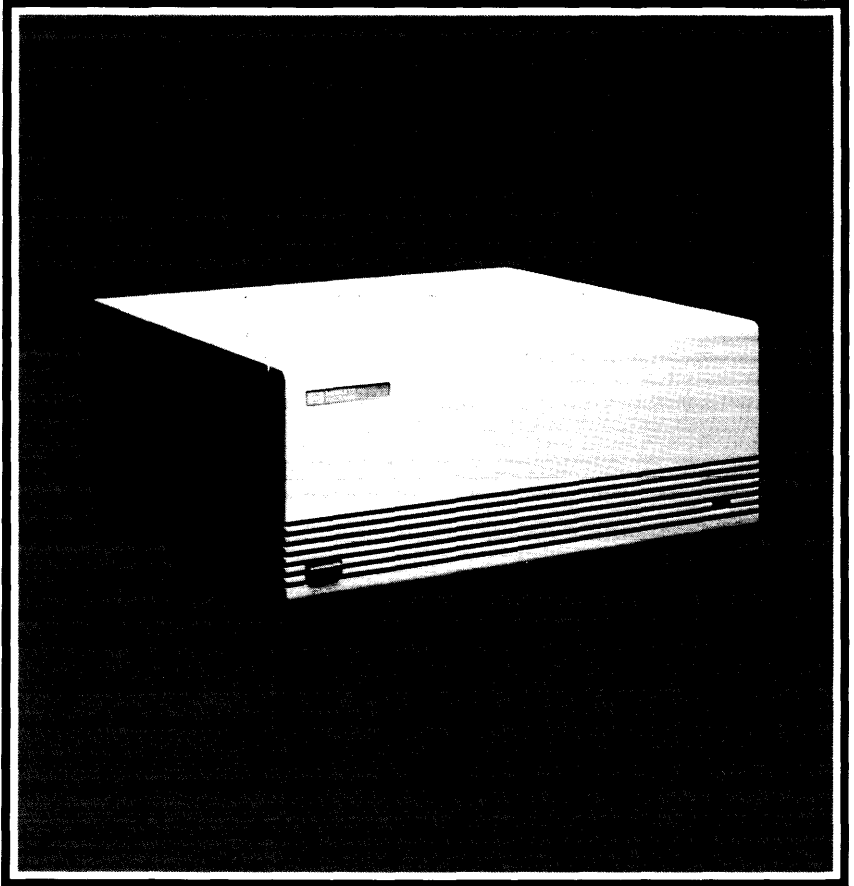


**HP 9000 Series 200 Computers  
Model 217**



**HP 9817  
CE Handbook**



# HP 9817 CE Handbook

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## Note

This handbook is only for the use of HP-Qualified Service Personnel.

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<b>Product Information</b>	<b>1</b>
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<b>Configuration</b>	<b>3</b>
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# Printing History

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New editions of this manual will incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged into the manual by the user. Each updated page will be indicated by a revision date at the bottom of the page. A vertical bar in the margin indicates the changes on each page. Note that pages which are rearranged due to changes on a previous page are not considered revised.

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

December 1984...Edition 1. Replaces part number 09817-90039.

May 1986...Update

June 1986...Edition 2. Update incorporated.

**NOTICE**

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# Chapter 1

## Product Information

Information in this manual refers to the HP 9000 Series 200 Model 217 computer. The product number of the Model 217 is HP 9817. The terms "Model 217" and "HP 9817" are used interchangeably.

### Processor

Type:	Motorola 68010
Clock frequency:	8 MHz
Internal architecture:	32-bit data and address registers
Address range:	16M bytes
Data bus:	16-bit asynchronous
Instruction types:	57
Major data types:	5
Addressing modes:	14
Interrupt levels:	6 maskable and 1 non-maskable

### Clock and Timers

Real-time clock	
Resolution:	10 msec
Accuracy:	50 ppm (4.3 sec/day)
Power-on reset:	Midnight, January 1
Timers	
Delay interrupt:	10 msec to 1.94 days
Cycled interrupt:	10 msec to 1.94 days
Match interrupt:	Match on time of day, 0.00 to 84600.00 seconds (23.5 hours)

### Beepers

Range (nominal):	81.375 Hz to 5208 Hz
Duration:	0.01 to 2.55 sec

Beeper hardware supports three tone generators with attenuators and white noise source.

## Features

- HP standard industrial package
- Six option card slots (three for external DIO interface cards)
- Pascal 3.0 and BASIC 3.0 language systems
- Supports external 14-inch medium-resolution, monochrome display
- HP-HIL keyboard support

## Physical

Height:	130 mm (5.12 inches)
Width:	325 mm (12.80 inches)
Depth:	285 mm (11.22 inches)
Net weight:	6 kg (13.2 pounds)
Shipping weight:	9.5 kg (20.9 pounds)

## Power Requirements

Operating voltage:	90 to 125 Vac, 198 to 250 Vac switch-selectable
Operating frequency:	48 to 66 Hz
Power consumption:	130 W (maximum)
Backplane power*:	41.25 W @ +5 V 18.70 W @ +12 V 6.00 W @ -12 V

\*The backplane +5 V lines are fuse-limited to 25 W for each pair of slots.

## Product Configuration

Product Number	Description
HP 9817A	Model 217 Computer * Built-in HP-IB interface with 2 m cable * Built-in RS-232 interface (order cable separately) * 6-slot card cage for interfaces, language systems and memory
HP 9817H	Model 217 Computer * Built-in HP-IB interface with 2 m cable * Built-in RS-232 interface (order cable separately) * 6-slot card cage for interfaces, language systems and memory 512K bytes of RAM memory (two HP 98256A cards) HP 46020A keyboard HP 35721A, B or C 14-inch monochrome monitor HP 98204B video interface HP 35722A tilt and swivel unit  Option 001: 1M bytes RAM memory (one HP 98257A substituted for two HP 98256A cards)

## Language Systems

Product Number	Description	Memory Requirements	
		RAM	Disc
HP 98613A	BASIC 3.0	512K bytes	512K bytes
HP 98615B	Pascal 3.0	512K bytes	512K bytes

## Backplane Accessories and Interface Cards

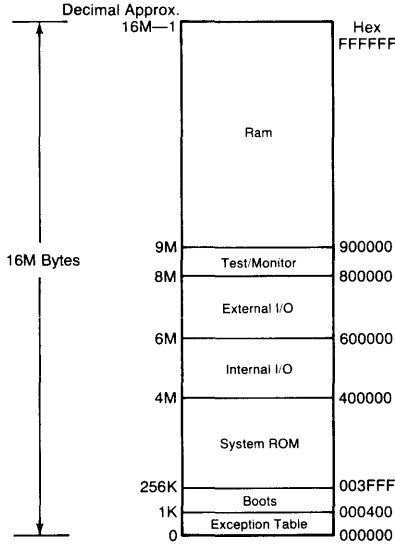
Product No.	Description
HP 98256A	256K byte RAM Card
HP 98257A HP 98620B	1M byte RAM Card 2-channel DMA Controller (only one DMA controller can be used per mainframe)
HP 98622A (Opt. 001) (Opt. 002) (Opt. 003) (Opt. 004)	16-bit GPIO Interface 4.6 m (15 feet) unterminated cable 0.8 m (2.5 feet) terminated cable for HP 9885M Flexible Disc Drive 4.6 m (15 feet) terminated cable for HP 6940A/B Multiprogrammer 2.5 m (8.3 feet) terminated cable for HP 9866A/B Thermal Printer
HP 98623A (Opt. 001)	BCD Interface 4.6 m (15 feet) unterminated cable
HP 98624A HP 10833A HP 10833B HP 10833C HP 10833D	HP-IB Interface 1 m (3.3 feet) HP-IB cable 2 m (6.6 feet) HP-IB cable 4 m (13.2 feet) HP-IB cable 0.5 m (1.6 feet) HP-IB cable
HP 98625A	Disc Interface (Pascal and SRM only)
HP 98626A (Opt. 001) (Opt. 002) HP 13265A HP 13266A	Serial Interface 4.9 m (16 feet) RS-232 cable with DTE connector (male) 4.9 m (16 feet) RS-232 cable with DCE connector (female) 300 Baud Modem Current Loop Interface
HP 98627A	Color Video Interface (includes cables)
HP 98628A  (Opt. 100)  (Opt. 001) (Opt. 002) (Opt. 003) (Opt. 099) HP 13264A HP 13265A HP 13266A	Datacomm Interface (BASIC and Pascal only. Always order with one personality option and one or more cable options) Personality Options Async and Data Link ROM Cable Options 4.9 m (16 feet) RS-232-C DTE (male) cable with test connector 4.9 m (16 feet) RS-232-C DCE (female) cable with test connector 4.9 m (16 feet) RS-449/423 DTE (male) cable with test connector No cable (for use with 1326X adapters) Data Link Adaptor 300 Baud Modem Current Loop Interface
HP 98629A (Opt. 001) (Opt. 002) (Opt. 003) (Opt. 004)	Resource Management Interface 10 m terminated cable 25 m terminated cable 60 m terminated cable 60 m unterminated cable
HP 98691A (Opt. 001) (Opt. 002) (Opt. 003) (Opt. 099)	Programmable Datacomm Interface with 4K RAM 4.9 m (16 feet) RS-232-C DTE (male) cable with test connector 4.9 m (16 feet) RS-232-C DCE (female) cable with test connector 4.9 m (16 feet) RS-449/423 DTE (male) cable with test connector No cable
HP 98630A (Opt. 001) HP 98255A HP 98253A HP 98259A	Breadboard Card Backplane Extender Card EPROM Card EPROM Development Kit (2 cards) 128K Byte Magnetic Bubble Memory Card
HP 98635A	Floating-point Math Card



