COMPAQ LTE Lite
Family of Personal Computers

Maintenance & Service Guide

COMPAQ

READ THIS FIRST

Maintenance and Service Guide
COMPAQ LTE Lite Family
of Personal Computers

The numeric coprocessor listed in Table 4-11 on page 4-12 of Chapter 4, "Illustrated Parts Catalog" is for use with the COMPAQ LTE Lite/25. When ordering the 387SX numeric coprocessor for COMPAQ LTE Lite/20, use the following spare part number:

- 118361-001

The fixed disk drives spare part numbers listed in Tables 6-10 and 6-11 on page 6-10 of Chapter 6, "Options" are incorrect. When ordering a spare fixed disk drive for the Desktop Expansion Base, use the following spare part numbers:

- 112483-001 (84 MB 1:1)

- 136918-001 (120 MB 1:1)

- 124013-001 (210 MB 1:1)

The following spare part numbers are not listed in the Maintenance and Service Guide. When ordering a ZIF connector slider, use the following numbers:

- 140069-001 (Diskette ZIF Connector Slider, located on the system module)

- 140070-001 (Display ZIF Connector Slider, located on the System Module)

- 140071-001 (Keyboard ZIF Connector Slider, located on the System Module)

NOTICE

The information in this guide is subject to change without notice.

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MAINTENANCE AND SERVICE GUIDE
COMPAQ LTE Lite Family of Personal Computers

Compaq Computer Corporation

CONTENTS

Chapter 3
POWER-ON SELF-TEST (POST)

Chapter 4
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Chapter 5
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Preface

This *Maintenance and Service Guide* is a troubleshooting guide that can be used for reference when servicing the COMPAQ LTE Lite/25c Personal Computer. Additional information is available in the *Maintenance and Service Guide-Software Support* and the *Technical Reference Guide*.

Compaq Computer Corporation reserves the right to make changes to the COMPAQ LTE Lite/25c Personal Computer without notice.

Symbols

The following words and symbols mark special messages throughout this guide:

⚠️ **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 could result in damage to equipment or loss of data.

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

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

Technician Notes

⚠️ **WARNING:** Only authorized technicians trained by Compaq Computer Corporation should attempt to 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 modifications may void any warranty or exchange allowances.

Locating Additional Information

For the Compaq Customer Support Center or your nearest Authorized COMPAQ Reseller, call:

U.S.   1-800-345-1518

Canada   1-800-263-5868

Or write: Compaq Customer Support Center
          P.O. Box 692000
          Houston, Texas 77269-2000

- *User's Guide*

- *Technical Reference Guide*

- *Maintenance and Service Guide-Support Software*

- *Maintenance and Service Guide-Options and Peripherals*

- *COMPAQ Service Quick Reference Guide*

- Service Training Guides

- *COMPAQ Service Advisories and Bulletins*

- COMPAQ QuickFind

ILLUSTRATED PARTS CATALOG

This chapter provides illustrated parts breakdowns and identifies the spare parts for the standard features of the COMPAQ LTE Lite Family of Personal Computers.
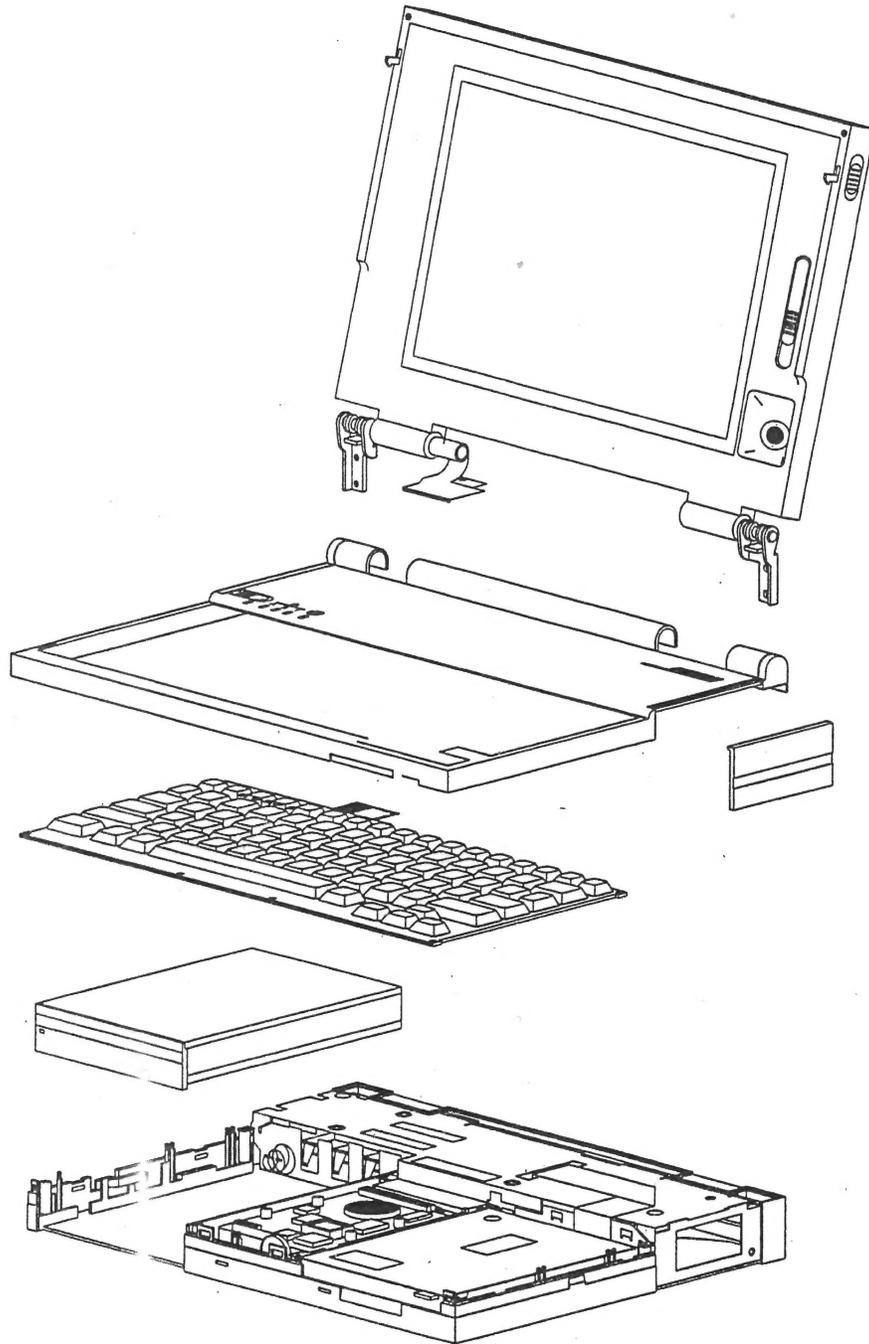
Figure 1-1. COMPAQ LTE Lite/25c Personal Computer
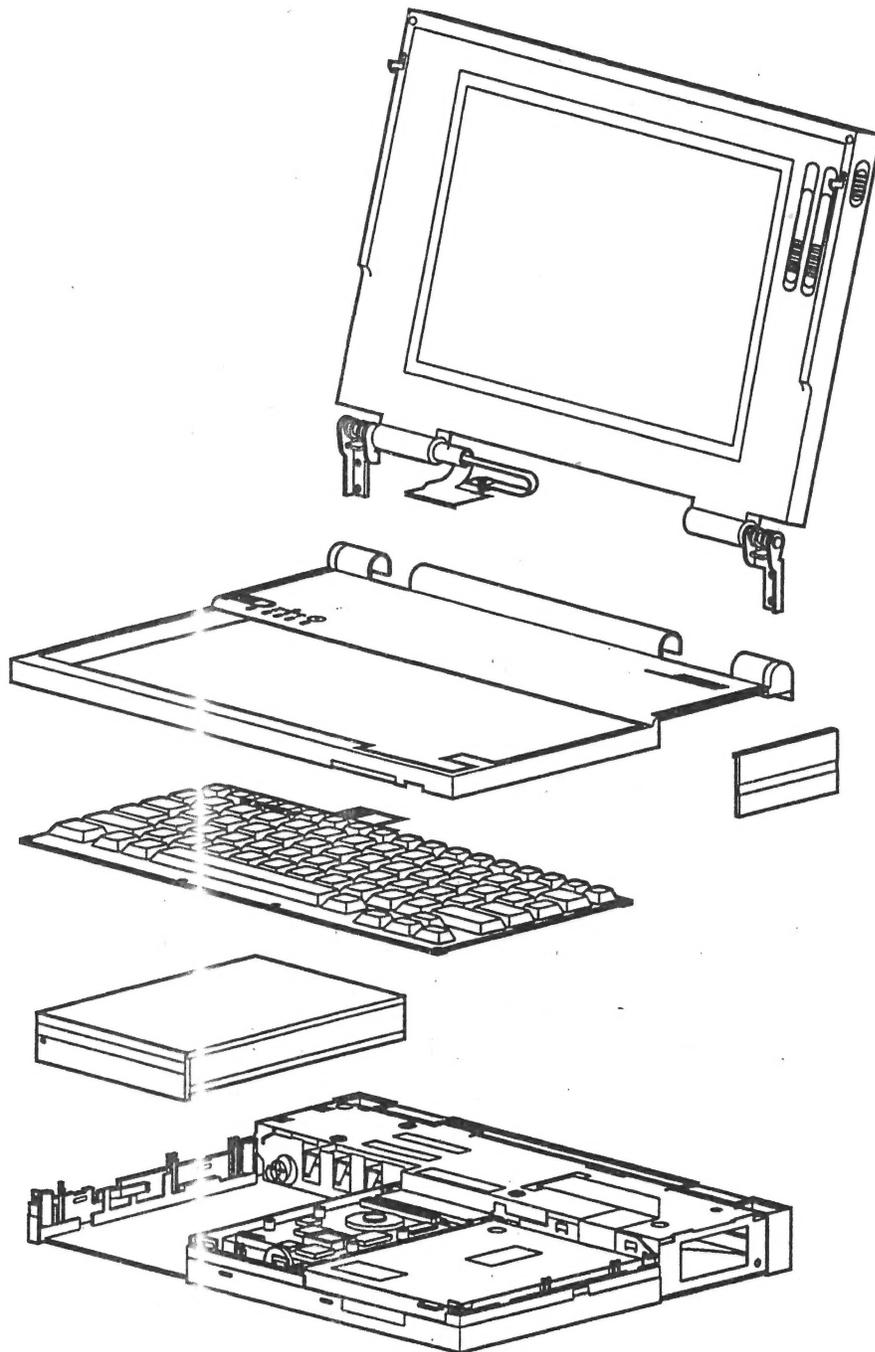
Figure 1-2. COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20 Personal Computers

