

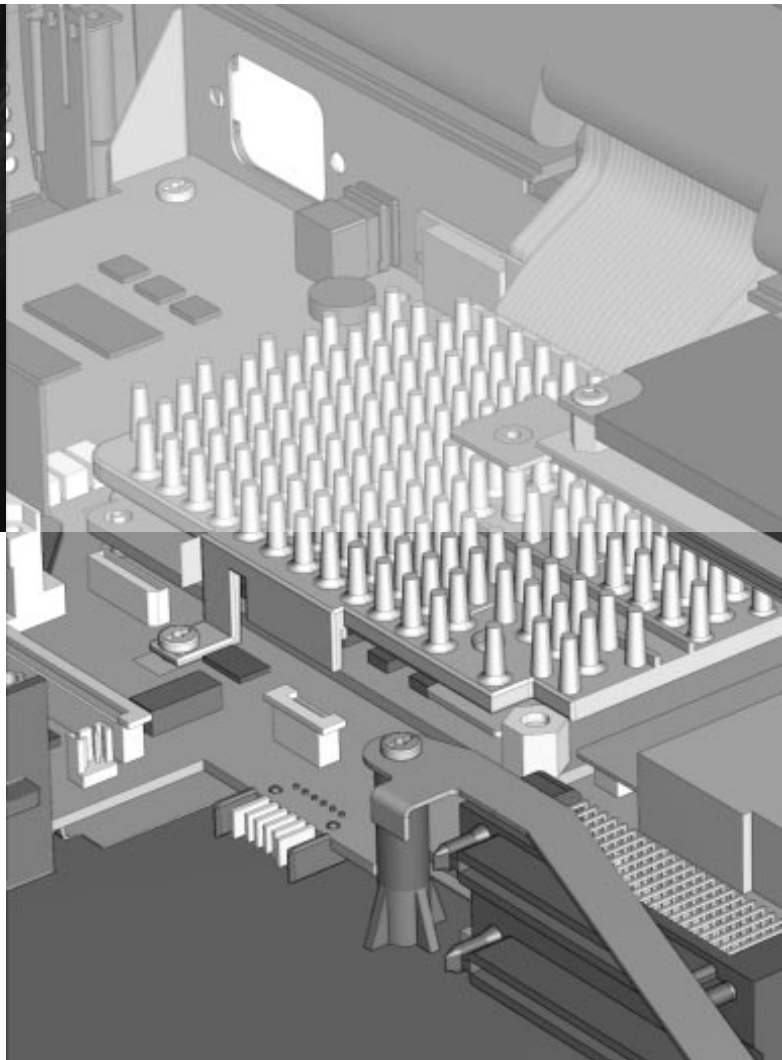
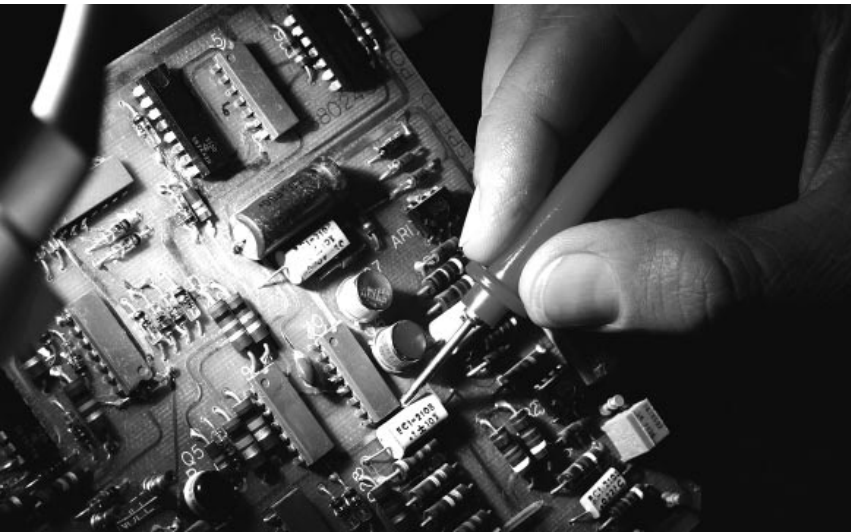
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Compaq Armada M700 Series of Personal Computers

Maintenance and Service Guide



COMPAQ

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MAINTENANCE AND SERVICE GUIDE

Compaq Armada M700 Series of Personal Computers

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preface

USING THIS GUIDE

This *Maintenance and Service Guide* is a troubleshooting reference that can be used when servicing the Compaq Armada M700 Series of Personal Computers.

Compaq Computer Corporation reserves the right to make changes to the Compaq Armada M700 Series of Personal Computers without notice.

Symbols



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions in the caution could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technical Notes



WARNING: Only authorized technicians trained by Compaq should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.



WARNING: The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded electrical outlet only.



CAUTION: To properly ventilate the system, you must provide at least 3 inches (7.62 cm) of clearance on the left and right sides of the computer.

Serial Number

When requesting information or ordering spare parts, provide the computer serial number. The serial number is on the bottom of the computer.

Locating Additional Information

In addition to this guide, the following documentation provides information for the computer:

- Compaq Armada M700 Series of Personal Computers documentation set
- *Getting Started, Microsoft Windows 98*
- *Introducing Microsoft Windows NT Workstation & Microsoft Windows 95*
- Compaq Service Training Guides
- Compaq Service Advisories and Bulletins
- *Compaq QuickFind*
- *Compaq Service Quick Reference Guide*
- *Compaq Armada M700 Maintenance and Service Guide*
- *Compaq Armada M700 Technical Reference Guide*
- Compaq Web site at:
<http://www.compaq.com>

chapter 1

PRODUCT DESCRIPTION

1.1 Computer Features and Models

The Compaq Armada M700 Series of Personal Computers offers advanced modularity, Intel Pentium III and II processors, and extensive multimedia support.



Figure 1-1. Compaq Armada M700 Personal Computer

Models

The Armada M700 models are shown in Table 1-1. The computer model designation is composed of a group of characters that define each model's features.

**Table 1-1
Models and Model Naming Convention
Compaq Armada M700 Series of Personal Computers**

| Key | | | | | | | | | | | | | | | | |
|-------|-------------------------------------|---------------------------------|----|-----|-----|----|---------------------------------------|----|-------|----|-----|-----------------|-------|----|----|----|
| A | M | 7 | P3 | 850 | T | 4 | X | 20 | V | M | 128 | 98 | N | S | F | |
| 1 | 2 | 3 | 4 | 5-6 | 7-9 | 10 | 11 | 12 | 13-14 | 15 | 16 | 17-19 | 20-21 | 22 | 23 | 24 |
| Key | Description | Options | | | | | | | | | | | | | | |
| 1 | Brand designator | A = Armada | | | | | | | | | | | | | | |
| 2 | Segment designator | M = Mobility | | | | | | | | | | | | | | |
| 3 | Series | 7 = 700 | | | | | | | | | | | | | | |
| 4 | Blank | | | | | | | | | | | | | | | |
| 5-6 | Processor type | P3 = Intel Pentium III | | | | | P2 = Intel Pentium II | | | | | | | | | |
| 7-9 | Processor speed | 1 = 1 GHz | | | | | 650 = 650 MHz | | | | | | | | | |
| | | 900 = 900 MHz | | | | | 500 = 500 MHz | | | | | | | | | |
| | | 850 = 850 MHz | | | | | 450 = 400 MHz | | | | | | | | | |
| | | 750 = 750 MHz | | | | | 400 = 400 MHz | | | | | | | | | |
| | | 700 = 700 MHz | | | | | 366 = 366 MHz | | | | | | | | | |
| 10 | Panel type | T = TFT | | | | | | | | | | | | | | |
| 11 | Panel size | 4 = 14.x" | | | | | 3 = 13.x" | | | | | | | | | |
| 12 | Panel resolution | X = XGA | | | | | | | | | | | | | | |
| 13-14 | Hard drive size (in GB, 1-2 digits) | 30 = 30.0 GB | | | | | 10 = 10.0 GB | | | | | 6 = 6.4 GB | | | | |
| | | 20 = 20.0 GB | | | | | | | | | | | | | | |
| | | 12 = 12.0 GB | | | | | | | | | | | | | | |
| 15 | Optical drive | D = CD-ROM | | | | | V = DVD-ROM | | | | | R = CD-RW | | | | |
| 16 | Integrated communication | M = Mini PCI V.90 Modem | | | | | C = NIC/modem combination | | | | | 0 = none | | | | |
| 17-19 | RAM (in MB, 2-3 digits) | 128 = 128 MB | | | | | 64 = 64 MB | | | | | | | | | |
| 20-21 | Operating system | 95 = Windows 95 | | | | | N4 = Windows NT 4.0 | | | | | 98 = Windows 98 | | | | |
| | | 58 = Windows 95/98 dual install | | | | | N2 = Windows NT 4.0/2000 dual install | | | | | | | | | |
| 22 | NAFTA | N = NAFTA | | | | | | | | | | | | | | |
| 23 | Pointing device | S = Pointing stick | | | | | | | | | | | | | | |
| 24 | Security | | | | | | | | | | | | | | | |

**Table 1-2
Models and Model Naming Convention
Compaq Armada M700 Series of Personal Computers**

| 1 | 2 | 3 | 4 | 5-6 | 7-9 | 10 | 11 | 12 | 13-14 | 15 | 16 | 17-19 | 20-21 | 22 | 23 | 24 | SKU# |
|---|---|---|---|-----|-----|----|----|----|-------|----|----|-------|-------|----|----|----|-------------------------|
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | C | 128 | N2 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | C | 128 | SE | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | C | 128 | N2 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | C | 128 | SE | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | 0 | 128 | N2 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 30 | R | 0 | 128 | SE | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | C | 128 | N2 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | C | 128 | SE | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | C | 128 | N2 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | C | 128 | SE | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | 0 | 128 | 2K | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 1 | T | 4 | X | 20 | V | 0 | 128 | 98 | | S | | 470011-XXX ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | 0 | 128 | 98 | | S | | 215198-XX2 ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | C | 128 | 98 | | S | | 215198-XX3 ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | 0 | 128 | N2 | | S | | 215198-XX8 ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | C | 128 | N2 | | S | | 215198-XX9 ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | C | 128 | 98 | | S | | 215199-XX2 ² |
| A | M | 7 | | P3 | 850 | T | 4 | X | 20 | V | C | 128 | N2 | | S | | 215199-XX8 ² |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | 0 | 64 | 58 | | S | | 206645-XX2 ¹ |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | 0 | 128 | N2 | | S | | 206645-XX8 ¹ |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | M | 64 | 58 | | S | | 206646-XX3 ¹ |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | M | 128 | N2 | | S | | 206646-XX9 ¹ |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | C | 64 | 58 | | S | | 206647-XX2 ¹ |
| A | M | 7 | | P3 | 750 | T | 4 | X | 12 | V | C | 128 | N2 | | S | | 206647-XX8 ¹ |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | 0 | 128 | 98 | | S | | 215191-XX2 |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | C | 128 | 98 | | S | | 215191-XX3 |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | 0 | 128 | N2 | | S | | 215191-XX8 |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | C | 128 | N2 | | S | | 215191-XX9 |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | C | 128 | 98 | | S | | 215197-XX2 |
| A | M | 7 | | P3 | 700 | T | 3 | X | 10 | D | C | 128 | N2 | | S | | 215197-XX8 |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | 0 | 64 | 98 | | S | | 205860-XX2 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | 0 | 64 | N4 | | S | | 205860-XX6 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | 0 | 64 | N2 | | S | | 205860-XX8 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | 58 | | S | | 205861-XX2 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | 58 | N | S | | 205861-XX3 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | N4 | | S | | 205861-XX6 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | N4 | N | S | | 205861-XX7 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | N2 | | S | | 205861-XX8 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | M | 64 | N2 | N | S | | 205861-XX9 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | C | 64 | 98 | | S | | 205862-XX2 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | C | 64 | N4 | | S | | 205862-XX6 ¹ |
| A | M | 7 | | P3 | 700 | T | 4 | X | 12 | V | C | 64 | N2 | | S | | 205862-XX8 ¹ |

¹ 4X DVD-ROM drive

² 8X DVD-ROM drive

Continued

Table 1-2 *continued*

| 1 | 2 | 3 | 4 | 5-6 | 7-9 | 10 | 11 | 12 | 13-14 | 15 | 16 | 17-19 | 20-21 | 22 | 23 | 24 | SKU# |
|---|---|---|---|-----|-----|----|----|----|-------|----|----|-------|-------|----|----|----|-------------------------|
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | 0 | 64 | 58 | | S | | 205857-XX2 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | 0 | 64 | N4 | | S | | 205857-XX6 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | 0 | 64 | N2 | | S | | 205857-XX8 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | 58 | | S | | 205858-XX2 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | 58 | N | S | | 205858-XX3 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | N4 | | S | | 205858-XX6 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | N4 | N | S | | 205858-XX7 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | N2 | | S | | 205858-XX8 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | M | 64 | N2 | N | S | | 205858-XX9 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | C | 64 | 58 | | S | | 205859-XX2 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | C | 64 | N4 | | S | | 205859-XX6 |
| A | M | 7 | | P3 | 650 | T | 4 | X | 6 | D | C | 64 | N2 | | S | | 205859-XX8 |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | 0 | 64 | 58 | | S | | 139114-XX2 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | 0 | 64 | N4 | | S | | 139114-XX6 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | 0 | 64 | N2 | | S | | 139114-XX8 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | M | 64 | 58 | | S | | 139116-XX2 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | M | 64 | 58 | N | S | | 139116-XX3 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | M | 64 | N4 | | S | | 139116-XX6 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | M | 64 | N2 | | S | | 139116-XX8 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | C | 64 | 58 | | S | | 140141-XX2 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | C | 64 | 58 | N | S | | 140141-XX3 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | C | 64 | N4 | | S | | 140141-XX6 ¹ |
| A | M | 7 | | P3 | 500 | T | 4 | X | 12 | V | C | 64 | N2 | | S | | 140141-XX8 ¹ |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | 0 | 64 | 58 | | S | | 159695-XX2 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | 0 | 64 | N4 | | S | | 159695-XX6 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | M | 64 | 58 | | S | | 159696-XX2 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | M | 64 | 58 | N | S | | 159696-XX3 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | M | 64 | N4 | | S | | 159696-XX6 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | 0 | C | 64 | 58 | | S | | 159697-XX2 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | D | C | 64 | 58 | N | S | | 159697-XX3 |
| A | M | 7 | | P3 | 450 | T | 4 | X | 6 | 0 | C | 64 | N4 | | S | | 159697-XX6 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | 0 | 64 | 58 | | S | | 139117-XX2 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | 0 | 64 | N4 | | S | | 139117-XX6 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | 0 | 64 | N2 | | S | | 139117-XX8 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | M | 64 | 58 | | S | | 139120-XX2 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | M | 64 | N4 | | S | | 139120-XX6 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | M | 64 | N2 | | S | | 139120-XX8 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | C | 64 | 58 | | S | | 140142-XX2 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | C | 64 | N4 | | S | | 140142-XX6 |
| A | M | 7 | | P3 | 450 | T | 3 | X | 6 | D | C | 64 | N2 | | S | | 140142-XX8 |

¹ 4X DVD-ROM drive

² 8X DVD-ROM drive

Continued

Table 1-2 *continued*

| 1 | 2 | 3 | 4 | 5-6 | 7-9 | 10 | 11 | 12 | 13-14 | 15 | 16 | 17-19 | 20-21 | 22 | 23 | 24 | SKU# |
|---|---|---|---|-----|-----|----|----|----|-------|----|----|-------|-------|----|----|----|-------------------------|
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | 0 | 64 | 95 | | S | | 400326-XX2 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | M | 64 | 95 | | S | | 400327-XX2 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | C | 64 | 95 | | S | | 124939-XX2 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | 0 | 64 | 98 | | S | | 400324-XX4 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | M | 64 | 98 | | S | | 400325-XX4 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | C | 64 | 98 | | S | | 124940-XX4 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | 0 | 64 | N4 | | S | | 400322-XX6 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | M | 64 | 98 | N | S | | 400325-XX5 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | M | 64 | N4 | | S | | 400323-XX6 ¹ |
| A | M | 7 | | P2 | 400 | T | 4 | X | 10 | V | C | 64 | N4 | | S | | 124941-XX6 ¹ |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | M | 64 | 95 | | S | | 149207-XX2 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | M | 64 | 98 | | S | | 149207-XX4 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | M | 64 | 98 | N | S | | 149207-XX5 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | M | 64 | N4 | | S | | 149207-XX6 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | C | 64 | 95 | | S | | 149208-XX2 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | C | 64 | 95 | | S | | 149208-XX4 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | C | 64 | 95 | | S | | 149208-XX6 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | O | 64 | 95 | | S | | 152550-XX2 |
| A | M | 7 | | P2 | 366 | T | 4 | X | 6 | D | O | 64 | N4 | | S | | 152550-XX6 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | 95 | | S | | 164462-XX2 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | 98 | | S | | 164462-XX4 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | 98 | N | S | | 164462-XX5 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | N4 | | S | | 164462-XX6 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | 0 | 64 | 95 | | S | | 400332-XX2 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | N4 | | S | | 400333-XX2 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | 0 | 64 | 98 | | S | | 400330-XX4 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | 98 | | S | | 400331-XX4 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | C | 64 | 95 | | S | | 124898-XX2 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | C | 64 | 98 | | S | | 124899-XX4 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | 0 | 64 | N4 | | S | | 400328-XX6 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | M | 64 | N4 | | S | | 400329-XX6 |
| A | M | 7 | | P2 | 366 | T | 3 | X | 6 | D | C | 64 | N4 | | S | | 124938-XX6 |

¹ 4X DVD-ROM drive

² 8X DVD-ROM drive

Features

The computer has the following standard features:

- Intel Pentium III 1-GHz, 900-, 850-, 750-, 700-, 650-, 600- or 450-MHz processors, or Intel Pentium II 400- or 366-MHz processors, depending on computer model
- 8-MB SDRAM (synchronous graphics)
- 64-MB of SDRAM (synchronous); expandable to 288 MB
- 13.3- or 14.1-inch XGA TFT color display; true color (24-bit) support
- Keyboard with Easy Access Buttons and an EasyPoint IV pointing device or Synaptics TouchPad, depending on computer model
- External AC Adapter
- 6- or 8-cell Lithium ion (Li-ion) battery pack plus the MultiBay battery pack (available only as an option)
- Removable 30.0-, 20.0-, 12.0-, 10.0-, or 6.4-GB hard drive, depending on computer model
- Mini PCI Type I slot which accommodates modem, network interface connection (NIC), or combination modem/NIC (combo) card. Cable connections are provided to RJ-11 and RJ-45 jacks on the system for modem and NIC connections, respectively.
- External diskette drive and cable
- MultiBay that supports a diskette drive, SuperDisk LS-120 drive, CD-ROM drive, CD-RW drive, DVD-ROM drive, second hard drive, or MultiBay battery pack
- Two PC Card slots that accept 32- and 16-bit Type I, II, and III PC Cards, with zoomed video interface in both slots
- Ports and connectors for external equipment, including universal serial bus (USB), serial, parallel, external monitor, composite TV out, and PS/2-compatible pointing device or keyboard
- Built-in stereo speakers featuring Compaq PremierSound, microphone, and stereo speaker/headphone jack for stereo audio sound with electronic equalization and wave table synthesis
- Security features
- Energy Star-compliant power saving features

Intelligent Manageability

Intelligent Manageability consists of preinstalled software tools for the computer and Compaq servers that assist in tracking, troubleshooting, protecting, and maintaining the computer. It provides the following functions:

- **Asset Management**—provides detailed configuration and diagnostic information.
- **Fault Management**—prevents, predicts, and alerts of impending hardware problems.
- **Security Management**—protects unauthorized access to data and components.

- **Configuration Management**—optimizes the computer by providing the latest drivers, utilities, and software, which are available on CD-ROM and the Compaq Web site at:

www.compaq.com/support/portables

NOTE: For further help with Intelligent Manageability, select Start → Compaq Information Center → Intelligent Manageability

Accessing the Web Agent

The computer may have a preinstalled Web Agent that allows computer configuration information to be viewed using Web technology. To access this feature, select Start → Compaq Information Center → Insight Web Management.

If the computer does not have a preinstalled Web Agent, it can be downloaded from the Compaq Web site at:

www.compaq.com

Asset Management

AssetControl enables component information to be retrieved when on the road or connected to the network.

AssetControl also enables the network administrator to remotely retrieve information from any Compaq computer connected to the network. The information can be used to assist in tracking and maintaining the computer and its components. It provides the following information:

- **Inventory information**—The network administrator can retrieve information about the computer over the network by using Compaq Insight Manager or any PC management tool provided by Compaq Solution Partners. Asset control information retrieved from the computer includes:
 - Manufacturer, model, and serial number of Compaq computers, monitors, hard drives, battery packs, memory boards, processor speeds, and operating systems
 - Asset tag: the computer and battery pack Asset tag numbers and the computer ownership tag can be changed by accessing Computer Setup → Security → System IDs.
 - System board and ROM revision levels
 - BIOS settings
- **Diagnostic information**—Diagnostics for Windows includes information on hard drives, ports, and video, sound, and other components. This application also allows the user to run multithreaded tests on hardware components. If problems are found, recommendations are provided.

All of the above information can be viewed, printed, or saved.

Fault Management

Fault Management features minimize downtime and data loss by monitoring system performance and generating the following alerts:

- **Hard drive alert**—provides 72-hour advance warning of impending hard drive problems and can automatically start optional backup software. Alerts can be enabled, disabled, and tested, and software can be set to back up information whenever a hard drive alert occurs.
- **System temperature alert**—reports overheating. As the system temperature rises, this feature first adjusts fan speed and other cooling components, then displays an alert, then shuts down the system.
- **Battery pack alert**—reports charging problems and battery pack failure. A battery charging problem alert is reported only on the computer display.
- **Monitor alert**—diagnoses and displays external monitor operational problems.
- **Memory alert**—reports memory board configuration changes when a memory board is removed, added, or reconfigured. It also provides the previous and current configurations for comparison.
- While the computer is connected to a network, alerts pop up on the computer display and are simultaneously reported to the network console. If the computer is not connected to the network, the user will receive a local alert.

To set alerts, select the Intelligent Manageability icon in the system tray.

Security Management

Security Management features customize system security.

- **Power-On and Setup Passwords**—prevent unauthorized access to information and computer configuration.
- **DriveLock**—prevents unauthorized access to hard drives.
- **Device disabling**—prevents unauthorized data transfer through modems, serial ports, parallel ports, and infrared ports on the computer and an optional docking station.
- **QuickLock/QuickBlank**—locks the keyboard and clears the screen.
- **Ownership Tag**—displays ownership information during system restart.

Configuration Management

Configuration Management optimizes software upgrade and customer support procedures. Compaq provides support software to optimize the performance of the computer. This support software is accessible through a monthly CD-ROM subscription. Support software can also be downloaded from the Compaq Web site at:

www.compaq.com/support/portables

Managing Power

The computer comes with a collection of power management features that allow battery operating time to be extended and power to be conserved. Use power management to monitor most computer components such as the hard drive, processor, and display.

Accessing Power Management

In Windows 95, select Start→Settings→Control Panel→Power to view or adjust settings in Power Properties.

NOTE: If Windows NT 4.0 is running, select Compaq Power instead of Power. If Windows 98 is running, select Power Management.

Power Management Levels

To extend the life of batteries, use the Battery Conservation tab in Power Properties. If Windows 95 is running, select Start → Settings → Control Panel → Power to access Power Properties.

NOTE: If Windows NT 4.0 is running, select Compaq Power instead of Power. If Windows 98 is running, select Power Management.

The level of battery conservation or selection of preset power management levels can be customized.

1.2 Computer Components

System Memory Options

The main memory subsystem supports a minimum standard 32 or 64 megabytes of Synchronous SDRAM, and is expandable to 544 or 576 megabytes, depending on computer model. The minimum standard Synchronous SDRAM is installed on the system board. The upgrade SDRAM is accomplished with memory expansion boards that are available in 32-, 64-, 128-, and 256-megabytes.

