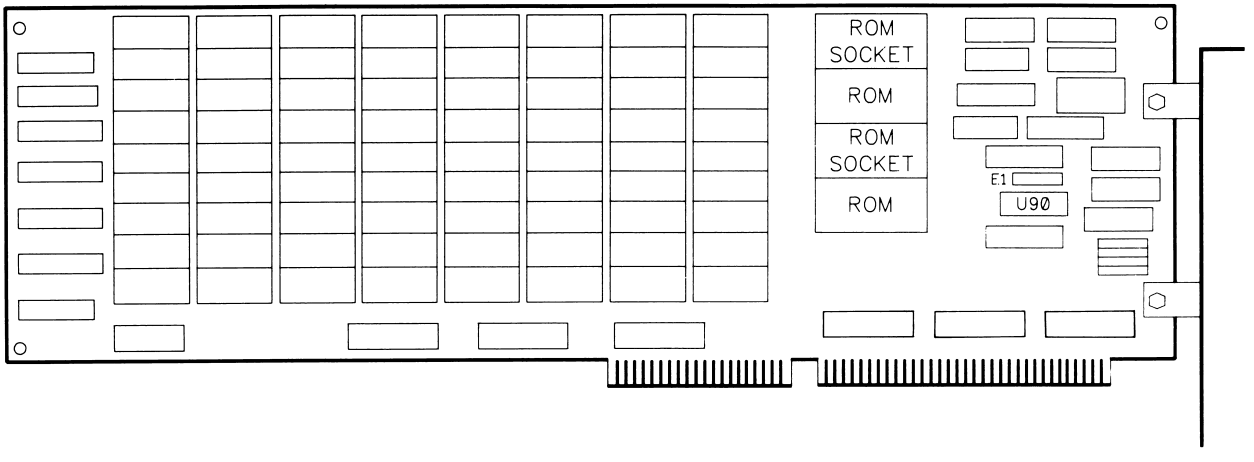


Figure 8-7. 8-MHz COMPAQ DESKPRO 286 Version 2 (assy. no. 000178 or 000382) System Memory Board.

8.4 512/2048-KBYTE MEMORY EXPANSION BOARD

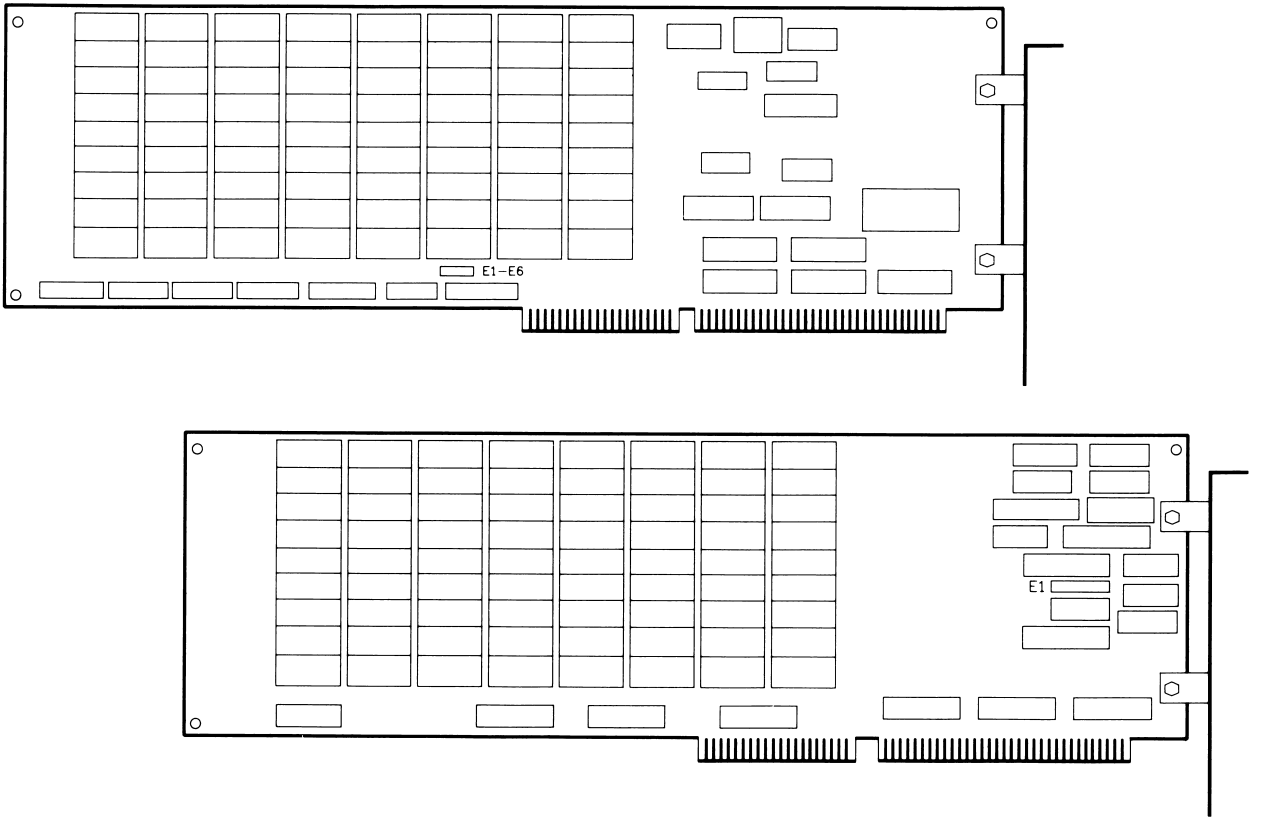


Figure 8-8. 512/2048-Kbyte Memory Expansion Boards Version 1 (assy. no. 000307 and 000308).

Memory Expansion Board 1.0- to 3.0-Megabyte Address Range

The 1-megabyte to 3-megabyte configuration of the memory expansion board is used only when the system memory board is populated with 64K × 1 DRAM chips.

Jumper Position	E1-E2 and E5-E6
Banks Filled	**Resulting Expansion Memory***
1	512K
1-2	1024K
1-3	1536K
1-4	2048K

*Resulting base memory is dependent on the system memory board configuration (see Tables 8-5 and 8-6)

Memory Expansion Board 2.5- to 4.5-Megabyte Address Range

The following memory expansion board configurations are used when the system memory board is populated with 256K × 1 DRAM chips:

NOTE: The system memory board should have 256K × 1 DRAM chips installed in all four banks before adding the memory expansion board in the 2.5- to 4.5-megabyte address range.

Likewise, the 2.5- to 4.5-megabyte memory expansion board should be fully populated before adding the expansion board in the 4.5- to 6.5-megabyte address range. The 4.5- to 6.5-megabyte memory expansion board should be fully populated before adding the memory expansion board in the 6.5- to 8.5-megabyte address range.

Jumper Position	E1-E2 and E4-E5
Banks Filled	Resulting Expansion Memory*
1	2048K
1-2	2560K
1-3	3072K
1-4	3584K

*Resulting base memory is 640K for any system with a system memory board populated with 256K × 1 DRAM chips

Memory Expansion Board 4.5- to 6.5-Megabyte Address Range

Jumper Position	E1-E2 and E4-E5
Banks Filled	Resulting Expansion Memory*
1	4096K
1-2	4608K
1-3	5120K
1-4	5632K

*Resulting base memory is 640K for any system with a system memory board populated with 256K × 1 DRAM chips

Memory Expansion Board 6.5- to 8.5-Megabyte Address Range

Jumper Position	E1-E2 and E4-E5
Banks Filled	Resulting Expansion Memory*
1	6144K
1-2	6656K
1-3	7168K
1-4	7680K

*Resulting base memory is 640 Kbytes for any system with a system memory board populated with 256K × 1 DRAM chips

8.5 ESDI FIXED DISK DRIVE CONTROLLER BOARD

Table 8-7. ESDI Fixed Disk Drive Controller Board (assy. no. WD1005WAH) Jumper Positions

Jumper	Function
W1	Reserved–not installed
W2	Reserved–not installed
W3	Reserved–2 to 3
W10	Reserved
W11	Reserved
W12	Reserved

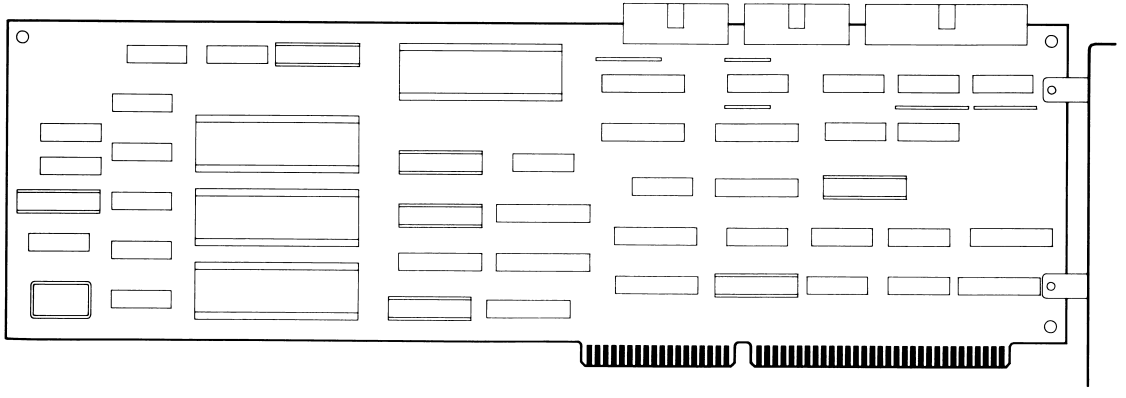


Figure 8-9. ESDI Fixed Disk Drive Controller Board (assy. no. WD1005WAH).