1.1   ILLUSTRATED PARTS BREAKDOWN

System Unit
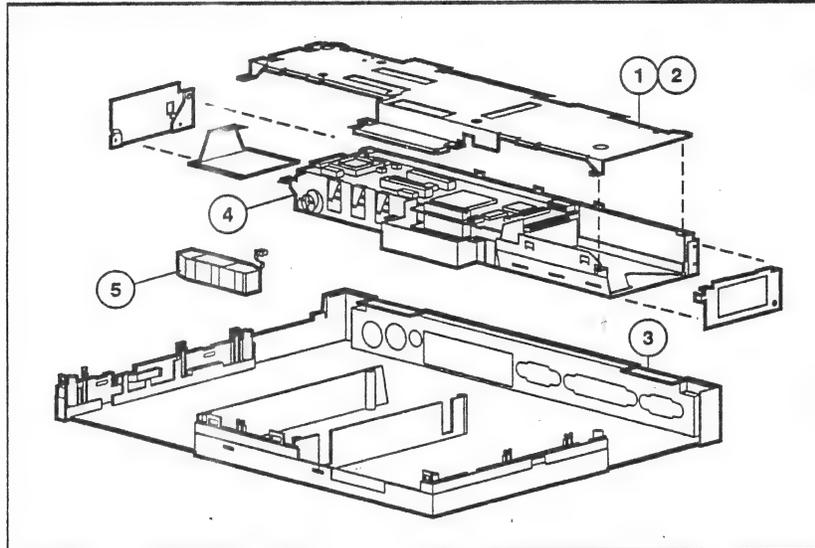
Figure 1-3.   System Unit

Table 1-1
System Unit

Description		Part Number
1. System Module	(COMPAQ LTE Lite/25c)	138319-001
	(COMPAQ LTE Lite/25)	129892-001
	(COMPAQ LTE Lite/20)	129971-001
2. CPU Base Enclosure		129926-001
3. Auxiliary Battery		129898-001
4. Power Supply (COMPAQ LTE Lite/25c)		138317-001
5. Power Supply		129895-001
6. System Unit Cover		129925-001*
7. Display Enclosure		129923-001*
8. NiCd Battery Pack		129948-001*
9. NiMH Battery Pack		129894-001*

* Not shown.

Table 1-2
Active Matrix Color VGA Display

Description	Part Number
1. Display Bezel	138327-001
2. Display Panel Assembly	138323-001
3. Cable Harness (Backlight)	138333-001
4. Display Inverter Board	138322-001
5. Trackball	138299-001
6. Display Enclosure	138324-001
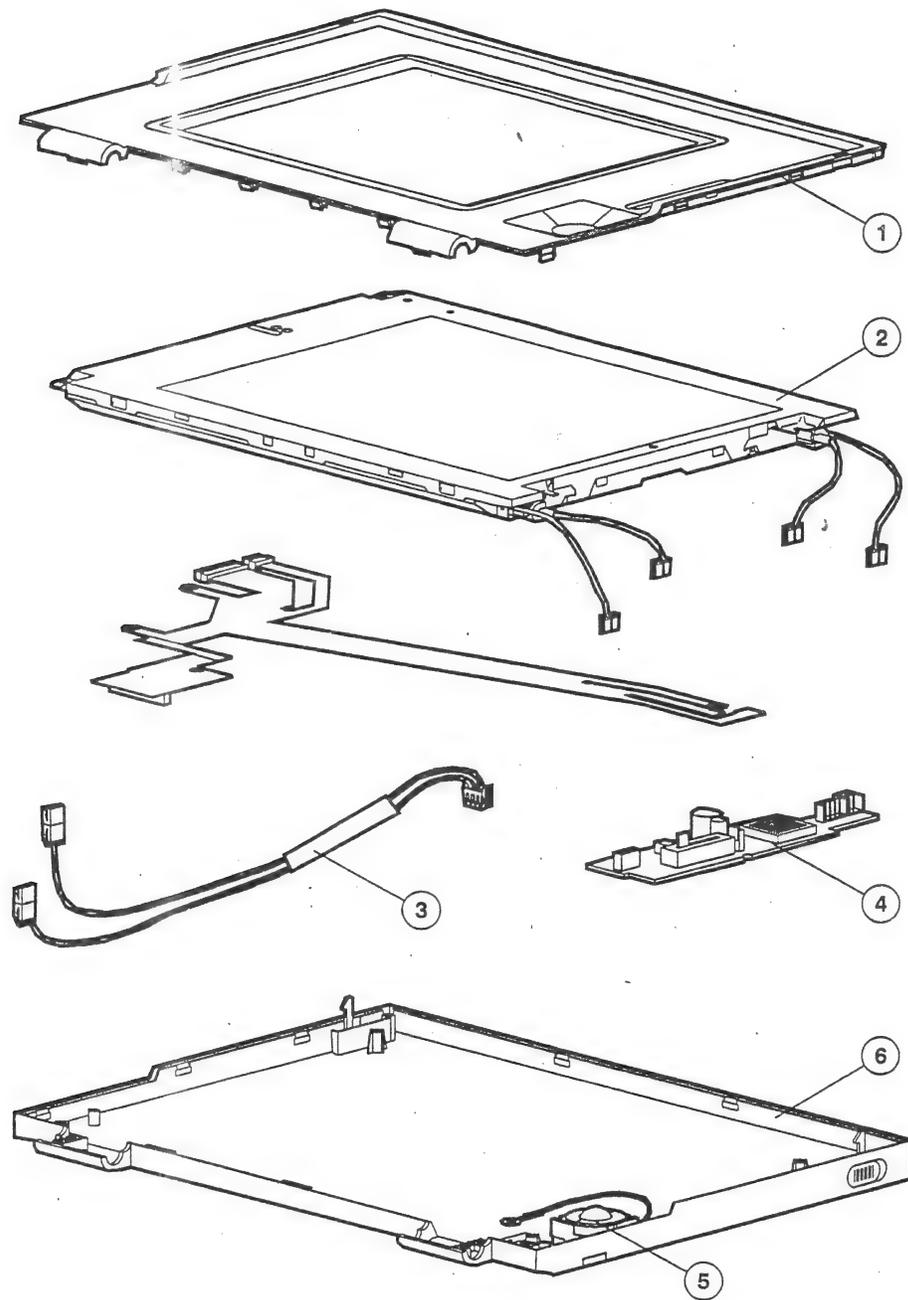
Figure 1-4.   Active Matrix Color VGA Display