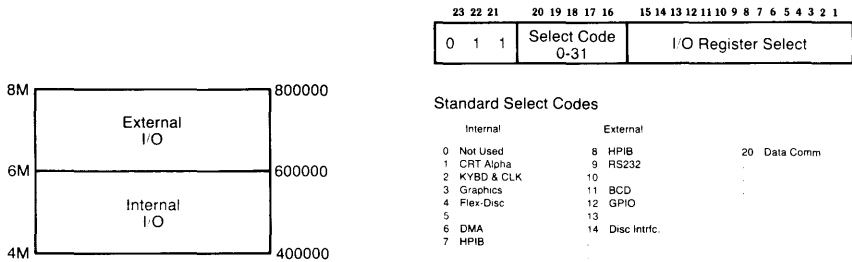
## Accessory Power Requirements

Product Description	+5	+12	-12	Total
HP 9888A Bus Expander	5.0			5.0
HP 13264A Data Link Pod	0.2	1.9	0.3	2.4
HP 13265A Modem	0.5	0.5	0.5	1.5
HP 13266A Current Loop Pod	1.0	1.0	1.0	3.0
HP 98028A Res. Mgmt. MUX	2.2	6.4		8.6
HP 98204B Video w/o Graph.	7.5			7.5
HP 98204B Video w/Graphics	15.0			15.0
HP 98253A EPROM Prog.	5.7			5.7
HP 98254A 64K byte RAM	3.0			3.0
HP 98255A EPROM Card	2.8			2.8
HP 98256A 256K byte RAM	4.1			4.1
HP 98257A 1M byte RAM	6.0			6.0
HP 98259A 128K byte Bubble	2.4	2.9		5.3
HP 98601A BASIC 2.0 ROM	2.4			2.4
HP 98601A BASIC 1.0 ROM	2.3			2.3
HP 98602A BASIC 2.1 ROM	3.6			3.6
HP 98604A HPL 2.0 ROM	1.5			1.5
HP 98620A DMA Controller	6.0			6.0
HP 98621A BASIC 1.0 Opt. 1	2.3			2.3
HP 98622A GPIO Interface	3.8			3.8
HP 98623A BCD Interface	2.5			2.5
HP 98624A HP-IB Interface	2.4			2.4
HP 98625A Disc Interface	3.0	0.1		3.1
HP 98626A RS-232 Interface	2.0	0.6	0.6	3.2
HP 98627A Color Interface	5.5			5.5
HP 98628A Datacomm Interf.	3.6	0.5	0.7	4.8
HP 98629A Resource Mgmt. w/o 98028A	3.7	0.5	0.5	4.7
HP 98629A Resource Mgmt. w/98028A	5.9	6.9	0.5	13.3
HP 98630A Breadboard Card	1.3			1.3
HP 98632A MS-DOS Card				
HP 98635A Floating-Point	4.2			4.2
HP 98640A A-D Card				
HP 98644A Serial Load Card				
HP 98691A Progr. Datacomm	6.4	2.0	1.3	9.7
HP 98695A IBM 3270 Coax				
09920- 66533 Keyboard/HP-IB	2.6			2.6
09920- 66534 Keyboard/HP-IB	2.6			2.6

## Address Information



## 9817 Memory Map



Memory--Mapped I/O

External Address Format

# Chapter 2

## Environmental/Installation/PM

### Environmental Range

Operating Temperature:	0°C to 55°C (32°F to 131°F)
Humidity:	5% to 95% R.H. non-condensing, 40°C (104°F) maximum wet-bulb temperature
Storage Environment:	-40°C to 75°C (-40°F to 167°F)
Maximum Altitude:	4600 metres (15 000 feet)
EMI:	Conducted and radiated interference meets VDE 073 and CISPR publication 11 standards.  Conducted and radiated interference also meets FCC class A standards, although some individual Model 217 computers may meet FCC class B standards. Check the FCC label on the rear panel.
Line Transient Spike Immunity:	1 kV (1 nsec. rise, 800 nsec. duration)
Additional regulatory compliance:	UL, CSA, IEC, SEV, FEI

These specifications apply to the Model 217, but not necessarily to any peripheral.

### Installation

The 9817 is customer-installable.

#### Mounting

Tabouret or mini-rack, or unmounted (desktop).

#### Cabling

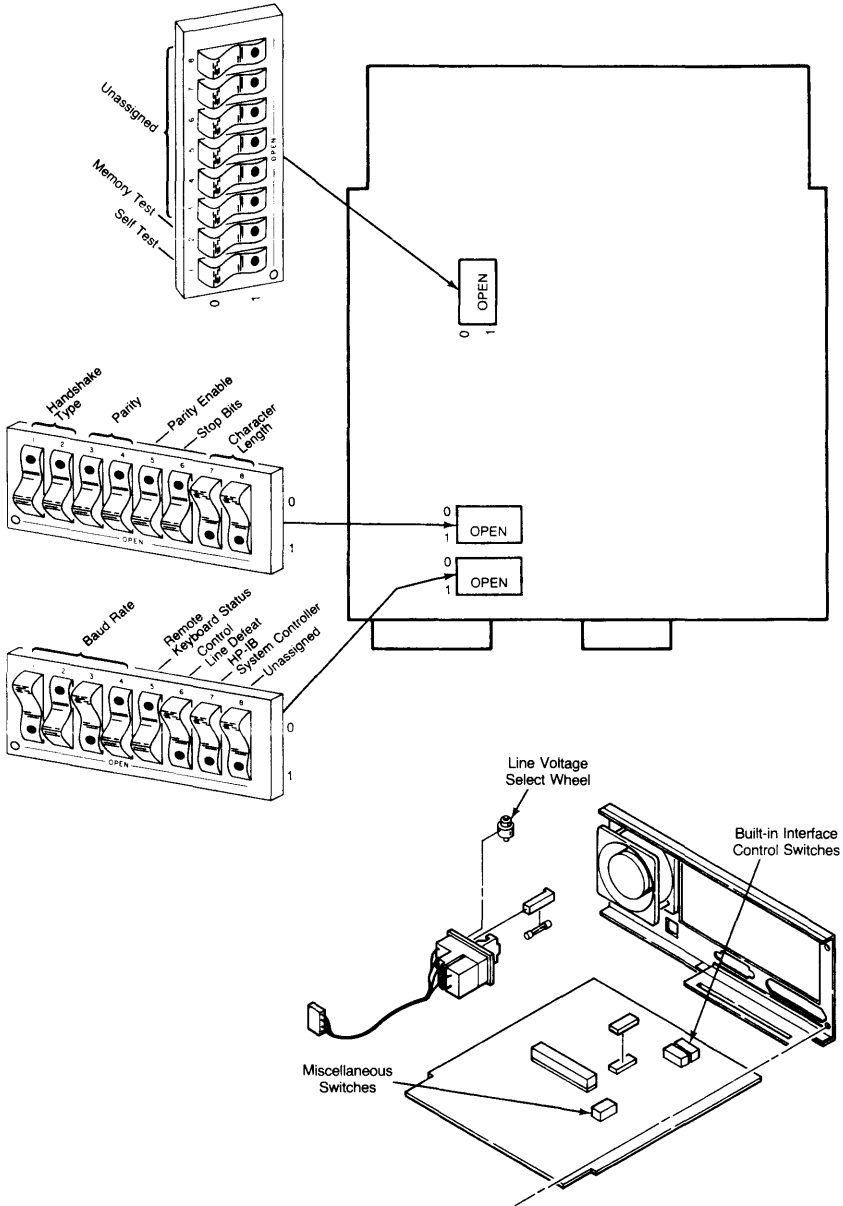
50-pin RS-232-C, HP-IB.

#### Site Preparation

Site preparation requirements are:

Environmental Class B or higher:	No site prep needed
Otherwise	Upgrade site to Class B

# Processor Board Switch Chart



## Setting Processor Board Switches

### RS-232 Handshake Type:

All values are non-operational and reserved for future use.