8.6 MULTIPURPOSE CONTROLLER BOARDS

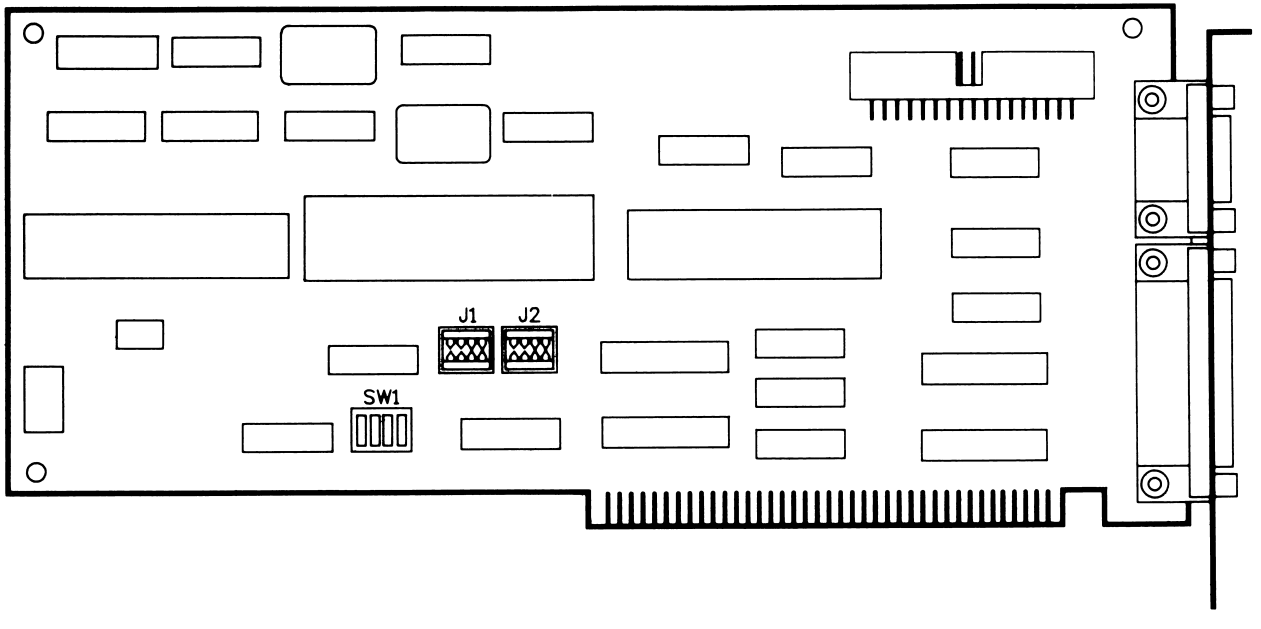


Figure 8-10. Multipurpose Controller Board (assy. no. 000181-001/021).

Table 8-8. Multipurpose Controller Board (assy. no. 000181-001/021)

Jumper/Switch	Setting/Function
J1	Open connectors on left–COM1 1RQ4 (default) Open connectors on right–COM2 1RQ3
J2	Open connectors on left–primary controller (default) Open connectors on right–secondary controller
SW1-1	Reserved
SW1-2	ON–enable parallel port (default) OFF–disable parallel port
SW1-3*	ON–enable serial port (default) OFF–disable serial port
SW1-4	OFF–Reserved

*Reserved on 000181-001 boards

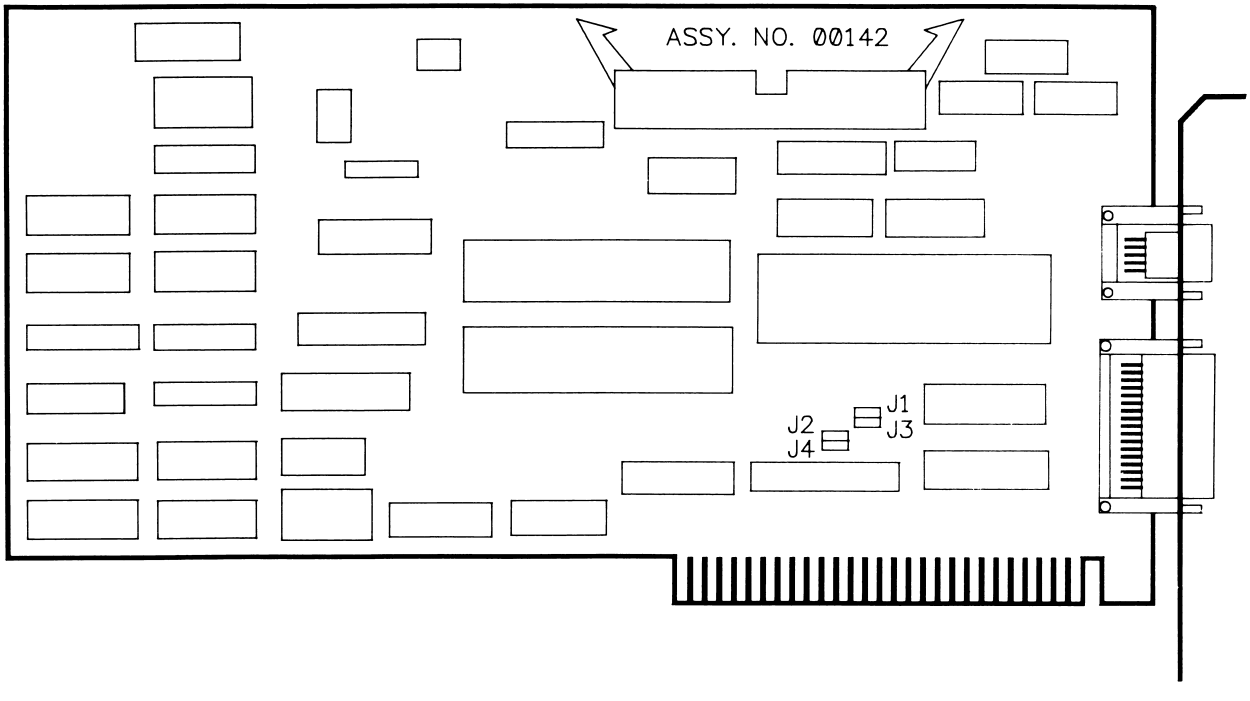


Figure 8-11. Multipurpose Controller Board (assy. no. 000142).

Table 8-9. Multipurpose Controller Board (assy. no. 000142)

Jumper	Function	Pin 1 to 2	Pin 2 to 3
J1	Multipurpose controller base address select	Secondary address (370h)	Primary address RESERVED DO NOT CHANGE
J2*	COM1/COM2 select	Asynchronous Communications port set to COM1 (default setting)	Asynchronous Communications port to COM2
J3	Parallel Printer port	Parallel printer port disabled	Parallel printer port enabled (default setting)
J4*	Communications interrupt select	Asynchronous Communications port IRQ4 selected (default setting)	Asynchronous port IRQ3 Communications selected

*J2 and J4 must be changed together.

When changing the communications port address of the asynchronous communications port, it is important to remember to change both the COM1/COM2 address (J2) and the interrupt IRQ3/IRQ4/(J4) selections. For proper operation when COM1 is selected, the interrupt IRQ4 must also be selected. If COM2 is selected, the interrupt IRQ3 must be selected.

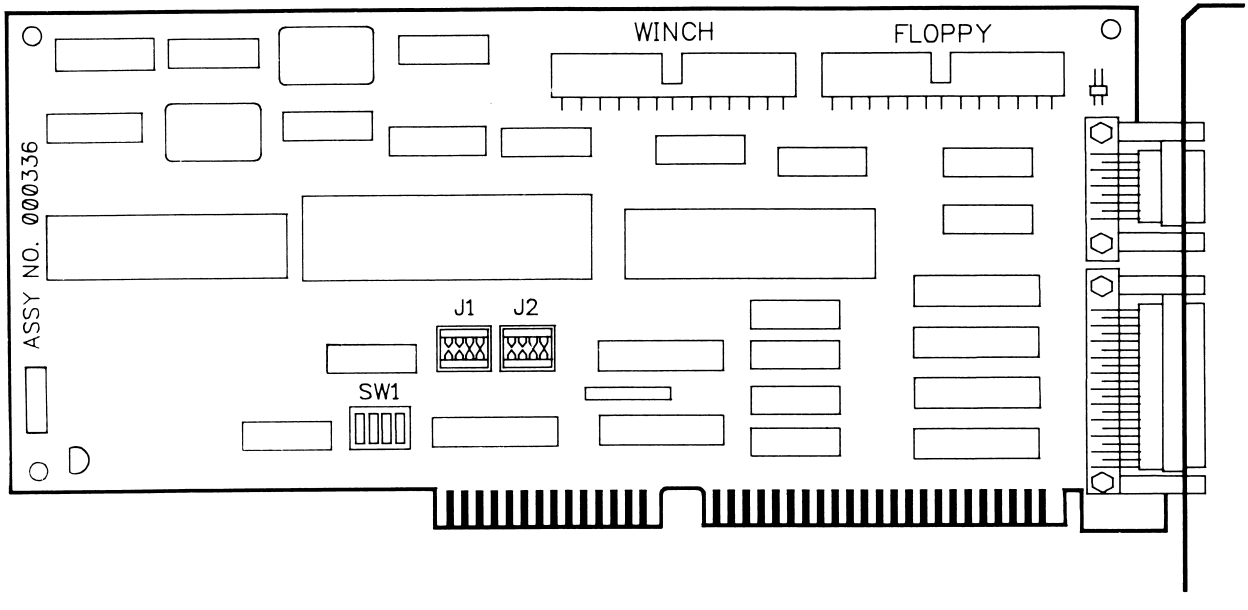


Figure 8-12. Multipurpose Fixed Disk Drive Controller Board (assy. no. 000336-001/021).