Table 1-3
VGA Maxlight Liquid Crystal Display

Description	Part Number
1. Display Bezel	129924-001
2. LCD Panel	129906-001
3. Backlight	136774-001
4. Display Inverter Board	129739-001
5. Display Enclosure	129923-001
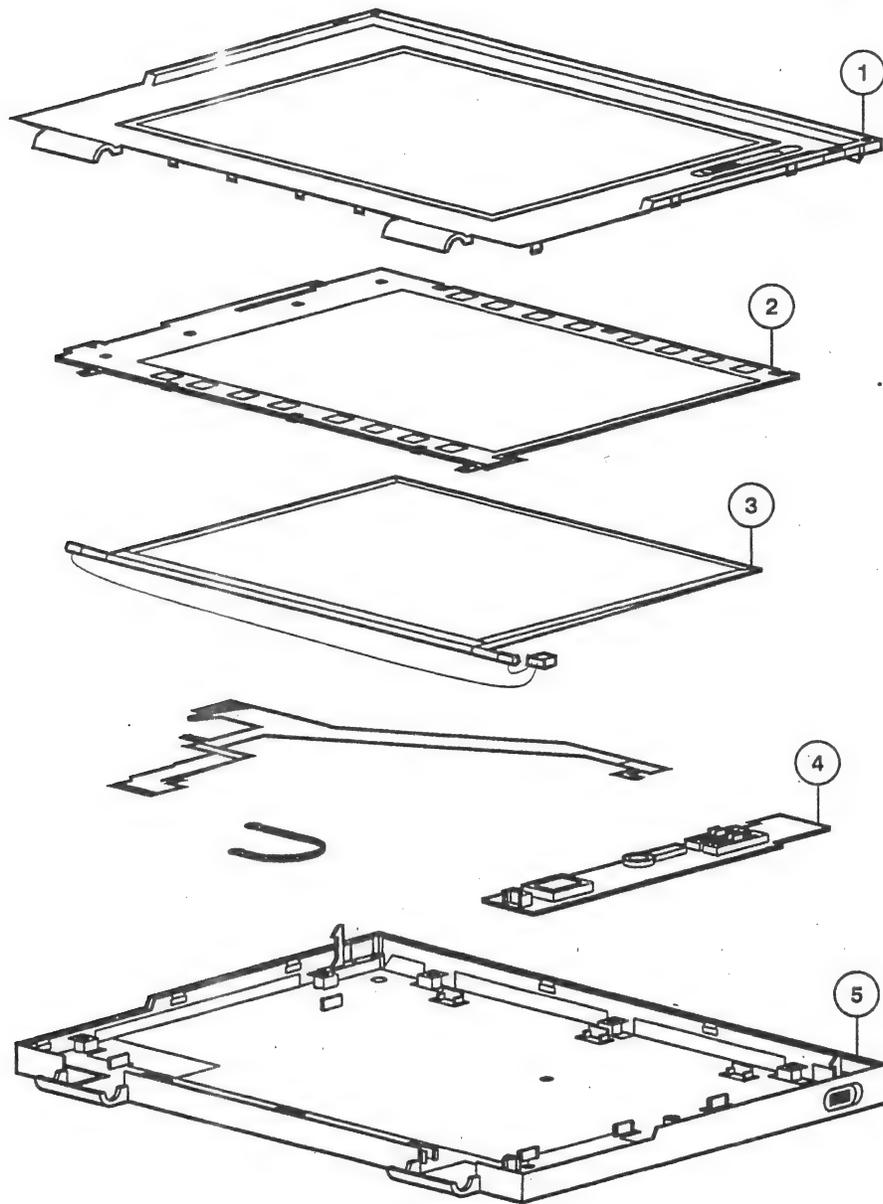
Figure 1-5.   VGA Maxlight Liquid Crystal Display
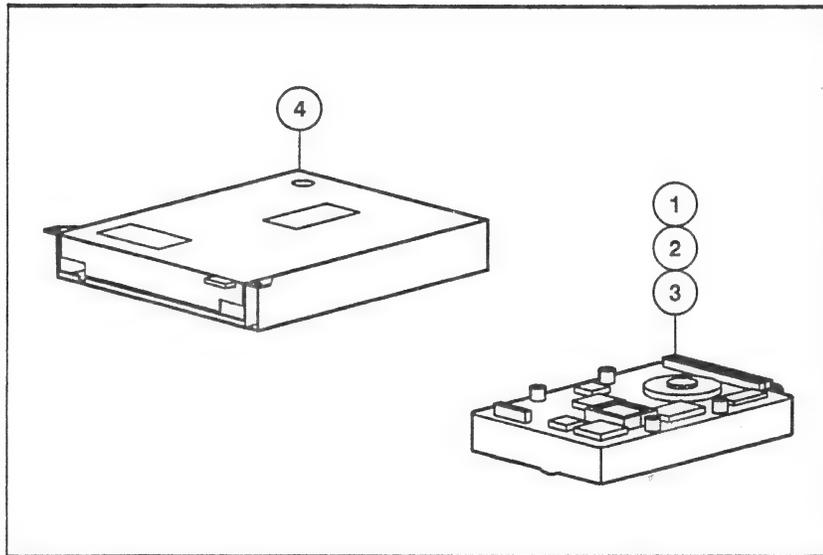
Figure 1-6.   Mass Storage Devices

Table 1-4
Mass Storage Devices
(COMPAQ LTE Lite/25c and COMPAQ LTE Lite/25)

Description	Part Number
1. 120-Megabyte Hard Drive	129981-001
2. 84-Megabyte Hard Drive	139390-001
3. 60-Megabyte Hard Drive	129984-001*
4. 3 1/2-Inch 1.44-Megabyte Diskette Drive	129900-001

* Not available for the COMPAQ LTE Lite/25c Personal Computer.

Table 1-5
Mass Storage Devices (COMPAQ LTE Lite/20)

Description	Part Number
1. 84-Megabyte Hard Drive	139390-001
2. 60-Megabyte Hard Drive	129984-001
3. 40-Megabyte Hard Drive	129902-001
4. 3 1/2-Inch 1.44-Megabyte Diskette Drive	129900-001
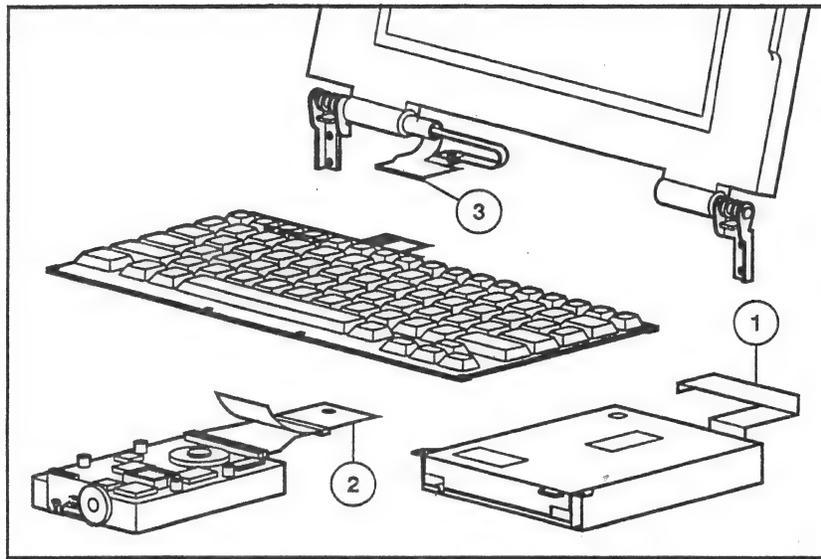
Figure 1-7.   Cables

Table 1-6
Miscellaneous Cables (Kits)

Description	Part Number
1. Diskette Drive Cable	129940-001
2. Hard Drive/Speaker Cable	126373-001
3. Display Flex Cable	126372-001
4. Display Ground Cable (COMPAQ LTE Lite/25c)	138331-001*
5. Display Cable (COMPAQ LTE Lite/25c)	138326-001*
6. Cable Harness (Backlight)	138333-001*
* Not shown.	
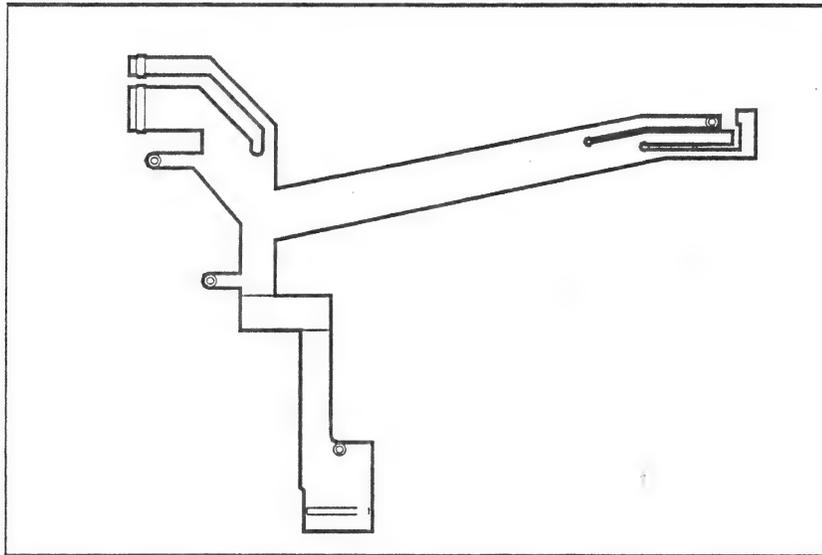
Figure 1-8. COMPAQ LTE Lite/25c Personal Computer Display Cable
Layout Diagram
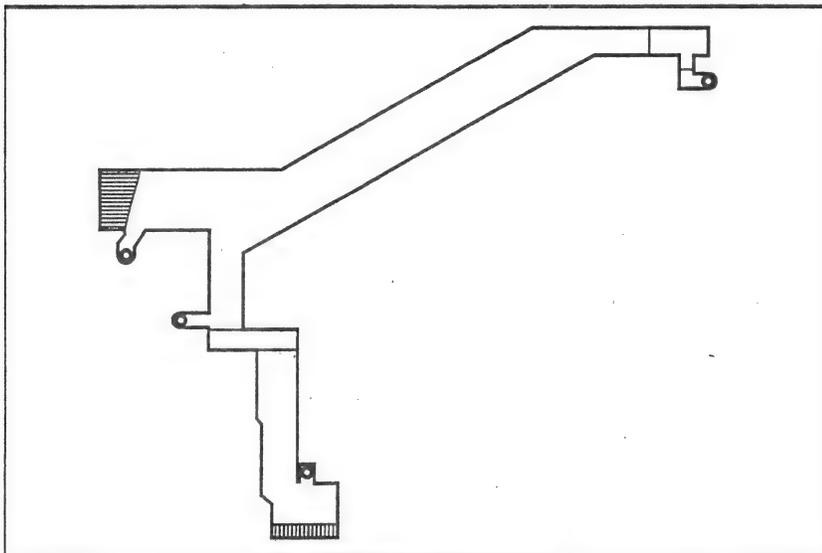
Figure 1-9. COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20
Personal Computers Display Flex Cable Layout Diagram