### RS-232 Parity Type:

00	Parity bit is odd (default)
01	Parity bit is even
10	Parity bit 1 always
11	Parity bit 0 always

### RS-232 Parity Enabled:

0	Parity disabled (default)
1	Parity enabled

### RS-232 Stop Bits:

0	1 stop bit per character (default)
1	1.5 stop bits for 5-bit characters, 2 bits otherwise

### RS-232 Character Length:

00	5 bits per character
01	6 bits per character
10	7 bits per character
11	8 bits per character (default)

### RS-232 Baud Rate:

0000	50
0001	75
0010	110
0011	134.5
0100	150
0101	200
0110	300
0111	600
1000	1200
1001	1800
1010	2400 (default)
1011	3600
1100	4800
1101	7200
1110	9600
1111	19200

### Remote Keyboard Status:

0	Local keyboard (default)
1	Remote keyboard

### RS-232 Control Line Defeat:

0	Control lines defeated
1	Control lines enabled (default)

This function enables or defeats the CD, CTR, DSR and OCR1 control lines.

**HP-IB System Controller:**

- 0 Computer is not system controller (HP-IB address 20)
- 1 Computer is system controller (HP-IB address 21) (default)

**RAM Memory Test:**

- 0 Extended RAM test
- 1 Fast RAM test (default)

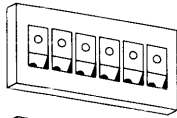
**Self Test:**

- 1 0 Self test runs continuously
- 0 1 Self test runs once at power-up (default)

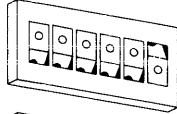
## Setting the RAM Starting Address

### 256K Byte Cards

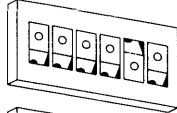
### 1M Byte Cards



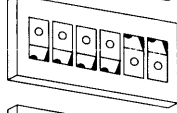
First Card



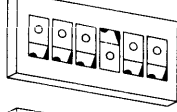
Second Card



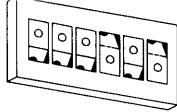
Third Card



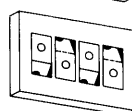
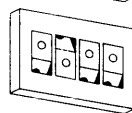
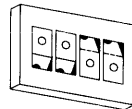
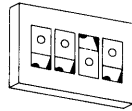
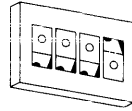
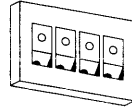
Fourth Card



Fifth Card



Sixth Card



## Preventive Maintenance

No preventive maintenance is required.

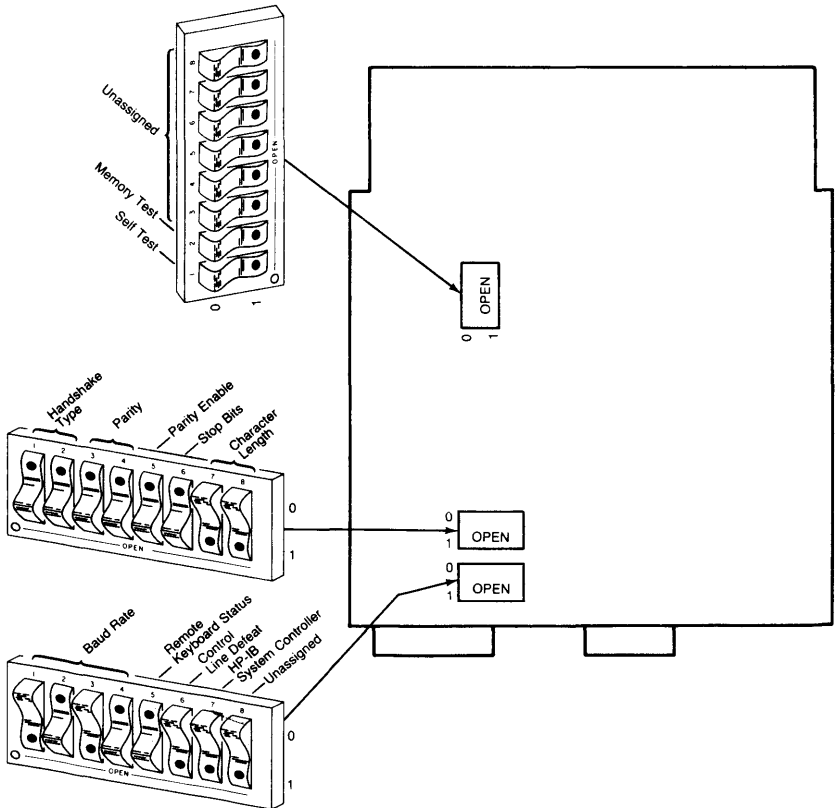




# Chapter 3 Configuration

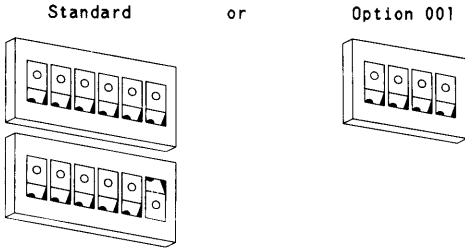
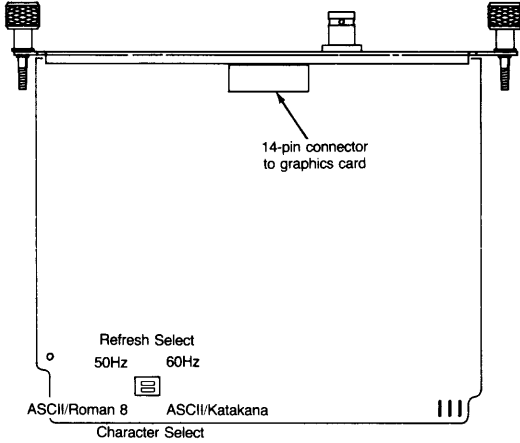
The HP 9000 Model 217 is marketed in these configurations:

- HP9817A: Computer only



**3-2 9817 Configuration**

- **HP 9817H:** Hardware system, includes the computer, HP 46020A keyboard, HP 98204B video interface, HP 35721 14-inch monitor, HP 35722A tilt and swivel unit, and two HP 98256A (standard) or one HP 98257A RAM cards (option 001)



**HP 9817H Configuration**

## Processor Board Switch Chart

### RS-232 Handshake Type:

All values are non-operational and reserved for future use.

### RS-232 Parity Type:

00	Parity bit is odd (default)
01	Parity bit is even
10	Parity bit 1 always
11	Parity bit 0 always

### RS-232 Parity Enabled:

0	Parity disabled (default)
1	Parity enabled

### RS-232 Stop Bits:

0	1 stop bit per character (default)
1	1.5 stop bits for 5-bit characters, 2 bits otherwise

### RS-232 Character Length:

00	5 bits per character
01	6 bits per character
10	7 bits per character
11	8 bits per character (default)

### RS-232 Baud Rate:

0000	50
0001	75
0010	110
0011	134.5
0100	150
0101	200
0110	300
0111	600
1000	1200
1001	1800
1010	2400 (default)
1011	3600
1100	4800
1101	7200
1110	9600
1111	19200

### Remote Keyboard Status:

0	Local keyboard (default)
1	Remote keyboard

### RS-232 Control Line Defeat:

0	Control lines defeated
1	Control lines enabled (default)

This function enables or defeats CD, CTR, DSR and OCR1 control functions.

### 3-4 9817 Configuration

#### HP-IB System Controller:

- 0 Computer is not system controller (HP-IB address 20)
- 1 Computer is system controller (HP-IB address 21) (default)

#### RAM Memory Test:

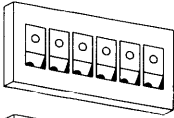
- 0 Extended RAM test
- 1 Fast RAM test (default)

#### Self Test:

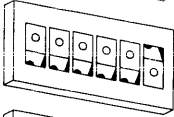
- 0 Self test runs continuously
- 1 Self test runs once at power-up (default)

# RAM Address Switch Chart

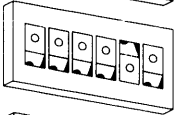
## 256K Byte Cards



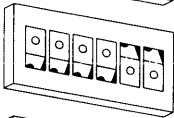
First Card



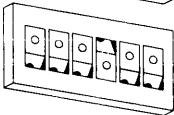
Second Card



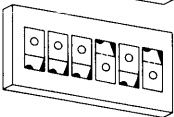
Third Card



Fourth Card

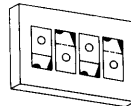
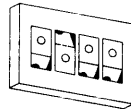
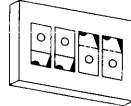
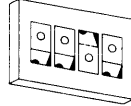
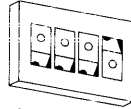
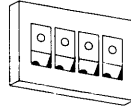