System memory can be upgraded as shown in the following table:

| Base Memory installed on System Board | | Memory Expansion Board | Total System Memory | |
|--|-------|--|----------------------------|--------|
| 32 MB | 64 MB | 512 MB (2 × 256 MB) | 544 MB | 576 MB |
| 32 MB | 64 MB | 384 MB (1 × 256 MB + 1 × 128 MB) | 416 MB | 448 MB |
| 32 MB | 64 MB | 320 MB (1 × 256 MB + 1 × 64 MB) | 352 MB | 384 MB |
| 32 MB | 64 MB | 288 MB (1 × 256 MB + 1 × 32 MB) | 320 MB | 352 MB |
| 32 MB | 64 MB | 256 MB (1 × 256 MB or 2 × 128 MB) | 288 MB | 320 MB |
| 32 MB | 64 MB | 192 MB (1 × 128 MB + 1 × 64 MB) | 224 MB | 256 MB |
| 32 MB | 64 MB | 160 MB (1 × 128 MB + 1 × 32 MB) | 192 MB | 224 MB |
| 32 MB | 64 MB | 128 MB (1 × 128 MB or 2 × 64 MB) | 160 MB | 192 MB |
| 32 MB | 64 MB | 96 MB (1 × 64 MB + 1 × 32 MB) | 128 MB | 160 MB |
| 32 MB | 64 MB | 64 MB (1 × 64 MB or 2 × 32 MB) | 96 MB | 128 MB |
| 32 MB | 64 MB | 32 MB (1 × 32 MB) | 64 MB | 96 MB |
| 32 MB | 64 MB | 0 MB | 32 MB | 64 MB |

Power Equipment

The following power options are available:

- AC Adapter
- Lithium ion battery pack
- Automobile Power Adapter/Charger
- Aircraft Power Adapter

AC Adapter

The AC Adapter is field replaceable and ships with the computer and is available as an option. The 50-watt AC Adapter converts 100/220 volts AC into low-voltage DC to drive the DC-DC converter and to recharge the battery pack. The output of this AC/DC supply is the battery voltage, approximately 10 to 19 volts.

Lithium Ion Battery Pack

The primary battery pack can be used and charged in the computer battery bay. The MultiBay battery pack can be used and charged in the MultiBay.

Automobile Power Adapter/Charger and Aircraft Power Adapter

The Automobile Power Adapter/Charger allows the computer to operate and the battery pack to charge from an automobile cigarette lighter receptacle. The Aircraft Power Adapter allows the computer to operate from a 12-volt aircraft DC socket.

Mass Storage Devices

The following mass storage devices are available for the computer:

| Device | Capacity |
|-------------------------|---|
| Diskette drive | 3.5-inch, 1.44 MB, 720 KB, and 1.2 MB (Japanese format) |
| Hard drive | 30.0, 20.0, 12.0-, 10.0-, and 6.4-GB (also available as an option) |
| CD-ROM drive | 24-Speed Max (also available as an option) |
| CD-RW drive | 20-Speed Max read, 4-Speed Max write and rewrite (available only as an option). |
| DVD-ROM | 4.7 GB |
| SuperDisk LS-120 drive | 120 MB (available only as an option) |
| External diskette drive | 3.5-inch, 1.44 MB |

1.3 Computer External Components

The computer external components on the front, rear, left side, right side, top, and bottom, of the computer as well as the keyboard components for the pointing stick model and TouchPad model are shown in the following figures and described in the accompanying tables.

Front Components



Figure 1-2 Front Components

**Table 1-5
Front Components**

| Item | Components | Function |
|------|-------------------------------|---|
| 1 | Hard drive bay | Accepts removable hard drive. |
| 2 | Stereo speaker/headphone jack | Connects external speakers, headset, or headphones to the computer. This jack is driven by an amplifier and has volume control. The internal computer speakers are turned off when external speakers or headphones are plugged into this jack. |
| 3 | Microphone jack | Connects an external microphone to the computer. |
| 4 | System-on light | Indicates that the computer is turned on. |
| 5 | Battery charge light | Indicates that the computer is charging a battery pack. |

Rear Components



Figure 1-3 Rear Components

**Table 1-6
Rear Components**

| Item | Component | Function |
|------|----------------------------|--|
| 1 | Infrared port | Provides wireless communication between the computer and another infrared-equipped device using an infrared beam. |
| 2 | Serial connector | Connects an optional external serial device such as a mouse. |
| 3 | External monitor connector | Connects optional external display. |
| 4 | Docking connector | Connects the computer to the optional desktop expansion base or convenience base. |
| 5 | Parallel connector | Connects an optional parallel device such as a printer. |
| 6 | Power connector | Connects the AC Adapter to the computer. |
| 7 | USB port | Connects USB devices, such as cameras for video conferencing, or hubs which connect multiple USB devices. The USB connector is a powered hub. When running Windows 95 or higher or Windows NT or higher, any combination of up to five powered or unpowered hubs can be connected in any sequence, as long as two unpowered hubs are not connected next to each other. |
| 8 | Keyboard/mouse connector | Connects an optional full-sized keyboard or a mouse. Both the external mouse and computer pointing device are active. A generic splitter/adaptor will allow the connection of both an external keyboard and external mouse at the same time. |

Left Side Components



Figure 1-4 Left Side Components

**Table 1-7
Left Side Components**

| Item | Component | Function |
|------|------------------------|---|
| 1 | Composite TV connector | Connects a television, VCR, camcorder, or overhead projector. |
| 2 | Cable lock connector | Accepts an optional security cable to secure the computer to a fixed object to prevent theft. |
| 3 | Airflow vent | Allows airflow needed to cool computer components. Do not block airflow vents. |

Right Side Components



Figure 1-5 Right Side Components

Table 1-8
Right Side Components





| Item | Component | Function |
|------|-----------------|--|
| 1 | PC Card slots | Accepts 16- and 32-bit CardBus PC Cards. |
| 2 | Airflow vent | Allows airflow needed to cool computer components. Do not block airflow vents. |
| 3 | MultiBay | Supports MultiBay devices. |
| 4 | Audio bass port | Enhances stereo sound. |
| 5 | RJ-11 jack | Connects a standard telephone cable or modem cable to the computer. |
| 6 | RJ-45 jack | Connects a network cable to the computer. |

Top Components



Figure 1-6 Top Components

**Table 1-9
Top Components**

| Item | Component/Icon | Function |
|------|---|---|
| 1 | Display switch | Turns off the display if the computer is closed while turned on. |
| 2 | Suspend button* | Initiates and exits Suspend.** When pressed with the Fn key, initiates Hibernation. |
| 3 | Hard drive light | Indicates hard drive activity. |
| 4 | MultiBay drive light | Indicates MultiBay activity. |
| 5 | Num Lock light | Indicates that Num lock is on and the embedded numeric keypad is enabled. |
| 6 | Caps Lock light | Indicates that Caps lock is on. |
| 7 | Scroll Lock light | Indicates that Scroll lock is on. |
| 8 |  | Information —Links directly to Compaq Armada user information for quick answers to your computer questions. This key is present only on computer models with SKUs 206645-XXX, 206646-XXX, 206647-XXX, 215191-XXX, 215197-XXX, 215198-XXX, and 215199-XXX. |
| 9 |  | Home —Provides an Internet starting point, connecting to a personalized Web page filled with local weather, news, sports, and financial information. This key is present only on computer models with SKUs 206645-XXX, 206646-XXX, 206647-XXX, 215191-XXX, 215197-XXX, 215198-XXX, and 215199-XXX. |
| 10 |  | Search —Opens the AltaVista search engine Web site, which helps you locate information on the Internet. This key is present only on computer models with SKUs 206645-XXX, 206646-XXX, 206647-XXX, 215191-XXX, 215197-XXX, 215198-XXX, and 215199-XXX. |
| 11 |  | Email —Accesses your default email application. This key is present only on computer models with SKUs 206645-XXX, 206646-XXX, 206647-XXX, 215191-XXX, 215197-XXX, 215198-XXX, and 215199-XXX. |
| 12 | Power switch | Turns the computer on or off or exits Suspend. |
| 13 | Internal speakers | Produce stereo sound. |

*In Windows 98 the term *sleep button* replaces the term *suspend button*.

**In Windows 98 the term *Standby* replaces the term *Suspend*.

Bottom Components

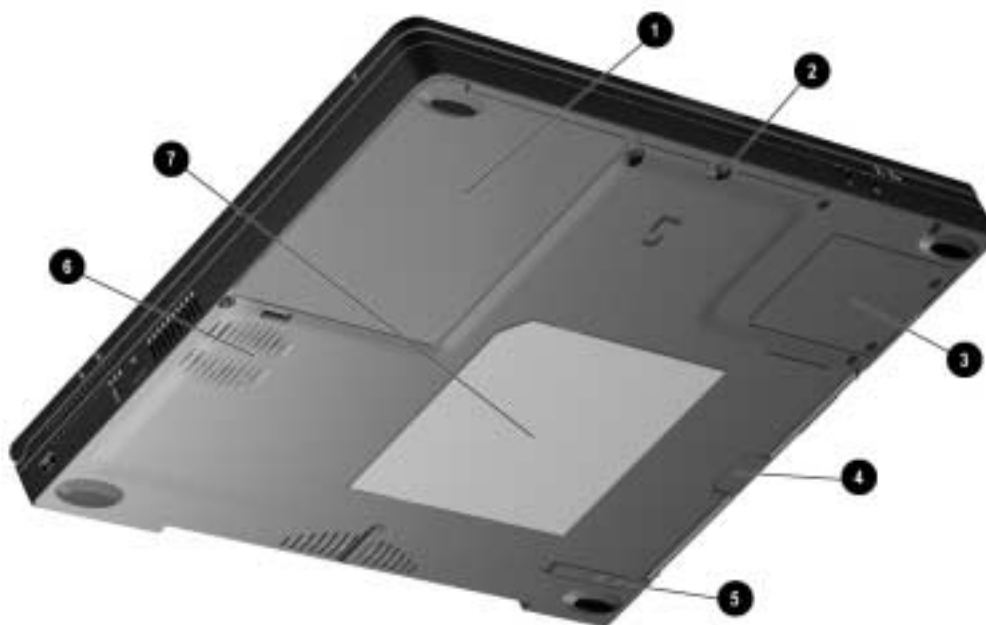


Figure 1-7 Bottom Components

**Table 1-10
Bottom Components**

| Item | Component | Function |
|------|---------------------------|---|
| 1 | Battery bay | Holds the primary battery. |
| 2 | Hard drive security screw | Secures the hard drive in the hard drive bay. |
| 3 | Modem slot cover | Contains the mini PCI modem card. |
| 4 | MultiBay notch | Helps to grasp a drive or battery pack from the MultiBay. |
| 5 | MultiBay release latch | Releases a removable drive or battery pack from the MultiBay. |
| 6 | Fan | Provides airflow to cool internal components. |
| 7 | Label | Identifies computer and provides the serial number needed when calling Compaq customer support. |

EasyPoint IV Pointing Stick Model Components



Figure 1-8 EasyPoint IV Pointing Stick Model Components

Table 1-11
Keyboard Components
Pointing Stick Model

| Item | Component | Function |
|-------------|-----------------------------|--|
| 1 | EasyPoint IV pointing stick | Moves the cursor in the direction of finger movement. |
| 2 | Left pick button | Functions like the left button on an external mouse. |
| 3 | Scroll button | Scrolls the document to allow quicker maneuverability. |
| 4 | Right pick button | Functions like a right button on an external mouse. |

TouchPad Components



Figure 1-9 TouchPad Components

Table 1-12
Keyboard Components
TouchPad Model

| Item | Component | Function |
|------|-----------------------|---|
| 1 | TouchPad | Moves the cursor in the direction of finger movement. |
| 2 | Left TouchPad button | Functions like the left button on an external mouse. |
| 3 | Right TouchPad button | Functions like a right button on an external mouse. |

1.4 Design Overview

This section presents a design overview of key parts and features of the computer. For assembly/disassembly instructions for the parts described in this section, refer to Chapter 5.

System Board

The system board provides the following device connections:

- Memory expansion board
- Diskette drive
- Hard drive
- CD-ROM, CD-RW, and DVD-ROM drive
- Display
- Keyboard/EasyPoint IV pointing device
- Audio
- Processor
- Fan
- PC Cards
- Modem

The computer is equipped with an Intel Pentium III 1-GHz, 900-, 850-, 750-, 700-, 650-, 600- or 450-MHz processor, or an Intel Pentium II 400- or 366-MHz processor, depending on the computer model. For ventilation, an electrical fan is installed. The fan operates on from 5 to 12 volts and is controlled by a temperature sensor. The fan is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the left side of the computer.



CAUTION: To properly ventilate the computer, allow at least a 3-inch (7.6 cm) clearance on the left and right sides of the computer.

chapter 2

TROUBLESHOOTING

Follow these basic steps when beginning the troubleshooting process:

1. Complete the preliminary steps listed in Section 2.1.
2. Run the Power-On Self-Test (POST) as described in Section 2.3.
3. Run Computer Setup as described in Section 2.5.
4. If you are unable to run POST or if the problem persists after running POST, perform the recommended actions described in the diagnostic tables in Section 2.5.

Follow these guidelines when troubleshooting:

- Complete the recommended actions in the order in which they are given.
- Repeat POST after each recommended action until the problem is resolved and the error message does not return.
- When the problem is resolved, stop performing the troubleshooting steps and do not complete the remaining recommended actions.
- Refer to Chapter 5 for recommended removal and replacement procedures.
- If the problem is intermittent, check the computer several times to verify that the problem is solved.

The following table describes the troubleshooting actions:

| If You Want To: | Then Run: |
|---|------------------|
| Check for POST error messages | POST |
| Perform any of the following: <ul style="list-style-type: none">■ Check the system configuration■ Set the system power management parameters■ Return the system to its original configuration■ Check system configuration of installed devices | Computer Setup |

2.1 Preliminary Steps

IMPORTANT: Use AC power when running POST or Computer Setup. A low battery condition could initiate Hibernation and interrupt the test.

Before running POST, complete the following steps:

1. Obtain established passwords. If you must clear the passwords, go to Section 2.2.
2. Ensure that the hard drive is installed in the computer.
3. Ensure that the battery pack is installed in the computer and the power cord is connected to the computer and plugged into an AC power source.
4. Turn on the computer.
5. If a power-on password has been established, type the password and press **Enter**.
6. Run Computer Setup (Section 2.5). If a Setup password has been established, type the password and press **Enter**.
7. Turn off the computer and all external devices.
8. Disconnect external devices that you do not want to test. If you want to use the printer to log error messages, leave it connected to the computer.

NOTE: If a problem only occurs when an external device is connected to the computer, the problem could be with the external device or its cable. Isolate the problem by running POST with and without the external device connected.

9. Use Compaq Utilities and loopback plugs in the serial and parallel connectors if you plan to test these ports.

Follow these steps to run Compaq Utilities:

- a. If you are running Compaq Utilities from the hard drive, turn on or restart the computer. Press **F10** when the cursor appears in the upper-right corner of the screen. If you do not press **F10** in time, restart the computer and try again.
If you are running Compaq Utilities from diskette, insert the Compaq Utilities diskette in drive A. Turn on or restart the computer.
- b. Press **Enter** to accept **OK**.
- c. Select Prompted Diagnostics.
- d. After “Identifying System Hardware” completes, select Interactive Testing and follow the instructions on the screen.

2.2 Clearing Passwords

1. Turn off the computer.
2. Disconnect the AC Adapter (refer to Section 5.3).
3. Remove the battery pack (Section 5.6).
4. Disconnect and remove the Real Time Clock (RTC) battery (Section 5.11).
5. Wait five minutes.
6. Reconnect the RTC battery.
7. Install the keyboard deck and keyboard assembly.
8. Reconnect the AC Adapter. Do **not** reinstall the battery pack yet.
9. Turn on the computer.

NOTE: Remember to set the date and time the next time the computer is turned on.

2.3 Power-On Self-Test (POST)

The Power-On Self-Test (POST) is a series of tests that run every time the computer is turned on. POST verifies that the system is configured and functioning properly.

To run POST, complete the following steps:

1. Complete the preliminary steps (Section 2.1).
2. Turn on the computer.

If POST does not detect any errors, the computer beeps once or twice to indicate that POST has run successfully. The computer boots from the hard drive or from a bootable diskette if one is installed in the diskette drive.

2.4 POST Error Messages

If the system is not functioning well enough to run POST, or if the display is not functioning well enough to show POST error messages, refer to the Troubleshooting tables in Section 2.6.

If POST detects an error, one of the following events occurs:

- A message with the prefix "WARNING" appears, informing you where the error occurred. The system pauses until you press **F1** to continue.
- A message with the prefix "FATAL" appears, informing you where the error occurred. After the message, the system emits a series of beeps, then stops.
- The system emits a series of beeps, then stops.

Warning messages indicate that a potential problem, such as a system configuration error, exists. When **F1** is pressed, the system should resume. You should be able to correct problems that produce WARNING messages.

If you receive one of the error messages listed below, follow the recommended action.

**Table 2-1
Warning Messages**

| Message | Description | Recommended Action |
|--|--|--|
| CMOS checksum invalid, run SCU | CMOS RAM information has been corrupted. | Run Computer Setup to reinitialize CMOS-RAM. |
| CMOS failure, run SCU | CMOS RAM has lost power. | Run Computer Setup to reinitialize CMOS-RAM. |
| Diskette controller error | The diskette drive controller failed to respond to the recalibrate command. | If there is no diskette drive in the system, run Computer Setup to properly configure the CMOS-RAM to show no diskette drive present. If the problem persists, or if a diskette drive is present, complete these steps until the problems is solved: 1. Check diskette drive connections. 2. Replace diskette drive. 3. Replace system board. |
| Diskette track 0 failed | The diskette drive cannot read track 0 of the diskette in the drive. | Try another diskette. If the problem persists, you may need to replace the diskette drive. |
| Hard disk controller error | The hard drive controller failed to respond to the reset command. | Check the drive parameters. Turn off the system and check all related connections. |
| Keyboard controller failure | The keyboard failed the self-test command. | Replace the system board. |
| Keyboard failure | The keyboard failed to respond to the RESET ID command. | Replace the keyboard. If the problem persists, replace the system board. |
| No interrupts from Timer 0 | The periodic timer interrupt is not occurring. | Replace the system board. |
| ROM at xxxx (LENGTH yyyy) with nonzero checksum (zz) | An illegal adapter ROM was located at the specified address. | Check the external adapter (such as a video card) to determine if it is causing the conflict. |
| Time/Date corrupt - run SCU | The time and date stored in the real time clock have been corrupted, possibly by a power loss. | 1. Run Computer Setup. 2. If problem persists, replace auxiliary battery. 3. If problems persists, replace system board. |
| Hard disk xx failure (or error) | A failure or an error occurred when trying to access the hard drive. | 1. Run ScanDisk. 2. Check disk in DOS and Windows 95. |

Fatal errors emit a beep and may display a FATAL message. Fatal errors indicate severe problems, such as a hardware failure. Fatal errors do not allow the system to resume. Some of the Fatal error beep codes are listed at the end of this section.

**Table 2-2
Fatal Error Messages**

| Message | Description | Beep code |
|-----------------------------|---|-----------|
| CMOS RAM test failed | A walking bit test of CMOS RAM location 0E (Hex) - 3F (Hex) failed. | 3 |
| DMA controller faulty | A sequential read/write of the transfer count and transfer address registers within the primary and secondary DMA controllers failed. | 4 |
| Faulty DMA page registers | A walking bit read/write of the 16 DMA controller page registers starting at location 80 Hex failed. | 0 |
| Faulty refresh circuits | A continuous read/write test of port 61h found that bit 4 (Refresh Detect) failed to toggle within an allotted amount of time. | 1 |
| Interrupt controller failed | A sequential read/write of various Interrupt Controller registers failed. | 5 |
| ROM checksum incorrect | A checksum of the ROM BIOS does not match the byte value at F000:FFFF. | 2 |
| RAM error at location xxxx | RAM error occurred during memory test. | None |

*Beep codes are defined in Table 2-3.

**Table 2-3
Fatal Error Beep Codes**

| Beep Code | Beep Sequence | Description | Recommended Action |
|-----------|-----------------|------------------------------------|---|
| 0 | S-S-S-P-S-S-L-P | The DMA page registers are faulty. | Replace system board. |
| 1 | S-S-S-P-S-L-S-P | The refresh circuitry is faulty. | |
| 2 | S-S-S-P-S-L-L-P | The ROM checksum is incorrect. | |
| 3 | S-S-S-P-L-S-S-P | The CMOS RAM test failed. | |
| 4 | S-S-S-P-L-S-L-P | The DMA controller is faulty. | |
| 5 | S-S-S-P-L-L-S-P | The interrupt controller failed. | |
| 6 | S-S-S-P-L-L-L-P | The keyboard controller failed. | |
| 7 | S-S-L-P-S-S-S-P | Graphics adapter is faulty. | |
| 8 | S-S-L-P-S-S-L-P | Internal RAM is faulty. | Replace memory board or system board if memory on system board is faulty. |

NOTE: S = Short, L = Long, P = Pause

2.5 Compaq Utilities

Compaq Utilities contain several functions that

- Determine if various computer devices are recognized by the system and are operating properly.
- Provide information about the system once it is configured.

Compaq Utilities include the following programs:

- Computer Setup
- Compaq Diagnostics

To access Compaq Utilities:

1. Turn on or restart the computer by clicking Start→Shut Down→Restart the computer.
2. Press **F10** when the blinking cursor appears in the upper-right corner of the display.
3. Select a menu option.

Selecting Computer Setup or Compaq Diagnostics for Windows

The computer features two system management utilities:

- **Computer Setup** is a system information and configuration utility that can be used even when your operating system is not working or will not load. It includes custom settings that are not available in Windows.

To configure a device in Windows NT 4.0, you must use Computer Setup.

- **Compaq Diagnostics for Windows** is a system information and diagnostic utility that is used within the Windows operating system. Use Compaq Diagnostics for Windows to test system components and to display system information whenever possible.

To configure a device in Windows 95 or 98 use the operating system itself.

Windows 95 and 98 can be used to add and remove programs, and provide Wizards to ensure proper device drivers are installed. Diagnostics for Windows is NOT a configuration tool and might only test devices that are properly configured by the operating system.

NOTE: It is not necessary to configure a device connected to a USB connector on the computer or an optional docking base.

Using Computer Setup

All information and settings in Computer Setup are accessed from the File, Security, or Advanced menus.

NOTE: Your settings in Computer Setup are not affected by updating the system ROM.

To view information or change a setting in Computer Setup:

1. Turn on or restart the computer. When the blinking cursor appears in the upper-right corner of the screen, press **F10**.
 - To change the language, press **F2**.
 - To view navigation information, press **F1**.
 - To return to the Computer Setup menu from anywhere in Computer Setup, press **Esc**.
2. Select the File, Security, or Advanced menu.
3. To close Computer Setup and restart the computer
 - Select File→Ignore Changes and Exit, then press **Enter**.
 - or
 - Select File→Save Changes and Exit, then press **Enter**.
4. To confirm your choice, press **F10**.