Top View

Bottom View

Rear View
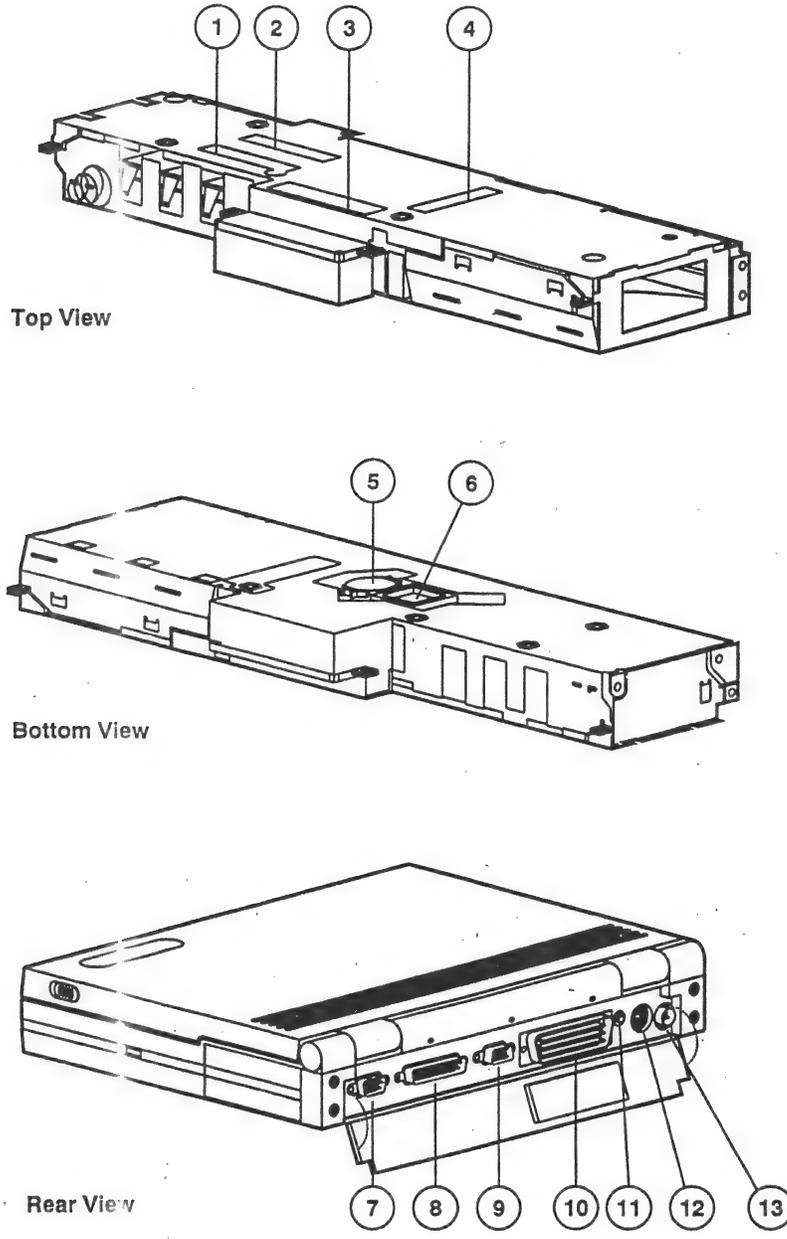
Figure 1-10.   System Module

Table 1-7
COMPAQ LTE Lite Family of Personal Computers
System Module Connectors

1. Internal Keyboard Connector

2. LCD Connector

3. Hard Drive/Speaker Cable Connector

4. Diskette Drive Connector

5. Clock/Calendar Battery

6. Coprocessor Socket

7. Serial Connector

8. Parallel Connector

9. VGA Monitor Connector

10. External Options/Desktop Expansion Base Connector

11. External Numeric Keypad Connector

12. Pointing Device (Mouse)/External Keyboard Connector

13. System Power Connector

Table 1-8
System Module Assemblies

Description	Part Number
System Module (COMPAQ LTE Lite/25c)	138319-001*
System Module (COMPAQ LTE Lite/25)	129892-001*
System Module (COMPAQ LTE Lite/20)	129971-001*
Power Supply (COMPAQ LTE Lite/25c)	138317-001*
Power Supply	129895-001*
Display Inverter Board (COMPAQ LTE Lite/25c)	138320-001*
Display Inverter Board	129739-001*
ROMPaq Diskette	129899-001*
Auxiliary Battery	129898-001*
Clock/Calendar Battery	129907-001*

* Not shown.
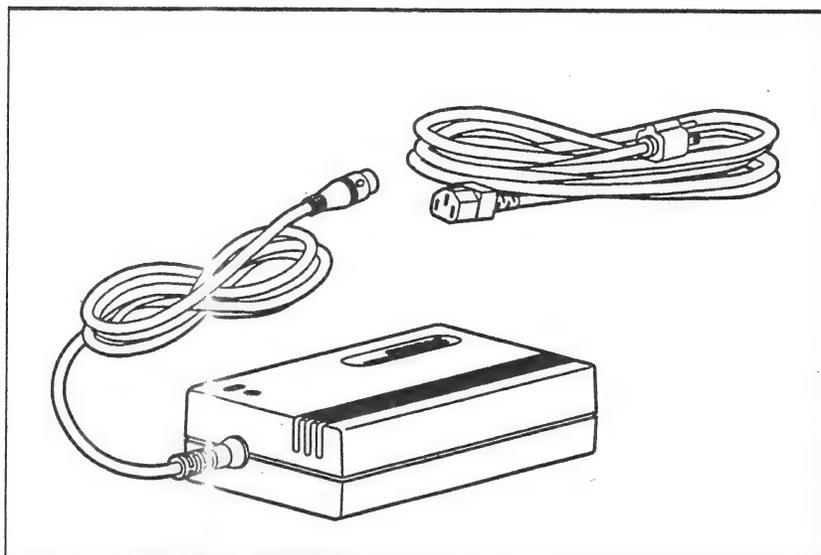
Figure 1-11.   AC Adapter

Table 1-9
AC Adapter

Description	Part Number
1. AC Adapter	129827-001
2. Power Cord (U.S./Canada)	121258-001
3. Power Cord (U.K.)	119176-001*
* Not shown.	

Table 1-10
Auto Adapter

Description	Part Number
Auto Adapter	129816-001*
* Not shown.	
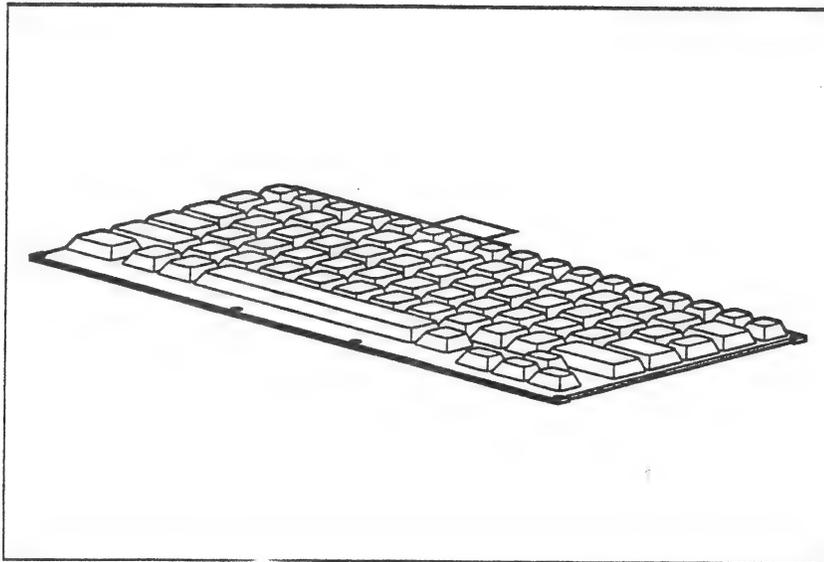
Figure 1-12.   Keyboard

Table 1-11
Keyboards

Description	Part Number
1. U.S. English	129903-001
2. U.K. English	129904-001*
3. German	129905-001*
4. French	129908-001*
5. Italian	129909-001*
6. Spanish	129910-001*
7. Danish	129911-001*
8. Norwegian	129912-001*
9. Swedish/Finnish	129913-001*
10. Swiss	129914-001*
11. French Canadian	129915-001*
12. Belgian	129920-001*
13. Portuguese	129916-001*
14. Greek	129918-001*
15. Latin American	129919-001*
16. Turkish	129917-001*
17. Japanese	129522-019*

*   Not shown.

Table 1-12
Spare Parts List

System Unit

Description	Spare Part Number
System Unit Cover	129925-001
CPU Base Enclosure	129926-001
Power Supply (COMPAQ LTE Lite/25c)	138317-001
(COMPAQ LTE Lite/25)	
(COMPAQ LTE Lite/20)	129895-001
NiCd Battery Pack	129948-001
NiMH Battery Pack	129894-001
Auxiliary Battery	129898-001

VGA Maxlight Liquid Crystal Display

Display Bezel	129924-001
LCD Panel	129906-001
Display Enclosure	129923-001
Display Inverter Board	129739-001

Active Matrix Color VGA Display

Display Panel Assembly	138323-001
Display Bezel	138327-001
Display Inverter Board	138320-001
Display Inverter Cable	138333-001
Display Enclosure	138324-001

EasyPoint Trackball

Trackball	138299-001
Trackball Removal Tool	138379-001
Trackball Kit (includes trackball & removal tool)	138340-001

Mass Storage Devices

120-Megabyte Hard Drive	129981-001
84-Megabyte Hard Drive	139390-001
60-Megabyte Hard Drive	129984-001
40-Megabyte Hard Drive	129902-001
3 1/2-Inch 1.44-Megabyte Diskette Drive	129900-001

Miscellaneous Cables

Diskette Drive Cable	129940-001
Hard Drive/Speaker/LED Cable	126373-001
Display Flex Cable	126372-001
Display Ground Cable (COMPAQ LTE Lite/25c)	138331-001
Display Cable (COMPAQ LTE Lite/25c)	138326-001