Fifth Card



Sixth Card

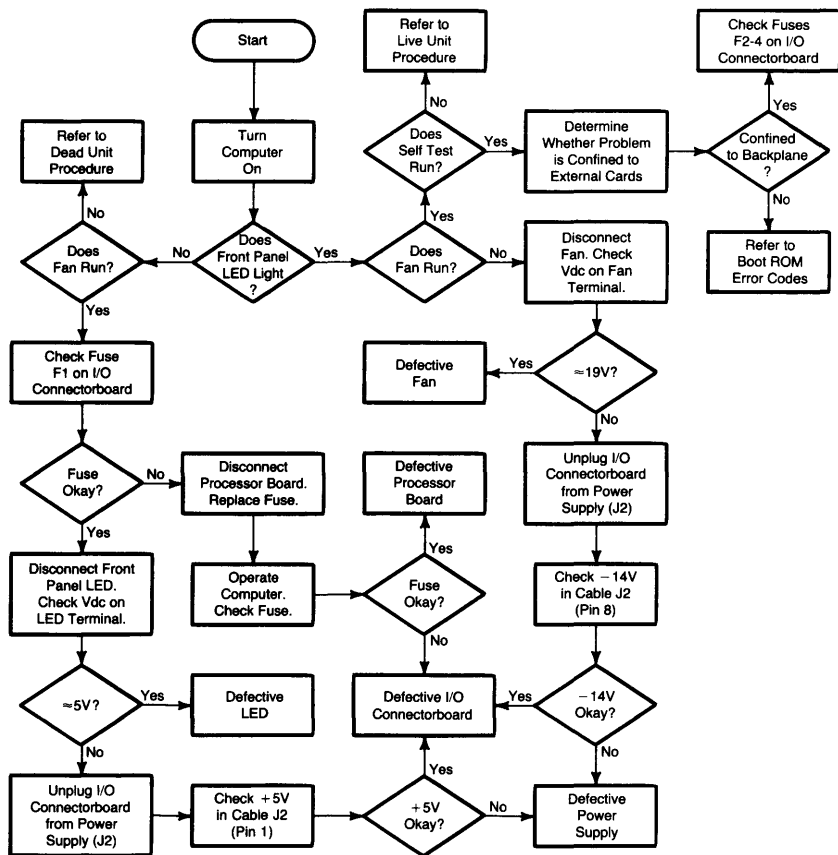
## 1M Byte Cards



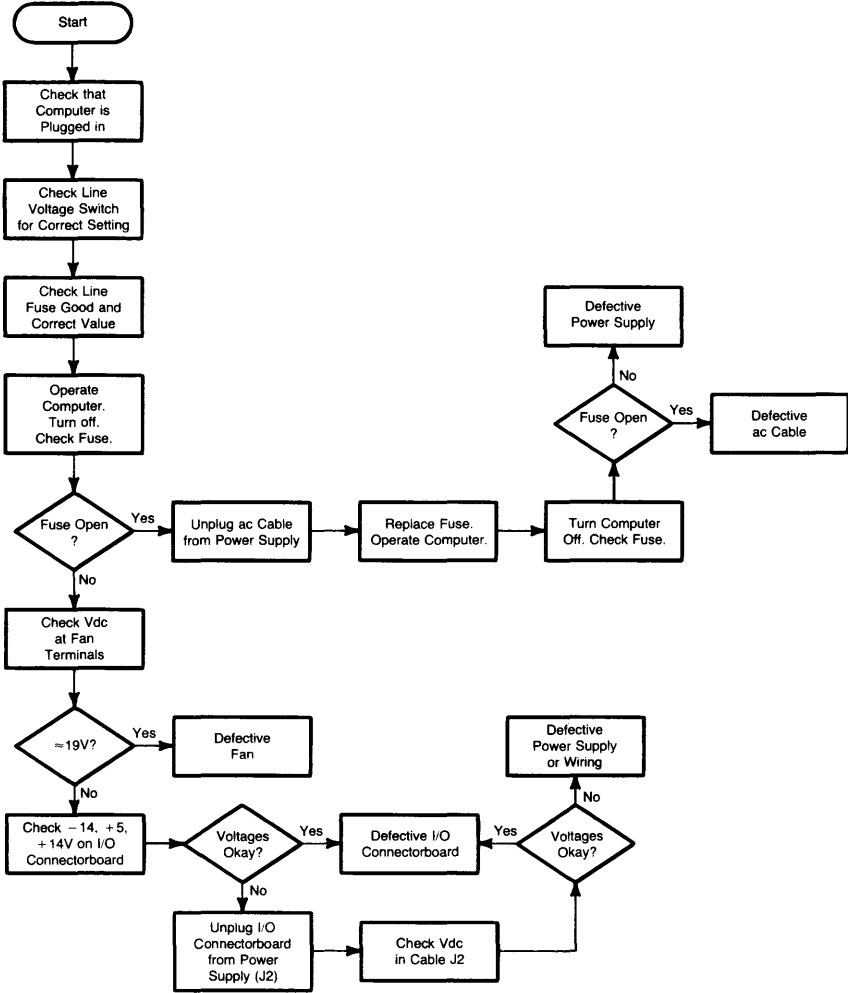


# Chapter 4 Troubleshooting

## Initial Troubleshooting Flowchart

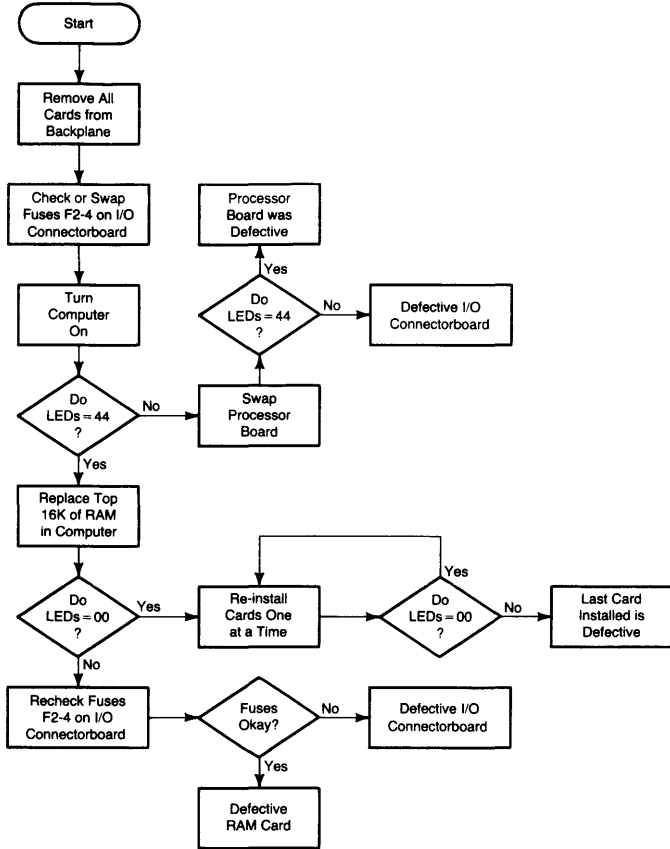


# Dead Unit Troubleshooting Flowchart





## Live Unit Troubleshooting Flowchart



## Power Supply Specifications

Voltage	Voltage Tolerance	Maximum Current	Ripple	Used By
-14 V	-13.30 to -18.00 V	0.7 A	140 mV	Fan, I/O connectorboard
-12 V	-11.50 to -12.40 V	0.6 A	200 mV	CPU board, I/O connectorboard
+5 V	5.125 to 5.275 V	13 A	50 mV	All assemblies
+12 V	11.50 to 12.40 V	1.6 A	200 mV	CPU board, I/O connectorboard
+14 V	13.30 to 18.00 V	2.0 A	140 mV	I/O connectorboard

## Power Supply Test Points

Voltage      Test Point to Ground

-14 V    I/O connectorboard connector J2 pin 8

-12 V    RS-232 connector pin 11

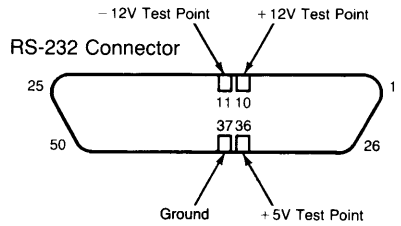
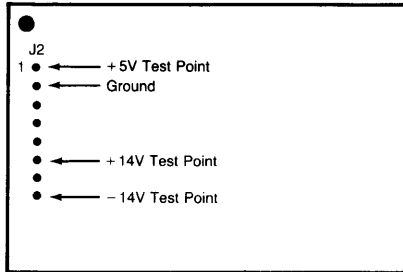
+5 V    RS-232 connector pin 36

+12 V    RS-232 connector pin 10

+14 V    I/O connectorboard connector J2 pin 6

Note that the +5 V line to the I/O connectorboard contains fuses. Therefore, the test point could indicate proper voltage, but any interface may not be powered.