File Menu

| Begin here | To do this |
|-------------------------|--|
| System information | <ul style="list-style-type: none">■ View identification information about the computer, docking base, and battery packs.■ View specification information about the processor, memory and cache size, and ROM date and family. |
| Save to floppy | Save system configuration to a diskette. |
| Restore from floppy | Restore system configuration from a diskette. (The diskette contains your personal configuration, so you should restore from the diskette before using the System Recovery CD-ROM.) |
| Restore defaults | Replace configuration settings in Computer Setup with factory default settings. (Identification information is retained.) |
| Ignore changes and exit | Cancel changes entered during the current Computer Setup session, then exit and restart the computer. |
| Save changes and exit | Save changes, then exit and restart the computer. |

Security Menu

| Begin here | To do this |
|---------------------|--|
| Setup password | Enter, change, or delete a setup password. |
| Power-On password | Enter, change, or delete a power-on password. |
| Password options | Enable/disable: <ul style="list-style-type: none">■ QuickLock/QuickBlank.■ Lock keyboard and pointing stick or touchpad at startup. (These features can be enabled only when a power-on password is set.) |
| DriveLock passwords | Enter, change, or delete a DriveLock password. |
| Device security | Enable/disable <ul style="list-style-type: none">■ Ports or diskette drives.■ Diskette write.■ CD-ROM or diskette startup. NOTE: Settings for a DVD-ROM can be entered in the CD-ROM field. |
| System IDs | Enter identification numbers for the computer, a docking base, and battery packs. |

Advanced Menu

| Begin here | To do this |
|--------------------------------|---|
| Language (or press F2) | Change the Computer Setup language. |
| Boot Options | <p>Enable/disable</p> <ul style="list-style-type: none">■ QuickBoot, which starts the computer more quickly by eliminating some startup tests. (If you suspect a memory failure and want to test memory automatically during startup, you may want to disable QuickBoot.) <p>MultiBoot, which enables you to set a startup sequence that can include any drives in the system.</p> |
| Device Options | <ul style="list-style-type: none">■ Enable/disable the embedded numeric keypad at startup.■ Enable/disable multiple standard pointing devices at startup. When this feature is disabled, only one pointing device is activated at startup.■ Enable/disable USB legacy support for one USB mouse and one USB keyboard. (When USB legacy support is enabled, the keyboard and mouse work without a loaded USB driver.)■ Set an optional external monitor or overhead projector connected to a video card in a docking base as the primary device. (When the computer display is set as secondary, the computer must be shut down before undocking.)■ Set video-out mode to NTSC (default), NTSC-J, PAL, or PAL-M. <p>Change the parallel port mode to or from EPP, standard, bidirectional, or ECP.</p> |

Using Compaq Diagnostics for Windows

1. Access Compaq Diagnostics for Windows by selecting Start→Settings→Control Panel→Compaq Diagnostics.
2. To select a category, choose one of two methods:
 - Select the Categories menu, then select a category from the drop-down list.
 - Select a category icon on the toolbar.
3. To run diagnostic tests
 - a) Select the Test tab.
 - b) In the scroll box, select the category or device you want to test.
 - c) Select the Quick, Complete, or Custom test type.
 - d) Select the Interactive or Unattended test mode.
 - e) Select the Begin Testing button.
 - f) View test information by selecting a report from the Status, Log, or Error tab.
4. To print the information or save it to a drive, select the File menu, then select Print or Save As.
5. To exit, select the File menu→Exit.

Factory Default Settings

**Table 2-4
Initialization**

| | |
|--------------------------|---|
| Enable POST Memory Test | Checked (enabled) |
| Keyboard Num Lock | Unchecked (Off) |
| Hard drive boot sequence | |
| 1 | Hard drive in the computer MultiBay |
| 2 | Hard drive in the computer hard drive bay |
| 3 | Hard drive in the expansion base or convenience base half-height/MultiBay |
| 4 | Hard drive in the expansion base or convenience base MultiBay |
| Boot display | Auto |
| Language | Language of country |

**Table 2-5
Ports**

| | |
|---------------|------------|
| Serial port | 3F8, IRQ4 |
| Infrared port | 2F8, IRQ9 |
| Parallel port | 378, IRQ7 |
| Ethernet port | 300, IRQ11 |

**Table 2-6
Power**

| | |
|--|---|
| Low Battery Warning Beep | Checked (enabled) |
| External Energy Saving Monitor Connected | Unchecked (not connected) |
| Power Management | |
| Enabled | While operating on battery power |
| Conservation Level | High |
| Level Definition | |
| High | Suspend Time: 3 minutes Hibernation Timeout: Immediate Drive Timeout: 1 minute Screen Timeout: 1 minute |
| Medium | Suspend Time: 5 minutes Hibernation Timeout: 1 hour Drive Timeout: 2 minutes Screen Timeout: 3 minutes |
| Custom | Suspend Time: disabled Hibernation Timeout: low battery Drive Timeout: always on Screen Timeout: always on |

**Table 2-7
Security**

| | |
|-------------------------------|----------------------|
| Enable QuickLock/QuickBlank | Unchecked (Disabled) |
| Enable Power-On Password | Unchecked (Disabled) |
| Disable Serial/Infrared Ports | Unchecked (Enabled) |
| Disable Parallel Port | Unchecked (Enabled) |
| Disable PC Card Slots | Unchecked (Enabled) |
| Setup Password | Password blank |
| Power-On Password | Password blank |
| Diskette Drives | |
| Disable Diskette Drives | Unchecked (Enabled) |
| Disable Diskette Boot | Unchecked (Enabled) |

2.6 Troubleshooting Without Diagnostics

This section provides information about how to identify and correct some common hardware, memory, and software problems. It also explains several types of messages that may be displayed on the screen.

Since symptoms can appear to be similar, carefully match the symptoms of the computer malfunction against the problem description in the Troubleshooting tables to avoid a misdiagnosis.

Before Replacing Parts

When troubleshooting a problem, check the following items for possible solutions before replacing parts:

- Verify that cables are connected properly to the suspected defective parts.
- Verify that all required device drivers are installed.
- Verify that all printer drivers have been installed for each application.

Obtaining Update Information with Info Messenger

Compaq Info Messenger allows you to set a customized search of the Compaq Web site. By registering for this utility, you can stay up to date with software and hardware information specific to your system.

- To access Compaq Info Messenger, go to www.compaq.com and select Info Messenger.
- To register, follow the instructions on the Info Messenger page. When your registration is complete, you can
 - Implement your customized search whenever you prefer from the Info Messenger page.
 - Set Info Messenger to send you the information by email as it becomes available.

Info Messenger will also inform you if there are updates to the system ROM for your computer.

Checklist for Solving Problems

If you encounter a minor problem with the computer or software applications, go through the following checklist for possible solutions:

- Is the computer connected to an external power source, or does it have a fully charged battery pack installed?
- Are all cables connected properly and securely?
- Did the diskette drive contain a nonbootable diskette when you turned on the computer?
- Have you installed all the needed device drivers? For example, if you are using a mouse, you may need to install a mouse device driver.
- Are printer drivers installed for each application?

Eliminating the typical problems described in this Troubleshooting section may save you time and money. If the problem appears related to a software application, check the documentation provided with the software. You may discover something you can resolve easily by yourself.

If the condition persists, contact your Compaq authorized dealer or service provider.

Table 2-8
Solving Audio Problems

| Problem | Possible Cause | Solution |
|---|---|---|
| Computer does not beep after the Power-On Self-Test (POST). | System beeps have been turned down. | Use the Fn+F5 hotkeys to turn up the system volume. |
| Internal speaker does not produce sound when an external audio source is connected to the stereo line-jack. | Volume may be turned off or set too low. | <ul style="list-style-type: none"> ■ Adjust the overall volume by pressing the Fn+F5 hotkeys. ■ Adjust the sliding mixer controls by double-clicking the speaker icon on the Windows taskbar. |
| | Line input may not be connected properly. | Check line input connection. |
| | Headphones or speakers are connected to the stereo speaker/ headphone jack, which disables the internal speakers. | Disconnect the head-phones or speakers to enable the internal speakers. |
| | Volume may be muted | Uncheck the mute box in the volume properties. |
| External microphone does not work. | You are using the wrong type of microphone or microphone plug for the computer. | Check to see if you are using a monophonic electret condenser microphone with a 3.5-mm plug. |
| | The microphone may not be connected properly. | Ensure that the micro-phone plug is properly connected to the mono microphone jack. |
| | Sound source not selected. | Ensure that microphone is selected as the recording source in Control Panel → Multimedia and that the recording level is adjusted. |
| | Audio settings are not set correctly. | Check the game program's audio settings. |
| | Volume control on the computer is turned down. | Adjust the computer volume with the Fn+F5 hotkeys. |
| | No sound from headphones | Volume or mixing controls set incorrectly. |
| Sound source not selected. | | Verify that the sound source is selected in Control Panel → Multimedia. |
| The headphones are connected to the wrong jack. | | Check the connection. |
| Volume too low or too loud | | Volume or mixing controls set incorrectly. |

**Table 2-9
Solving Battery/Battery Gauge Problems**

| Problem | Possible Cause | Solution |
|---|---|---|
| Computer is beeping and battery power light is blinking | Battery pack charge is low. | <ul style="list-style-type: none"> ■ Charge the battery pack by connecting to an external power source. ■ Replace the battery pack with another fully charged battery. ■ Initiate Hibernation or turn the computer off until AC power or a fully charged battery is available. |
| Computer battery charge light blinks to indicate low battery condition, but computer does not beep. | Volume turned down too low. | Turn up the volume using the Fn+F5 hotkeys. |
| Battery pack will not charge. | Battery pack was exposed to temperature extremes. | Allow time for the battery pack to return to room temperature. |
| | Battery pack is already charged. | No action required. |
| | Battery pack has exceeded its useful life cycle. | Use a different battery pack. |
| Computer shut down and memory was lost when replacing the battery pack. | Hibernation was not initiated before removing the battery pack. | Work is lost. |
| Battery charge does not last very long. | Battery is exposed to higher temperatures. | Put the computer in a cooler place and recharge the battery pack. |
| | Battery is exposed to extremely cold temperatures. | Put the computer in a warmer place and recharge the battery pack. NOTE: The recommended operating temperature range for the battery is from 10°C to 40°C (50°F to 104°F). The recommended storage temperature range for the battery is from 0°C to 30°C (32°F to 86°F). |
| | Battery conservation is disabled or set to drain. | Reset the battery conservation level. |
| | An external device is draining the battery. | Turn off or remove any external device or PC Cards when not in use. |
| | Battery gauge may be inaccurate and require recalibration. | Recalibrate the gauge. |
| | | |
| Date and time must be set every time computer is turned on. | The Real Time Clock battery has reached the end of its useful life. | <ul style="list-style-type: none"> ■ Restore power, then turn on the computer with the power switch. ■ Contact your Compaq authorized service provider to replace the Real Time Clock battery. |
| Battery gauge seems inaccurate. | The battery pack may need calibration. | Recalibrate the battery. |
| | The battery pack has reached the end of its useful life. | Replace the battery pack. |
| Battery pack is warm after charging. | Warming occurs during charging. | No action required. |

Table 2-10
Solving Compact Disc and DVD-ROM Problems

| Problem | Possible Cause | Solution |
|--|---|---|
| Drive cannot read a disc | Disc is not properly seated in the drive. | Open the loading tray, insert the disc, then close the tray. |
| | Disc is loaded in the loading tray upside down. | Open the loading tray, turn over the disc (label facing up), then close the tray. |
| | Disc has a scratch on its surface. | Insert a different disc. |
| CD-ROM drive or DVD-ROM drive is not detected by the computer. | Drive is not connected properly. | If you are running a version of Windows that was pre-installed by Compaq, remove the drive from the MultiBay and reinsert it. |
| | | If you are running a version of Windows that was not pre-installed by Compaq, turn off the computer. Then remove the drive from the MultiBay and reinsert it. |

Table 2-11
Solving Diskette Drive/SuperDisk LS-120 Drive Problems

| Problem | Possible Cause | Solution |
|---|---|--|
| Drive cannot write to a diskette. | Diskette is not formatted. | Format the diskette: If you are using Windows 95 or Windows 98: 1. From the Windows desktop, select My Computer. 2. Select 3.5-in. Floppy (A). 3. Select File, then Format. 4. Fill in the appropriate information, then select Start. If you are using Windows NT 4.0, format the diskette by entering format a: at the system prompt. |
| | Diskette is write-protected. | Use another diskette that is not write-protected or disable the write-protect feature. |
| | Writing to the wrong drive. | Check the drive letter in your path statement. |
| | Not enough space is left on the diskette. | Save the information to another diskette. |
| | Drive is disabled. | Enable the proper drive through Device Manager. |
| | Disable diskette write ability is turned on. | Run Computer Setup. Select the Storage icon. Make sure Disable diskette write ability is not checked. |
| System cannot start up from diskette or SuperDisk LS-120 drive. | A bootable diskette is not in the drive. | Verify that a diskette with the necessary system files is in the drive. |
| | Diskette bootability is disabled in Computer Setup. | Enable diskette bootability in Computer Setup, Security menu. |

**Table 2-12
Solving Hard Drive Problems**

| Problem | Possible Cause | Solution |
|--|---|---|
| Accessing information on the hard drive is much slower than usual. | Hard drive entered low power state due to timeout and is now exiting from it. | Wait for the system to restore the previously saved data to its state prior to initiating a low power state. |
| | Hard drive is fragmented/not optimized or has errors. | Run ScanDisk and Disk Defragmenter. |
| Hard drive does not work. | Hard drive is not seated properly. | Turn off and unplug the computer, remove the hard drive, and reinsert the hard drive. |
| Errors occur after starting from an additional hard drive. | Additional hard drive has not been specially prepared with necessary software. | Boot from the original hard drive or a specially prepared hard drive. |
| System does not recognize a hard drive. | The drive is not seated properly. | Remove, then reinsert the drive. |
| | The drive is damaged. | Try using the hard drive in another bay to verify that the problem is with the drive. Run ScanDisk on the drive. |
| | The drive was inserted while system was on or in Suspend or Hibernation. | Shut down the computer before inserting removing a hard drive. |
| DriveLock settings cannot be accessed in Computer Setup. | The DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer. | Completely turn off the computer. Turn the computer back on, then run Computer Setup by pressing F10 when the blinking cursor light appears upper-right on the screen. |

**Table 2-13
Solving Infrared Problems**

| Problem | Possible Cause | Solution |
|---|---|---|
| Cannot communicate with another computer. | The appropriate software is not running on both computers. | Install the appropriate software on the second device, start the second device, and start the program on both computers. |
| | The other computer does not have an IrDA-compliant infrared port. Your Compaq computer uses the IrDA communications protocol. | Communication between infrared devices must use the same communications protocol. Check the manufacturer's instructions for connecting with infrared devices or try connecting with a device you know to be IrDA-compliant. |
| | The pathway between the infrared ports is obstructed, one port is more than 30 degrees (plus or minus 15 degrees off the center line) from the other, or the ports are more than one meter apart. | Remove the obstruction, align the infrared ports to within 30 degrees, and position computers within 1.5 feet (about 0.5 meter) of each other. |
| | There is an interrupt request (IRQ) conflict. | Check for IRQ conflicts in the Device Manager. If two devices have the same IRQ address, reassign one of the devices. |
| | There is a baud rate conflict. | Select the same baud rate for both computers. |

Continued

Table 2-13 *continued*

| Problem | Possible Cause | Solution |
|---|--|---|
| Cannot communicate with another computer (continued). | There is a conflict with the # bits. | Select the same # bits setting for both computers. |
| | There is a stop byte conflict. | Select the same stop byte for both computers. |
| | There is a parity conflict. | Select the same parity setting for both computers. |
| Cannot transmit data. | Direct sunlight, fluorescent light, or flashing incandescent light is close to the infrared connections. | Remove the interfering light source(s). |
| | There is interference from other wireless devices. | Keep remote control units such as wireless headphones and other audio devices away from the infrared connections. |
| | There is a physical obstruction in the way. | Do not place objects that will interfere with a line-of-sight data transmission between the two units. |
| | One of the units was moved during data transmission. | Do not move either unit during data transmission. |
| | The orientation of the units is wrong. | Adjust the devices so that they point directly at each other. |
| | The distance between the units is too great. | Verify that devices are not more than 1.5 feet (0.5 meter) apart. |
| | Infrared port doesn't work. | Direct sunlight, fluorescent light, or flashing incandescent light is close to the infrared connections. |
| There is interference from other wireless devices. | | Keep remote control units such as wireless headphones and other audio devices away from the infrared connections. |
| IR has been disabled. | | Run IR configuration utility in Control Panel. |

Table 2-14
Solving Keyboard Problems

| Problem | Possible Cause | Solution |
|---|---|---|
| Screen is blank and keyboard is working. | A screen timeout has been initiated.. | Press any key to refresh the screen. |
| | QuickLock/QuickBlank has been initiated | To enable the keyboard and return your information to the screen, enter your power-on password. |
| | LCD has been disabled. | Press Fn+F4 to cycle from external monitor to internal LCD. |
| Embedded numeric keypad on computer keyboard is disabled. | Num Lock function is not turned on | Press Fn+Num Lk to enable the Num Lock function and embedded numeric keypad. |

**Table 2-15
Solving Modem Problems**

| Problem | Possible Cause | Solution |
|---|--|--|
| Modem loses connection. | The cable connection from the phone line to the modem is loose. | Check to make sure the telephone cable is properly connected. |
| | Call Waiting has not been disabled. | Disable Call Waiting: 1. Select Start → Setting → Control Panel → select Modems. 2. From the General tab of the Modems Properties page, select Dialing Properties. From the My Locations tab of the Dialing Properties page, check the box labeled This location has call waiting. Select *70, 70#, or 1170 from the drop-down list to disable call waiting. |
| | There is noise or excessive traffic on the phone line. | Try connecting at a later time. |
| Modem not responding | Modem is not set up correctly in system BIOS. | Check the computer BIOS setup. If it requires specific settings for modems, be sure that they have been enabled. |
| Modem does not dial correctly. | Telephone number is not entered correctly in the modem's dialing software. | <ul style="list-style-type: none"> ■ Make sure the telephone number you dialed is correct if you are using the dialing directory or the terminal mode. ■ Dial 1 if using dialing long distance. ■ The other line could be busy or not answering. ■ Make sure call waiting is disabled. ■ The modem may not recognize an international dial tone. Try the ATX3DT command and the telephone number. |
| Characters are garbled/transfer rates are slow. | There is noise in the telephone line. | <ul style="list-style-type: none"> ■ Check your telephone and modem cable connections. If they are a little loose, they can cause noise on the line. ■ Check with your local telephone company for a phone line filter. |

Continued

Table 2-15 *Continued*

| Problem | Possible Cause | Solution |
|---|---|--|
| Phone line noise causing a disconnection. | Hang-up Delay S Register (S10) set too low. | Change S10 default to 150. To set S10=150: 1. Select Start → Programs → Accessories → HyperTerminal, then go to Command Mode. 2. Type ATS10=150 and press Enter. This command causes the modem to take longer to disconnect even if there is noise on the line. |
| No dial tone | Phone service is not connected to the telephone wall jack. | Verify that service from the local phone company by following these steps: 1. Unplug the telephone cable from the telephone wall jack. 2. Connect a telephone to the jack, pick up the handset, and listen for a dial tone. If there is a dial tone, reconnect the modem to the telephone wall jack with the telephone cable and make sure all connections are secure. 3. If there is still no dial tone, contact your local phone company or building manager. |
| | The modem is not responding to commands from the computer keyboard. | Verify the modem and computer are connected: 1. Select Start → Programs → Accessories → HyperTerminal, then go to Terminal Mode. 2. Type AT and press the Enter key. If the modem displays OK, the modem and computer are working together. If the modem displays ERROR, or does not respond, restart the computer and repeat step 1. 3. Type ATDT and listen for dial tone. 4. Type ATH0 to hang up. |

Continued

Table 2-15 *Continued*

| Problem | Possible Cause | Solution |
|--|---|--|
| Modem does not connect at highest speed. | Line conditions in your area or in the area you are calling may not support the highest connect speeds. | Have your telephone line checked by your local telephone service provider. <hr/> Try dialing an alternate telephone number for the service you are using. |
| | Another device on your telephone line may be causing interference. | Hang up an extension telephone and disconnect any other devices that may be using the same telephone line, then redial. |
| | The service or site called does not support 56K or supports an incompatible 56K implementation. | An internal modem supports K56flex. To find an Internet service provider (ISP) that supports K56flex, go the Compaq Web site at www.compaq.com . |
| | There is noise on the telephone line. | The 56K protocol of an internal modem will fall back to lower speeds if the telephone line is too noisy for a high-speed connection. Try using another telephone line. <hr/> Change the Hang-up Delay S Register: 1. Select Start → Programs → Accessories → HyperTerminal. 2. Go to Command Mode, type <code>ATS10=150</code> , then press Enter. NOTE: This command causes the modem to take longer to disconnect even if there is no noise on the line. |
| | The telephone line does not support 56K implementation. | The 56K protocol requires that the telephone line contain no more than one analog-to-digital conversion. Try connecting from an alternate site. |

Table 2-16
Solving PC Card Problems

| Problem | Possible Cause | Solution |
|--|---|---|
| Computer does not beep when a PC Card is inserted. | PC Card is not inserted properly. | Try reinserting the card. Ensure that the PC Card is inserted in the correct orientation. Insert the card gently to prevent damage to the pins. |
| | Speakers are turned off or volume is turned down. | Adjust the volume control on the computer. |
| | PC Card or card driver is not PCMCIA compliant. | Contact your Compaq authorized dealer, reseller, or service provider for a list of PC Cards tested successfully in Compaq PC Card platforms. |
| Computer beeps only once when a PC Card is inserted. | The computer beeps once to indicate that a PC Card is recognized but not properly configured. | Before a new PC Card can be used, it may be necessary to perform an initial setup procedure. Follow the PC Card manufacturer's instructions for formatting a hard drive card or installing PC Card-specific drivers for a network card. |
| Network PC Card does not work. | Necessary drivers are not installed (turned on). | Refer to the instructions that came with the PC Card or contact the vendor for information on installing the correct drivers. |
| | PC Card is not fully inserted or is upside down. | Ensure the PC Card is inserted correctly. |
| | Network PC Card or driver is not PCMCIA compliant. | Contact your Compaq authorized dealer, reseller, or service provider for a list of PC Cards tested successfully in Compaq PC Card platforms. |
| Storage PC Card does not work. | SRAM and flash memory PC Cards require the memory card driver to be loaded. | Memory cards can only be accessed using DOS real mode drivers. |
| | You are trying to access the storage PC Card using the wrong drive letter. | If you are running Windows 95, change the drive letter assignment in Device Manager. If you are running Windows NT 4.0, change the drive letter assignment through the Control Panel. |
| | The PC Card is not formatted. | For memory cards, run MCFORMAT in MS-DOS Mode to format the PC Card. For ATA cards, run ATAINIT, then run MCFORMAT in MS-DOS Mode to format the PC Card. |
| | The card is not supported. | Contact your Compaq authorized dealer, reseller, or service provider for a list of PC Cards tested successfully in Compaq PC Card platforms. |
| | Storage cards, such as SRAM, do not work in the expansion base. | Use the storage card in the computer. |

**Table 2-17
Solving Power Problems**

| Problem | Possible Cause | Solution |
|---|--|--|
| Computer will not turn on. | Battery is discharged and computer is not connected to a power source. | <ul style="list-style-type: none"> ■ Charge the battery pack. ■ Replace the battery pack. ■ Connect the computer to an external power source. |
| | Battery is discharged and cables to the external power source are unplugged. | Ensure that cables connecting the computer and the external power source are plugged in properly. |
| Computer turned off while it was left unattended. | Computer initiated because of a critical low battery condition. | <ul style="list-style-type: none"> ■ Charge the battery pack. ■ Replace the battery pack. ■ Connect the computer to an external power source. |
| | The computer initiated Hibernation after a user-defined timeout expired. | Turn on the computer. |

**Table 2-18
Solving Screen Problems**

| Problem | Possible Cause | Solution |
|---|--|--|
| Characters on computer display are dim. | Computer is in direct light. | Move the computer or adjust the screen. |
| | The brightness control is not set properly. | Adjust the brightness control by pressing the Fn+F10 hotkeys. |
| | You may have a screen saver or screen blanking utility installed. | Press any key to refresh the screen. |
| | Screen timeout was initiated. | Press any key to light the screen. |
| | System initiated Suspend after a user-defined timeout expired. | Press the suspend button to exit Suspend. |
| | Computer initiated a low battery Suspend or Hibernation. | <ul style="list-style-type: none"> ■ Replace the battery pack and exit Suspend or Hibernation. ■ Connect the computer to an external power source and exit Suspend or Hibernation. |
| | Power Management, which controls Suspend and Hibernation, is disabled and the battery pack has discharged. | <ul style="list-style-type: none"> ■ Replace the battery pack and turn on the computer. ■ Connect the computer to an external power source and turn on the computer. |
| Computer screen is blank and external monitor displays information. | Display was switched to the external monitor. | Press Fn+F4 to display information on the computer screen; press Fn+F4 again to display information simultaneously on both screens. |
| | Display switch is stuck. | Tap the switch. |
| Fn+F4 hotkey combination does not switch between internal and external displays. | CRT or other display device is not connected properly. | Check your connections to ensure that an external device is connected properly. |

Table 2-19
Solving USB Problems

| Problem | Possible Cause | Solution |
|--|---|---|
| External device connected to a USB connector does not work. | The operating system limits external devices connected by USB to two tiers which can include no more than two hubs on the first tier and no more than one keyboard and one pointing device on the first or second tier. | Reduce the number of connected external USB devices to no more than two hubs on the first tier, and no more than one keyboard and one pointing device on the first or second tier. |
| External device connected to USB connector does not work during startup (before Windows 95 loads). | During startup, only two tiers are supported by the USB port. These tiers can include no more than two hubs on the first tier and no more than one keyboard and one pointing device on the first or second tier. | Use the external device only after Windows 95 or Windows 98 has loaded. Reduce the number of connected external USB devices to no more than two hubs on the first tier, and no more than one keyboard and one pointing device on the first or second tier. |
| External devices in lower tiers do not work. | An unpowered hub is connected to another unpowered hub. | Use only powered hubs. Make sure that all unpowered hubs are immediately preceded by powered hubs in the USB chain. |

chapter 3

ILLUSTRATED PARTS CATALOG

This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers for the Compaq Armada M700 Series of Personal Computers.