Table 8-10. Multipurpose Fixed Disk Drive Controller Board (assy. no. 000336-001/021)

Jumper/ Switches	Setting/Function
J1	Open connectors on left–COM1 IRQ4 (default) Open connectors on right–COM2 IRQ3
J2	Open connectors on left–primary diskette controller address (default) Open connectors on right–secondary diskette controller address
SW1-1	ON–enable fixed disk drive (default) OFF–disable fixed disk drive
SW1-2	ON–enable parallel port (default) OFF–disable parallel port
SW1-3*	ON–enable serial port (default) OFF–disable serial port
SW1-4	Reserved (always OFF)

*SW1-3 Reserved on 000336-001 Rev P or earlier boards

If the parallel printer port is disabled, the port is not recognized by the system. This feature allows for use of multifunction devices that have parallel printer ports that would normally conflict with the standard parallel printer port, contained in all COMPAQ Computers.

If the base address of the multipurpose controller board or the multipurpose fixed disk drive controller board is changed, the system is unable to boot, and fails the Power-On Self-Tests. This address selection is available only for special applications and, under normal circumstances, should never be changed.

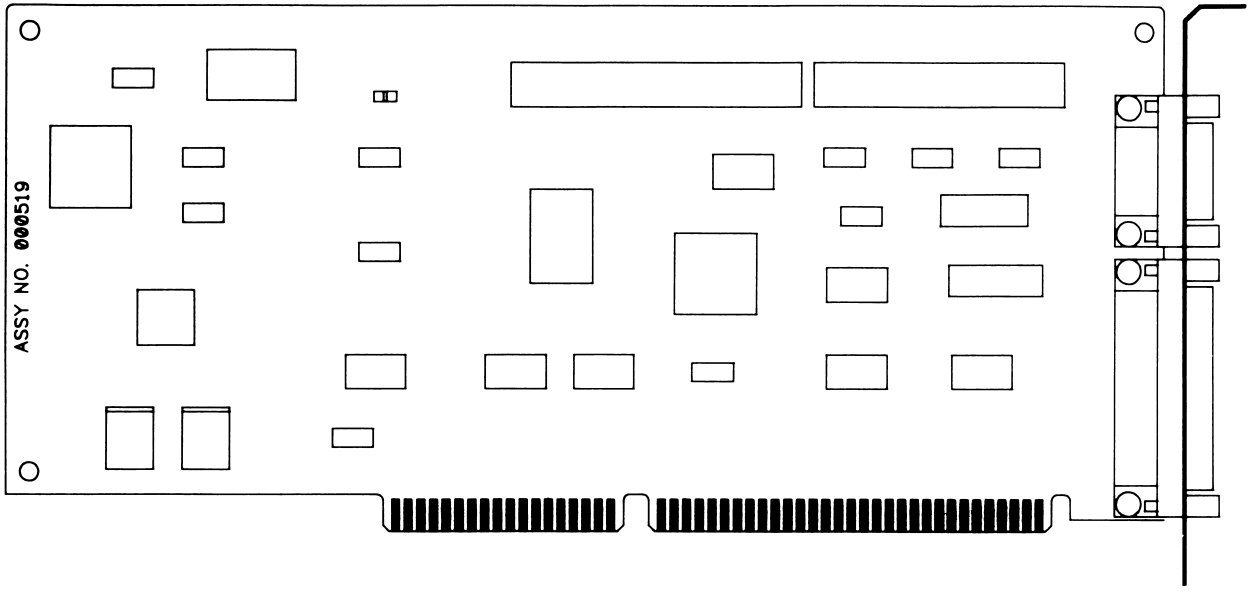


Figure 8-13. Multipurpose Fixed Disk Controller Board (assy. no. 000519 and 000815).

Table 8-11. Multipurpose Fixed Disk Controller Board (assy. no. 000519 and 000815)

Switch	Setting/Function
SW500-1	OFF–primary diskette controller address (default) ON–secondary diskette controller address
SW500-2	OFF–disable high-speed transfer rates (for systems without 1.2 MB diskette drive or 40 MB fixed disk drive backup) (default) ON–enable high-speed transfer rates (for systems with 1.2 MB diskette drive or 40 MB fixed disk drive backup)
SW500-3	OFF–enable fixed disk drive ON–disable fixed disk drive
SW500-4	OFF–serial interface COM1 IRQ4 (default) ON–serial interface COM2 IRQ3
SW500-5	OFF–enable serial port (default) ON–disable serial port
SW500-6	OFF–enable parallel port (default) ON–disable parallel port

8.7 FIXED DISK DRIVE CONTROLLER BOARDS

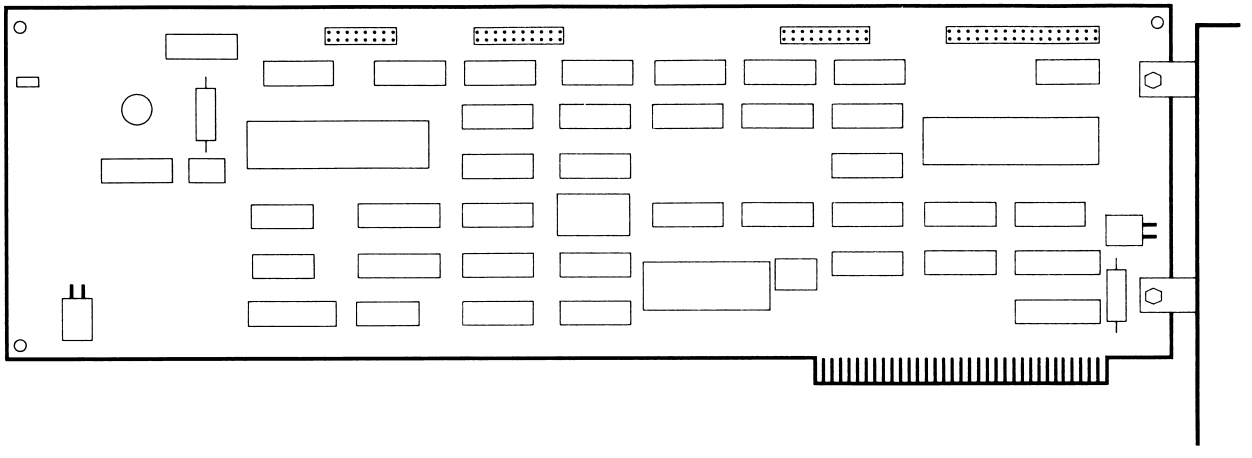


Figure 8-14. Full-Length Fixed Disk Drive Controller Board (WD1002WX2 or HX4).

Table 8-12. SW1 Switch Settings for Full-Length Fixed Disk Drive Controller Board (assy. no. WD1002WX2 or HX4)*, **

	SW1			
	Drive D		Drive C	
Fixed Disk Drive Type	1	2	3	4
10-Megabyte	ON	ON	ON	ON
20-Megabyte	OFF	ON	OFF	ON
30-Megabyte	OFF	OFF	OFF	OFF

*Earlier versions of this board have no switch settings and are fixed for 10-MB
**Do not remove jumper E17-E18

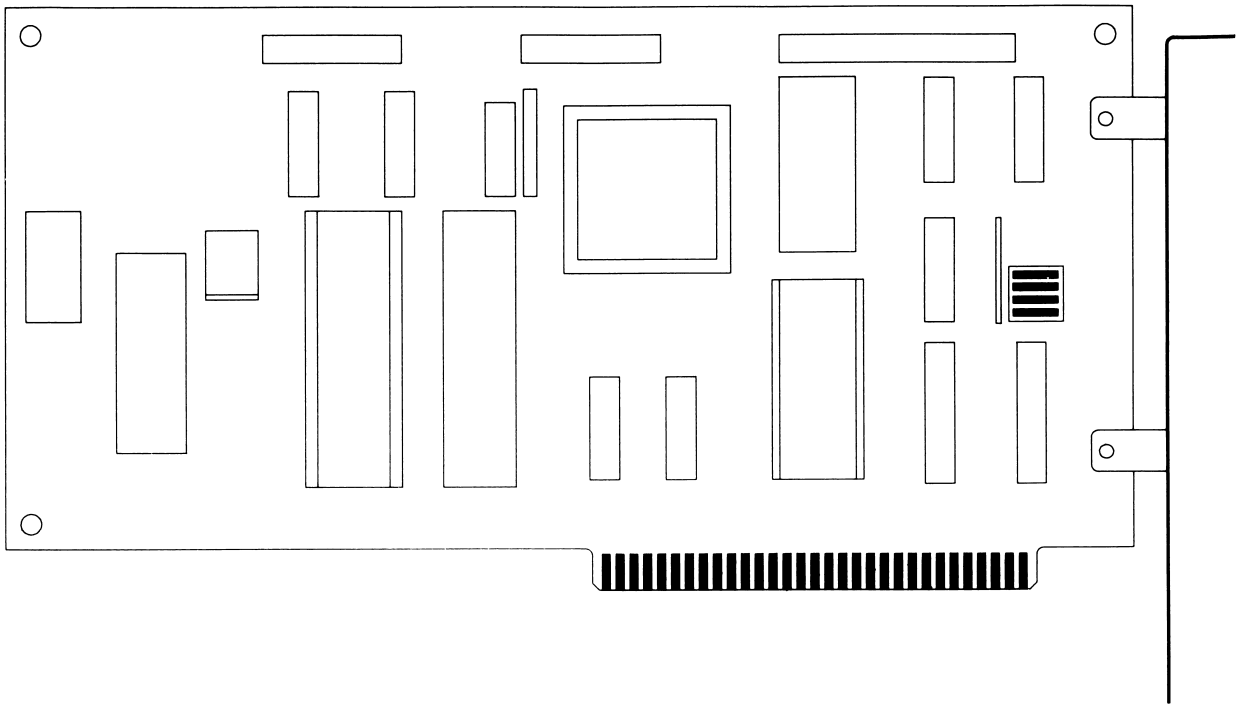


Figure 8-15. Half-Length Fixed Disk Drive Controller Board (WD1002SWX2).