Front of I/O Connectorboard





# Chapter 5

## Diagnostics

### Boot ROM Self Test Sequence

Test	LED display	Hex equivalent
Top 16K RAM test*	0000 0100	04
CRT alpha test	0001 1110	1E
Keyboard test	0001 0010	12
Boot ROM test	0000 0011	03
CRT graphics test	0001 1111	1F
Internal HP-IB test	0001 0100	14
I/O board test	001X XXXX	20 to 3F
ROM checksum test	0000 1101	0D
RAM test	0000 1001	09

\*Self test stops here and displays 0100 0100 (44 hexadecimal) on the LEDs unless functional RAM is present in the top 16K bytes of RAM space.

## Boot ROM Error Codes

LEDs	Hexadecimal Equivalent	Probable Failure	What to Do
0000 0000	00	No Failure Detected	
0100 0100	44	Top RAM Failed Test	Check RAM Addressing
0101 0010	52	No Keyboard DTACK	Replace Processor Board
0101 0100	54	No HP-IB DTACK	Replace Processor Board
0101 1110	5E	No Alpha DTACK	Replace Video Interface
0101 1111	5F	No Graphics DTACK	Replace Video Interface
011X XXXX	60 to 7F	I/O Card at XXXXX no DTACK	Replace I/O Card at Select Code XXXXX
0110 1001	69	No RS-232 DTACK	Replace Processor Board
1000 0001	81	CPU Failed	Replace Processor Board
1000 0011	83	Boot ROM Failed Checksum	Replace Processor Board
1000 0100	84	Top RAM Failed Test	Check RAM Addressing Replace Processor Board
1000 1001	89	RAM Failure	Check RAM Addressing Replace Processor Board
1000 1010	8A	Insufficient RAM	Check RAM Addressing Replace Processor Board
1000 1101	8D	ROM Operating System Failed Checksum	Replace Processor Board Replace I/O Connectorboard
1001 0010	92	Keyboard Processor Failed	Replace Processor Board
1001 0100	94	HP-IB Failed	Replace Processor Board
1001 1000	98	DMA Card Failed	Replace DMA Card Replace Processor Board
1001 1110	9E	Alpha Failed	Replace Video Interface
1001 1111	9F	Graphics Failed	Replace Video Interface
101X XXXX	A0 to BF	I/O Card at XXXXX Failed	Replace I/O Card at Select Code XXXXX Replace Processor Board Replace I/O Connectorboard
1111 1111	FF	LEDs Never Accessed	Replace Processor Board

## Remote System Analysis

The 9817 computer provides for remote system analysis of problems by means of the beeper. To diagnose the computer remotely, follow this procedure:

1. Establish a telephone connection with someone at the location of the computer.
2. Have them hold the receiver near the front panel of the computer.
3. Now have them turn the computer on.
4. The computer will go through its self test and report problems as a series of beeps. These beeps correlate with the above error codes.
5. The beeper annunciates the seven least significant bits. A high beep indicates a one and a low beep indicates a zero.

A high first beep indicates an internal peripheral failed. A low first beep indicates an internal peripheral failed to DTACK. Therefore, if the first beep is low, the certainty of knowing what board failed is high. If the first beep is high, the certainty is low.

For example, suppose that on power-up a computer emits three low beeps, a high beep, two low beeps and a high beep. This will be of the form:

X000 1001                      (09 or 89 hexadecimal)

where 0 represents a low beep, 1 represents a high beep and X represents an unbeeped high or low. Referring to the table of Boot ROM Error Codes leads us to RAM Failure as the probable cause.

## Other Testing

The self test does not check some small areas of the computer and optional hardware. If you suspect a problem with any of the areas covered below, follow the instructions for checking it.

### Alpha Output

Install the Test Card or load the System Functional Test Disc and select test k3.

### Graphics Output

Install the Test Card or load the System Functional Test Disc and select test k7.

### Keyboard

Turn the computer on with no operating system loaded. Then type some keys. The keys should appear in the lower right corner of the display.

### RS-232 Drivers

Install the RS-232 loopback connector. Then install the Test Card or load the System Functional Test Disc and select the RS-232 interface test.

### HP-IB Drivers

Boot an operating system through the HP-IB port.

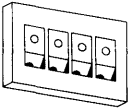
## Locating a Defective RAM Card

The RAM failure message may be decoded to determine which RAM card caused the failure. For example, in the message

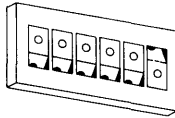
Memory Failed at FB53A9 W:F58A8C2C,R:F78A8C2C

the failure occurred at memory address FB53A9. To correlate this with a RAM card, follow this procedure:

Take the first two letters or digits of the address and translate them into binary. Then find a card whose address switches are set to the first four or six bits of that address. For instance, in the above example, FB is 11111011 in binary. Therefore, the switches on the defective board would be:



if a 1M byte card, or



if a 256K byte card.



# Chapter 6

## Adjustments

There are no adjustments.



# Chapter 7

## Peripherals

### Supported Peripherals List

#### Printers

Product Number	Option Number	Description	Cable Included	Interface Type
2225A-AY		150 cps Dot-matrix	No	HP-IB
2601A	826	40 cps Daisywheel Impact Printer	No	HP-IB
2602A	046	25 cps Daisywheel Impact Printer	No	HP-IB
2631B	046	Dot Matrix Impact Printer, 180 cps, 128 character ASCII set, 120 Vac, 48-66 Hz power supply, ribbon cartridge and power cord. <i>See 2631B Data Sheet for complete list of additional options.</i>	No	HP-IB
2631G		Dot-matrix Impact Printer, 180 cps, text and graphics capability, 128 character ASCII set, ribbon cartridge, power cord.	No	HP-IB
	001-	Local language character sets		
	009	<i>See 2631A/B Data Sheet.</i>		
	010	Math character set		
	011	Line draw character set		
	012	High density print character set		
	015	220 Vac, 48-62 Hz		
	016	100 Vac, 48-62 Hz		
	017	240 Vac, 48-62 Hz		
	715	Service documentation		
2671A		Dot-matrix Thermal Printer	No	HP-IB
2671G		2671A plus Graphics	No	HP-IB
2673A		Intelligent Dot-matrix Graphics Printer	No	HP-IB
2932A	046	Serial Dot-matrix Impact Printer	No	HP-IB
2933A	046	Serial Dot-matrix Impact Printer	No	HP-IB
2934A	046	Serial Dot-matrix Impact Printer	No	HP-IB
82905A/B		80 cps Serial Impact Printer	No	HP-IL
	248	120 Vac		
	348	220 Vac		
	448	240 Vac		
	001-4	HP-IB Interface	No	HP-IB
82906A		160 cps Serial Impact Printer	No	HP-IL
	001-4	HP-IB Interface	No	HP-IB

## Monitors

Product Number	Option Number	Description	Cable Included	Interface Type
35721A/B/C		14-inch Monochrome Monitor		Composite Video
82912A		9-inch Monochrome Monitor		
82913A		12-inch Monochrome Monitor		

## Terminals

Product Number	Option Number	Description	Cable Included	Interface Type
45610A		HP 150 as 2623A Emulator		

## Plotters

Product Number	Option Number	Description	Cable Included	Interface Type
7470A	002	Two-pen Graphics Plotter, A size	No	HP-IB
7475A	002	Six-pen Graphics Plotter, B size	No	HP-IB
7550A	002	Eight-pen Graphics Plotter, B size	No	HP-IB
7580A/B	900	Eight-pen Drafting Plotter, D size	No	HP-IB
7585A/B	900	Eight-pen Drafting Plotter, E size	No	HP-IB
7586B		Eight-pen Roll-fed Plotter, E size	No	HP-IB
9872C/T		Eight-pen Vector Plotter, B size	No	HP-IB

## Interfaces and Accessories

Product Number	Option Number	Description	Cable Included	Interface Type
46020A		HP-HIL Keyboard	Yes	HP-HIL
46060A		HP-HIL Mouse	Yes	HP-HIL
46080A		HP-HIL Expander	Yes	HP-HIL
46083A		HP-HIL RCK	Yes	HP-HIL
98620B		Direct Memory Access Controller	No	None
98628A		Datacomm Interface		
	001	RS-232 DTE Cable	Yes	RS-232
	002	RS-232 DCE Cable	Yes	RS-232
	003	RS-423 DTE Cable	Yes	RS-423

## Tablets

Product Number	Option Number	Description	Cable Included	Interface Type
9111A		Graphics Input Tablet	No	HP-IB

## Flexible Disc Drives

Product Number	Option Number	Description	Cable Included	Interface Type
82901M/S		Dual 5 1/4 inch Flexible Disc Drives 540K byte, dual drive, master	No	HP-IB
82902M/S		Single 5 1/4 inch Flexible Disc Drive 270K byte, single drive, master	No	HP-IB
9121D		Dual 3 1/2 inch Flexible Disc Drives	No	HP-IB
9121S		Single 3 1/2 inch Flexible Disc Drive	No	HP-IB
9122D		Dual 3 1/2 inch 600K byte Flexible Disc Drive		
9122S		Single 3 1/2 inch 600K byte Flexible Disc Drive		
9895A		Dual 8 inch Flexible Disc Drives 2.4M byte, dual drive, master	No	HP-IB
	001	50 Hz Operation		
	002	Rack mount enclosure		
	010	Single drive, master		
	011	Single drive, slave		
	012	Dual drive, slave		