3.1 Serial Number Location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer (Figure 3-1).



Figure 3-1. Serial Number Location

3.2 Computer System Major Components

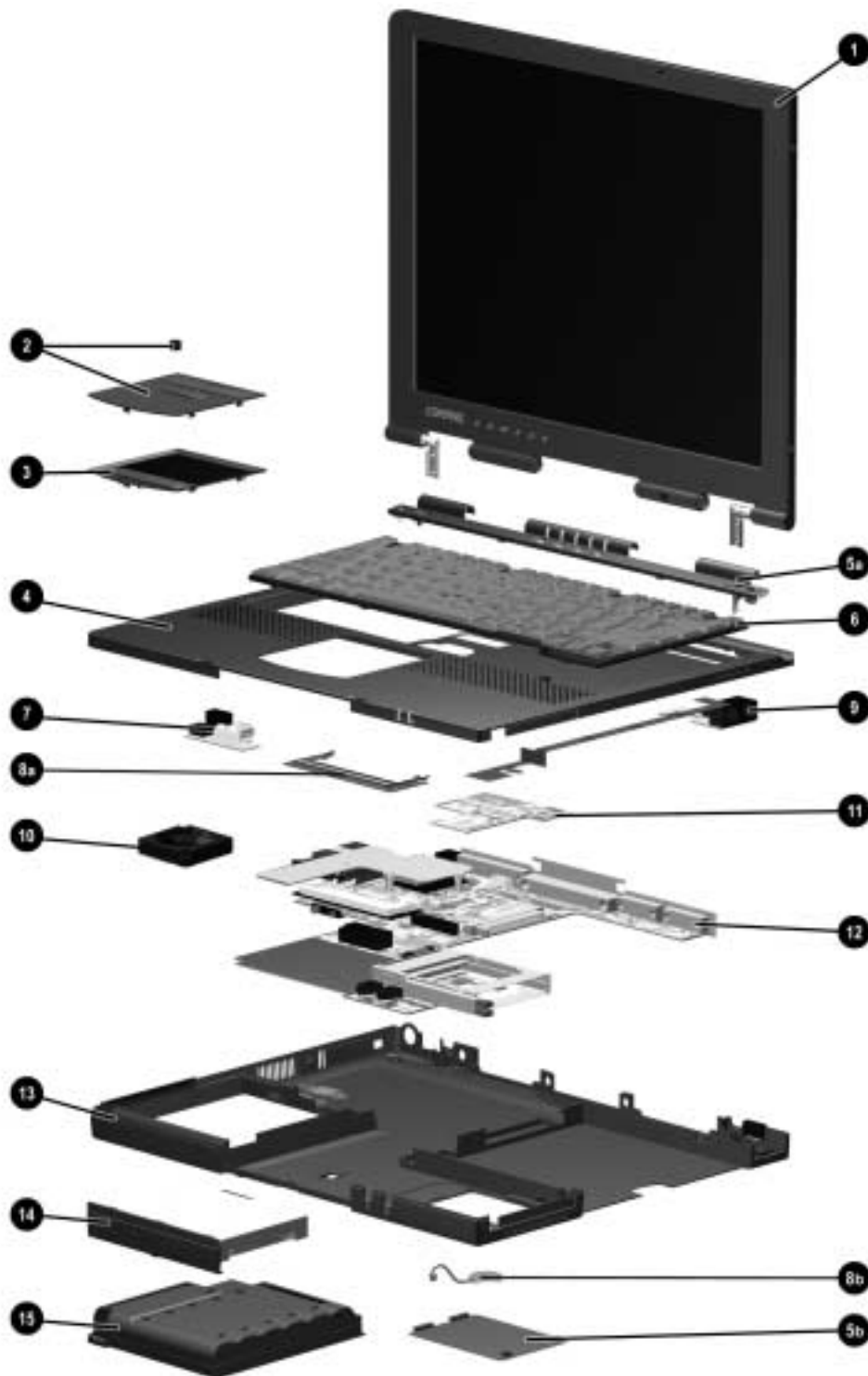
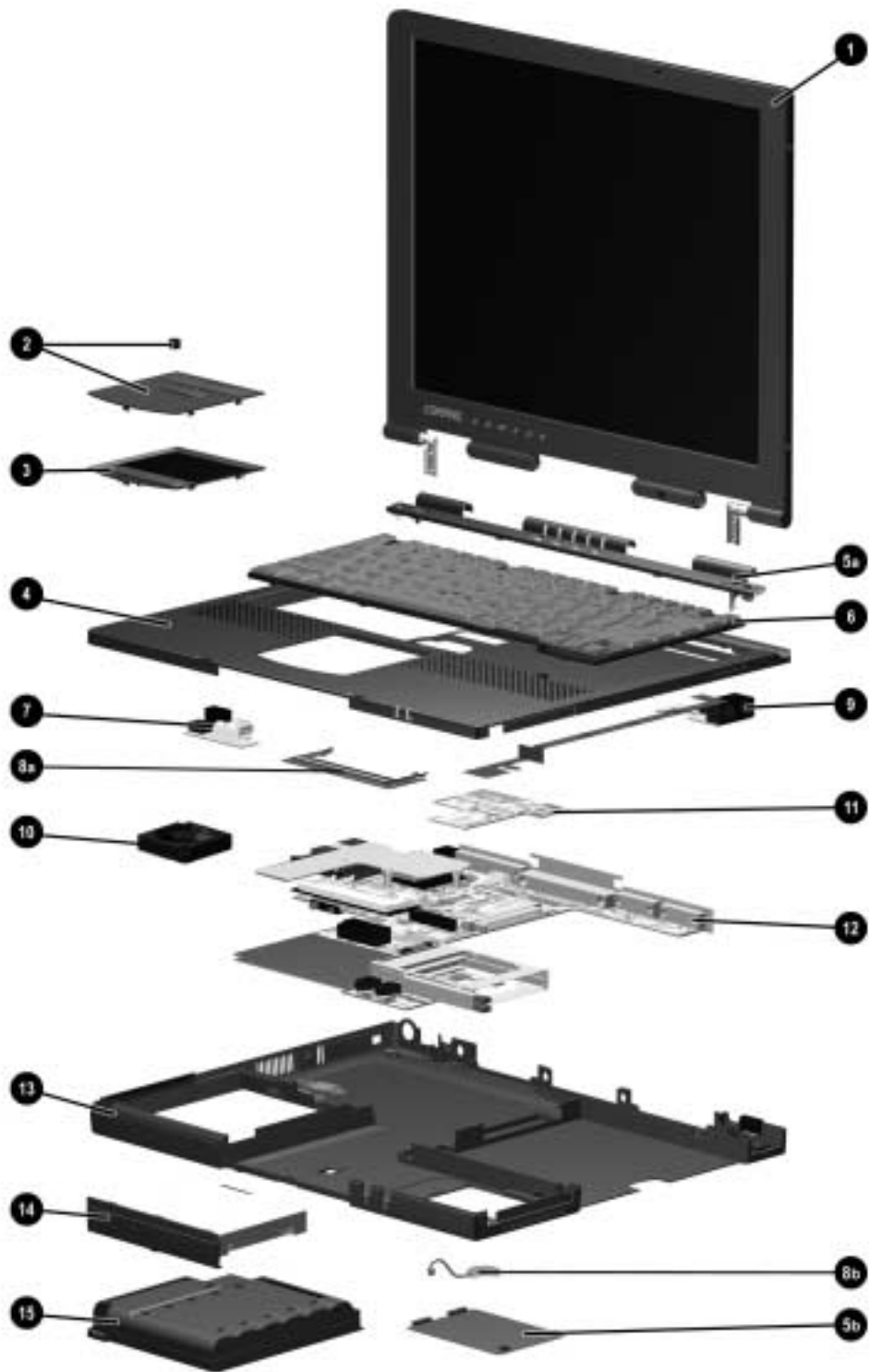


Figure 3-2. Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components

| Item | Description | Spare Part Number | | | | |
|-------------|--|---|-----------------------------|------|--------------|------|
| 1 | Display assembly | | | | | |
| | 14.1-inch, XGA, CTFT | 135219-001 | | | | |
| | 13.3-inch, XGA, CTFT | 135218-001 | | | | |
| 2 | Touch button with TouchPad | 173721-001 | | | | |
| 3 | Touch button | 135226-001 | | | | |
| 4 | Top cover | | | | | |
| | includes LED board and Internet buttons; used with the following SKUs: | 192999-001 | | | | |
| | 470011-XXX | 215198-XXX | 215199-XXX | | | |
| | 206645-XXX | 206646-XXX | 206647-XXX | | | |
| | includes LED board; used with the following SKUs: | 176468-001 | | | | |
| | 205857-XXX | 205858-XXX | 205859-XXX | | | |
| | 205860-XXX | 205862-XXX | 215191-XXX | | | |
| | 215197-XXX | 205861-XXX | | | | |
| | does not include LED board; used with the following SKUs: | 135224-001 | | | | |
| | 124898-XXX | 124899-XXX | 124938-XXX | | | |
| | 124939-XXX | 124940-XXX | 124941-XXX | | | |
| | 139114-XXX | 139116-XXX | 139117-XXX | | | |
| | 139120-XXX | 140141-XXX | 140142-XXX | | | |
| | 164462-XXX | 400322-XXX | 400323-XXX | | | |
| | 400324-XXX | 400325-XXX | 400326-XXX | | | |
| | 400327-XXX | 400328-XXX | 400329-XXX | | | |
| | 400330-XXX | 400331-XXX | 400332-XXX | | | |
| | 400333-XXX | | | | | |
| | | Plastics Kit, includes: | 135230-001 | | | |
| | 5a | Switch cover (2) | not illustrated: | | | |
| 5b | Modem cover | mini PCI dummy card | | | | |
| | | display screw covers (4) | left & right display covers | | | |
| | | infrared lens | computer feet (4) | | | |
| | | power switch | PC Card dummy cards (2) | | | |
| | | | RJ-11 & RJ-45 covers | | | |
| 6 | Keyboard - TouchPad model | 125788-XX1 | | | | |
| | Belgian | -181 | Italian | -061 | Spanish | -071 |
| | Brazilian | -201 | Japanese | -291 | Swedish | -101 |
| | Danish | -081 | Korean | -AD1 | Swiss | -111 |
| | French | | Latin American | | Taiwanese | -AB1 |
| | Canadian | -121 | Spanish | -161 | U.K. English | -031 |
| | French | -051 | Norwegian | -091 | U.S. English | -001 |
| | German | -041 | Portuguese | -131 | | |
| | International | -021 | | | | |
| | Keyboard - EasyPoint IV model | | 125788-XX2 | | | |
| | Arabic | -172 | International | -022 | Spanish | -072 |
| | Belgian | -182 | Italian | -062 | Swedish | -102 |
| | Brazilian | -202 | Japanese | -292 | Swiss | -112 |
| | Danish | -082 | Korean | -AD2 | Taiwanese | -AB2 |
| | French | | Latin American | | Turkish | -142 |
| | Canadian | -122 | Spanish | -162 | U.K. English | -032 |
| | French | -052 | Norwegian | -092 | U.S. English | -002 |
| | German | -042 | Portuguese | -132 | | |
| | 7 | USB board assembly (includes mouse connector and video connector) | 135229-001 | | | |

Continued

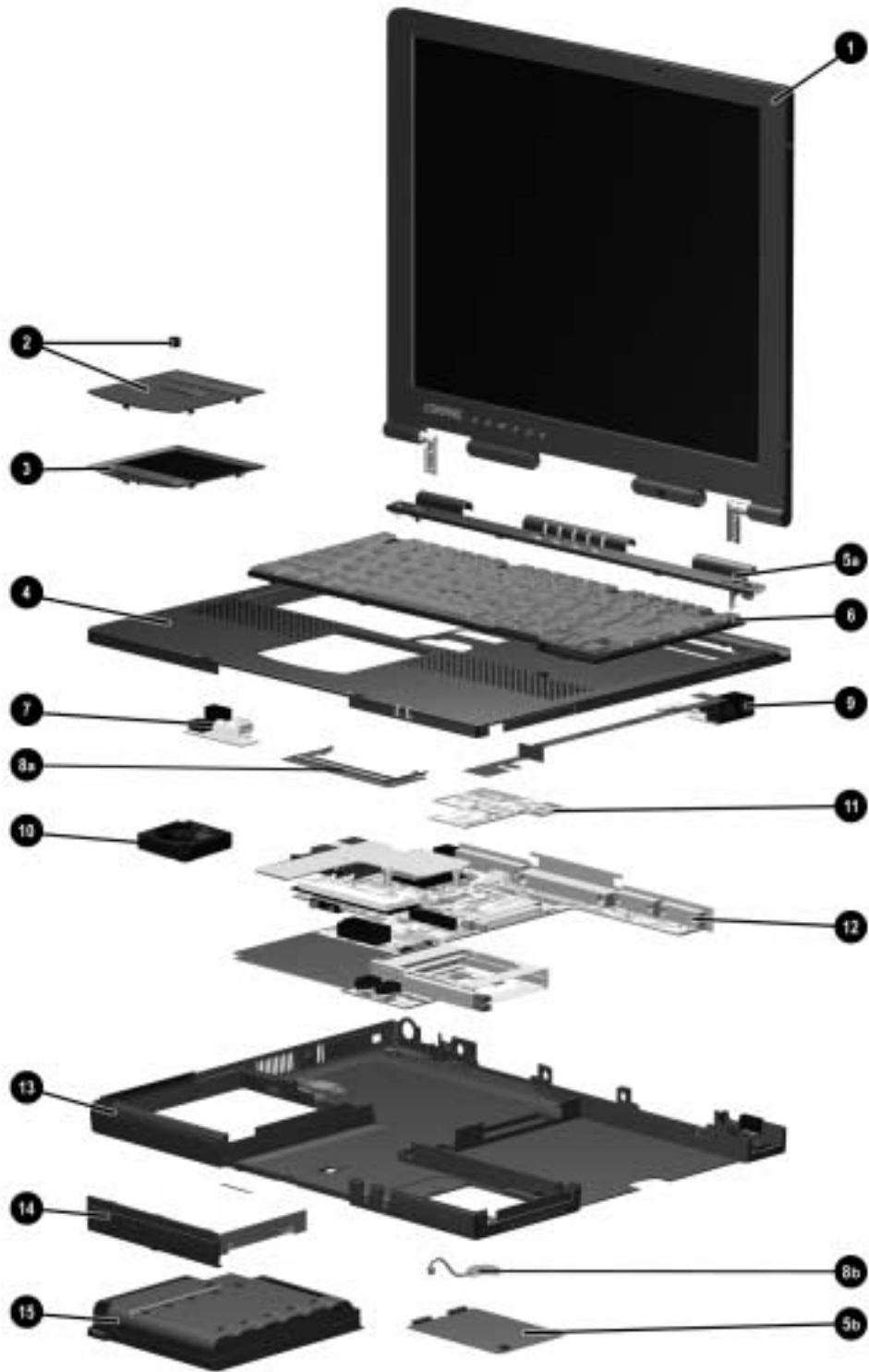


Computer System Major Components (continued)

Table 3-1 *continued*

| Item | Description | Spare Part Number |
|-------------|--|--|
| | Cable Kit, includes: | 152605-001 |
| 8a | RAM board | not illustrated: |
| 8b | Real time clock (RTC) battery | microphone assembly microphone cable speaker cable |
| 9 | Infrared board (includes RJ-11 and RJ-45 jacks) | 135228-001 |
| 10 | Fan | 135222-001 |
| 11 | Voltage converter board used with the following SKUs: | 215375-001 |
| | 470011-XXX 215199-XXX 215198-XXX | |
| | 215191-XXX 215197-XXX | |
| | used with the following SKUs: | 171803-001 |
| | 139114-XXX 140141-XXX 205858-XXX | |
| | 139116-XX2 140142-XXX 205860-XXX | |
| | 139116-XX6 159695-XXX 205861-XXX | |
| | 139116-XX8 159696-XXX 205862-XXX | |
| | 139117-XXX 159697-XXX 206645-XXX | |
| | 139120-XXX 205857-XXX 206647-XXX | |
| | used with the following SKUs: | 135220-001 |
| | 124898-XXX 152550-XXX 400327-XXX | |
| | 124899-XXX 164462-XXX 400328-XXX | |
| | 124938-XXX 400322-XXX 400329-XXX | |
| | 124939-XXX 400323-XXX 400330-XXX | |
| | 124940-XXX 400324-XXX 400331-XXX | |
| | 124941-XXX 400325-XXX 400332-XXX | |
| | 149207-XXX 400326-XXX 400333-XXX | |
| | 149208-XXX | |
| 12 | System board (includes processor assembly) supports Intel Mobile Pentium III 1-GHz with MMX technology; used with SKUs 470011-XXX. | 231788-001 |
| | supports Intel Mobile Pentium III 900-MHz with MMX technology; used configure-to-order (CTO) SKUs. | 231789-001 |
| | supports Intel Mobile Pentium III 850-MHz with MMX technology; used with SKUs 215198-XXX and 215199-XXX. | 212873-001 |
| | supports Intel Mobile Pentium III 800-MHz with MMX technology; used configure-to-order (CTO) SKUs. | 212872-001 |
| | supports Intel Mobile Pentium III 750-MHz with MMX technology; used with SKUs 206645-XXX, 206646-XXX, and 206647-XXX. | 192277-001 |
| | supports Intel Mobile Pentium III 700-MHz with MMX technology; used with the following SKUs: | 171805-001 |
| | 205860-XXX 205861-XXX 205862-XXX | |
| | 215191-XXX 215197-XXX | |
| | supports Intel Mobile Pentium III 650-MHz with MMX technology; used with SKUs 205857-XXX, 205858-XXX, and 205858-XXX. | 171804-001 |
| | supports Intel Mobile Pentium III 600-MHz with MMX technology; used configure-to-order (CTO) SKUs. | 191747-001 |
| | supports Intel Mobile Pentium III 500-MHz with MMX technology; used with SKUs 139114-XXX, 139116-XXX, and 140141-XXX. | 159758-001 |

Continued



Computer System Major Components (continued)

Table 3-1 *continued*

| Item | Description | Spare Part Number |
|-------------|--|--|
| 12 | System board (continued; includes processor assembly) supports Intel Mobile Pentium III 450-MHz with MMX technology; used with the following SKUs: 139117-XXX 139120-XXX 140142-XXX 159696-XXX 159697-XXX 159695-XXX | 159757-001 |
| | supports Intel Mobile Pentium II 400-MHz with MMX technology; used with the following SKUs: 124939-XX2 124940-XX4 124941-XX6 400322-XX6 400323-XX6 400324-XX4 400325-XXX 400326-XX2 400327-XX2 | 135215-001 |
| | supports Intel Mobile Pentium II 366-MHz with MMX technology; used with the following SKUs: 124898-XX2 124899-XX4 124938-XX6 149207-XXX 149208-XXX 152550-XXX 164462-XXX 400328-XX6 400329-XX6 400330-XX4 400331-XX4 400332-XX2 400333-XX2 | 135216-001 |
| 13 | CPU base enclosure (includes modem cover); used with the following SKUs: 470011-XXX 215199-XXX 215198-XXX 215191-XXX 215197-XXX | 215374-001 |
| | does not include modem cover; used with all other SKUs. | 135225-001 |
| 14 | Hard drive 30.0 GB 20.0 GB 18.0 GB 12.0 GB 10.0 GB 6.4 GB 6.0 GB; used only with SKUs 205857-XXX and 205858-XXX | 231790-001 216541-001 219134-001 159759-001 143471-001 and 216396-001 135217-001 190763-001 |
| 15 | Battery pack 8-cell Li ion 6-cell Li ion | 230608-001 and 135214-002 135213-002 |
| | AC Adapter, 50W (not illustrated) | 163444-001 |
| | Power Cord (not illustrated) | 246959-XXX |
| | Australian -011 Italian -061 Swiss -AG1 | |
| | Danish -081 Japanese -291 U.K. English -031 | |
| | Europe, Middle East, Africa -021 Korean -AD1 U.S. English -001 | |

3.3 Plastics Kit Components

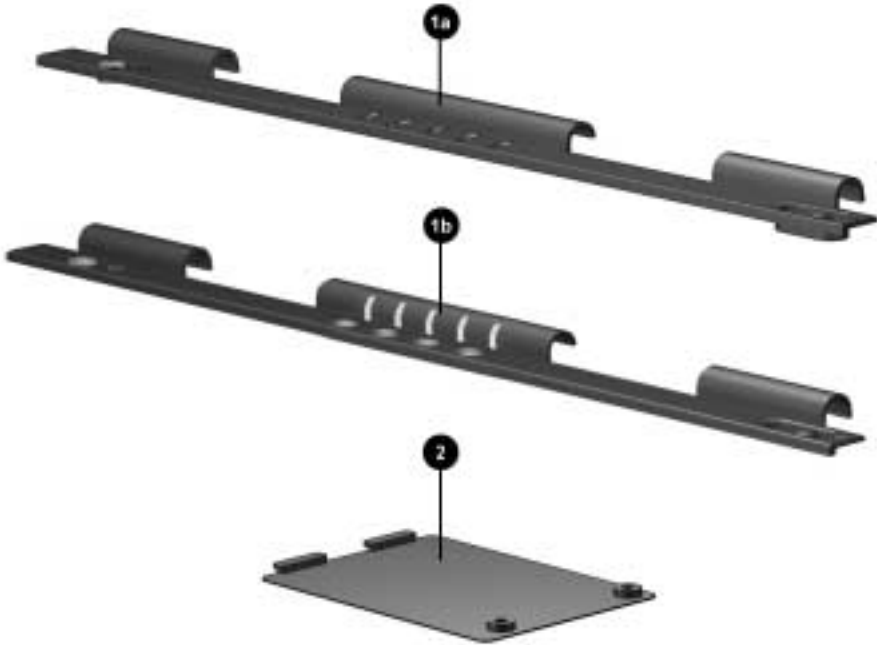


Figure 3-3. Plastics Kit Components

Table 3-2
Plastics Kit Components
Spare Part Number 135230-001

| Item | Description |
|------|---|
| 1a | Switch cover without Easy Access buttons; used with the following SKUs: 124898-XXX 149208-XXX 400322-XXX 124899-XXX 152550-XXX 400323-XXX 124938-XXX 159695-XXX 400324-XXX 124939-XXX 159696-XXX 400325-XXX 124940-XXX 159697-XXX 400326-XXX 124941-XXX 164462-XXX 400327-XXX 139114-XXX 205860-XXX 400328-XXX 139116-XXX 205861-XXX 400329-XXX 139117-XXX 205862-XXX 400330-XXX 139120-XXX 205857-XXX 400331-XXX 140141-XXX 205858-XXX 400332-XXX 140142-XXX 205859-XXX 400333-XXX 149207-XXX |
| 1b | Switch cover with Easy Access buttons; used with the following SKUs: 470011-XXX 206647-XXX 215198-XXX 206645-XXX 215191-XXX 215199-XXX 206646-XXX 215197-XXX |
| 2 | Modem cover not illustrated: Mini PCI dummy card Display screw covers (4) Infrared lens Power switch RJ-11 & RJ-45 covers Left & right display covers Computer feet (4) PC Card dummy cards (2) |

3.4 Cable Kit Components



Figure 3-4. Cable Kit Components

**Table 3-3
Cable Kit Components
Spare Part Number 152605-001**

| Item | Description |
|-------------|--|
| 1 | RAM board |
| 2 | Real time clock (RTC) battery |
| | not illustrated: microphone assembly microphone cable speaker cable |