Continued

Table 1-12   *Continued*

System Module Assemblies	
System Module (COMPAQ LTE Lite/25c)	138319-001
(COMPAQ LTE Lite/25)	129892-001
(COMPAQ LTE Lite/20)	129971-001
Power Supply (COMPAQ LTE Lite/25c)	138317-001
Internal Power Supply	129895-001
Display Inverter Board	129739-001
ROMPaq Diskette	129899-001
Keyboard Controller	140068-001
Clock/Calendar Battery	129907-001

Coprocessor	
80387SX	136775-001
80387SL	139344-001

Memory Options	
2-Megabyte Memory Card	129937-001
4-Megabyte Memory Card	129947-001
8-Megabyte Memory Card	129938-001
16-Megabyte Memory Card	138343-001

AC Adapter	
AC Adapter	129827-001
Power Cord (U.S./Canada)	121258-001
Power Cord (U.K.)	119176-001

Automobile Adapter	
Description	**Spare Part Number**
Auto Adapter	129816-001

Keyboards	
U.S. English	129903-001
U.K. English	129904-001
German	129905-001
French	129908-001
Italian	129909-001
Spanish	129910-001
Danish	129911-001
Norwegian	129912-001
Swedish/Finnish	129913-001
Swiss	129914-001
French Canadian	129915-001
Belgian	129920-001
Portuguese	129916-001
Greek	129918-001
Latin American	129919-001
Turkish	129917-001
Japanese	129522-019

Continued

Table 1-12   *Continued*

Documentation	
Maintenance and Service Guide	129932-001
Maintenance and Service Guide	
Support Software	120576-003
COMPAQ LTE Lite Family User's Guide	138344-001
COMPAQ Service Quick Reference Guide	107315-015

Table 1-13
Miscellaneous Kits (Plastics)

Description	Part Number
Slide Volume Knob	139348-001
Rubber Foot Display	139349-001
CPU Rubber Foot	139350-001
Option Access Panel	139351-001
I/O Connector (Cover Assembly)	139352-001

Table 1-14
Miscellaneous Kits (Hardware)

Description	Part Number
Left Clutch	129701-001
Right Clutch	129702-001
Left/Right Clutches (COMPAQ LTE Lite/25c)	138328-001
Inverter Board Cap	139353-001
Spring Latch	139354-001
Left Latch	129706-001
Right Latch	129708-001

Chapter 2

REMOVAL AND REPLACEMENT PROCEDURES

This chapter provides subassembly/module level removal and replacement procedures for the COMPAQ LTE Lite Family of Personal Computers.

After completing all necessary removal and replacement procedures, run the Diagnostics program to verify that all components operate properly.

2.1 ELECTROSTATIC DISCHARGE INFORMATION

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 (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Or it may function normally for awhile and then degrade in the internal layers, reducing its life expectancy.

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.

Generating Static

Table 2-1 shows how different methods generate static electricity and at different electrostatic voltage levels.

Table 2-1
Typical Electrostatic Voltages

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 tubes	2,000 V	700 V	400 V
Removing DIPs from vinyl trays	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 PCBs	26,000 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.

Preventing Electrostatic Damage to Equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. Proper packaging and grounding precautions are necessary to prevent damage.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.

- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.

- Keep electrostatic sensitive parts in their containers until they arrive at static-free stations.

- 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 conductive foam.

Use transporters and conveyers made of antistatic belts and metal roller bushings. Mechanized equipment used for moving materials must be wired to ground and proper materials selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Preventing Damage to Drives

To prevent static damage to diskette drives and hard drives, handle drives gently and perform the following static-guarding techniques:

- Handle drives gently, using static-guarding techniques.

- Store them in the original shipping containers.

- Avoid dropping them from any height onto any surface.

- Handle drives on surfaces which have at least one inch of shock-proof foam.

- Always place drives PCB assembly side down on the foam.

Grounding Methods

The method for grounding 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 When standing, use footstraps and a grounded floor mat.

Table 2-2 lists different antistatic materials and their shielding protection levels.

Table 2-2
Static-Shielding Protection Levels

Method	Voltages
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding Workstations

■ Cover workstations with approved static dissipative material. Provide a wrist strap connected to work surface and properly grounded tools and equipment.

■ Use static dissipative mats, heel straps, or air ionizers to give added protection.

■ Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free workstations.

■ Avoid contact with pins, leads, or circuitry.

■ Turn off power and input signals before inserting and removing connectors or test equipment.

■ Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

■ Keep work area free of non-conductive materials such as ordinary plastic assembly aids and styrofoam.

■ Use field service tools, such as cutters, screwdrivers, vacuums, that are conductive.

■ Use a portable field service kit with a static dissipative vinyl pouch that folds out to a work mat. Also use a wrist strap and a ground cord for the work surface. Ground the cord to the chassis of the equipment undergoing test or repair.

Grounding Equipment

Use the following equipment to prevent static electricity damage to equipment:

Wrist Straps are flexible straps with a minimum of 1 megohm +/– 10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats without banana plug connectors, connect a wrist strap with alligator clips.

Heelstraps/Toestraps/Bootstraps 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 1 megohm resistance between operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Recommended Materials and Equipment

Other materials and equipment that are recommended for use in preventing static electricity include:

- Antistatic tape

- Antistatic smocks, aprons or sleeve protectors

- Conductive bins and other assembly or soldering aids

- Conductive foam

- Conductive table-top workstations with ground cord of 1 megohm resistance

- Static dissipative table or floor mats with hard tie to ground

- Field service kits

- Static awareness labels

- Wrist straps and footwear straps providing 1 megohm +/– 10% resistance

- Material handling packages
  Conductive plastic bags
  Conductive plastic tubes
  Conductive tote boxes
  Metal tote boxes
  Opaque shielding bags
  Transparent metallized shielding bag
  Transparent shielding tubes

2.2 SERVICE CONSIDERATIONS

The COMPAQ LTE Lite Family of Personal Computers differ from other
COMPAQ products. Listed below are some of the considerations that should
be kept in mind during the disassembly and assembly of these units.

Tools and Software Requirements

To service the COMPAQ LTE Lite Family of Personal Computers, you need
the following:

- Torx screwdriver, size T-8

- Flat-bladed screwdriver

- JIS screwdriver, sizes JIS-0, JIS-1

- Phillips screwdriver, sizes P-0, P-1

- Modem terminating plug

- Diagnostics software

- Formatted scratch diskettes

- COMPAQ 5-in-1 Service Tool, spare part number 130619-001

- COMPAQ Case Utility Tool, spare part number 119070-001

- COMPAQ Trackball Removal Tool, spare part number 138340-001

Screws

The screws used in these products are not interchangeable. If an incorrect
screw is used during the reassembly process, it could cause damage to the unit.
Compaq strongly recommends that all screws removed during disassembly be
kept with the part that was removed, then returned to their proper locations.

IMPORTANT: As each subassembly is removed from the computer, it
should be placed away from the work area to prevent inadvertent damage.

Cables and Connectors

Most cables used throughout the unit are ribbon cables and flex cables
(Figure 2-1). These cables must be handled with extreme care to avoid damage.
Apply only that tension required to seat or unseat the cables during insertion
or removal from the connector. Handle cables by the connector or pull tabs
whenever possible. In all cases avoid bending, twisting, or tearing the cables,
and ensure that cables are placed such that they cannot be caught or snagged
by parts being removed or replaced.

⚠ **CAUTION:**   The ribbon cables are folded to ensure proper placement during assembly. When servicing these units ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can cause severe damage to the unit.
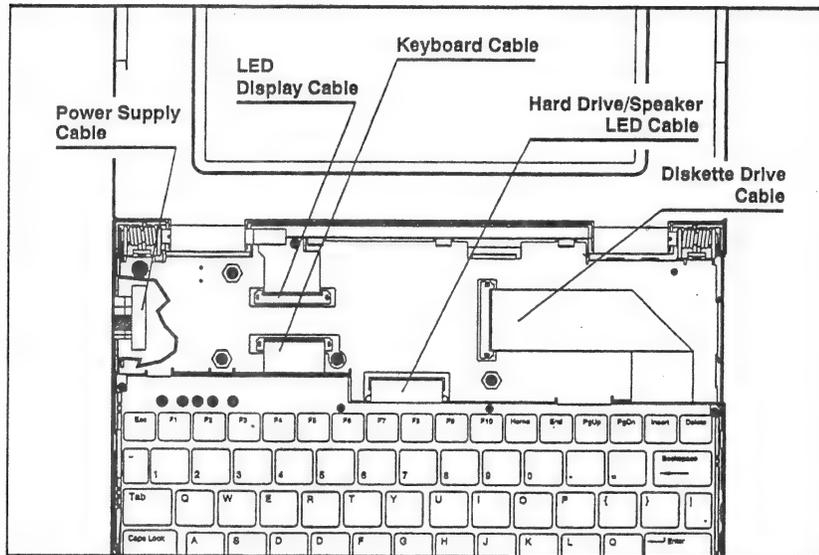

Figure 2-1.   ZIF Connectors and Cables

Plastics

The plastics used throughout the COMPAQ LTE Lite Family of Personal Computers can be damaged by the use of excessive force during disassembly and reassembly. When handling the plastic cases and housing assemblies, use care. Do not use screwdrivers or similar tools to pry apart plastics. Where necessary, use the case utility tool (spare part number 119070-001). Proper handling of this tool is illustrated in the appropriate disassembly and reassembly procedures.