## Magnetic Tape Drives

Product Number	Option Number	Description	Cable Included	Interface Type
9144A		1/4-inch Cartridge Tape Drive		
88140L/S		CS/80 Cartridge Tape Drive		

## Hard/Winchester Disc Drives

Product Number	Option Number	Description	Cable Included	Interface Type
7908P/R		CS/80 16.5M byte Disc Drive w/integral 16.7M byte tape cartridge (88140S), controller, power supply. 7908P = stand-alone cabinet 7908R = rack mount enclosure	2 m	HP-IB
	015	220/240 Vac, 48-66 Hz		
	140	Delete cartridge tape drive		
7911P/R		CS/80 28.1M byte Disc Drive w/integral 67M byte tape cartridge (88140L), controller, power supply. 7911P = stand-alone cabinet 7911R = rack mount enclosure	1 m 2 m	HP-IB
	001	Separate ctg. tape controller		
	015	220/240 Vac, 50 Hz operation		
	140	Delete cartridge tape drive		
7912P/R		CS/80 65.6M byte Disc Drive w/integral 67M byte tape cartridge (88140L), controller, power supply. 7912P = stand-alone cabinet 7912R = rack mount enclosure	1 m 2 m	HP-IB
	001	Separate ctg. tape controller		
	015	220/240 Vac, 50 Hz operation		
	140	Delete cartridge tape drive		
7914P/R		CS/80 132.1M byte Disc Drive w/two integral 67M byte tape cartridges (88140L), controller, power supply. 7911P = stand-alone cabinet 7911R = rack mount enclosure	1 m 2 m	HP-IB
	001	Separate ctg. tape controller		
	015	220/240 Vac, 50 Hz operation		
	140	Delete cartridge tape drive		
9133A		4.8M byte Winchester Disc Drive and 3 1/2 inch Flexible Disc Drive	No	HP-IB
	010	Single 4.6M byte Volume Format		
9133B		9.7M byte Winchester Disc Drive and 3 1/2 inch Flexible Disc Drive	No	HP-IB
9133V		5M byte Winchester Disc Drive and 600K byte 3 1/2 inch Flexible Disc Drive	No	HP-IB
	004	Four 1.2M byte Volume Format		
9133XV		15M byte Winchester Disc Drive and 600K byte 3 1/2 inch Flexible Disc Drive	No	HP-IB
9134A		4.8M byte Winchester Disc Drive	No	HP-IB
	010	Single 9.7M byte Volume Format		
9134B		9.7M byte Winchester Disc Drive	No	HP-IB
9134XV		15M byte Winchester Disc Drive	No	HP-IB
	010	Single 9.7M byte Volume Format		
9135A		4.8M byte Winchester Disc Drive and 5 1/4 inch Flexible Disc Drive	No	HP-IB
9135B		9.7M byte Winchester Disc Drive and 5 1/4 inch Flexible Disc Drive	No	HP-IB

# Chapter 8

## Replacement Parts

### Assemblies

Check Digit	HP Part Number	Total Quantity	Description	Repair Status
7	09817-66511	1	Processor Board	Exchange
6	09817-66552	1	Power Supply	Non-exchange
9	09817-66563	1	I/O Connectorboard	Non-exchange
0	09817-80001	1	ID PROM	Non-exchange
3	09826-66524		256K Byte Memory	Exchange
1	98257-66524		1M Byte Memory	Exchange
1	98204-66577		Graphics Inter.	Exchange
2	98204-66578		Alpha Interface	Exchange

The ID PROM (part number 09817-80001) is ordered through normal channels, that is, the repair order or Hot-Line to CPC for the CE and HP Order Processing for customers. Here is the procedure for ordering replacement ID PROMs.

1. On-site CE determines that an ID PROM has failed and hot-lines the PROM from CPC. The hot-line order must include:
  - a. The Model Number
  - b. The serial number
  - c. The CE's name
2. CPC orders the PROM from FSD.
3. FSD programs the PROM using the serial and Model Number information supplied.
4. FSD ships the programmed PROM to the CE field office.

### Miscellaneous Parts

Check Digit	HP Part Number	Total Quantity	Description
2	2110-0055	1	Line Fuse (4A/B)
6	2110-0520	4	Internal Fuse
6	09817-47700	1	Light Pipe
1	09817-67901	1	Speaker Assembly
7	7101-0591	1	I/O Cover Plate
0	5041-1203	1	On/Off Pushbutton
6	09817-40100	1	Baffle
8	1400-0560	1	LED Clamp
5	2110-0686	1	U.S. Fuse Holder
6	2110-0687	1	European Fuse Holder
3	1410-1207	1	Line Voltage Select Wheel

## Case Parts

Check Digit	HP Part Number	Total Quantity	Description
9	09817-64103	1	Top Cover (Early Production)
4	09817-04104	1	Top Plate
0	09817-64104	1	Top Shroud
1	09817-64105	1	Rear Panel Assembly
0	09817-60201	1	Front Panel Assembly
8	09817-60100	1	Base Assembly
9	09817-41200	1	Power Supply Guide
0	09817-41201	2	I/O Card Guide
1	0403-0302	2	PC Board Guide
6	09121-48303	2	Front Foot
1	0403-0427	2	Rear Foot
2	09817-04102	1	Front Sub-panel

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### NOTE

The top cover has been replaced by a two-piece top cover. Replace the one-piece cover with both the top plate and the top shroud.

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## Internal Cable Assemblies

Check Digit	HP Part Number	Total Quantity	Description
5	09817-61600	1	Ac Cable
6	09817-61601	1	Dc Cable
7	09817-61602	1	LED Cable

## External Cable Assemblies

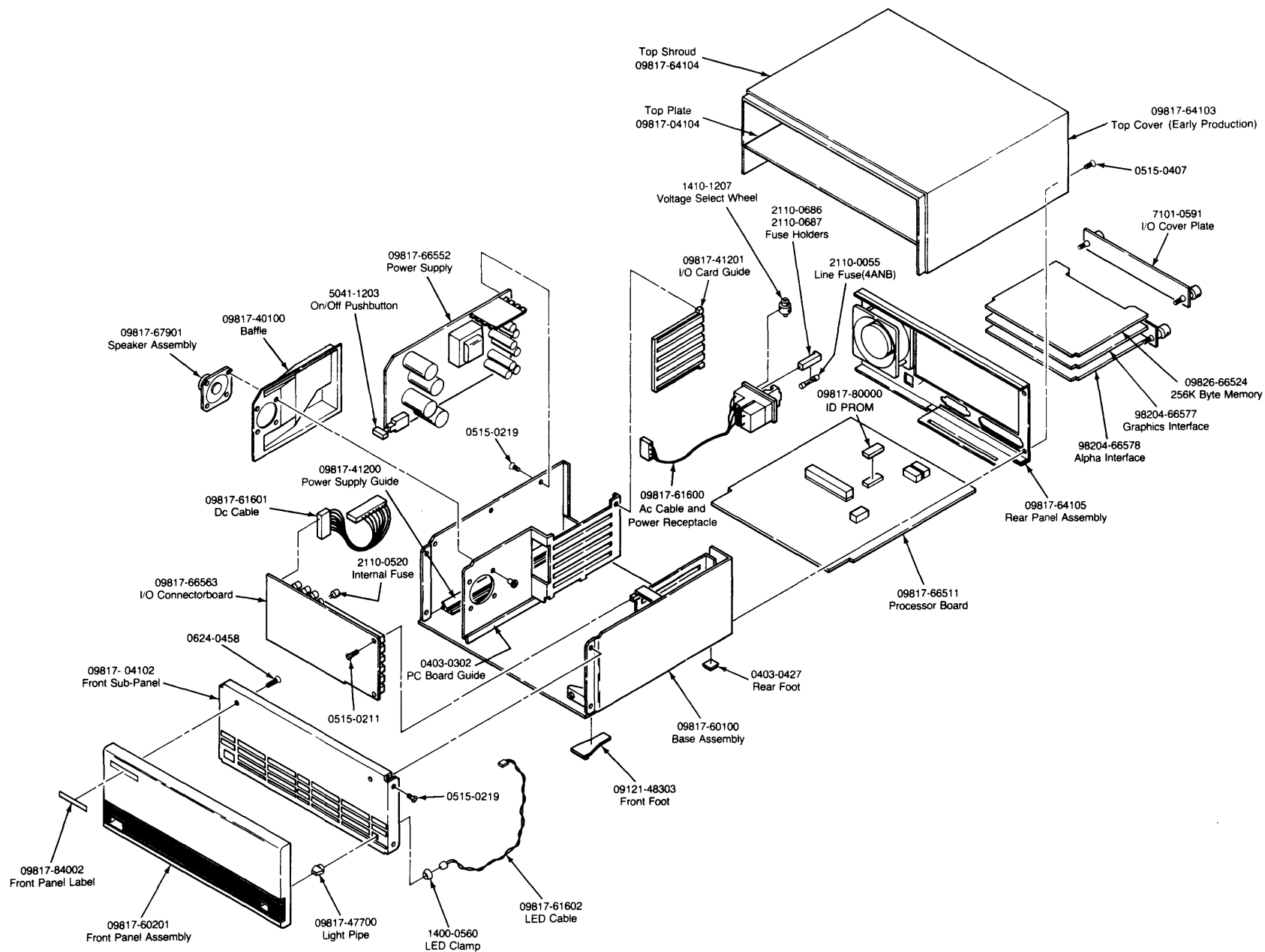
Check Digit	HP Part Number	Total Quantity	Description
3	46020-60001		Keyboard Cable
9	8120-4221		Video Cable
8	10833B		HP-IB Cable