Table 8-13. SW1 Switch Settings for Half-Length Fixed Disk Drive Controller Board (WD1002SWX2)

	SW1			
	Drive D		Drive C	
Fixed Disk Drive Type	1	2	3	4
10-Megabyte	OFF	OFF	OFF	OFF
20-Megabyte	ON	OFF	ON	OFF
30-Megabyte	ON	ON	ON	ON

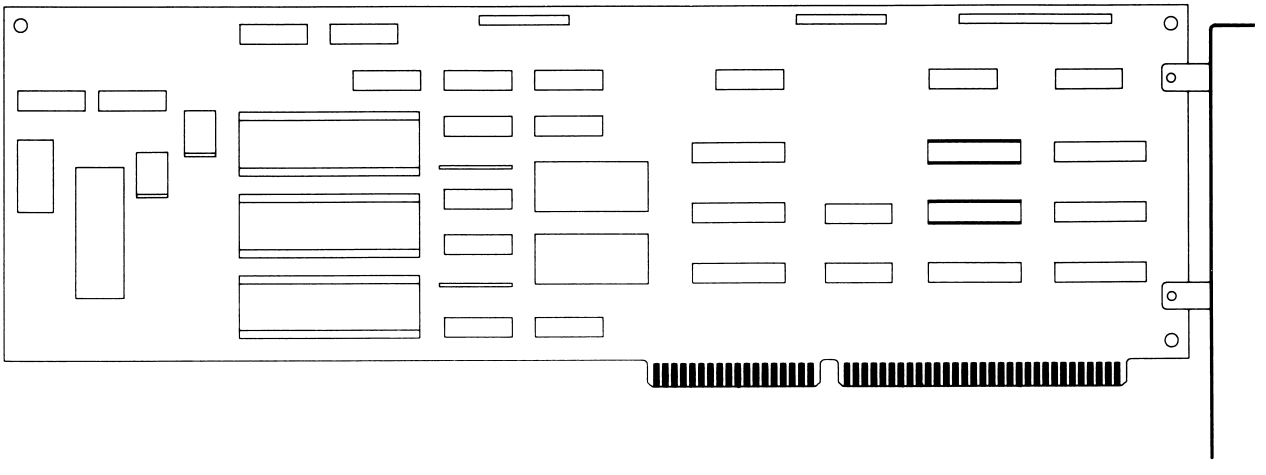


Figure 8-16. Fixed Disk Drive Controller Board (assy. no. WD1002WAH).

Table 8-14. Fixed Disk Drive Controller Board (assy. no. WD1002WAH).

Jumper/Setting	Function	
W1	1-2	Primary controller
W2	NL	LED operation
J4		No connections

Jumpers set at the factory. Do not change.

8.8 HOST ADAPTER BOARD

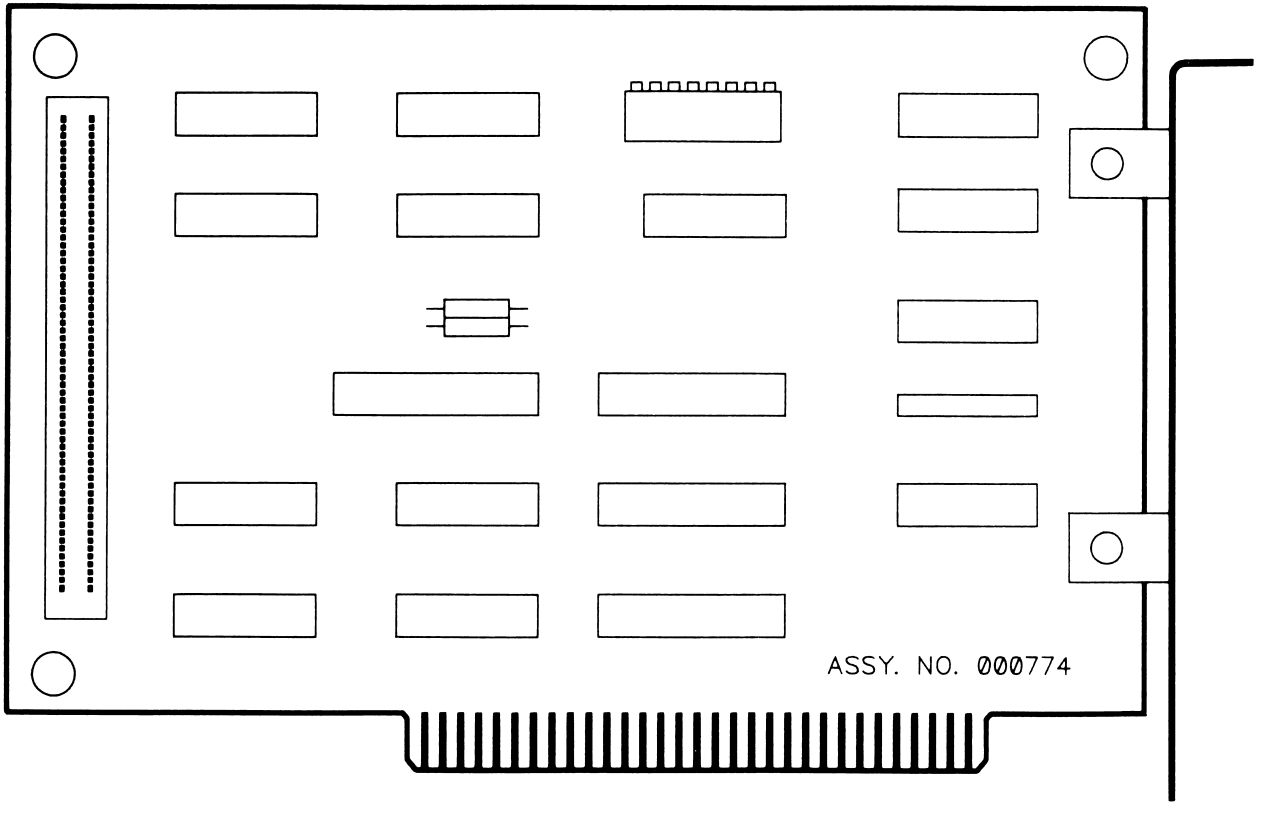


Figure 8-17. Host Adapter Board (assy. no. 000774).

Table 8-15. Host Adapter Board (assy. no. 000774) Switch Settings

Switch Setting								Function
1	2	3	4	5	6	7	8	
ON	OFF							IRQ5 (Standard)
OFF	ON							IRQ3
		ON	OFF	ON	OFF			Channel 3 (default)
		OFF	ON	OFF	ON			Channel 1
						ON	OFF	300 HEX (default)
						OFF	ON	200 HEX

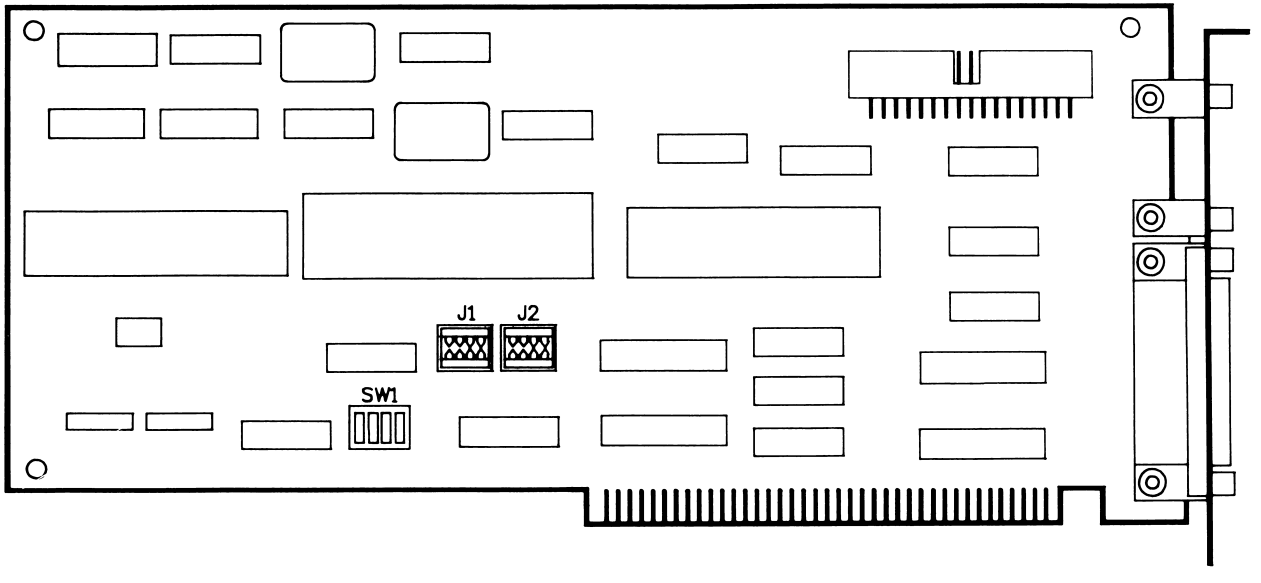


Figure 8-18. Diskette/Printer Board (assy. no. 000181-011).

Table 8-16. Diskette/Printer Board (assy. no. 000181-011)

Switch	Setting/Function
SW1-1	Reserved
SW1-2	ON–enable parallel interface (default) OFF–disable parallel interface
SW1-3	Reserved
SW1-4	Reserved

8.9 COMPAQ ENHANCED COLOR GRAPHICS BOARD

The COMPAQ Enhanced Color Graphics Boards (assy no. 000410 and 000471) have two banks of configuration switches and two jumpers that must be set to allow the board to work properly with your computer system. Refer to Figures 8-19 and 8-20 for illustrations of the boards.

The monitor you use with the COMPAQ Enhanced Color Graphics Board determines the correct setting for one of the jumpers and one bank of configuration switches. The other configuration switch bank setting is determined by whether the COMPAQ Enhanced Color Graphics Board is the primary or the secondary video display controller board in your computer. The correct setting of this configuration switch bank is also determined by the power-on mode of the board.