3.5 Mass Storage Devices

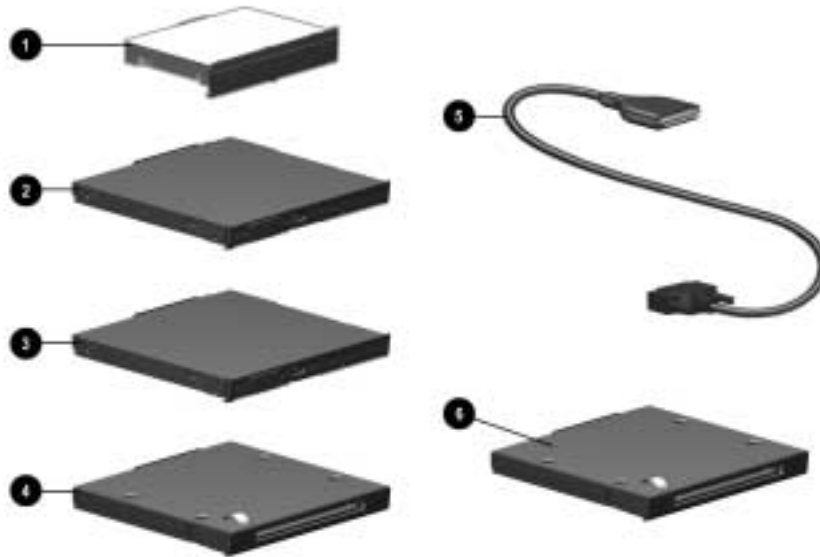


Figure 3-5. Mass Storage Devices

Table 3-4
Spare Parts: Mass Storage Devices

| Item | Description | Spare Part Number |
|--------|---|------------------------------|
| 1 | Hard drive | |
| | 30.0 GB | 231790-001 |
| | 20.0 GB | 216541-001 |
| | 18.0 GB | 219134-001 |
| | 12.0 GB | 159759-001 |
| | 10.0 GB | 143471-001 and 216396-001 |
| 6.4 GB | 6.4 GB | 135217-001 |
| | 6.0 GB; used only with SKUs 205857-XXX and 205858-XXX | 190763-001 |
| 2 | 24-speed Max CD-ROM drive | 315082-002 |
| | 20-speed Max CD-RW drive (not illustrated) | 153992-001 |
| 3 | 8-speed Max DVD-ROM drive | 173949-001 |
| | 4-speed Max DVD-ROM drive | 102266-001 |
| 4 | Diskette drive, 1.44-megabyte, 3.5-inch | 135233-001 |
| | Diskette drive cradle (not illustrated) | 175375-001 |
| 5 | Diskette drive cable | 135232-001 |
| 6 | LS-120 SuperDisk drive (available as an option only) | 327456-003 |

3.6 Miscellaneous

Table 3-5
Spare Parts: Miscellaneous (not illustrated)

| Description | Spare Part Number |
|--|--------------------------|
| <i>Armada M700 Maintenance & Service Guide</i> | 158339-001 |
| Battery Charger | 153991-001 |
| Cables | |
| Automobile Power Adapter/Charger cable | 102257-001 |
| Aircraft Power Adapter cable | 102259-001 |
| Composite TV cable | 102260-001 |
| RJ11 modem cable | 165224-001 |
| RJ45 modem cable | 191230-001 |
| Hard Drive Adapter | 153100-001 |
| Logo Kit | 213741-001 |
| Memory expansion board | |
| 256 MB | 167136-001 |
| 128 MB | 135244-001 |
| 64 MB | 135243-001 |
| 32 MB | 135242-001 |
| Miscellaneous Screw Kit | 135231-001 |
| Modems | |
| Mini PCI modem board, V.90, Type-I | 121896-001 |
| Mini PCI combination modem/network interface card (NIC), V. 90, Type-I | 153107-001 |
| Pointing device caps | 176223-001 |
| Return Kit | 135246-001 |

chapter 4

REMOVAL AND REPLACEMENT PRELIMINARIES

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

You will need the following tools to complete the removal and replacement procedures:

- Magnetic Torx T-8 screwdriver (for all screws unless otherwise specified)
- 9/32-inch socket for bushing guides

4.2 Service Considerations

Listed below are some of the considerations that you should keep in mind during disassembly and assembly procedures.

Plastic Parts

Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

IMPORTANT: As you remove each subassembly from the computer, place it (and all accompanying screws) away from the work area to prevent damage.

Cables and Connectors

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Ensure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; they tear easily.



CAUTION: When servicing the computer, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can damage the computer.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer or a removable drive, or loss of information, observe these precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, then shut it down.
- Before removing a diskette drive, CD-ROM drive, SuperDisk LS-120 drive, or a DVD-ROM drive, ensure that a diskette or disc is *not* in the drive. Ensure that the drive tray is closed.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces that have at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- Do not use excessive force when inserting a drive into a drive bay.
- Avoid exposing a hard drive to products that have magnetic fields such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or to liquids.
- If a drive must be mailed, ship it in a suitable form of protective packaging. Shipping the drive in standard packaging may not cushion it from destructive shock, vibration, temperature, or humidity. Place a mailing label with the wording “Fragile: Handle With Care” on the mailer.
- After the hard drive has been removed from the computer, avoid turning the hard drive and tray upside down. The drive is not secured to the tray and can fall out.
- Do not place labels on the ventilation area on the hard drive.
- Heed the labels on the hard drive.

4.4 Preventing Electrostatic Damage

Many electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge may not be affected at all and can work perfectly throughout a normal cycle. Or it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or non-conductive foam.
- Use transporters and conveyers made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground, and that proper materials were selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-dissipative material (refer to Table 4-2 later in this chapter).
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use field service tools, such as cutters, screwdrivers, and vacuums that are conductive.
- When using fixtures that must directly contact dissipative surfaces, use fixtures made of static-safe materials only.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle them only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Grounding Equipment and Methods

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm $\pm 10\%$ resistance in the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats with banana-plug connectors, connect a wrist strap with alligator clips.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a minimum of one-megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Other grounding equipment recommended for use in preventing electrostatic damage include:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Non-conductive foam
- Conductive tabletop workstations with ground cord of one-megohm resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Non-conductive plastic bags, tubes, or boxes
- Metal tote boxes

Electrostatic Voltage Levels and Protective Materials

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

| Event | Relative Humidity | | |
|---------------------------------|--------------------------|------------|------------|
| | 10% | 40% | 55% |
| Walking across carpet | 35,000 V | 15,000 V | 7,500 V |
| Walking across vinyl floor | 12,000 V | 5,000 V | 3,000 V |
| Motions of bench worker | 6,000 V | 800 V | 400 V |
| Removing DIPS from plastic tube | 2,000 V | 700 V | 400 V |
| Removing DIPS from vinyl tray | 11,500 V | 4,000 V | 2,000 V |
| Removing DIPS from Styrofoam | 14,500 V | 5,000 V | 3,500 V |
| Removing bubble pack from PCB | 26,500 V | 20,000 V | 7,000 V |
| Packing PCBs in foam-lined box | 21,000 V | 11,000 V | 5,000 V |

NOTE: 700 volts can degrade a product.

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

| Material | Use | Voltage Protection Level |
|-----------------------|------------|---------------------------------|
| Antistatic plastic | Bags | 1,500 V |
| Carbon-loaded plastic | Floor mats | 7,500 V |
| Metallized laminate | Floor mats | 15,000 V |

chapter 5

REMOVAL AND REPLACEMENT PROCEDURES

5.1 Serial Number

The computer serial number should be reported to Compaq when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



Figure 5-1. Serial Number Location

5.2 Disassembly Sequence Chart

Use the chart below to determine the section number to be referenced when removing the components from the computer.

| | |
|------|--|
| 5.3 | Disconnecting the Computer |
| 5.4 | Computer Feet |
| 5.5 | Preparing the Computer for Disassembly |
| 5.6 | Battery Packs |
| | Removing a Battery Pack |
| | Inserting a Battery Pack |
| 5.7 | Hard Drives |
| | Removing a Hard Drive |
| | Inserting a Hard Drive |
| 5.8 | MultiBay Devices |
| | Removing MultiBay Devices |
| | Inserting MultiBay Devices |
| | Inserting a Hard Drive in the MultiBay Adapter |
| 5.9 | PC Cards |
| | Removing a PC Card |
| | Inserting a PC Card |
| 5.10 | Modem/Combo Card |
| 5.11 | RTC Battery |
| 5.12 | Keyboard |
| 5.13 | Memory Expansion |
| | Removing a Memory Expansion Board |
| | Installing a Memory Expansion Board |
| 5.14 | Switch Cover |
| 5.15 | Display Assembly |
| 5.16 | Top Cover |
| 5.17 | USB Board |
| 5.18 | Voltage Converter Board |
| 5.19 | Infrared Board |
| 5.20 | System Board |
| 5.21 | Fan |

Figure 5-2. Computer Disassembly Sequence Chart

5.3 Disconnecting the Computer

1. Shut down the computer.
2. Close the computer.
3. Position the computer so the rear panel faces forward.
4. Disconnect the power cord from the AC Adapter ❶ (Figure 5-3).
5. Disconnect the power cord from the wall outlet ❷.
6. Disconnect the AC Adapter cord from the computer ❸.



Figure 5-3. Disconnecting the Computer

7. Turn off and disconnect external devices.

5.4 Computer Feet

The computer feet are oval, adhesive-backed rubber pads. The computer feet are included in the Miscellaneous Plastic Spare Kit.

Install the feet by removing the protective covering from the adhesive back and attaching the feet to the bottom of the computer (Figure 5-4).

NOTE: The front left computer foot adheres to the bottom of the battery pack.



Figure 5-4. Installing the Computer Feet

5.5 Preparing the Computer for Disassembly

1. Shut down the computer.
2. Disconnect the AC Adapter and all external devices connected to the computer.
3. Remove the battery pack from the battery bay (Section 5.6).



CAUTION: Failure to disconnect the AC Adapter from the computer and remove the battery pack before removing and installing internal components can damage the equipment.

4. Remove the hard drive (Section 5.7).
5. Remove MultiBay devices (Section 5.8).

NOTE: MultiBay devices other than MultiBay battery packs may be left inside the MultiBay to provide balance when the computer is open. If installed, remove the MultiBay battery pack.

6. Remove all PC Cards (Section 5.9).

5.6 Battery Packs



WARNING: To reduce the risk of injury or damage to the battery pack, do not crush, puncture, or incinerate the battery pack or short the metal contacts. Do not attempt to open or service the battery pack.

Removing a Primary Battery Pack from the Battery Bay

1. If the computer is turned on, press the suspend button. If there is hard drive or diskette activity, Suspend may not occur immediately. The computer screen clears and the power/suspend light begins to flash when Suspend is initiated.
If the computer is turned off or in Suspend or Hibernation, proceed to Step 2.
2. Close the computer.
3. Tilt the computer at an angle ❶ so the bottom of the computer is accessible (Figure 5-5).
4. Slide the battery release latch toward the back of the computer ❷.
5. Pull the battery pack out of the battery bay ❸.



Figure 5-5. Removing a Battery Pack

Inserting a Primary Battery Pack in the Battery Bay



CAUTION: To prevent damage to the computer, do not insert a battery pack until the computer is fully reassembled.

1. Close the computer.
2. Tilt the computer up ① (Figure 5-6).
3. With the smooth side of the battery pack facing up and the battery cells facing in, lead the rounded edge of the battery pack into the battery bay. Angle the battery pack into the bay until it is fully seated ②.



Figure 5-6. *Inserting a Battery Pack*

4. If the computer is in Suspend, press the suspend button to return to your work. Refer to Section 5.8 for information on removing a MultiBay battery pack.

5.7 Hard Drives

Removing a Hard Drive from the Hard Drive Bay

Before removing a hard drive, back up all information on the hard drive.

1. Save all work, exit all applications, and shut down the computer.
2. Tilt the computer at an angle **1** so the bottom of the computer is accessible (Figure 5-7).
3. If the hard drive has been secured in the hard drive bay with a security screw **2**, remove the screw using the security screwdriver provided with the computer.



Figure 5-7. Removing the Hard Drive Screw

4. Push down on the hard drive bezel on the front of the hard drive ❶ (Figure 5-8).
5. Lift the bezel up 90 degrees to create a handle ❷. Pull the hard drive out of the hard drive bay.

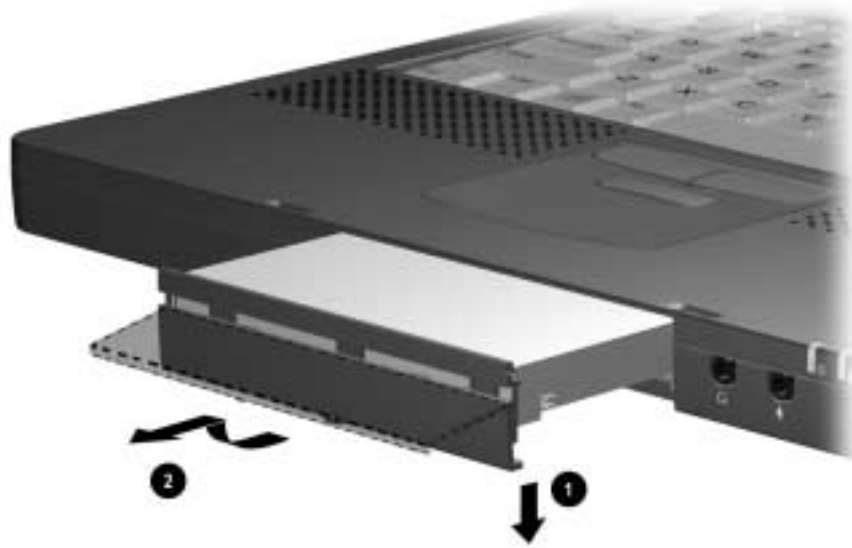


Figure 5-8. Removing the Hard Drive

Inserting a Hard Drive into the Hard Drive Bay

1. With the hard drive bezel pulled down, slide the hard drive into the hard drive bay ❶ until the drive is seated (Figure 5-9).
2. Push up on the hard drive bezel to secure the hard drive in the bay ❷.

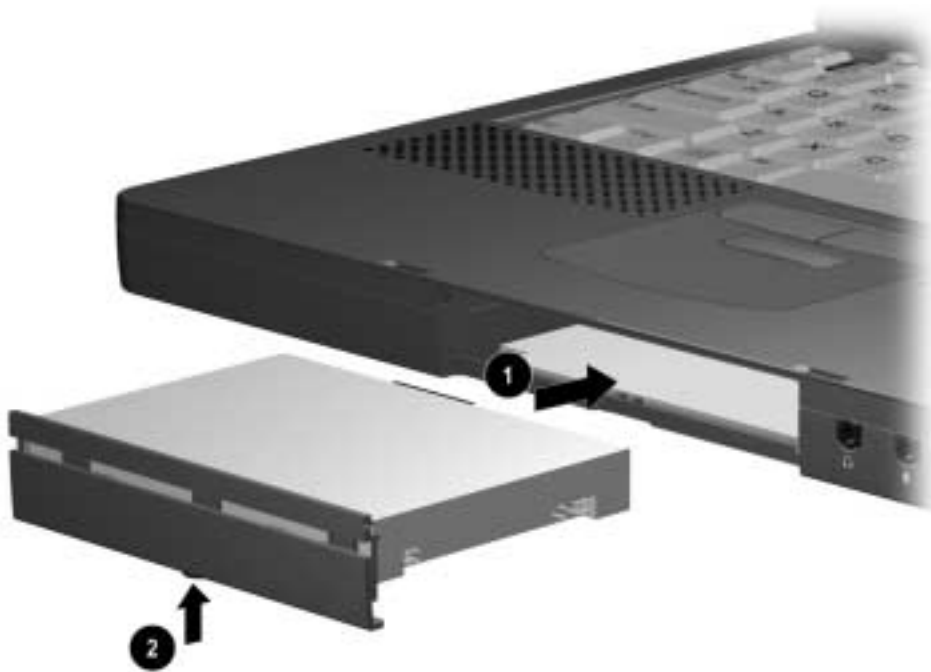


Figure 5-9. Inserting a Hard Drive

3. If the hard drive was secured in the hard drive bay using a security screw, replace the screw.

5.8 MultiBay Devices

Removing MultiBay Devices

1. Save all work, exit all applications, and shut down the computer.
2. Remove the media (diskette, CD-ROM, DVD-ROM) from the drive. Be sure the drive tray is closed.
3. Tilt the computer at an angle ❶ so the bottom of the computer is accessible (Figure 5-10).
4. Slide the MultiBay release latch ❷ forward.
5. Pull the device out of the MultiBay ❸.

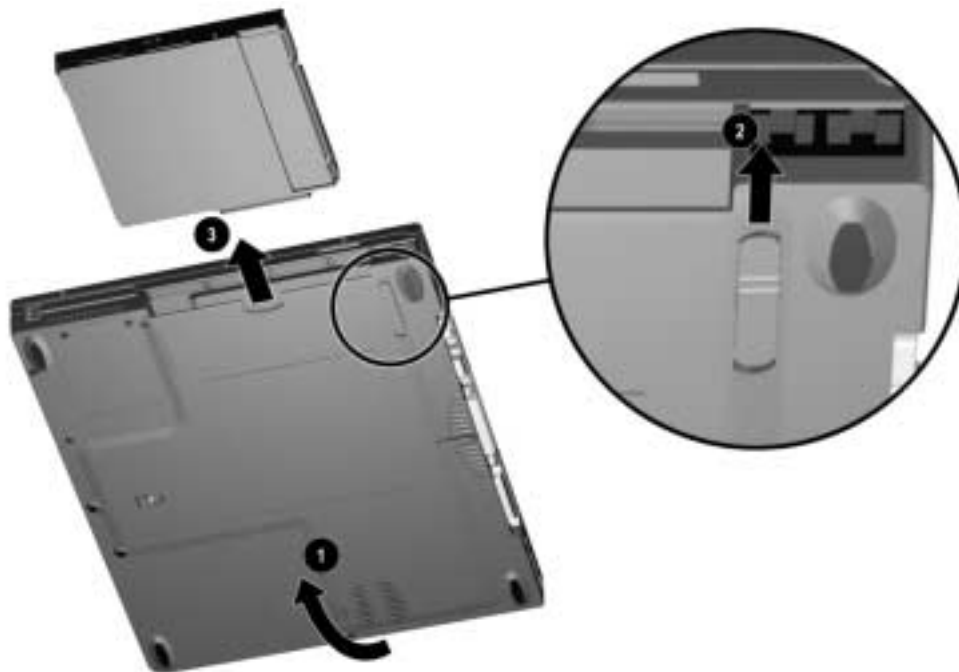


Figure 5-10. Releasing a Device from the MultiBay

NOTE: If you are not inserting another device into the MultiBay, insert the MultiBay weight saver included with the computer.

Inserting MultiBay Devices

1. Remove the media (diskette, CD-ROM, etc.) from the drive to be inserted into the MultiBay. Ensure that the CD tray is closed.
2. With the bezel facing out, slide the device into the MultiBay until it clicks into place (Figure 5-11).



Figure 5-11. *Inserting a Device into the MultiBay*

Inserting a Hard Drive into the MultiBay Adapter

Before a hard drive can be inserted into the MultiBay, it must first be placed in the hard drive MultiBay adapter.

1. Push the adapter slide tabs ❶ toward the outside of the adapter (Figure 5-12).
2. Place the hard drive, label up, into the adapter ❷, and slide the drive connector toward the adapter connector ❸ until the drive is seated.
3. Release the adapter slide tabs.

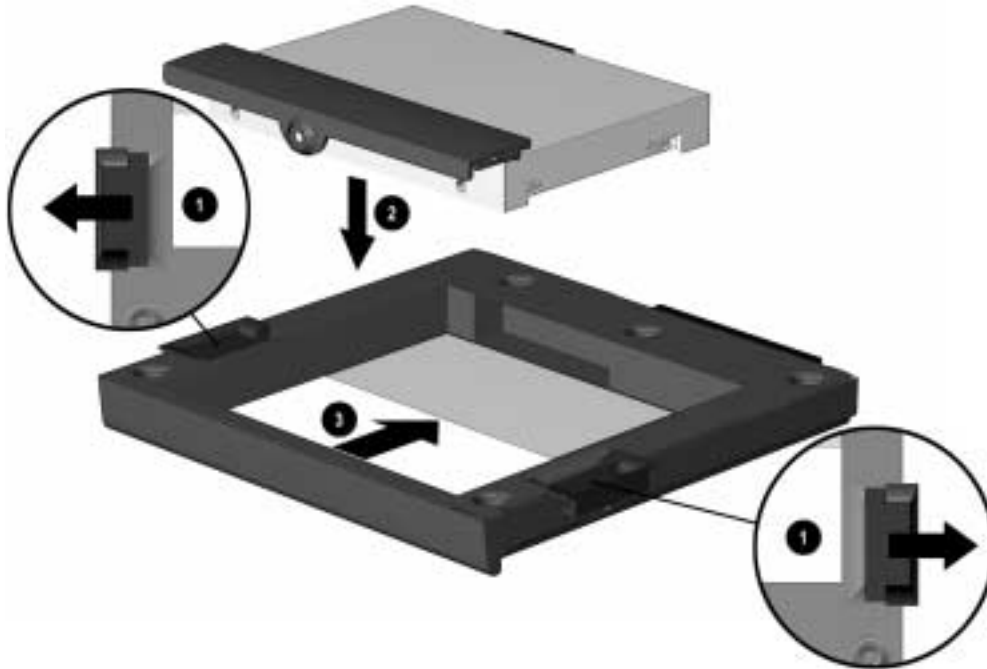


Figure 5-12. Inserting a Hard Drive into the MultiBay Adapter

5.9 PC Cards

The procedure for removing PC Cards varies with the operating system being used and with the kind of PC Card being removed.

If Windows 95 or Windows 98 is running:

- A PC Card can be removed while the computer is on or off.
- The PC Card icon appears in the system tray on the Windows taskbar only while a PC Card is inserted.

If Windows NT is running:

- Some PC Cards, such as modem, ATA, flash, and SRAM cards, can be removed while the computer is on. However, the computer must be shut down before removing other PC Cards, such as LAN and SCSI cards. For removal information about a particular PC Card, refer to the documentation that came with the card and the Help program with CardWare.

CardWare displays the PC Card icon on the system tray on the Windows taskbar whether or not a PC Card is inserted. The CardWare program is available on your Windows NT Workstation 4.0 system if you need Plug and Play functionality for PC Cards.

To install Cardware, select → Programs → CardWare Setup → Install CardWare. Follow the instructions on the screen.

If you are using third party PC Cards that have enablers or if you do not require Plug and Play functionality, then you do not need to install CardWare.

Removing a PC Card

If you are running Windows 95 or Windows 98, you do not need to turn off the computer or initiate Suspend before removing a PC Card.



CAUTION: If you are running Windows 95 or Windows 98, you should always stop PC Cards before removing them to prevent damage to the PC Card or computer.

If you are running Windows NT 4.0 without CardWare provided by Compaq, you must turn off the computer before removing a PC Card.

To remove a PC Card from the computer:

1. Press the PC Card eject button **1** for the card to be ejected. The eject button extends (Figure 5-13).
2. Press the eject button a second time. The PC Card partially ejects from the PC Card slot **2**.
3. Remove the PC Card from the PC Card slot.

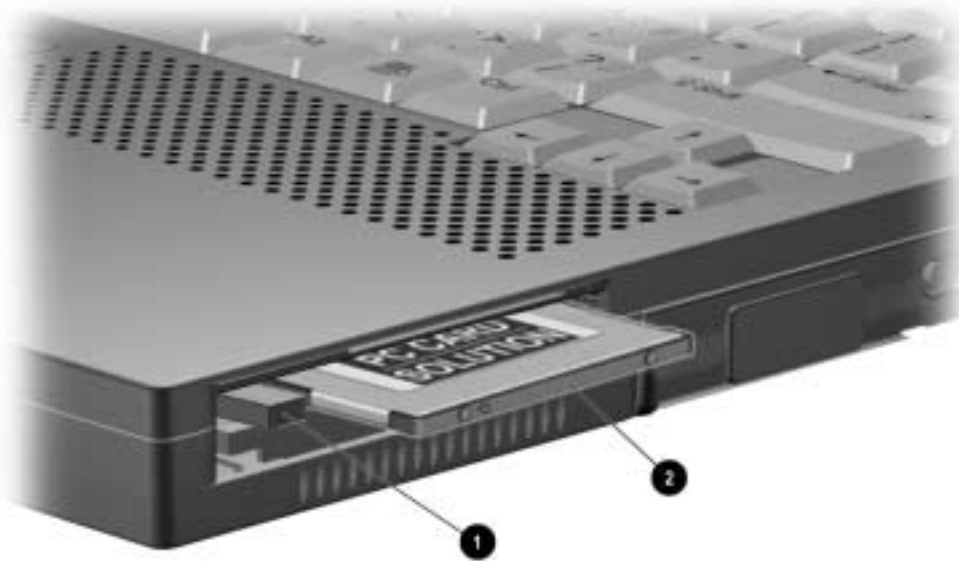


Figure 5-13. Removing a PC Card

Inserting a PC Card

1. Save all work, exit all applications, and turn off the computer.
2. Open the PC Card door by flipping it down (Figure 5-14).
3. Align the edges of the PC Card with the rails on the sides of one of the PC Card slots.
4. Insert the PC Card into the PC Card slot until it is seated.