2.3   DISASSEMBLY/ASSEMBLY SEQUENCE CHART

This section provides instructions for removing and replacing these components:

```
2.4      PREPARATION PROCEDURES
2.5      ├── BATTERY PACK
2.6      ├── SYSTEM UNIT COVER
              └── REAR CONNECTOR COVER
2.7      ├── ACTIVE MATRIX COLOR VGA DISPLAY
              └── Display Bezel
                    └── LCD Panel
                          └── Display Inverter Board
                                └── EasyPoint Trackball
2.8      ├── VGA MAXLIGHT LIQUID CRYSTAL DISPLAY
              └── Display Bezel
                    └── LCD Panel
                          └── Backlight
                                └── Display Inverter Board
2.9      ├── KEYBOARD
2.10     ├── DISKETTE DRIVE
2.11     ├── HARD DRIVE
2.12     ├── SYSTEM MODULE
2.13     ├── COPROCESSOR AND REAL-TIME BATTERY
2.14     ├── POWER SUPPLY
2.15     └── AUXILIARY BATTERY
```

2.4 PREPARATION PROCEDURES

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

1. Turn off the computer.

2. Disconnect all external devices (printer, monitor, and other devices) from
   the computer.

⚠ **CAUTION:** The system unit power should be off before any
cables are connected or disconnected.

---

3. Disconnect the AC power cord from the AC outlet, then from the system
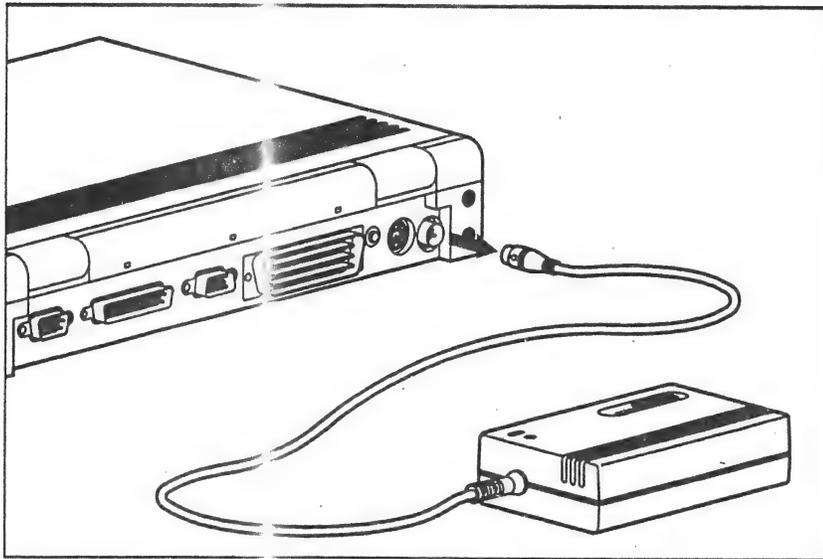   unit (Figure 2-2)

Figure 2-2. Disconnecting the AC Power

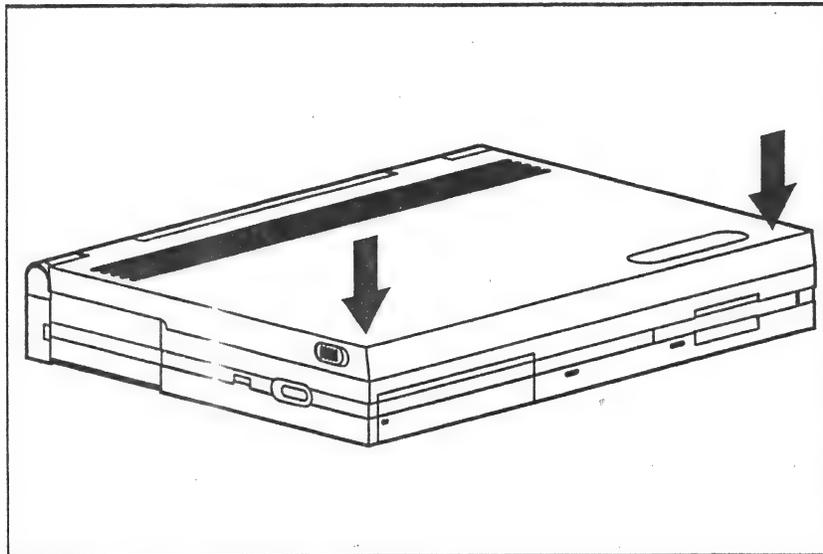4. Lower the display to the latched position (Figure 2-3).

Figure 2-3.   Closing the Computer

⚠️ **CAUTION:**   Static electricity can damage the CMOS components. Be sure that you are properly grounded before performing any of the following procedures.

Screws in these systems are not interchangeable. As you remove screws, place them with the component you removed. Damage may occur if you insert these screws in the wrong place.

2.5   BATTERY PACK

To remove an installed battery pack, complete the following steps:

1.   Press in on the battery pack. At the same time, press the battery release button on the left side of the computer; then release the battery pack (Figure 2-4).
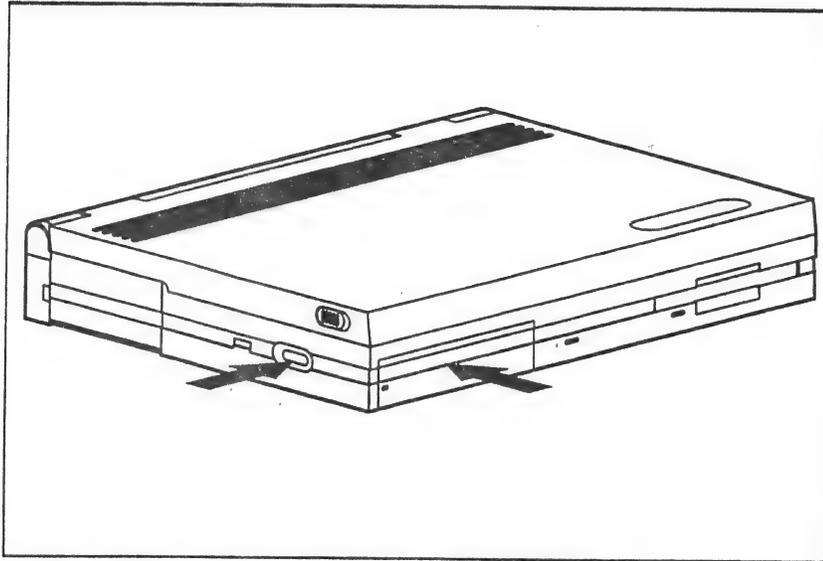
The battery pack springs outward.

Figure 2-4.   Releasing the Battery Pack
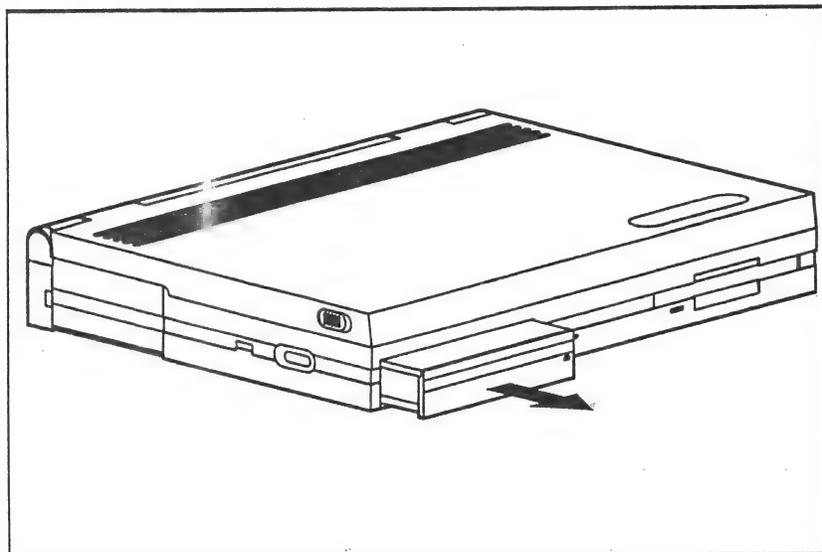
2. Remove the battery pack (Figure 2-5).

Figure 2-5. Removing the Battery Pack

⚠ **CAUTION:** Metal objects can damage the battery pack as well as the connectors in the compartment. To prevent damage, do not let metal objects touch any of the connectors. Do not place any objects other than the battery pack or battery replica in the battery compartment.

To replace the battery pack, complete the following steps:

1. Insert the battery pack, with the battery contacts facing to the inside of the battery compartment.

2. Push firmly on the battery pack. When released, it locks into place.

Disposal of a Used Battery Pack

Battery components are considered environmentally harmful. Disposal of either a Nickel Cadmium (NiCd) or a Nickel Metal Hydride (NiMH) battery pack should comply with country, state, province, or local regulations. Whenever possible battery components should be recycled.

⚠ **CAUTION:** Never attempt to open or service a battery pack. Opening a battery pack not only damages the pack and makes it unusable, but also exposes potentially harmful battery components.

2.6 SYSTEM UNIT COVER

To remove the system unit cover, complete the following steps:

1. Remove the battery pack (Section 2.5).

2. Rotate the display to the fully open position.

3. Remove the option bezel (Figure 2-6).

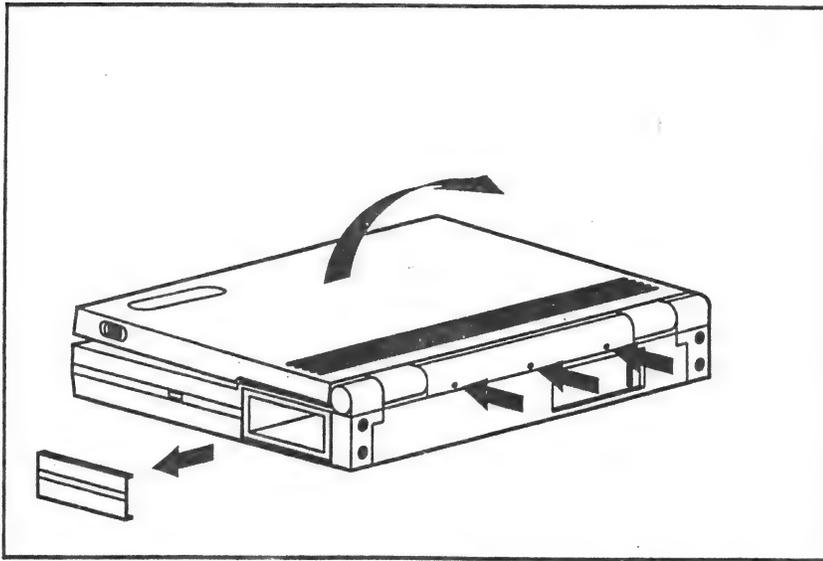4. Loosen the rear snaps with the case utility tool (Figure 2-6).