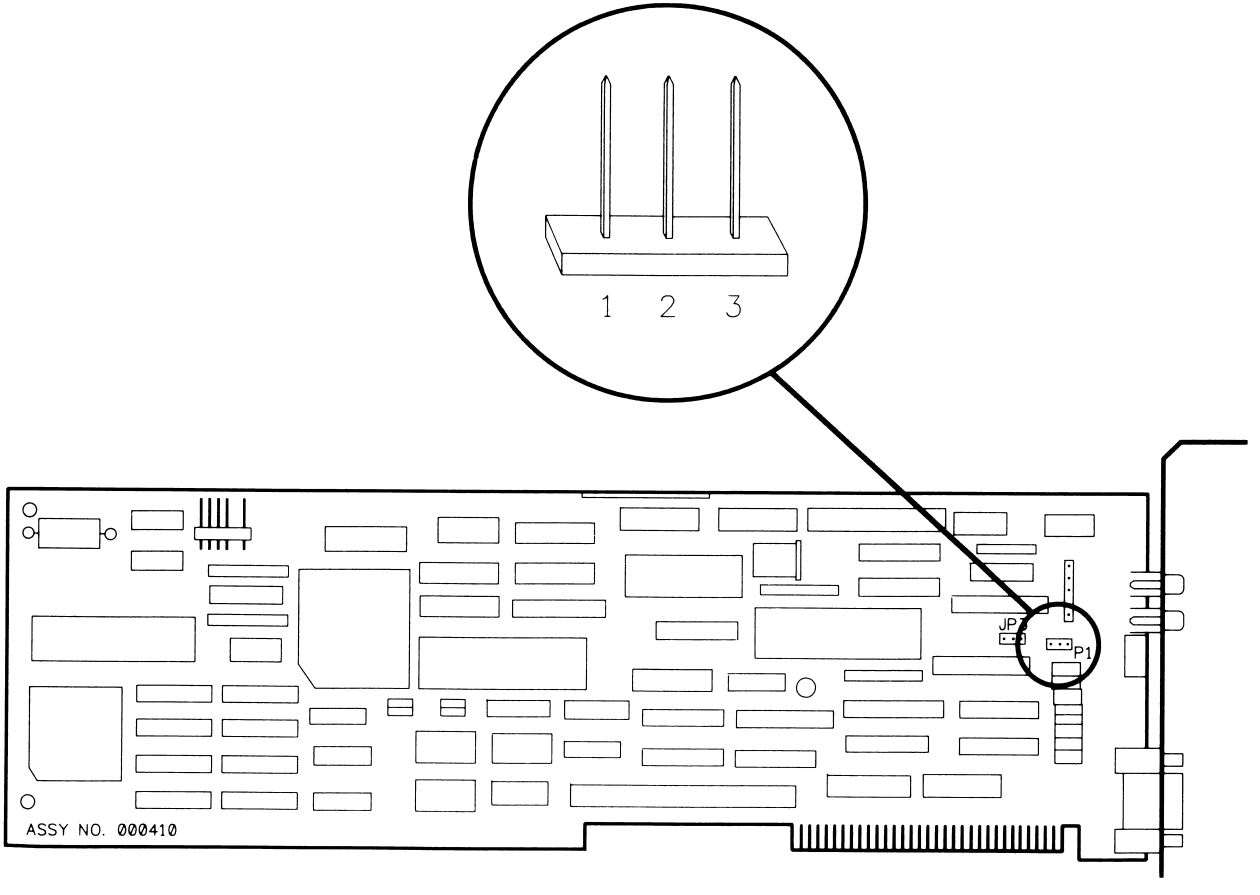


Figure 8-19. COMPAQ Enhanced Color Graphics Board (assy. no. 000410).

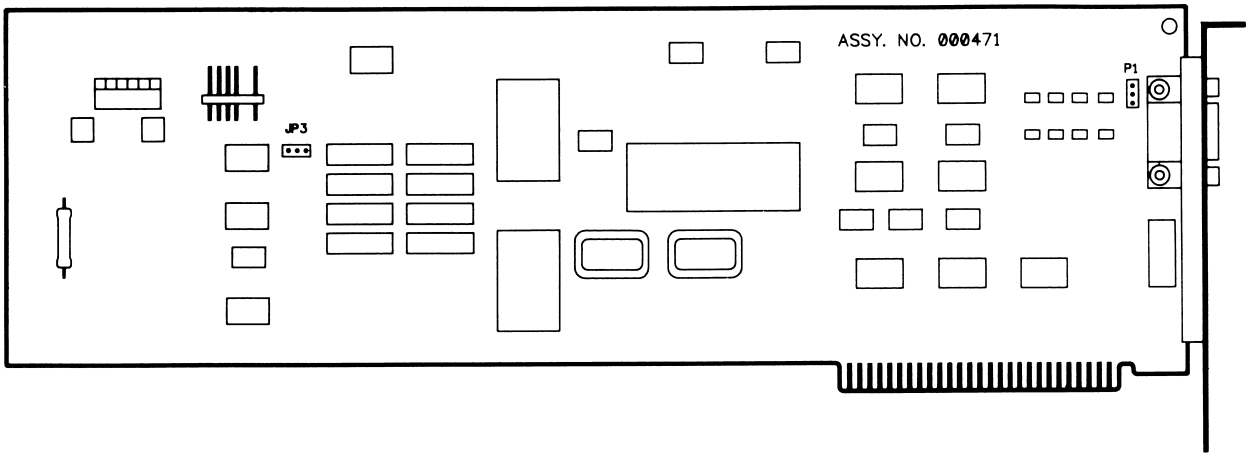


Figure 8-20. COMPAQ Enhanced Color Graphics Board (assy. no. 000471).

The following sections provide jumper and configuration switch locations and instructions on how to set them.

CAUTION

Use care when setting the configuration switches on either the COMPAQ Enhanced Color Graphics Board or the system board. Many of the components on the board are sensitive to static electricity. Be sure that you are discharged of static electricity by briefly touching a grounded metal object.

Correctly setting the configuration switches is vital to the operation of the COMPAQ Enhanced Color Graphics Board. Be sure that you make the appropriate setting for your computer system before installing the board.

Use Table 8-17 to change the switches or jumpers on the system board so that the COMPAQ Enhanced Color Graphics Board works properly.

Table 8-17. System Board Switch Settings or Jumper Positions

System Board	Switch or Jumper Setting
COMPAQ DESKPRO System Board	SW1-6 = ON
8-MHz COMPAQ DESKPRO 286 System Board (000094)	JUMPER ED Pin 2 to Pin 3
8-MHz COMPAQ DESKPRO 286 System Board (000361)	SW1-8 = ON
12-MHz COMPAQ DESKPRO 286 System Boards	SW1-8 = ON

Configuration Switch Bank SW1

The setting for configuration switch bank SW1 is determined by whether the COMPAQ Enhanced Color Graphics Board is to be used as:

1. The only video display controller board or the primary video display controller board (the one active on power-on or system reset).

   Table 8-18 shows the correct settings for configuration switch bank SW1 if the COMPAQ Enhanced Color Graphics Board is the only or the primary video display controller board in the system.

2. The secondary video display controller board in your computer.

   Table 8-19 shows the correct settings for configuration switch bank SW1 if the COMPAQ Enhanced Color Graphics Board is the secondary video display controller board in the system.

   To change settings, use the end of a pen to toggle the switch to the correct position. Refer to Figure 8-19 or 8-20 for the location of switch bank SW1.

Table 8-18. COMPAQ Enhanced Color Graphics Board as the Primary Video Display Controller Board.

Monitor Type	Power-On Mode (Character Format)	SW1 Switches 1	2	3	4	Allowable Secondary Board Type
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor	80 × 25 (640 × 350 resolution)	OFF	ON	ON	OFF	Monochrome Display Adapter 380 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor	80 × 25 (640 × 200 resolution)	ON	ON	ON	OFF	Monochrome Display Adapter 80 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor or RGBI Color Monitor	80 × 25 (640 × 200 resolution)	OFF	OFF	OFF	ON	Monochrome Display Adapter 380 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor or RGBI Color Monitor	40 × 25 (320 × 200 resolution)	ON	OFF	OFF	ON	Monochrome Display Adapter 80 × 25
COMPAQ Dual-Mode Monitor	80 × 25 (720 × 350 resolution)	OFF	OFF	ON	OFF	COMPAQ Video Display Controller or Color Graphics Adapter 80 × 25
COMPAQ Dual-Mode Monitor	80 × 25 (720 × 350 resolution)	ON	OFF	ON	OFF	COMPAQ Video Display Controller or Color Graphics Adapter 40 × 25

Table 8-19. COMPAQ Enhanced Color Graphics Board as the Secondary Video Display Controller Board

Monitor Type	Power-On Mode (Character Format)	SW1 Switches 1	2	3	4	Allowable Primary Board Type
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor	80 × 25 (640 × 350 resolution)	OFF	OFF	ON	ON	Monochrome Display Adapter 80 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor	80 × 25 (640 × 200 resolution)	ON	OFF	ON	ON	Monochrome Display Adapter 80 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor or RGBI Color Monitor	80 × 25 (640 × 200 resolution)	OFF	ON	ON	ON	Monochrome Display Adapter 80 × 25
COMPAQ Color Monitor or Compatible Enhanced Color Monitor or COMPAQ Dual-Mode Monitor or RGBI Color Monitor	40 × 25 (320 × 200 resolution)	ON	ON	ON	ON	Monochrome Display Adapter 80 × 25
COMPAQ Dual-Mode Monitor	80 × 25 (720 × 350 resolution)	OFF	ON	OFF	ON	COMPAQ Video Display Controller or Color Graphics Adapter 80 × 25
COMPAQ Dual-Mode Monitor	80 × 25 (720 × 350 resolution)	ON	ON	OFF	ON	COMPAQ Video Display Controller or Color Graphics Adapter 40 × 25

Configuration Switch Bank SW2

The setting for configuration switch bank SW2 is determined by the monitor type that you use with the COMPAQ Enhanced Color Graphics Board. Configuration switch bank SW2 is located at the top of the board, near the board slot bracket (See Figure 8-19 or 8-20).