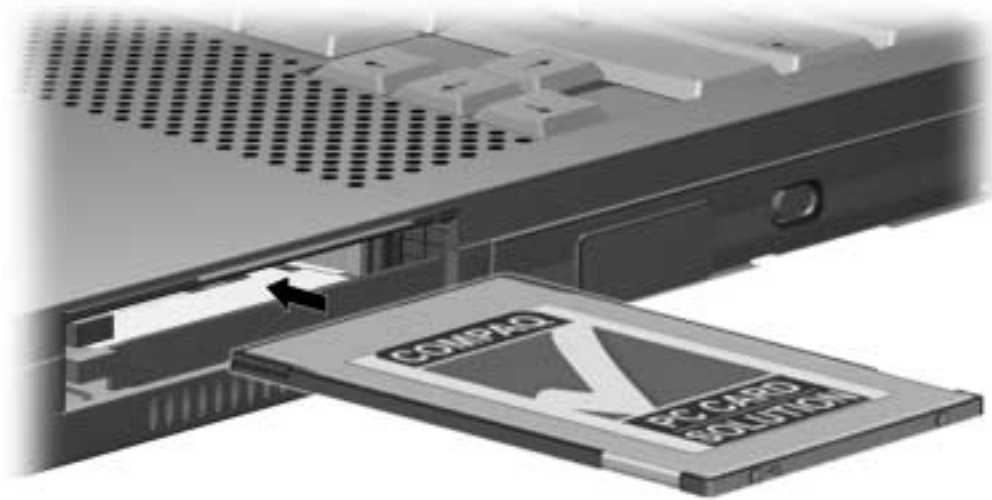


Figure 5-14. Inserting a PC Card

5.10 Modem/Combo Card

The computer can be equipped with a modem card, a network interface card (NIC), or a combination modem/NIC (modem/combo) card.

1. Prepare the computer for disassembly (Section 5.5).
2. Turn the computer bottom side up with the rear panel facing forward.
3. Remove the two screws ❶ that secure the modem/combo card cover to the base assembly (Figure 5-15).
4. Swing the right side of the cover up and to the left ❷.

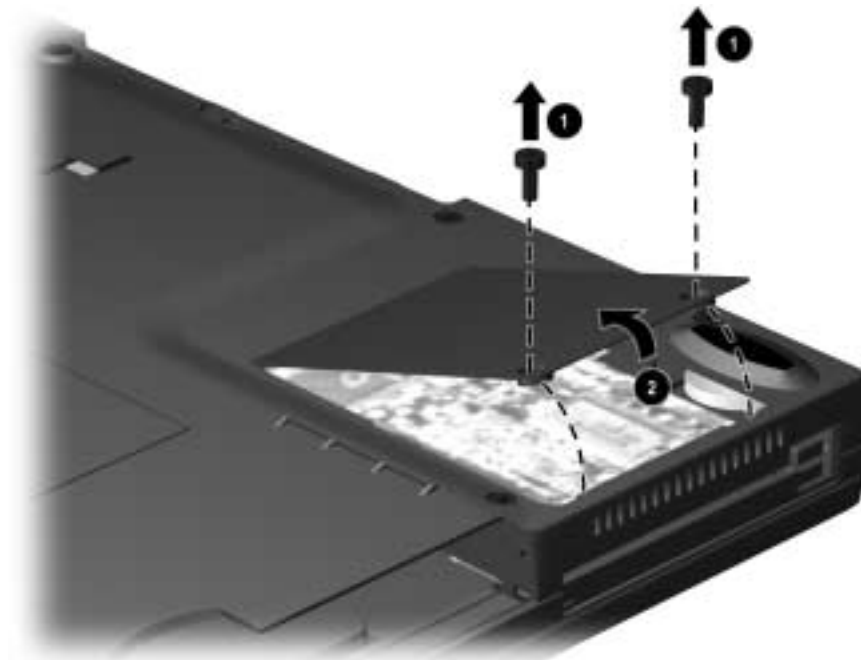


Figure 5-15. Removing the Modem/Combo Card Cover

5. Lift the left side of the modem/combo card to disconnect it from the system board.
Swing the card to the right ❶ (Figure 5-16).
6. Disconnect the LAN and modem connectors from the card ❷.

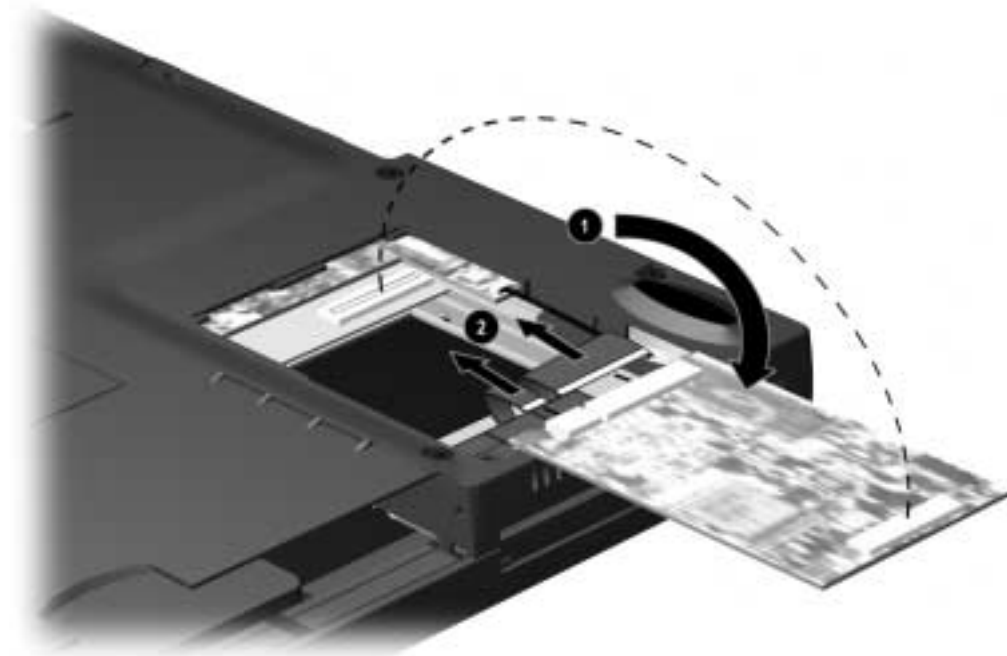


Figure 5-16. *Removing a Modem/Combo Card*

Reverse the above procedure to install the modem/combo card and its cover.

5.11 RTC Battery

1. Save all work, exit all applications, and shut down the computer.
2. Remove the modem/combo card cover and the modem/combo card (Section 5.10).
3. Disconnect the RTC battery cable from the system board ❶ (Figure 5-17).
4. Remove the battery from the base assembly ❷.



Figure 5-17. *Disconnecting the RTC Battery Cable*

Reverse the above procedure to replace the RTC battery.

5.12 Keyboard



WARNING: Failure to unplug the power cord and remove the battery pack before installing a memory expansion board can damage the equipment and expose you to the risk of electrical shock.



CAUTION: Electrostatic discharge (ESD) can damage electronic components. Before beginning this procedure, ensure that you are properly grounded. For more information, refer to Section 4.4 “Preventing Electrostatic Damage.”

1. Prepare the computer for disassembly (Section 5.5).
2. Open the computer.
3. Slide the four tabs **1** located along the top of the keyboard toward the front of the computer (Figure 5-18).
4. Swing the top of the keyboard toward the front of the computer **2**.



CAUTION: There are two cables underneath the keyboard that connect it to the system board. If you lift it too quickly, you may damage the cables.



Figure 5-18. Removing the Keyboard

5. Release the Zero Insertion Force (ZIF) connector to which the keyboard cable is connected ❶ (Figure 5-19).
6. Disconnect the keyboard cable from the connector on the system board ❷.
7. Release the ZIF connector to which the pointing device cable is connected ❸ (EasyPoint IV models only).
8. Disconnect the pointing device cable from the connector on the top cover ❹ (EasyPoint IV models only).



Figure 5-19. *Disconnecting the Pointing Device and the Keyboard Cables*

9. Remove the keyboard.
- Reverse the above procedure to install the keyboard.

5.13 Memory Expansion

The memory compartment is located underneath the keyboard and contains two memory slots. The computer standard memory is contained in one slot. Computer memory can be expanded by installing a memory board in the empty slot and/or replacing the standard memory board. SDRAM memory boards are available in 32-, 64-, and 128-MB increments.

Removing a Memory Expansion Board

1. Pull away the plastic retention clips ❶ on each side of the memory expansion board. The memory expansion board tilts upward ❷ (Figure 5-20).
2. Lift the edge of the memory expansion board and slide it out of the memory expansion slot at a 45-degree angle.
3. Place the removed memory expansion board in an electrostatic-safe container.



Figure 5-20. Removing a Memory Expansion Board

4. If no memory expansion board is to be installed, replace the keyboard.

Installing a Memory Expansion Board

All memory expansion boards supported by the computer can be used in either of the two memory expansion slots. The memory expansion boards are also all keyed (notched) to ensure correct positioning.

1. Insert the memory expansion board into an empty memory expansion slot at a 45-degree angle **1**. Slide it into place until it is seated while tilted (Figure 5-21).
2. Push the memory expansion board down until the plastic retention clips **2** snap into place.



Figure 5-21. *Installing a Memory Expansion Board*

NOTE: If, after installation, a memory expansion board fails to be recognized, remove the board and make sure the memory expansion slot is clean and free of debris. Reinsert the card.

5.14 Switch Cover

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Position the computer so the rear panel faces forward.
4. Remove the two screws from the rear panel of the computer that secure the switch cover to the base assembly (Figure 5-22).



Figure 5-22. *Removing the Switch Cover Screws*

5. Position the computer so the front faces forward.
6. Open the computer as far as it will open.

7. Lift the switch cover straight up (Figure 5-23).



Figure 5-23. *Removing the Switch Cover*

Reverse the above procedure to install the switch cover.

5.15 Display Assembly

NOTE: To prevent the computer from tipping over during removal of the display assembly, a MultiBay device can be inserted into the computer MultiBay.

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Remove the switch cover (Section 5.14).
4. Disconnect the audio/microphone cable ❶ (Figure 5-24).
5. Disconnect the display cable ❷.
6. Disconnect the inverter cable ❸.

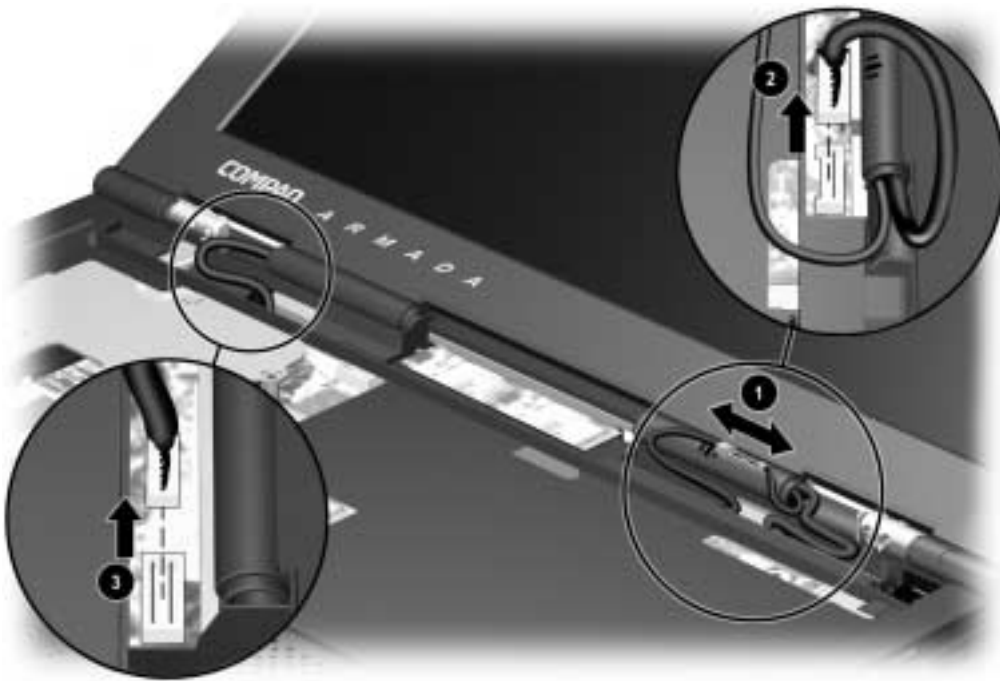


Figure 5-24. *Disconnecting the Audio/Microphone and Display Connectors*

7. Position the computer so the rear panel faces forward.
8. Remove the two screws that secure the display assembly to the base assembly (Figure 5-25).



Figure 5-25. Removing the Display Assembly Screws

9. Lift the display assembly straight up (Figure 5-26).

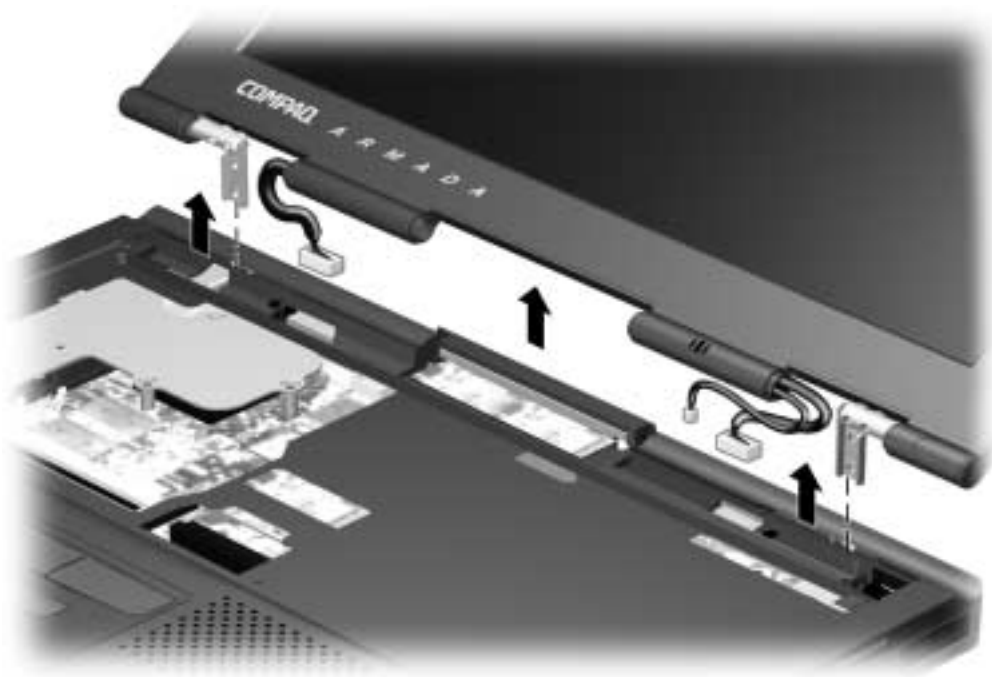


Figure 5-26. *Removing the Display Assembly*

Reverse the above procedure to install the display assembly.

5.16 Top Cover

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Remove the switch cover (Section 5.14).
4. Remove the display assembly (Section 5.15).
5. Turn the computer bottom side up with the front of the computer facing forward.
6. Remove the six screws from the bottom of the computer (Figure 5-27).

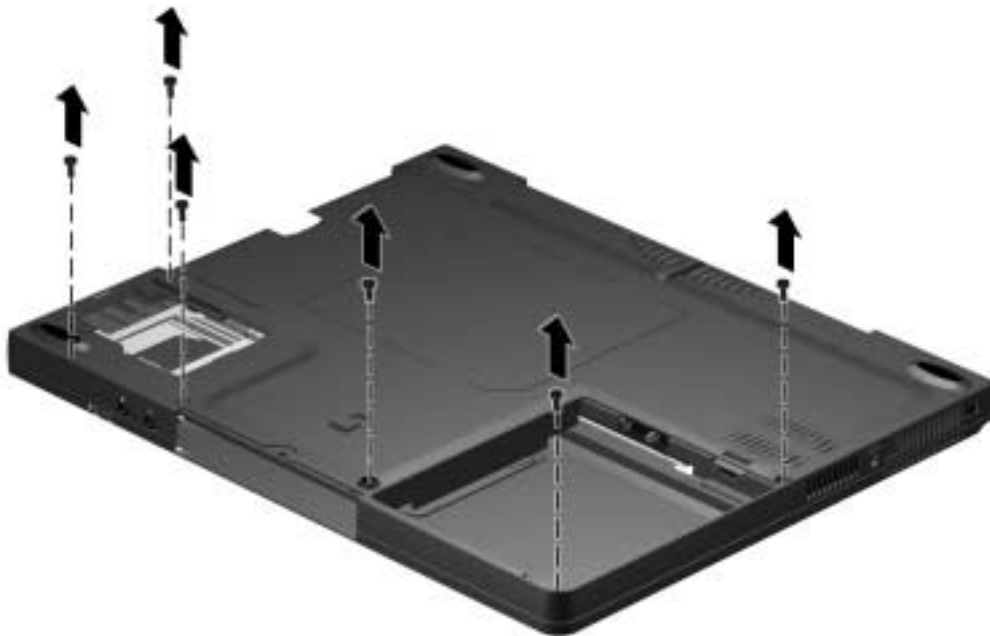


Figure 5-27. Removing the Top Cover Screws

7. Turn the computer top side up with the front of the computer facing forward.

8. Remove the four screws securing the top cover to the computer base (Figure 5-28).

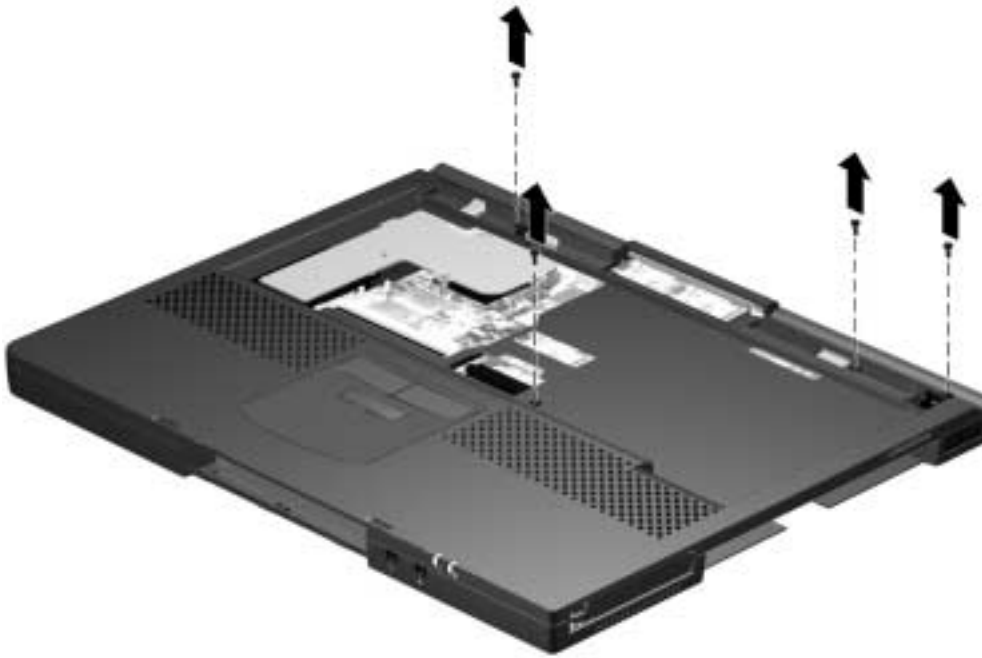


Figure 5-28. *Removing the Top Cover Screws*

9. Disconnect the pointing device button cable ❶ (Figure 5-29).
10. Disconnect the right ❷ and left ❸ speaker cables.
11. Partially lift the top cover.
12. Disconnect the LED board cable ❹.
13. Remove the top cover.

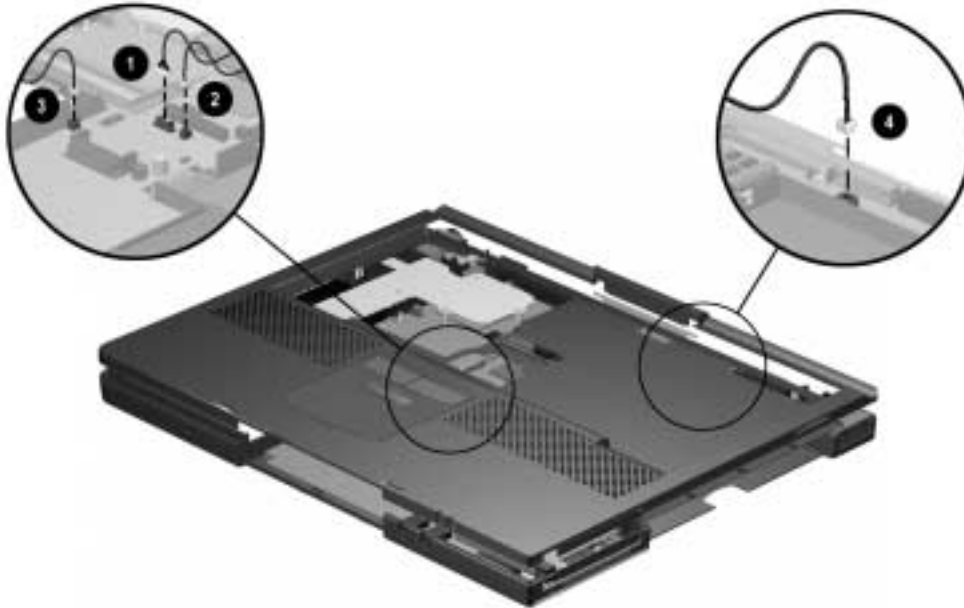


Figure 5-29. *Removing the Top Cover*

Reverse the above procedures to install the top cover.

The top cover must be removed before the LED board can be removed.

1. Remove the two screws ❶ securing the LED board to the top cover (Figure 5-30).
2. Remove the LED board from the top cover ❷.

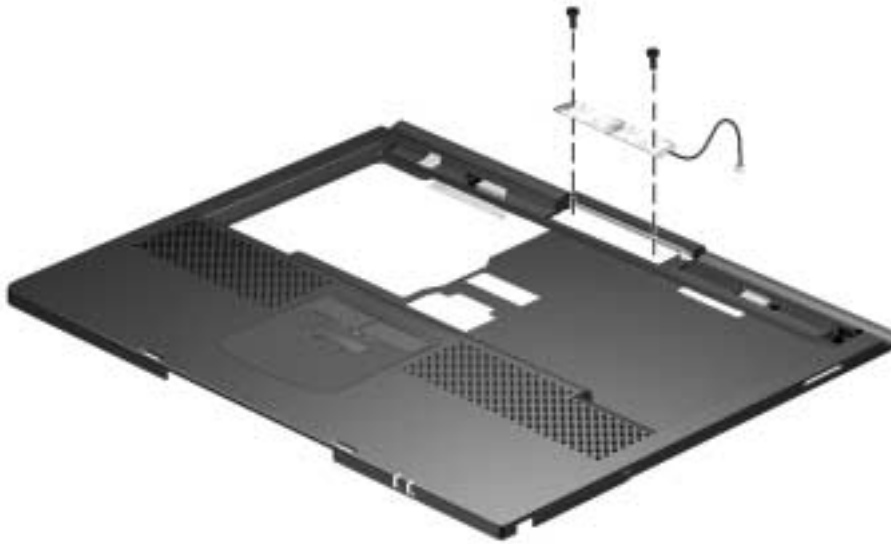


Figure 5-30. *Removing the LED Board*

Reverse the above procedures to install the LED board.