Figure 2-6. Removing the Option Bezel and Locating the Rear Snaps

5. Grasp the system unit cover above the option area. Lift up on the system unit cover and pry open the snaps in front of the option area. Pull the system unit cover off of the CPU base (Figure 2-7).

6. Remove the battery latch actuator.
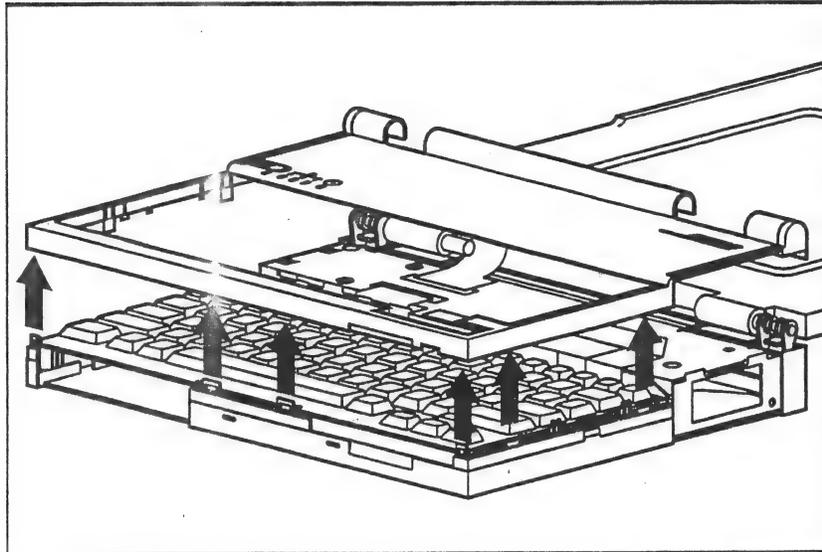
Figure 2-7.　Removing the System Unit Cover from the Computer

To replace the system unit cover, complete the following steps:

1. Rotate the display to the fully open position (Figure 2-8).
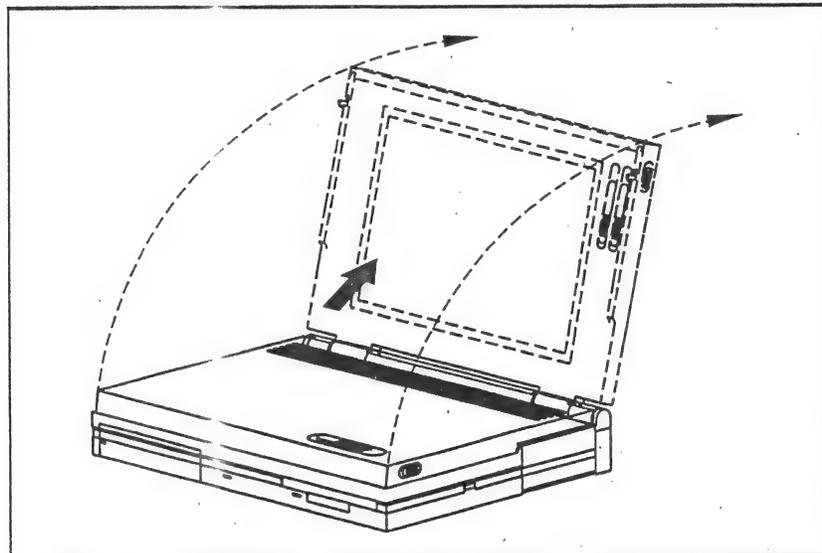
Figure 2-8.　Rotating the Display to the Open Position

2. Position the battery latch actuator (Figure 2-9).
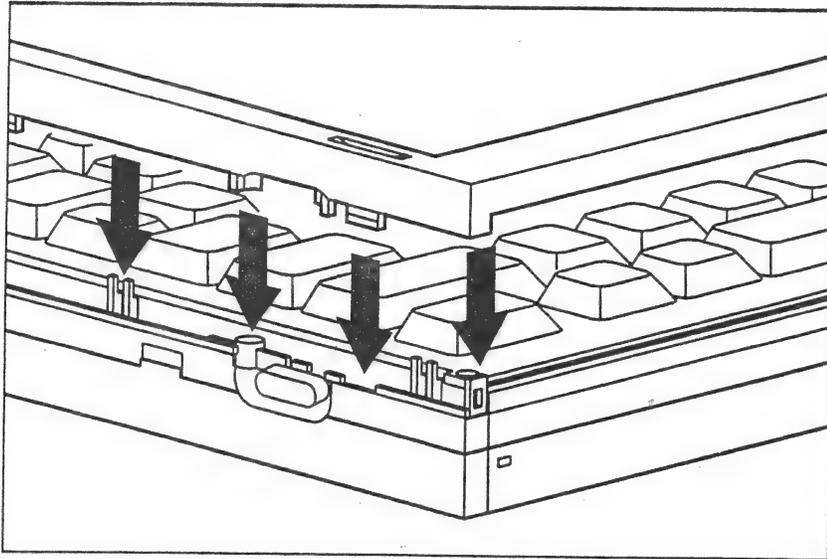
Figure 2-9. Replacing the System Unit Cover

3. Engage the cover's front snaps to the base (Figure 2-9).

4. Snap the system unit cover into place (Figure 2-9). (Replace the option bezel by inserting it with arrows pointing up. The arrows are located on the inside of the option bezel.)

NOTE: Be sure that all four snaps are engaged into the CPU base.

2.7   ACTIVE MATRIX COLOR VGA DISPLAY

To remove the Active Matrix Color VGA Display, complete the following steps:

1.   Remove the system unit cover. (To remove the system unit cover, refer to Section 2.6.)

2.   Using a Torx T-8, remove the cable screw securing the display cable and ground wire (Figure 2-10).
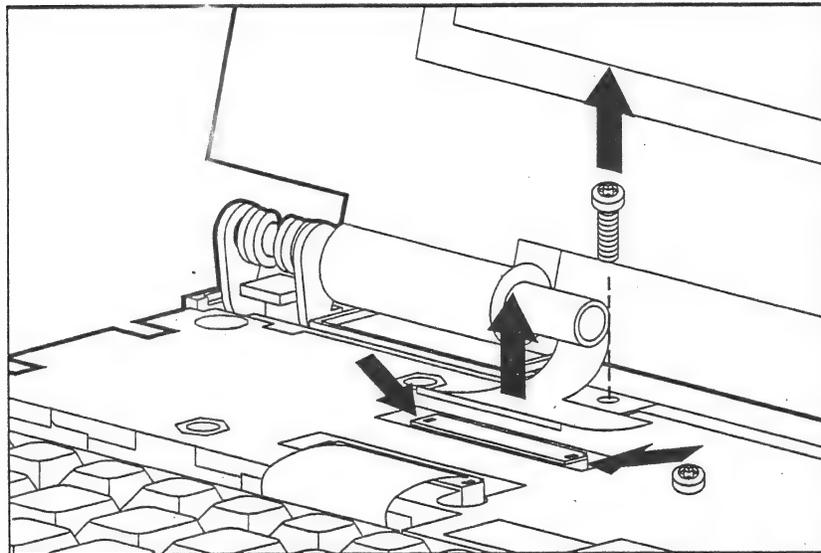
Figure 2-10.   Removing the Cable Screw and Unlocking the LIF Connectors


⚠   **CAUTION:**   Cables in this unit are fragile and can easily tear. Be careful when disconnecting or reconnecting them. Mishandling the cables can result in irreparable damage to the computer.

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3.   Using the case utility tool, carefully lift up on the LIF connector to release the cable; then disconnect the display cable from the system module (Figure 2-10).

IMPORTANT: The display cable is coiled to accommodate the rotation of the display. When this cable is reinstalled, it must be reinserted with the exact number of coils.