Table 8-20. Configuration Switch Bank SW2 Settings

Monitor Type	SW2 Switches: 1	2	3	4	5	6
COMPAQ Color Monitor or Compatible Enhanced Color Monitor	OFF	OFF	ON	ON	OFF	ON
COMPAQ Dual-Mode Monitor (12-inch external)	OFF	OFF	ON	ON	OFF	ON
RGBI Color Monitor	OFF	OFF	ON	ON	OFF	ON

Jumper P1 Positions on the COMPAQ Enhanced Color Graphics Board

The setting for Jumper P1 is determined by the external monitor type that you use with the COMPAQ Enhanced Color Graphics Board. Jumper P1 is located in the right top corner of the board (Figure 8-21). The preconfigured setting of Jumper P1 is for the COMPAQ Color Monitor or a compatible enhanced color monitor. If you need to reset the jumper, remove the jumper from its current pins and press it into place on the correct pins.

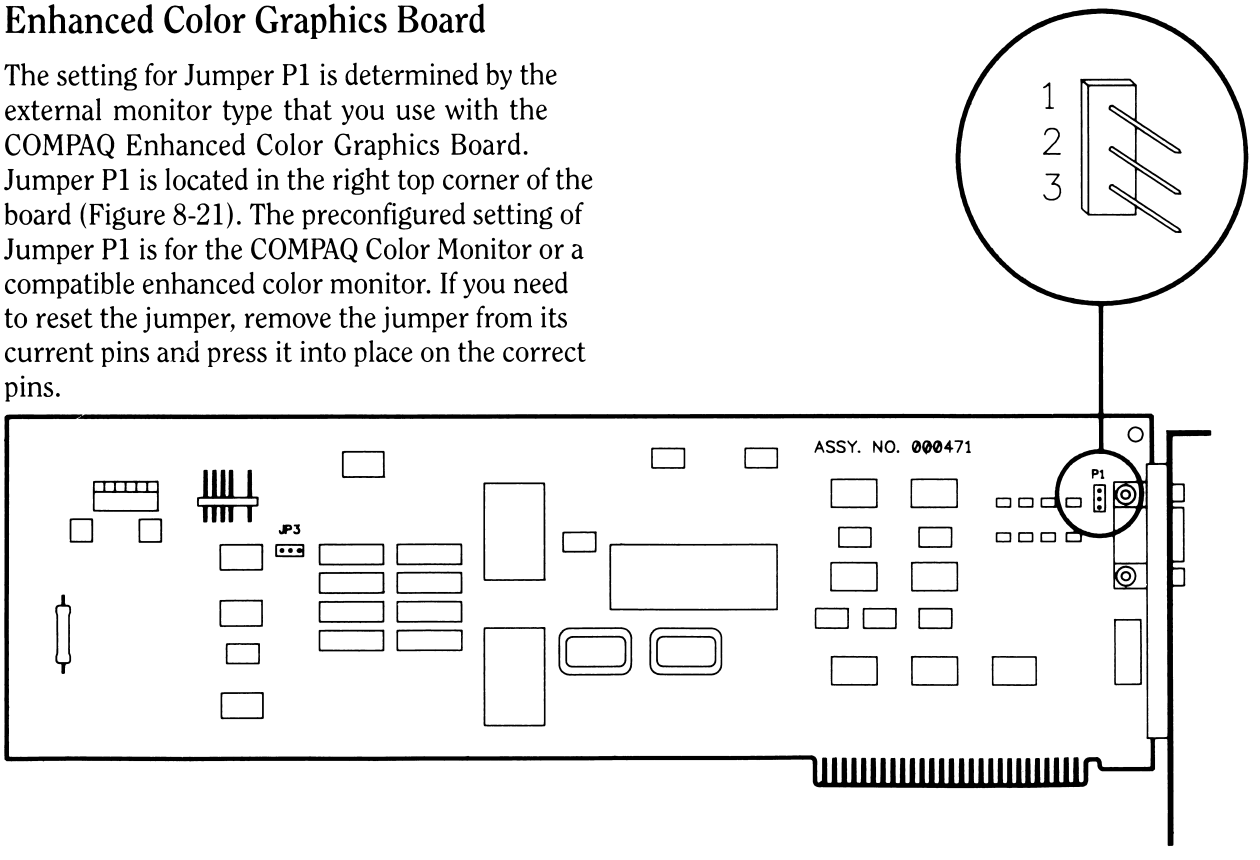


Figure 8-21. Jumper P1 Location.

COMPAQ Color Monitor or a Compatible Enhanced Color Monitor

Placing Jumper P1 on pins 1 and 2 enables the board to work with a COMPAQ Color Monitor or a compatible enhanced color monitor. Figure 8-22 illustrates positioning for Jumper P1 if you are using an enhanced color monitor.

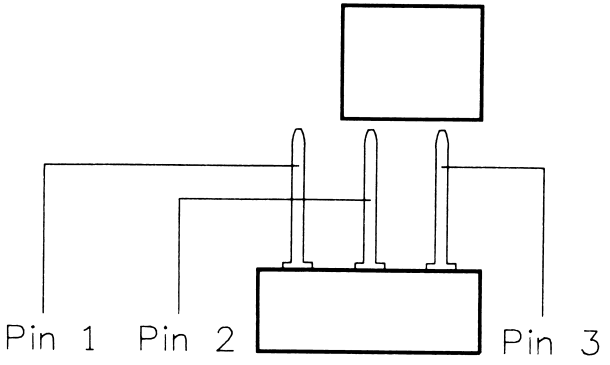


Figure 8-22. Jumper P1 Position for a COMPAQ Color Monitor or a Compatible Enhanced Color Monitor.

COMPAQ Dual-Mode Monitor or RGBI Color Monitor

Placing Jumper P1 on pins 2 and 3 enables the board to work with an external COMPAQ Dual-Mode Monitor or an RGBI color monitor. Figure 8-23 illustrates positioning for Jumper P1 if you are using either of these monitor types.

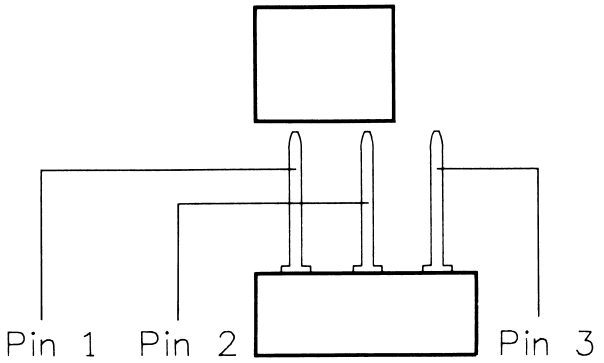


Figure 8-23. Jumper P1 Position for a COMPAQ Dual-Mode Monitor or an RGBI Color Monitor.

Jumper JP3

Jumper JP3 is located near the center of the board, next to switch bank SW2 (Figure 8-19 or 8-20). This jumper should always be set on pin 1 and pin 2 (Figure 8-24).

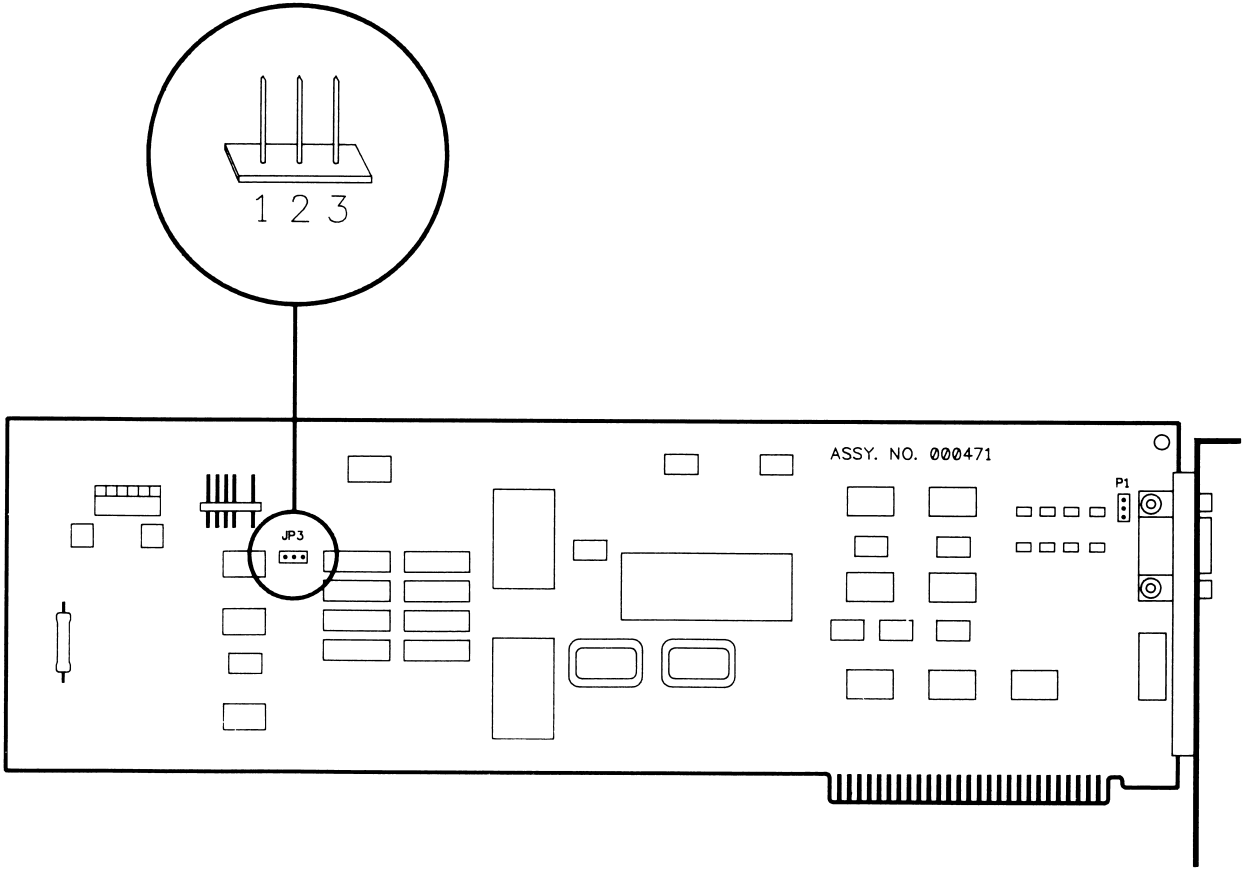


Figure 8-24. Jumper JP3 Position.