## Labels

Check Digit	HP Part Number	Total Quantity	Description
5	7120-3428	1	Identification Label
9	09817-84002	1	Front Panel Label
0	09817-84003	1	Power Matrix Label

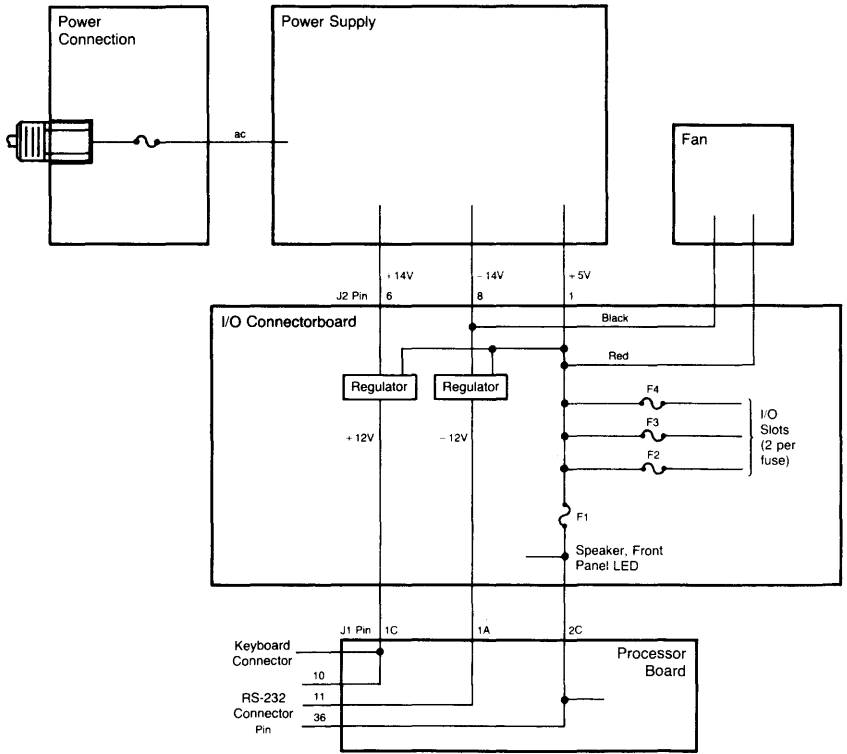
## Screws

Check Digit	HP Part Number	Total Quantity	Description
8	0515-0211	3	M3X0.5
6	0515-0219	9	M3X0.5
4	0515-0407	2	M3X0.5
2	0535-0031	4	Hex Nut
6	0624-0458	4	Screw 8-16