5.17 USB Board

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Remove the switch cover (Section 5.14).
4. Remove the display assembly (Section 5.15).
5. Remove the top cover (Section 5.16).
6. Position the computer so the rear panel faces forward.
7. Remove the screw that secures the USB board to the base assembly ❶ (Figure 5-31).
8. Disconnect the USB cable ❷.
9. Lift up on the left side of the board. Pull the board out at an angle to remove it from the base assembly ❸.

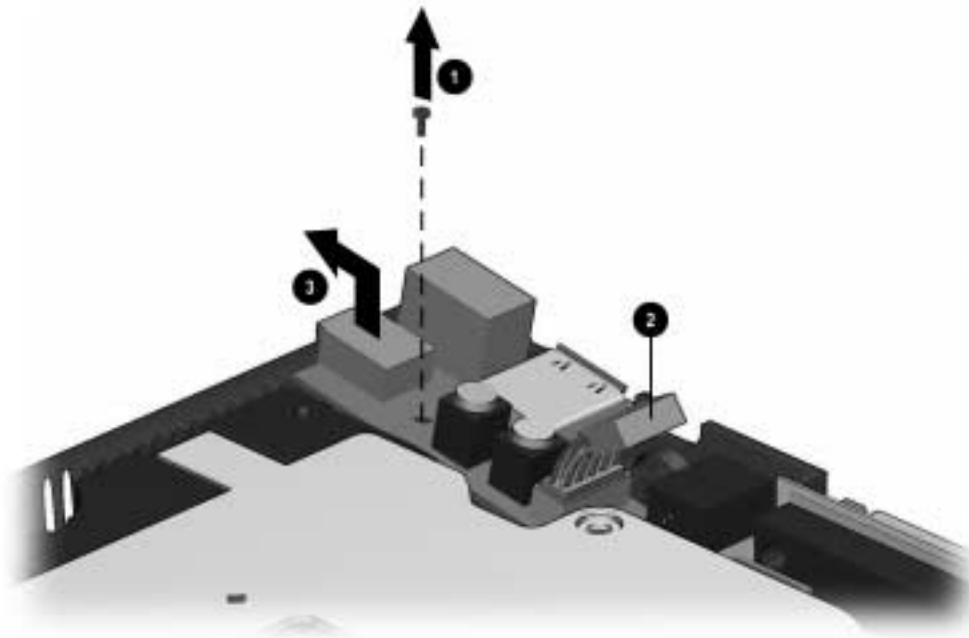


Figure 5-31. Removing the USB Board

Reverse the above procedure to connect the USB board.

5.18 Voltage Converter Board

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Remove the switch cover (Section 5.14).
4. Remove the display assembly (Section 5.15).
5. Remove the top cover (Section 5.16).
6. Lift up on the front and right side of the voltage converter board to disconnect it from the system board (Figure 5-32).
7. Remove the voltage converter board.

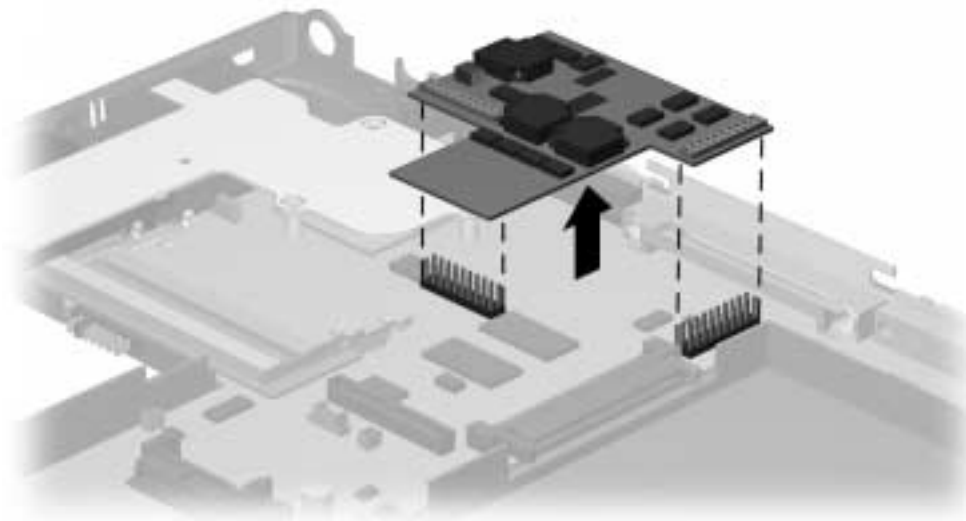


Figure 5-32. *Removing the Voltage Converter Board*

Reverse the above procedure to connect the voltage converter board.

5.19 Infrared Board

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the keyboard (Section 5.12).
3. Remove the switch cover (Section 5.14).
4. Remove the display assembly (Section 5.15).
5. Remove the top cover (Section 5.16).
6. Remove the screw that secures the infrared board to the base assembly ❶ (Figure 5-33).
7. Remove the infrared board assembly ❷.

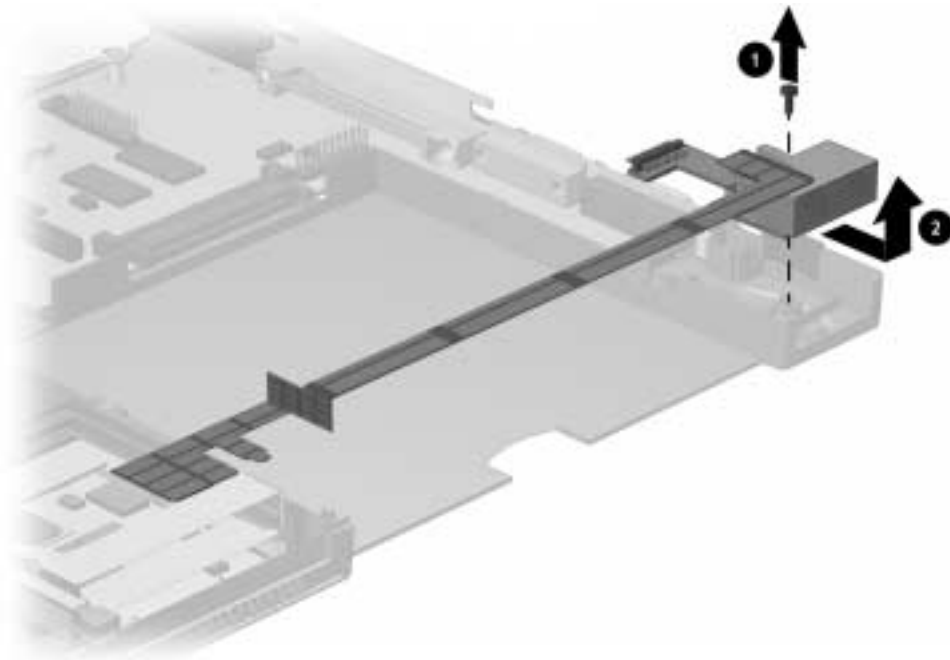


Figure 5-33. Removing the Infrared Board Assembly

Reverse the above procedure to connect the voltage converter board.

5.20 System Board

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the modem/combo card (Section 5.10).
3. Remove the RTC battery (Section 5.11).
4. Remove the keyboard (Section 5.12).
5. Remove the switch cover (Section 5.14).
6. Remove the display assembly (Section 5.15).
7. Remove the top cover (Section 5.16).
8. Remove the USB board (Section 5.17).
9. Remove the voltage converter board (Section 5.18).
10. Remove the infrared board (Section 5.19).
11. Turn the computer top side up with the rear panel facing forward.
12. Remove the two bushing guides (Figure 5-34).

NOTE: The left bushing guide is shorter than the right.



Figure 5-34. Removing the Bushing Guides

13. Disconnect the memory bracket/connector by lifting up on the left side ❶ (Figure 5-35).
14. Remove the screw underneath the memory bracket/connector that secures the system board to the base assembly ❷.
15. Remove the two screws that secure the system board to the base assembly ❸.

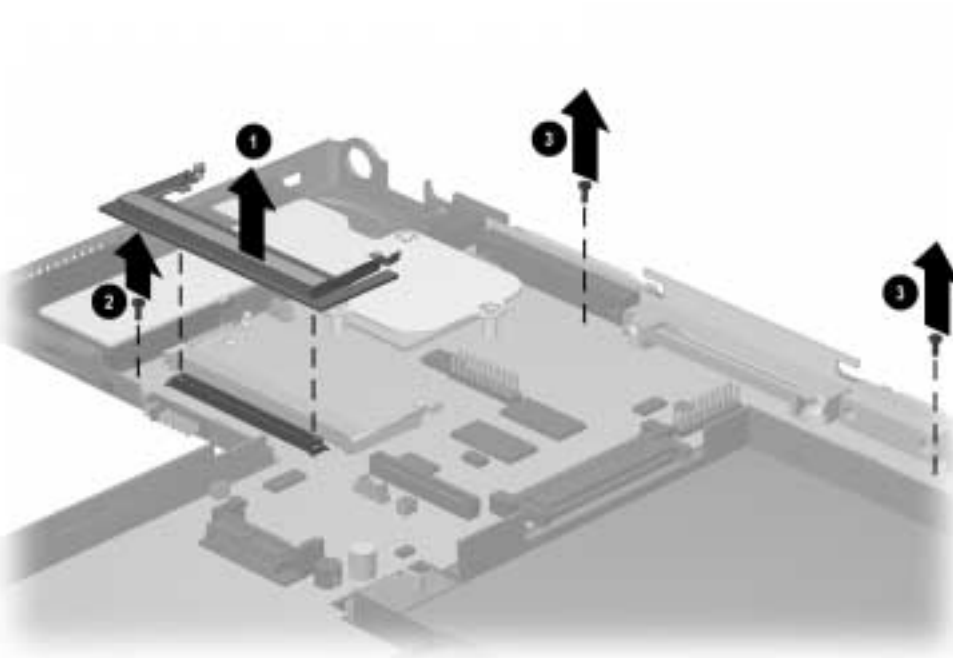


Figure 5-35. Removing the Memory Bracket/Connector and System Board Screw

16. Remove the two screws that secure the PC Card assembly to the base assembly (Figure 5-36).

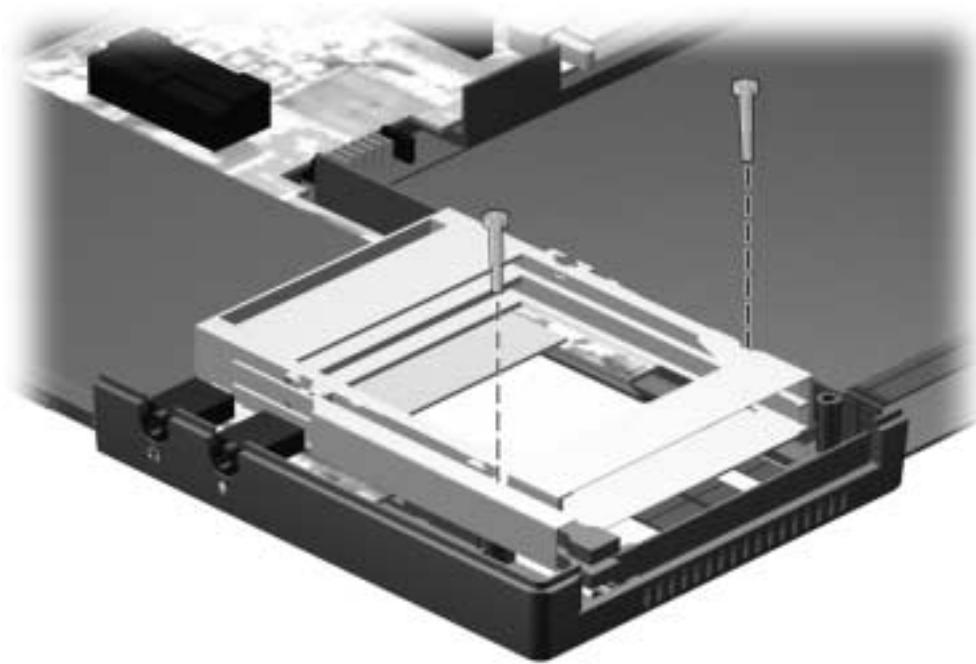


Figure 5-36. Removing the PC Card Assembly Screws

17. Lift straight up on the system board to remove it from the base assembly (Figure 5-37).

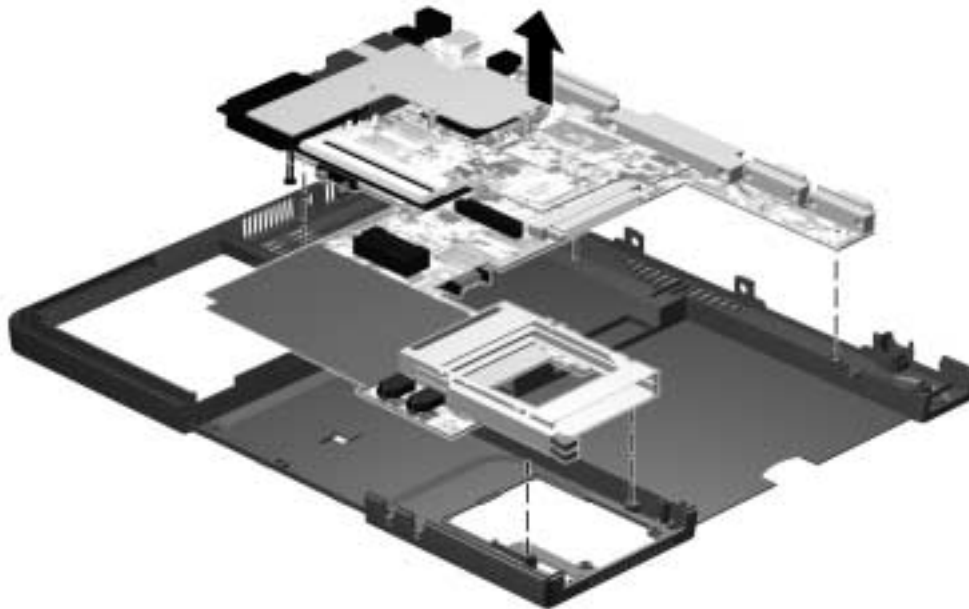


Figure 5-37. *Removing the System Board*

Reverse the above procedure to install the system board.

5.21 Fan

1. Prepare the computer for disassembly (Section 5.5).
2. Remove the modem/combo card (Section 5.10).
3. Remove the RTC battery (Section 5.11).
4. Remove the keyboard (Section 5.12).
5. Remove the switch cover (Section 5.14).
6. Remove the display assembly (Section 5.15).
7. Remove the top cover (Section 5.16).
8. Remove the USB board (Section 5.17)
9. Remove the system board (Section 5.19).
10. Disconnect the fan cable from the system board (Figure 5-38).

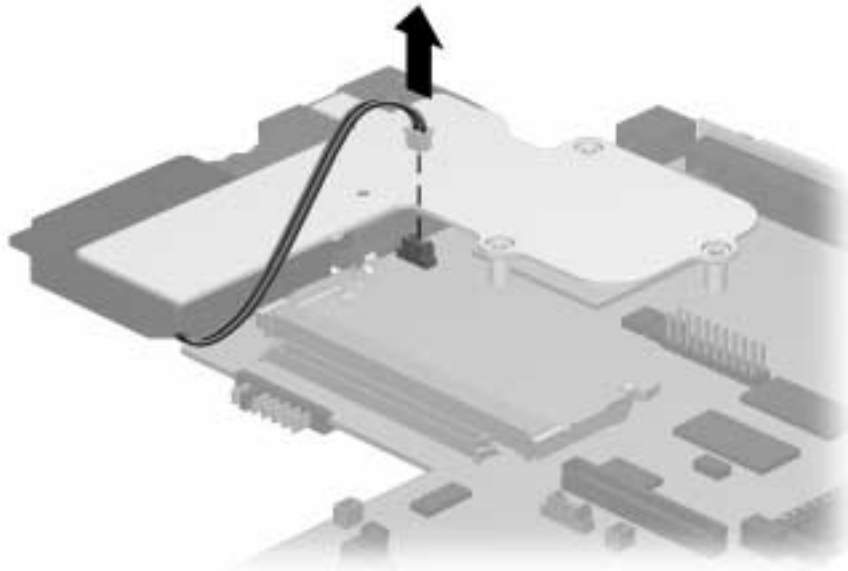


Figure 5-38. *Disconnecting the Fan Cable from the System Board*

11. Turn the system board bottom side up.

12. Remove the screw ❶ that secures the fan to the system board (Figure 5-39).
13. Remove the fan ❷.

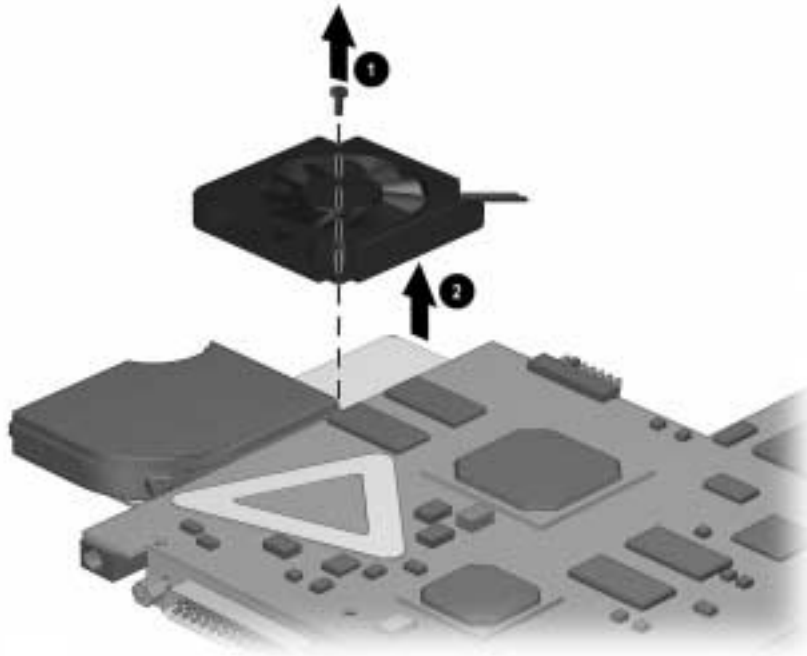


Figure 5-39. Removing the Fan

Reverse the above procedure to install the fan to the system board.

chapter 6

SPECIFICATIONS

6.1 Physical and Environmental

| Table 6-1 Computer | | |
|---|---|---------------|
| | U.S. | Metric |
| Dimensions | | |
| Height | 1.1 in. | 2.8 cm |
| Depth | 9.8 in. | 24.9 cm |
| Width | 12.4 in. | 31.4 cm |
| Weight (depends on configuration) | 4.8 lbs. | 2.2 kg |
| Standalone (Battery) Power Requirements | | |
| Nominal operating voltage | 14.4 VDC | |
| Average operating power | 15 W | |
| Peak operating power | 30 W | |
| AC Adapter Power Requirements | | |
| Operating voltage | 100-120/220-240 | |
| Operating current | 1.2/0.6 Amp | |
| Operating frequency range | 50 to 60 Hz AC | |
| Maximum output voltage | +18.85 volts | |
| Maximum transient | 1kV for 50 ns | |
| Temperature | | |
| Operating | 50 to 104°F | 10 to 40°C |
| Nonoperating | -4 to 140°F | -20 to 60°C |
| Relative Humidity (noncondensing) | | |
| Operating | 10 to 90% | |
| Nonoperating ($t_w = 101.6^\circ\text{F}/38.7^\circ\text{C}$ max) | 5 to 95% | |
| Altitude (nonpressurized environment) | | |
| Operating | 0 to 10,000 ft | 0 to 3048 m |
| Nonoperating | 0 to 30,000 ft | 0 to 9144 m |
| Shock | | |
| Operating | 10 G, 11 ms, half sine | |
| Nonoperating | 240 G, 2 ms, half sine | |
| Vibration | | |
| Operating | 0.25 G, 50-500 Hz sine, 1/2 octave/minute sweep | |
| Nonoperating | 1.00 G, 50-500 Hz sine, 1/2 octave/minute sweep | |
| NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures. | | |

6.2 Displays

Table 6-2
14.1-inch XGA, CTFT Display

| | U.S. | Metric |
|--------------------------------|----------------------------|-----------------------|
| Dimensions | | |
| Height | 8.46 in. | 21.50 cm |
| Width | 11.22 in. | 28.50 cm |
| Diagonal | 14.10 in. | 35.81 cm |
| Number of Colors | up to 16.8 million | |
| Contrast Ratio | 150:1 | |
| Brightness | 120 nits, 150 nits typical | 125 CD/M ² |
| Pixel Resolution | | |
| Pitch | | 0.264 × 0.264 mm |
| Format | 1024 × 768 | |
| Configuration | RGB Stripe | |
| Backlight | Edge Lit, bottom | |
| Character Display | 80 × 25 | |
| Total Power Consumption | 4.2 W / Inverter (max) | |

Table 6-3
13.3-inch XGA, CTFT Display

| | U.S. | Metric |
|--------------------------------|----------------------------|-----------------------|
| Dimensions | | |
| Height | 7.98 in. | 20.28 cm |
| Width | 10.64 in. | 27.03 cm |
| Diagonal | 13.30 in. | 33.79 cm |
| Number of Colors | up to 16.8 million | |
| Contrast Ratio | 150:1 | |
| Brightness | 120 nits, 150 nits typical | 125 CD/M ² |
| Pixel Resolution | | |
| Pitch | | 0.264 × 0.264 mm |
| Format | 1024 × 768 | |
| Configuration | RGB Stripe | |
| Backlight | Edge Lit, bottom | |
| Character Display | 80 × 25 | |
| Total Power Consumption | 4.0 W / Inverter (max) | |

6.3 Hard Drives

**Table 6-4
Hard Drives**

| | 6.4 GB | 10.0 GB | 12.0 GB | 20.0 GB | 30.0 GB |
|--|---------------|----------------|----------------|----------------|----------------|
| User capacity per drive¹ | 6.4 GB | 10.0 GB | 12.0 GB | 20.0 GB | 30.0 GB |
| Form factor | 2.5 inches | 2.5 inches | 2.5 inches | 2.5 inches | 2.5 inches |
| Drive height (with drive frame, in mm) | 9.5 | 9.5 | 9.5 | 9.5 | 12.5 |
| Drive width (with drive frame, in mm) | 70 | 70 | 70 | 70 | 70 |
| Interface type | ATA-4 | ATA-4 | ATA-4 | ATA-5 | ATA-5 |
| Seek times (typical read, including settling) | | | | | |
| Single track | 2.5 ms | 2.5 ms | 2.5 ms | 2.5 ms | 2.5 ms |
| Average | 12.0 ms | 12.0 ms | 12.0 ms | 12.0 ms | 12.0 ms |
| Full stroke | 23.0 ms | 23.0 ms | 23.0 ms | 23.0 ms | 23.0 ms |
| User addressable sectors³ | 12,685,680 | 19,640,880 | 23,677,353 | 39,070,080 | 58,605,120 |
| Logical configuration | | | | | |
| Cylinders | 13,424 | 16,383 | 16,383 | 16,383 | 22,784 |
| Heads | 15 | 16 | 16 | 16 | 16 |
| Sectors per track | 63 | 63 | 63 | 63 | 63 |
| Physical configuration | | | | | |
| Cylinders ³ | 9,279 | 22,784 | 15,880 | 22,784 | 22,784 |
| Heads | 6 | 2 | 6 | 4 | 6 |
| Sectors per track ³ | 168 - 280 | 293 - 560 | 270 - 420 | 293 - 560 | 293 - 560 |
| Bytes per sector | 512 | 512 | 512 | 512 | 512 |
| Buffer size³ | 512 KBytes | 512 Kbytes | 512 Kbytes | 2 Mbytes | 2 Mbytes |
| Disk rotational speed (rpm) | 4200 | 4200 | 4200 | 4200 | 4200 |
| Transfer rate | | | | | |
| Interface max (Mbytes/sec) ² | 66.6 | 66.6 | 66.6 | 66.6 | 66.6 |
| Media (Mbits/sec) ³ | 85.5 - 161.6 | 109 - 203 | 85.5 - 161.6 | 109 - 203 | 109 - 203 |

¹ 1 GB = 1,000,000,000 bytes.