8.10 VIDEO DISPLAY CONTROLLER BOARD

Figures 8-25, 8-26, 8-27 and 8-28 shows the jumper locations on the video display controller boards.

This board supports only those video monitors that require positive and vertical horizontal synchronization pulses.

Jumpers J3 and J5 must both be changed at the same time or the video display controller board will not function correctly.

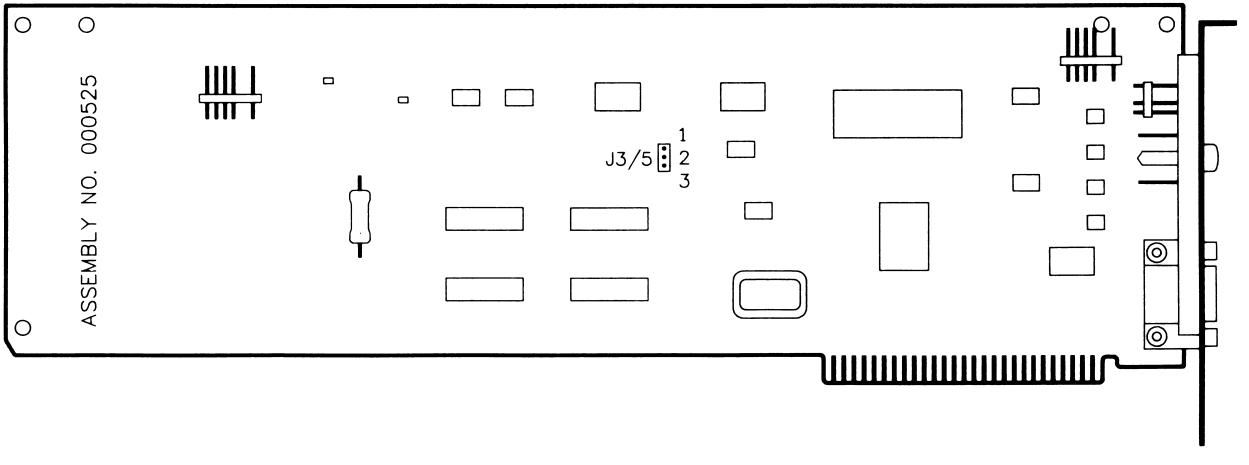


Figure 8-25. Video Display Controller Board (assy. no. 000525) Jumper Locations.

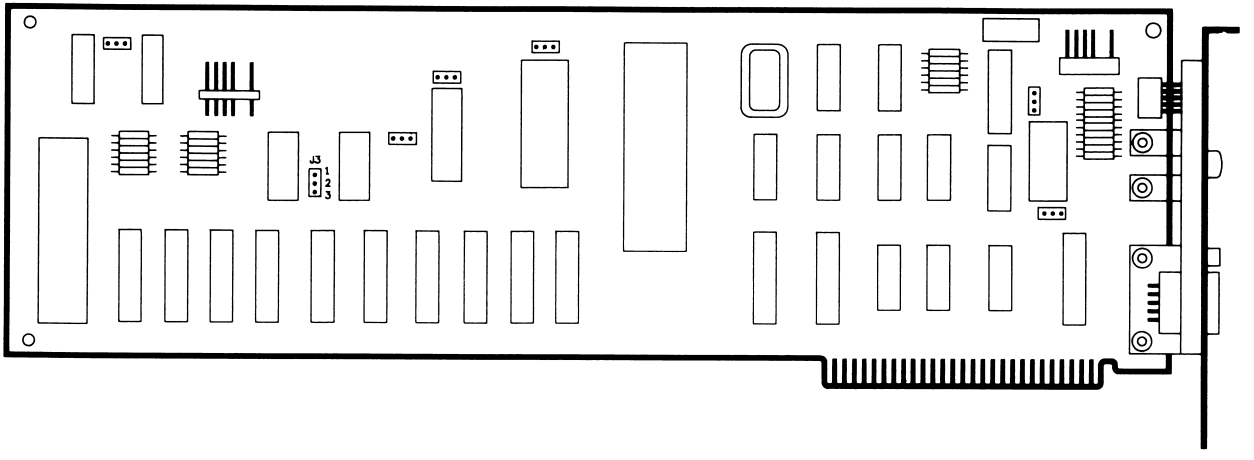


Figure 8-26. Video Display Controller Board (assy. no. 000031) Jumper Locations.

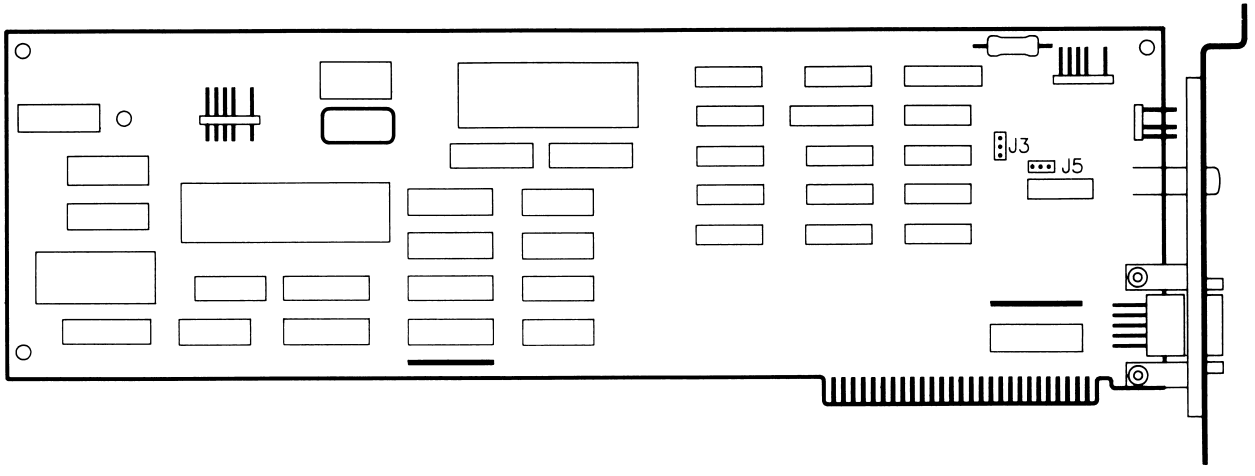


Figure 8-27. Video Display Controller Board (assy. no. 000160) Jumper Locations.

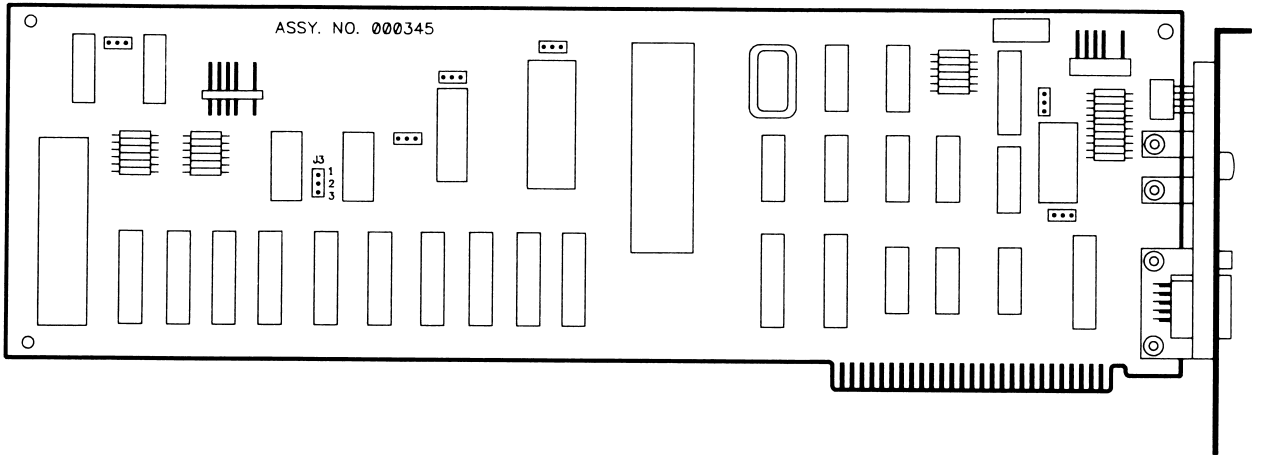


Figure 8-28. Video Display Controller Board (assy. no. 000345) Jumper Locations.