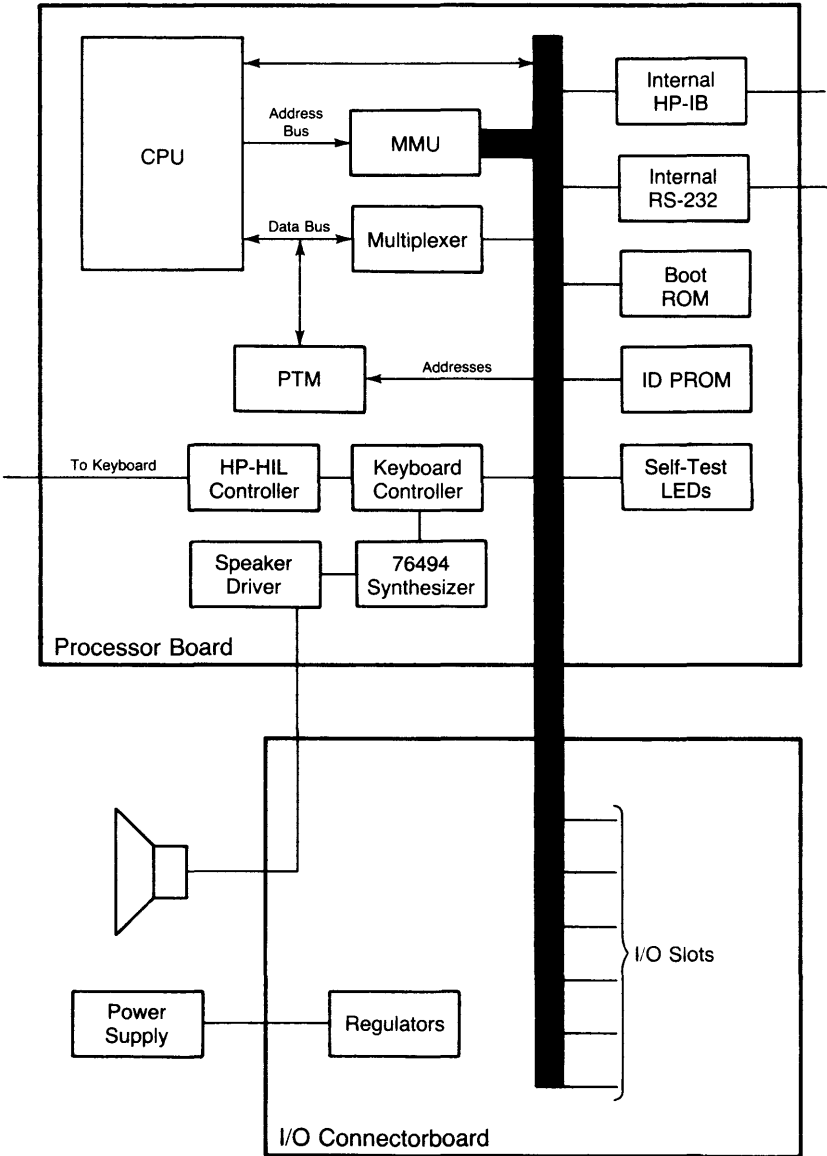


# Chapter 9 Diagrams

## Power Distribution Diagram



# Basic Block Diagram



## Assembly Functions

### Processor Board

CPU

Memory manager

Boot ROM

ID PROM

23 address lines

16 data lines

7 interrupt lines

17 control/handshake lines

8 MHz clock

Internal HP-IB

Internal RS-232

Self-test LEDs

Speaker synthesizer and drive

Keyboard controller

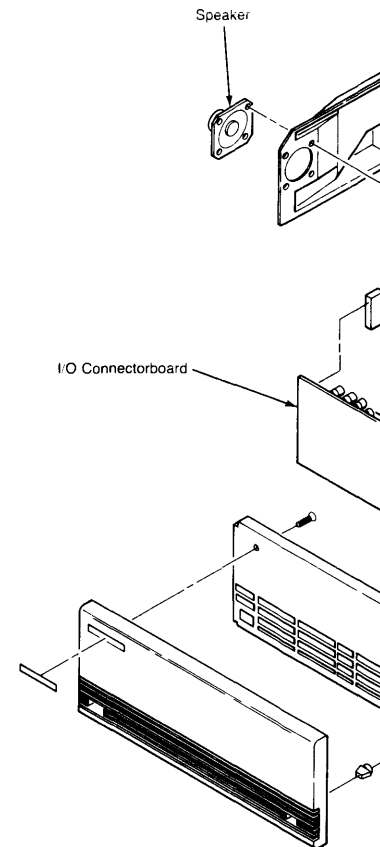
### I/O Connectorboard

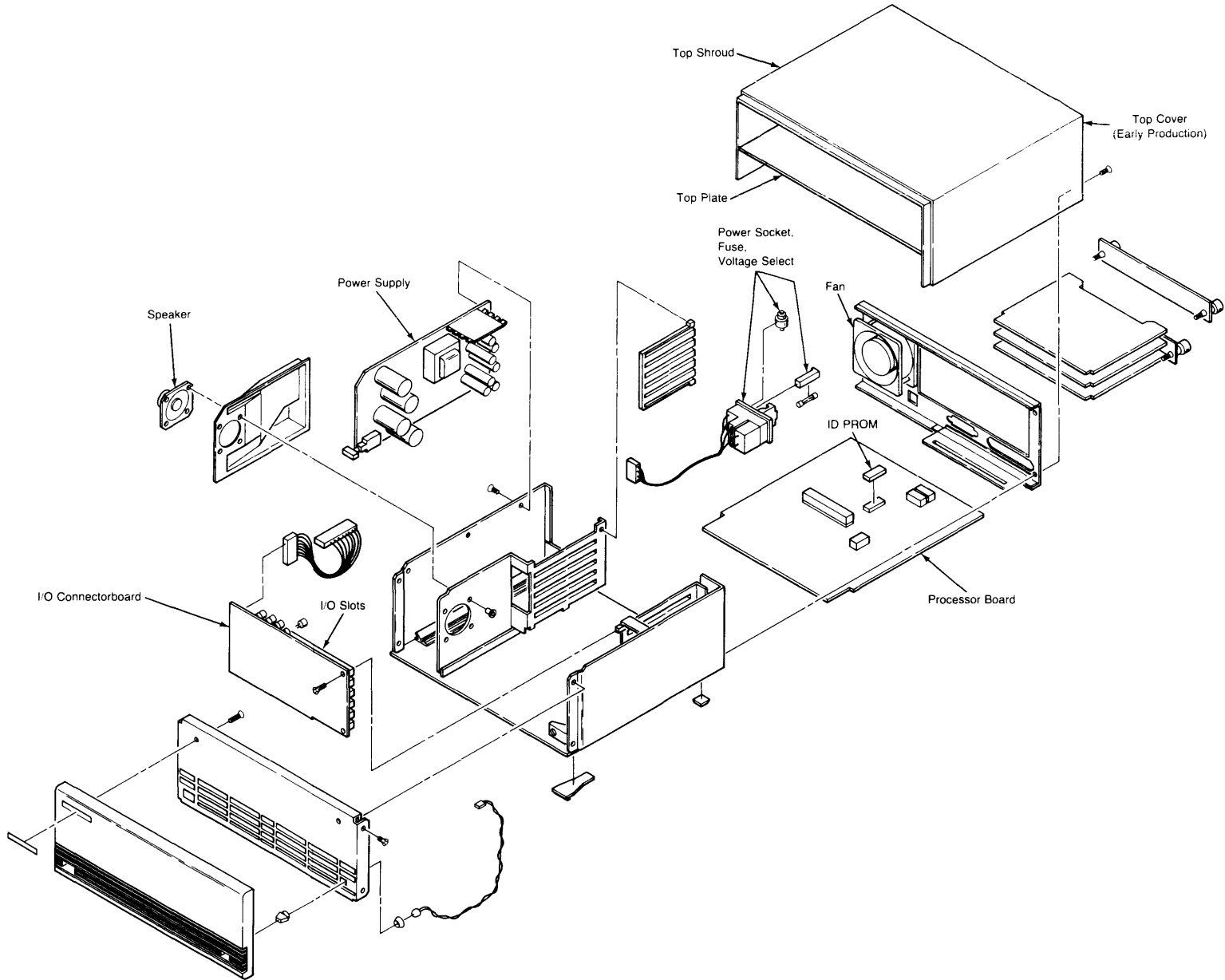
-12, +12V regulation

6 option card slots

### Power Supply

-14, +5, +14V supply





# Chapter 10

## Reference

### Related Documentation

#### BASIC

Manual  
Part Number

Description

98613-10010	CSUB Preparation Manual
98613-87901	BASIC 3.0 Manual Kit contains one each of the following manuals:
98613-10020	Utilities Library Manual
98613-10030	Loader Utility Manual
98613-90010	BASIC 3.0 Programming Techniques
98613-90020	BASIC 3.0 Interfacing Techniques
98613-90030	BASIC 3.0 Graphics Techniques
98613-90040	BASIC 3.0 User's Guide
98613-90050	BASIC 3.0 Language Reference
98613-90060	BASIC 3.0 Condensed Reference
98613-90070	BASIC 3.0 Documentation Guide and Master Index

#### Pascal

Manual  
Part Number

Description

98615-87902	Pascal 3.0 Manual Kit contains one each of the following manuals:
09826-90072	Pascal Textbook (Wiley)
09826-90073	MC68000 User's Manual
98615-90021	Pascal 3.0 Workstation System
98615-90030	Pascal 3.0 Procedure Library
98615-90035	Pascal 3.0 Graphics Techniques
98615-90040	Pascal 3.0 User's Guide
98615-90050	Pascal Language Reference for Series 200 Computers

**HP-UX****Manual****Part Number****Description**

98680-87901	HP-UX 2.1 Manual Kit contains one each of the following manuals:
09000-90006	Series 200/500 HP-UX Reference
09800-11001	CS/80 User's Manual
09826-90073	MC68000 User's Manual
97076-90001	HP-UX Async Communications Manual
97084-90000	Device-Independent Graphics Library Programming Reference
97084-90001	HP-UX Supplement for 97084-90000
97084-90025	Graphics/9000 Device Handler's Manual
97089-90000	The C Programming Language
97089-90003	HP-UX Selected Articles
98615-90050	HP Pascal Reference
98680-90010	System Administrator's Manual
98680-90020	Series 200 FORTRAN/9000 Reference
98680-90025	Introducing the Unix System, McGraw-Hill
98680-90027	Getting Started with Series 200 HP-UX

**Service Documentation****Manual****Part Number****Description**

09817-90030	Model 217 Hardware Support Document
09817-90039	Model 217 CE Handbook Section
09817-87922	Model 217 Self-Paced Hardware Training Guide

**Miscellaneous****Manual****Part Number****Description**

98201-90000	HP 98201A Custom Keyboard Installation Note
98203-90001	HP 98203/204 Keyboard Installation Note
98257-90000	98257A RAM Card Installation Note
98620-90001	98620A/B DMA Card Installation Note
98622-90000	GPIO Installation Manual
98623-90000	BGD Installation Note
98624-90000	HP-IB Installation Note
98625-90000	Disc Interface Installation Manual
98626-90000	RS-232 Installation Manual
98627-90000	Color Video Interface Installation Manual
98628-90001	98628/98691 Datacomm Installation Manual
98630-90000	98630A Breadboard Installation Manual
98635-90000	98635A Floating-Point Math Card Instal. Note



## Boot ROM Self Test Sequence

Test	LED display	Hex equivalent
Top 16K RAM test*	0000 0100	04
CRT alpha test	0001 1110	1E
Keyboard test	0001 0010	12
Boot ROM test	0000 0011	03
CRT graphics test	0001 1111	1F
Internal HP-IB test	0001 0100	14
I/O board test	001X XXXX	20 to 3F
ROM checksum test	0000 1101	0D
RAM test	0000 1001	09

\*Self test stops here and displays 0100 0100 (44 hexadecimal) on the LEDs unless functional RAM is present in the top 16K bytes of RAM space.

## Boot ROM Error Codes

LEDs	Hexadecimal Equivalent	Probable Failure	What to Do
0000 0000	00	No Failure Detected	
0100 0100	44	Top RAM Failed Test	Check RAM Addressing
0101 0010	52	No Keyboard DTACK	Replace Processor Board
0101 0100	54	No HP-IB DTACK	Replace Processor Board
0101 1110	5E	No Alpha DTACK	Replace Video Interface
0101 1111	5F	No Graphics DTACK	Replace Video Interface
011X XXXX	60 to 7F	I/O Card at XXXXX no DTACK	Replace I/O Card at Select Code XXXXX
0110 1001	69	No RS-232 DTACK	Replace Processor Board
1000 0001	81	CPU Failed	Replace Processor Board
1000 0011	83	Boot ROM Failed Checksum	Replace Processor Board
1000 0100	84	Top RAM Failed Test	Check RAM Addressing Replace Processor Board
1000 1001	89	RAM Failure	Check RAM Addressing Replace Processor Board
1000 1010	8A	Insufficient RAM	Check RAM Addressing Replace Processor Board
1000 1101	8D	ROM Operating System Failed Checksum	Replace Processor Board Replace I/O Connectorboard
1001 0010	92	Keyboard Processor Failed	Replace Processor Board
1001 0100	94	HP-IB Failed	Replace Processor Board
1001 1000	98	DMA Card Failed	Replace DMA Card Replace Processor Board
1001 1110	9E	Alpha Failed	Replace Video Interface
1001 1111	9F	Graphics Failed	Replace Video Interface
101X XXXX	A0 to BF	I/O Card at XXXXX Failed	Replace I/O Card at Select Code XXXXX Replace Processor Board Replace I/O Connectorboard
1111 1111	FF	LEDs Never Accessed	Replace Processor Board

## Tools List

The following tools are needed to service the 9817 Computer:

Part Number	Description
	Standard CE Tool Kit
	#1 Pozidriv
	5mm nutdriver
	Nutdriver extension
	Flat-blade screwdriver
	IC extractor
9300-0933	Anti-static workstation
3476B	Multimeter

The following tool is helpful, but not necessary:

98626-67950	RS-232 Test connector
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# Chapter 11

## Service Notes