² System capability may differ.

³ Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Consult the Compaq Customer Support Center for details.

6.4 Diskette Drive

Table 6-5
Diskette Drive

| | |
|---------------------------|--------------------------|
| Diskette Size | 3.5 in. |
| High Density | 1.44 MB/1.2 MB |
| Low Density | 720 KB |
| Light | None |
| Height | 0.50 in / 12.7 mm |
| Bytes per Sector | 512 |
| Sectors per Track | |
| High Density | 18 (1.44 MB)/15 (1.2 MB) |
| Low Density | 9 |
| Tracks per Side | |
| High Density | 80 (1.44 MB)/80 (1.2 MB) |
| Low Density | 80 |
| Read/Write Heads | 2 |
| Average Seek Times | |
| Track-to-Track (high/low) | 3 ms/6 ms |
| Average (high/low) | 94 ms/174 ms |
| Settling Time | 15 ms |
| Latency Average | 100 ms |

6.5 CD-ROM Drive

Table 6-6
CD-ROM Drive

| | |
|----------------------------------|---|
| Applicable Disc | CD-ROM (Mode 1, 2, and 3) CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and Form 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD Extra Video CD CD-WO (fixed packets only) CD-Bridge |
| Center Hole Diameter | .59 in./15 mm |
| Disc Diameter | 12 cm, 8 cm |
| Disc Thickness | 1.2 mm |
| Track Pitch | 1.6 μ m |
| Laser | |
| Beam Divergence | 53.5 \pm 1.5 degrees |
| Output Power | 0.24 \pm 0.1 mw |
| Type | Semiconductor Laser GaAlAs |
| Wave Length | 780 nm \pm 25 nm |
| Access Time | |
| Random | < 150 ms |
| Full Stroke | < 300 ms |
| Audio Output Level | |
| Line Out | 0.7 V rms |
| Headphone | none |
| Cache Buffer | 128 KB |
| Data Transfer Rate | |
| Sustained, 24X | 150 KB/sec |
| Variable | 1500 to 3600 KB/sec |
| Normal PIO Mode 4 (single burst) | 16.6 MB/sec |
| Startup time | < 8.3 seconds |
| Stop time | < 4.0 seconds |
| Capacity | |
| Mode 1, 12 cm | 550 MB |
| Mode 2, 12 cm | 640 MB |
| 8 cm | 180 MB |

6.6 DVD-ROM Drive

Table 6-7
DVD-ROM Specifications

| | |
|----------------------------------|--|
| Applicable Disc | DVD-5, DVD-9, DVD-10 CD-ROM mode 1, mode 2 CD-Digital Audio CD-XA mode 2 (Form 1, Form 2) CD-I mode 2 (Form 1 and Form 2) CD-I Ready CD-Bridge CD-R Photo CD (single/multisession) |
| Center Hole Diameter | .59 in./15 mm |
| Disc Diameter | 12 cm, 8 cm |
| Disc Thickness | 1.2 mm |
| Track Pitch | .74 μ m |
| Capacity | |
| DVD-5 | 4.7 GB |
| DVD-9 | 8.5 GB |
| DVD-10 | 9.4 GB |
| Mode 1, 12 | 550 MB |
| Mode 2, 12 cm | 640 MB |
| 8 cm | 180 MB |
| Laser | |
| Output Power | 5 mw |
| Type | Semiconductor Laser GaAlAs |
| Wave Length | 650 nm \pm 25nm (DVD-ROM mode) 795 nm \pm 25 nm (CD-ROM mode) |
| Access Time | |
| Random | < 150 ms |
| Full Stroke | < 225 ms |
| Audio Output Level | |
| Line Out | 0.7 V rms |
| Headphone | none |
| Cache Buffer | 128 KB |
| Data Transfer Rate | |
| Sustained, 16x | 150 KB/sec |
| Sustained, 4x DVD | 5520 KB/sec |
| Normal PIO Mode 4 (single burst) | 16.6 MB/sec |
| Startup Time | < 15 seconds |
| Stop time | < 6 seconds |

6.7 LS-120 Drive

**Table 6-8
LS-120 Drive**

| | 1.68 MB DMF | 1.44 MB | 1.2 MB | 1.2 MB | 720 KB |
|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Formatted capacity (bytes) | 1,720,320 | 1,474,560 | 1,261,568 | 1,228,800 | 737,280 |
| Sector size (bytes) | 512 | 512 | 1,024 | 512 | 512 |
| Sectors | 3,360 | 2,880 | 1,232 | 2,400 | 1,440 |
| Magnetic tracks surface | 80 | 80 | 77 | 80 | 80 |
| Optical servo tracks/surface | N/A | N/A | N/A | N/A | N/A |
| Sectors/track | 21 | 18 | 8 | 15 | 9 |
| Sector interleave | 2:1 | 1:1 | 1:1 | 1:1 | 1:1 |
| Spare sectors | 0 | 0 | 0 | 0 | 0 |
| Zones (each side) | 1 | 1 | 1 | 1 | 1 |
| Average random seek | 70 ms | 70 ms | 70 ms | 70 ms | 70 ms |
| Track-to-track seek | 25 ms | 25 ms | 25 ms | 25 ms | 25 ms |
| Max single seek | 170 ms | 170 ms | 170 ms | 170 ms | 170 ms |
| Average latency | 41.67 ms | 41.67 ms | 41.67 ms | 41.67 ms | 41.67 ms |
| Motor RPM | 720±0.5% | 720±0.5% | 720±0.5% | 720±0.5% | 720±0.5% |
| Motor start time | 800 ms | 800 ms | 800 ms | 800 ms | 800 ms |
| Track density | 135 TPI | 135 TPI | 135 TPI | 135 TPI | 135 TPI |
| Track width | 125 µm | 125 µm | 125 µm | 125 µm | 125 µm |
| Encoding method | MFM | MFM | MFM | MFM | MFM |
| Max flux density | 17,334 FCI | 17,334 FCI | 17,334 FCI | 17,334 FCI | 17,334 FCI |
| Recording density | 17,334 BPI | 17,334 BPI | 17,334 BPI | 17,334 BPI | 17,334 BPI |
| Nominal transfer rate | 150 KB/sec | 150 KB/sec | 125 KB/sec | 125 KB/sec | 75 KB/sec |
| Nominal sustained transfer rate across interface | 65 KB/sec read, 32 KB/sec write | 55 KB/sec read, 28 KB/sec write | 49 KB/sec read, 25 KB/sec write | 46 KB/sec read, 23 KB/sec write | 28 KB/sec read, 14 KB/sec write |
| Buffer transfer rate | 4.0 MB/sec | 4.0 MB/sec | 4.0 MB/sec | 4.0 MB/sec | 4.0 MB/sec |

6.8 Battery Pack

**Table 6-9
Lithium Ion Battery Pack**

| | U.S. | Metric |
|---|---------------|--------------|
| Dimensions | | |
| Height | 0.57 in. | 1.44 cm |
| Length | 4.55 in. | 11.50 cm |
| Weight | 3.93 in. | 9.90 cm |
| Weight | 0.85 lb | 0.39 kg |
| Energy | | |
| Voltage | 14.4 V | |
| Amp-hour capacity | 2.8 Ah | |
| Watt-hour capacity | 40.0 Wh | |
| Environmental Requirements | | |
| Operating Temperatures | 50°F to 104°F | 10°C to 40°C |
| Charging Temperatures | 50°F to 104°F | 10°C to 40°C |
| Recommended Storage Temperatures | | |
| No longer than 1 month | 32°F to 140°F | 0°C to 60°C |
| No longer than 3 months | 32°F to 113°F | 0°C to 45°C |
| No longer than 1 year | 32°F to 68°F | 0°C to 20°C |

6.9 System DMA

**Table 6-10
System DMA**

| Hardware DMA | System Function |
|--------------|---|
| DMA0 | Available for audio |
| DMA1 | Entertainment Audio (Default; Alternate = DMA0, DMA3, None) |
| DMA2 | Diskette Drive |
| DMA3 | ECP Parallel Port LPT1 (Default; Alternate = DMA 0, none) |
| DMA4 | DMA Controller Cascading (Not available) |
| DMA5 | Available for PC Card |
| DMA6 | Not Assigned |
| DMA7 | Not Assigned |

NOTE: PC Card controller can use DMA 1, 2, or 5.

6.10 System Interrupts

Table 6-11
System Interrupts

| Hardware IRQ | System Function |
|---------------------|---|
| IRQ0 | System timer |
| IRQ1 | Keyboard controller |
| IRQ2 | Cascaded |
| IRQ3 | COM2 |
| IRQ4 | COM1 |
| IRQ5 | Audio (default)* |
| IRQ6 | Diskette drive |
| IRQ7 | Parallel port |
| IRQ8 | Real Time Clock (RTC) |
| IRQ9 | Infrared |
| IRQ10 | System use |
| IRQ11 | System use |
| IRQ12 | Internal Point Stick or External Mouse |
| IRQ13 | Coprocessor (Not available to any peripheral) |
| IRQ14 | IDE Interface (Hard Disk and CD-ROM Drive) |
| IRQ15 | Fixed Disk Drives on the Expansion Base or Convenience Base |

NOTE: PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15.

Either the infrared or the serial port may assert IRQ3 or IRQ4.

*Default configuration; audio possible configurations are: IRQ5, IRQ7, IRQ9, IRQ10 or none.

6.11 System I/O Addresses

Table 6-12
System I/O Addresses

| I/O Address (Hex) | System Function (Shipping Configuration) |
|--------------------------|---|
| 000 - 00F | DMA Controller no. 1 |
| 010 - 01F | Unused |
| 020 - 021 | Interrupt Controller no. 1 |
| 022 - 024 | Chipset Configuration registers |
| 025 - 03F | Unused |
| 02E - 02F | 87334 "Super IO" configuration for CPU |
| 040 - 043 | Counter/Timer Registers |
| 044 - 05F | Unused |
| 060 | Keyboard Controller |
| 061 | Port B |
| 062 - 063 | Unused |
| 064 | Keyboard Controller |
| 065 - 06F | Unused |
| 070 - 071 | NMI Enable/Real Time Clock |
| 072 - 07F | Unused |
| 080 - 08F | DMA Page Registers |
| 090 - 091 | Unused |
| 092 | Port A |
| 093 - 09F | Unused |
| 0A0 - 0A1 | Interrupt Controller no. 2 |
| 0A2 - 0BF | Unused |
| 0C0 - 0DF | DMA Controller no. 2 |
| 0E0 - 0EF | Unused |
| 0F0 - 0F1 | Coprocessor Busy Clear/Reset |
| 0F2 - 0FF | Unused |
| 100 - 16F | Unused |
| 170 - 177 | Secondary Fixed Disk Controller |
| 178 - 1EF | Unused |
| 1F0 - 1F7 | Primary Fixed Disk Controller |
| 1F8 - 200 | Unused |

Continued

Table 6-12 continued

| I/O Address (Hex) | System Function (Shipping Configuration) |
|--------------------------|--|
| 201 | Joystick (Decoded in ESS1688) |
| 202 - 21F | Unused |
| 220 - 22F | Entertainment Audio |
| 230 - 26D | Unused |
| 26E - 26 | National 87334 "Super IO" Controller in ArmadaStation/Armada MiniStation |
| 278 - 27F | Unused |
| 280 - 2AB | Unused |
| 2A0 - 2A7 | ArmadaStation/Armada MiniStation PC Card DMA Selection, Hard Drive Reset, IDE Select, MultiBay Device Identification |
| 2A8 - 2E7 | Unused |
| 2E8 - 2EF | Reserved Serial Port |
| 2F0 - 2F7 | Unused |
| 2F8 - 2FF | Infrared port |
| 300 - 31F | Network Interface in ArmadaStation/Armada MiniStation (Default; Alternate is 320, 340, or 360h) |
| 320 - 36F | Unused |
| 370 - 377 | Secondary Floppy Controller (In ArmadaStation/Armada MiniStation when a floppy is installed in the CPU) |
| 378 - 37F | Parallel Port (LPT1/Default) |
| 380 - 387 | Unused |
| 388 - 38B | FM Synthesizer - OPL3 / MIDI |
| 38C - 3AF | Unused |
| 3B0 - 3BB | VGA |
| 3BC - 3BF | Reserved (Parallel Port/No EPP Support) |
| 3C0 - 3DF | VGA |
| 3E0 - 3E1 | PC Card Controller in CPU |
| 3E2 - 3E3 | PC Card Controller in ArmadaStation/Armada MiniStation |
| 3E8 - 3EF | Internal Modem |
| 3F0 - 3F7 | "A" Diskette Controller |
| 3F8 - 3FF | Serial Port (COM1/Default) |
| CF8 - CFB | PCI Configuration Index Register (PCIDIV0-1) |
| CFC - CFF | PCI Configuration Data Register (PCIDIV0-1) |

6.12 System Memory Map

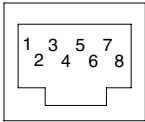
Table 6-13
System Memory Map

| Size | Memory Address | System Function |
|-------------|-----------------------|------------------------------|
| 640 K | 00000000 - 0009FFFF | Base Memory |
| 128 K | 000A0000 - 000BFFFF | Video Memory |
| 48 K | 000C0000 - 000CBFFF | Video BIOS |
| 160 K | 000C8000 - 000E7FFF | Unused |
| 64 K | 000E8000 - 000FFFFF | System BIOS |
| 15 M | 00100000 - 00FFFFFF | Extended Memory |
| 58 M | 01000000 - 047FFFFFFF | Super Extended Memory |
| 58 M | 04800000 - 07FFFFFFF | Unused |
| 2 M | 08000000 - 080FFFFF | Video Memory (Direct Access) |
| 4 G | 08200000 - FFFFFFFFFF | Unused |
| 64 K | FFFF0000 - FFFFFFFF | System BIOS |

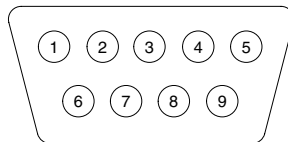
appendix **A**

CONNECTOR PIN ASSIGNMENTS

**Table A-1
RJ-11**

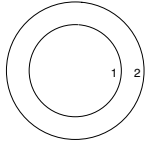
| Connector | Pin | Signal |
|---|-----|--------|
|  | 1 | NC_J3A |
| | 2 | NC_J3B |
| | 3 | TIP |
| | 4 | RING |
| | 5 | NC_J3C |
| | 6 | NC_J3D |
| | 7 | Unused |
| | 8 | Unused |

**Table A-2
Serial Connector**

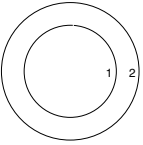


| Pin | Signal | Pin | Signal |
|-----|---------------------|-----|----------------|
| 1 | Carrier Detect | 6 | Data Set Ready |
| 2 | Receive Data | 7 | Ready to Send |
| 3 | Transmit Data | 8 | Clear to Send |
| 4 | Data Terminal Ready | 9 | Ring Indicator |
| 5 | Ground | | |

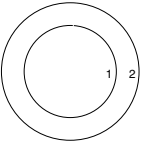
**Table A-3
Microphone Jack**

| Connector | Pin | Signal |
|---|-----|----------|
|  | 1 | Audio in |
| | 2 | Ground |

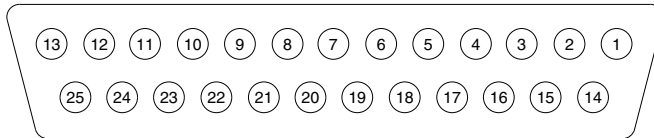
**Table A-4
Stereo Speaker/Headphone Jack**

| Connector | Pin | Signal |
|---|-----|-----------|
|  | 1 | Audio out |
| | 2 | Ground |

**Table A-5
Stereo Line-in Jack**

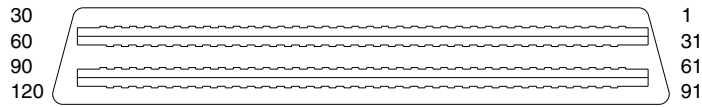
| Connector | Pin | Signal |
|---|-----|----------|
|  | 1 | Audio in |
| | 2 | Ground |

**Table A-6
Parallel Connector**



| Pin | Signal | Pin | Signal |
|-----|-------------|-----|--------------------|
| 1 | Strobe | 14 | Auto Linefeed |
| 2 | Data Bit 0 | 15 | Error |
| 3 | Data Bit 1 | 16 | Initialize Printer |
| 4 | Data Bit 2 | 17 | Select In |
| 5 | Data Bit 3 | 18 | Ground |
| 6 | Data Bit 4 | 19 | Ground |
| 7 | Data Bit 5 | 20 | Ground |
| 8 | Data Bit 6 | 21 | Ground |
| 9 | Data Bit 7 | 22 | Ground |
| 10 | Acknowledge | 23 | Ground |
| 11 | Busy | 24 | Ground |
| 12 | Paper End | 25 | Ground |
| 13 | Select | | |

**Table A-7
Docking Connector**



| Pin | Signal | Pin | Signal |
|-----|-------------|-----|---------------|
| 1 | EBOXL | 34 | XA1/R OUT |
| 2 | AGND | 35 | GND |
| 3 | EBOXS1 | 36 | GND |
| 4 | RED | 37 | EXPCLK2 |
| 5 | AGND | 38 | +3.3V |
| 6 | GREEN | 39 | EXPCLK0 |
| 7 | AGRD | 40 | +5V (8051VCC) |
| 8 | BLUE | 41 | EXPCLK |
| 9 | AGND | 42 | EBOXS2 |
| 10 | VSYNC | 43 | GND |
| 11 | HSYNC | 44 | EBOXL |
| 12 | DDC DAT | 45 | EBOXL /GND |
| 13 | DDC CLK | 46 | SRDY |
| 14 | GND | 47 | EBOXS1 /GND |
| 15 | INDEX | 48 | RI1 EX |
| 16 | RDATA | 49 | GND |
| 17 | TRK0 | 50 | SLCT LD0 |
| 18 | WDATA | 51 | PE LD1 |
| 19 | WGATE | 52 | ACK LD2 |
| 20 | STEP | 53 | BUSY LD3 |
| 21 | DIR | 54 | GND |
| 22 | POWER ON | 55 | STRB LD4 |
| 23 | SYS RESET | 56 | ALF LD5 |
| 24 | GND | 57 | INIT LD6 |
| 25 | DSKCHG | 58 | SLCTIN LD7 |
| 26 | +5 V (VDD) | 59 | GND |
| 27 | AUGND | 60 | PDATA0 LD8 |
| 28 | XA2/L IN | 61 | PDATA1 LD9 |
| 29 | XA3/R IN | 62 | PDATA2 LD10 |
| 30 | MID0/MIC IN | 63 | PDATA3 LD11 |
| 31 | AUGND | 64 | GND |
| 32 | XA0/L OUT | 65 | PDATA4 LD12 |
| 33 | XSD/MIC SN | 66 | PDATA5 LD13 |

Continued

Table A-7 *Continued*

| Pin | Signal | Pin | Signal |
|-----|---------------|-----|------------------|
| 67 | PDATA6 LD14 | 105 | AD[16] |
| 68 | PDATA7 LD15 | 106 | GND |
| 69 | GND | 107 | AD[15] |
| 70 | ERROR LCLK | 108 | AD[13] |
| 71 | RXD1 LVREQ | 109 | AD[11] |
| 72 | TXD1 LCREQ | 110 | AD[09] |
| 73 | RTS1 LEN | 111 | GND |
| 74 | GND | 112 | AD[06] |
| 75 | CTS1 LIIC CLK | 113 | AD[04] |
| 76 | DTR1 LIIC DAT | 114 | AD[02] |
| 77 | DSR1 EX | 115 | AD[00] |
| 78 | DCD1 EX | 116 | GND |
| 79 | 12C DATA | 117 | FRAME |
| 80 | GND | 118 | TRDY |
| 81 | 12C CLK | 119 | STOP |
| 82 | GND | 120 | PAR |
| 83 | HDSEL | 121 | CBE0 |
| 84 | GND | 122 | CBE1 |
| 85 | WPROT | 123 | GND |
| 86 | EBOXS2 /GND | 124 | KB CLK |
| 87 | ERDY | 125 | RSVD1/M CTRL2 |
| 88 | EBOXL /GND | 126 | XSC/L OUT SN |
| 89 | FLUSHREQ | 127 | RSVD2/M OFF HOOK |
| 90 | MEMACK | 128 | KB DATA |
| 91 | PS2 VCC | 129 | MGND |
| 92 | SERIRQ | 130 | STANDBY |
| 93 | PS2 CLK | 131 | M DRZP |
| 94 | EXPREQ | 132 | M DRXN |
| 95 | AD[29] | 133 | VBATT |
| 96 | AD[31] | 134 | EXPGNT |
| 97 | AD[30] | 135 | VBATT |
| 98 | AD[28] | 136 | GND |
| 99 | AD[26] | 137 | VBATT |
| 100 | GND | 138 | PS2 DATA |
| 101 | AD[24] | 139 | VBATT |
| 102 | AD[22] | 140 | AD[25] |
| 103 | AD[20] | 141 | VBATT |
| 104 | AD[18] | 142 | AD[27] |

Continued

Table A-7 *Continued*

| Pin | Signal | Pin | Signal |
|-----|--------|-----|------------|
| 143 | VBATT | 160 | CBE3 |
| 144 | AD[23] | 161 | CBE2 |
| 145 | GND | 162 | IRDY |
| 146 | AD[21] | 163 | DEVSEL |
| 147 | AD[19] | 164 | LOCK |
| 148 | AD[17] | 165 | OERR |
| 149 | GND | 166 | SERR |
| 150 | AD[14] | 167 | GND |
| 151 | AD[12] | 168 | RSVD3 |
| 152 | AD[10] | 169 | M 12C CLK |
| 153 | AD[08] | 170 | M 12C DATA |
| 154 | GND | 171 | M RING |
| 155 | AD[07] | 172 | MGND |
| 156 | AD[05] | 173 | M DXTN |
| 157 | AD[03] | 174 | GND |
| 158 | AD[01] | 175 | M DXTP |
| 159 | GND | 176 | MSTRBAT |

Table A-8
External Keyboard/Mouse Connector

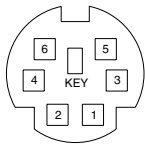
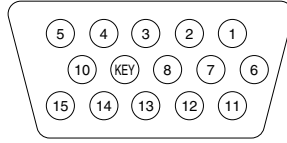
| Connector | Pin | Signal |
|--|-----|---------------------|
|  | 1 | Keyboard/Mouse DATA |
| | 2 | Keyboard/Mouse DATA |
| | 3 | Ground |
| | 4 | +5 VDC |
| | 5 | Keyboard/Mouse CLK |
| | 6 | Keyboard/Mouse CLK |

Table A-9
External Monitor Connector



| Pin | Signal | Pin | Signal |
|-----|--------------|-----|-----------------|
| 1 | Red Analog | 9 | NC |
| 2 | Green Analog | 10 | Ground |
| 3 | Blue Analog | 11 | NC |
| 4 | NC | 12 | DDC Data |
| 5 | Ground | 13 | Horizontal Sync |
| 6 | Ground | 14 | Vertical Sync |
| 7 | Ground | 15 | DDC Clock |
| 8 | Ground | | |

appendix **B**

POWER CORD SET REQUIREMENTS

3-Conductor Power Cord Set

The wide range input feature of the Compaq Armada M700 Series of Personal Computers permits it to operate from any line voltage from 100 to 120 or 220 to 240 volts AC.

The power cord set received with the computer meets the requirements for use in the country where the equipment is purchased.

Power cord sets for use in other countries must meet the requirements of the country where the computer is used. For more information on power cord set requirements, contact a Compaq authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

1. The length of the power cord set must be at least 5.00 feet (1.5 m) and a maximum of 6.50 feet (2.0 m).
2. All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
3. The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
4. The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with appliance inlet on the back of the computer.

Country-Specific Requirements

| 3-Conductor Power Cord Set Requirements—By Country | | |
|--|-------------------|-------------------------|
| Country | Accredited Agency | Applicable Note Numbers |
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | JIS | 3 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |
| United Kingdom | BSI | 1 |
| United States | UL | 2 |

Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 0.75mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

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