Table 8-21. Video Display Controller Board (assy. no. 000525)

J3/5	Function
2-3	Enable RGBI & composite video (high-scan) (Desktops–default)
1-2	Disable RGBI & composite video (high-scan) (Portables–default)

Table 8-22. Video Display Controller Boards (assy. no. 000031, 000160, and 000345)

J3	J5	Function
2-3	2-3	Enable RGBI & composite video (high-scan) (Desktops–default)
1-2	1-2	Disable RGBI & composite video (high-scan) (Portables–default)

8.11 VIDEO GRAPHICS CONTROLLER BOARD

Table 8-23. Video Graphics Controller Board Jumper Positions

Jumper	Function
J1 – 16 bit	Video RAM
J2 – 8 bit	Reserved

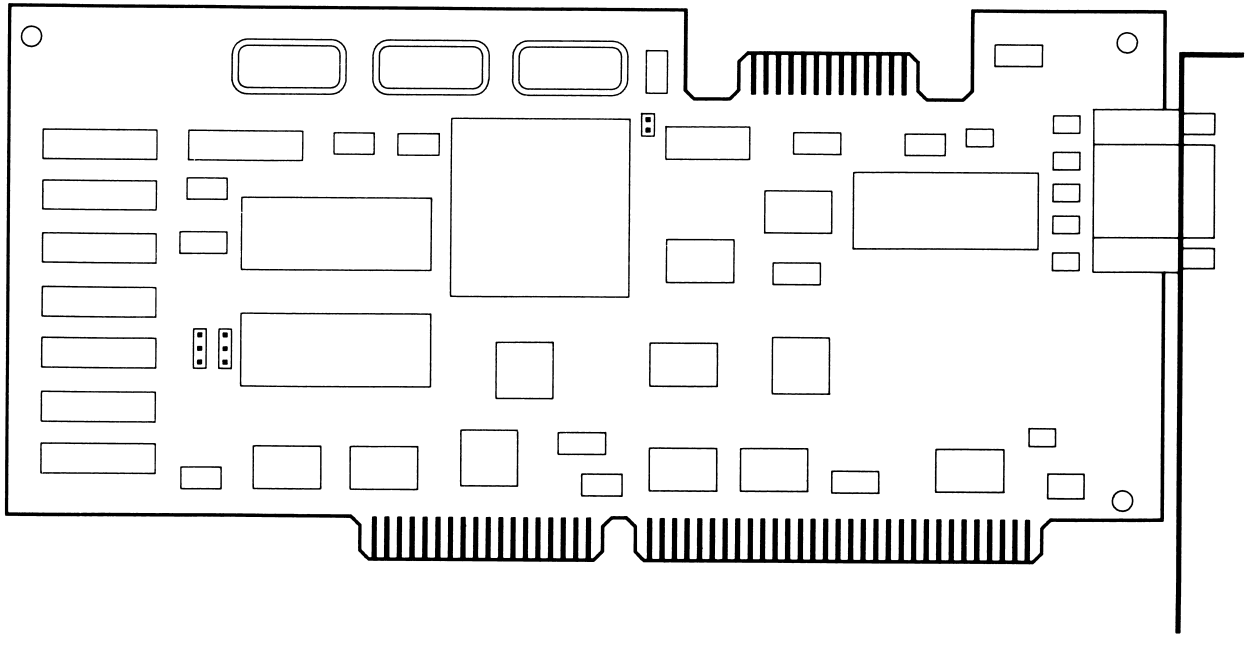


Figure 8-29. Video Graphics Controller Board.

8.12 ASYNCHRONOUS COMMUNICATIONS/CLOCK BOARD

Jumpers on the COMPAQ DESKPRO Asynchronous Communications/Clock Board are used to determine the communications address and the interrupt selection on the board (see Figure 8-19).

There is an option that allows selection of a 20-mA current loop operation instead of the standard RS-232C voltage operation.

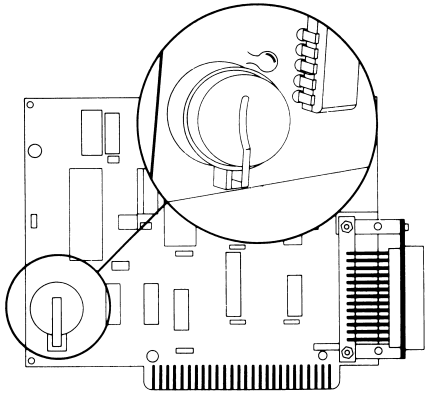


Figure 8-30. COMPAQ DESKPRO Asynchronous Communications/Clock Board.

When changing the COM1/COM2 address of the serial port, both jumpers (J702 and J703) must be changed together to correctly select the option desired.

Do not attempt to install two asynchronous communications/clock boards in one system without disabling the clock. If two asynchronous communications/clock boards are installed with clocks enabled, incorrect operation results.

Table 8-24 shows the asynchronous communications/clock board jumper settings. Table 8-25 lists the pin numbers for the external connection on the asynchronous communications/clock board.

Table 8-24. COMPAQ DESKPRO Asynchronous Communications/Clock Board Jumper Positions

Jumper	Pin 1 to Pin 2	Pin 2 to Pin 3
J702*	COM2 address	COM1 address
J703	IRQ3	IRQ4
Jumper	**Status**	**Status**
J704	Jumper–enables 8th slot No Jumper–disables 8th slot	
J705**	Jumper–enables clock No Jumper–disables clock	
U13	Pins 5-12,6-11,7-10,8-9 Serial RS-232C operation	Pins 1-16,2-15,3-14,4-13 20-mA current loop operation

*Jumpers J702 & J703 must be changed together
**If no physical jumper, clock is enabled

Table 8-25. Signal Names and Description

Signal Names	Pin Number
Protective Ground	1
Transmit Data (TX)	2
Receive Data (RX)	3
Request to Send (RTS)	4
Clear to Send (CTS)	5
Data Set Ready (DSR)	6
Signal Ground (GND)	7
Carrier Detect (CD)	8
+ Transmit Current Loop Data (20 mA)	9
+ 5 VDC, 200 mA (fuse on board)	10
– Transmit Current Loop Return (20 mA)	11
Reverse Channel Option	12
No Connection	13
No Connection	14
No Connection	15
No Connection	16
No Connection	17
+ Receive Current Loop Data (20 mA)	18
No Connection	19
Data Terminal Ready	20
No Connection	21
Ring Indicator	22
EIA ON + 12V Option	23
EIA OFF–12V Option	24
– Receive Current Loop Return (20 mA)	25

8.13 ASYNCHRONOUS COMMUNICATIONS/PARALLEL PRINTER BOARD

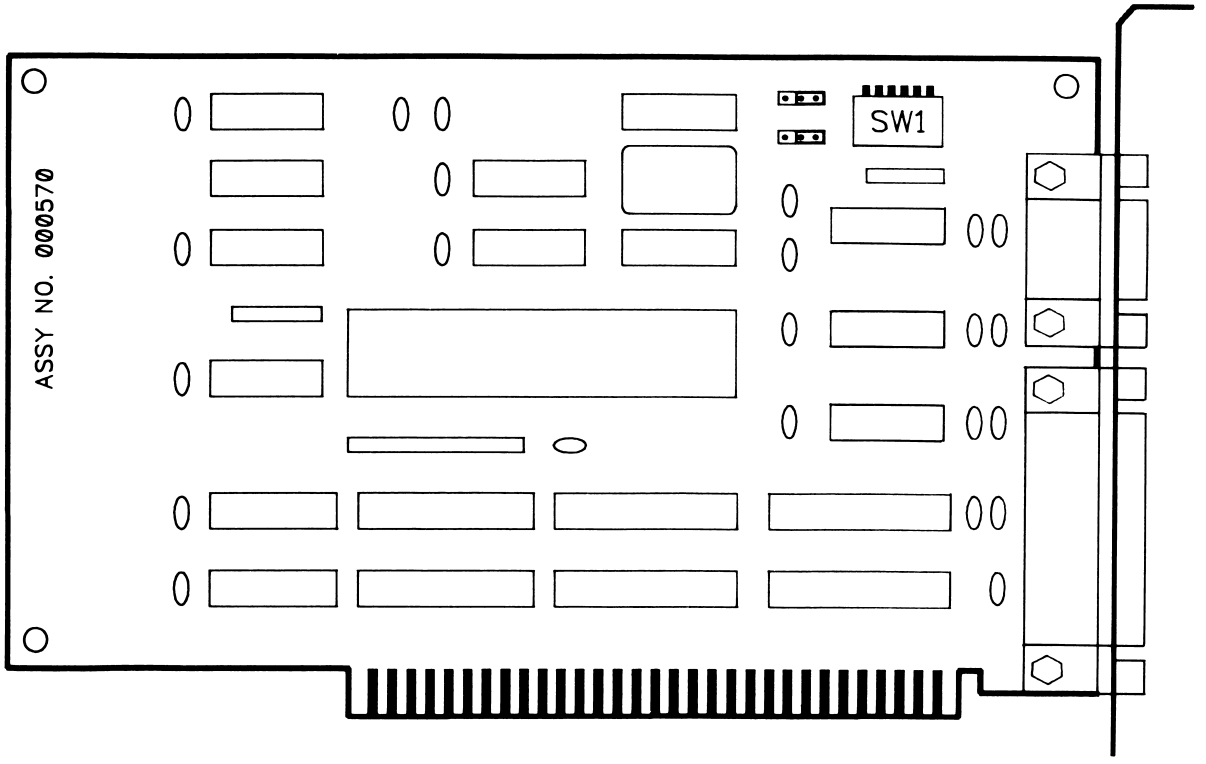


Figure 8-31. Asynchronous Communications/Parallel Printer Board (assy. no. 000570).

Table 8-26. Asynchronous Communications/Parallel Printer Board (assy. no. 000570) Switch Settings

Switch	Function	Setting	
1	Reserved	Always Off	
2	Serial Port	2 = ON	Enabled
		2 = OFF	Disabled
3, 4	Parallel Part		
	LPT1 Selected	3 = ON	4 = ON
	LPT2 Selected	3 = OFF	4 = ON
	LPT3 Selected	3 = ON	4 = OFF
	LPT Disabled	3 = OFF	4 = OFF
5, 6	Serial Port Select		
	COM1 Selected	5 = ON	6 = ON
	COM2 Selected	5 = OFF	6 = ON