4.   Using a Torx T-8 screwdriver, remove the four screws that secure the display clutches (Figure 2-11).
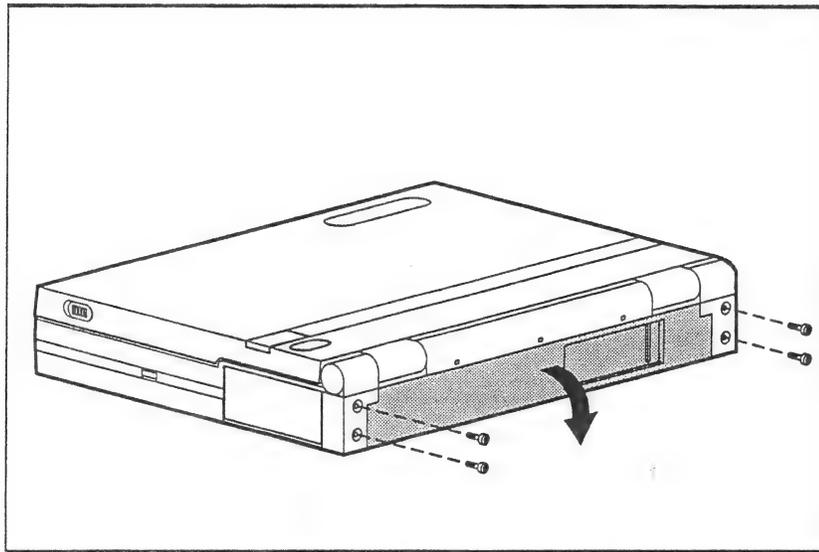
Figure 2-11.   Removing the Rear Connector Panel

5.   Lift the display out of the computer (Figure 2-12).
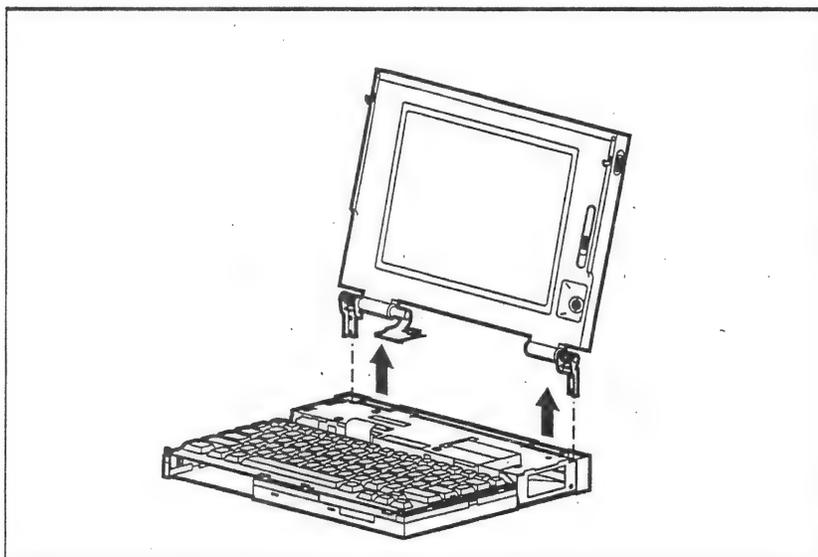
Figure 2-12.   Lifting the Display Panel

To replace the display panel assembly, complete the following steps:

1. Position the display panel by aligning the display clutches with the CPU base (Figure 2-13).
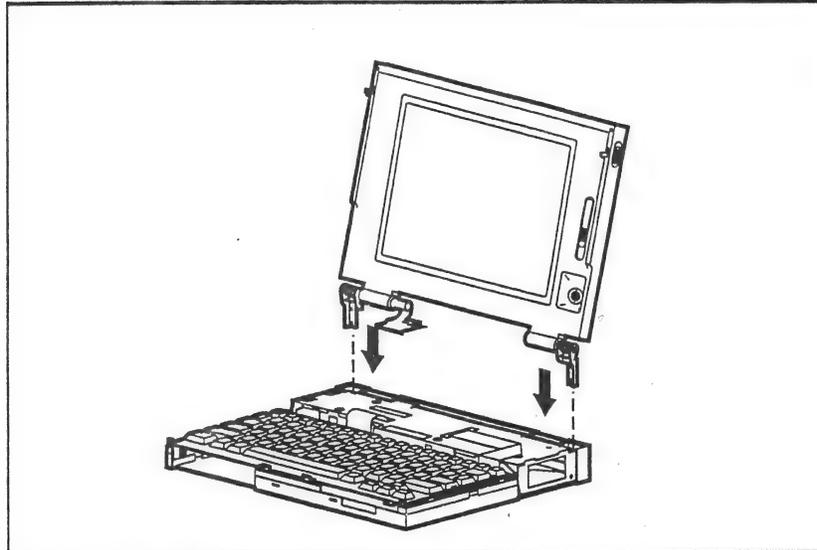
Figure 2-13.   Aligning the Display Panel

2. Replace the four screws securing the display panel to the CPU base.

3. Reconnect the display cable and ground wire to the system module.

4. Replace the display cable screw, securing the display cable wire and ground wire, and press down to lock the LIF connector.

△   **CAUTION:**   When reconnecting the ground wire, be sure that it is placed on top of the display cable. If it is not properly reinstalled, irreparable damage to the computer may occur.

Display Bezel

To remove the display bezel, complete the following step:

1. Remove the display assembly (Section 2.7).

2. Remove the two screw covers at the top of the display (Figure 2-14).

3. Using a JIS-0 screwdriver, remove the two screws located at the top of the display panel (Figure 2-14).
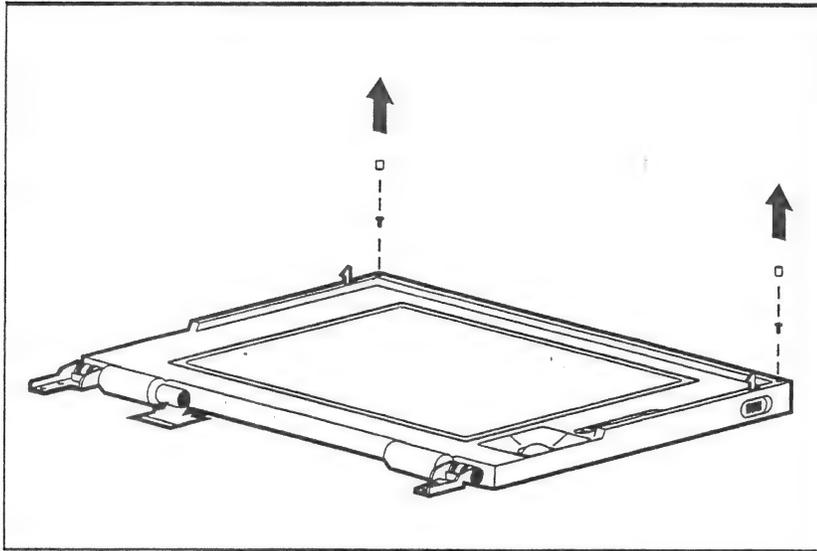
Figure 2-14. Removing the Screws

4. Remove the display bezel from the display panel by gently pulling the bezel frame from the inside and working from the bottom up (Figure 2-15).
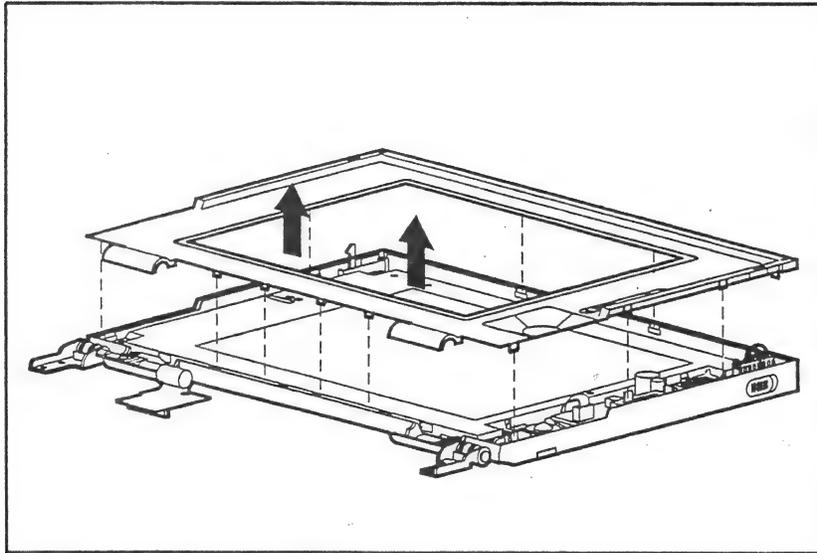
Figure 2-15. Removing the Display Bezel

NOTE: When replacing the display bezel, remove the slide knobs from the display bezel by squeezing the tabs on the underside of the bezel and popping the knobs out. Then replace the bezel and insert the slide actuators, ensuring that they are properly aligned.

Liquid Crystal Display Panel

To remove the Liquid Crystal Display (LCD) panel, complete the following steps:

1. Remove the display bezel.

2. Tilt the display assembly until it is flat (Figure 2-16).
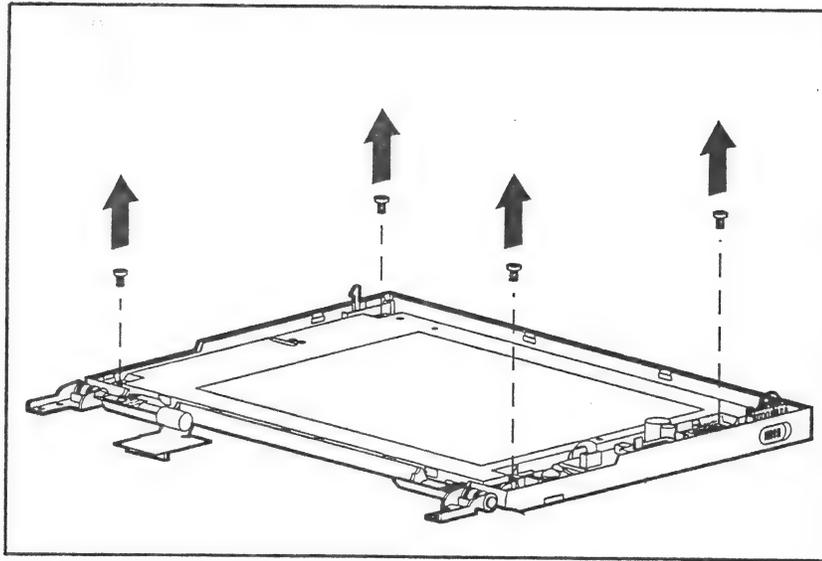
Figure 2-16.   Positioning the LCD Panel

3.   Using a JIS-1 screwdriver, remove the four screws that secure the LCD panel.

4.   Lift the LCD panel out of the display enclosure and unplug the two display cables (Figure 2-17).
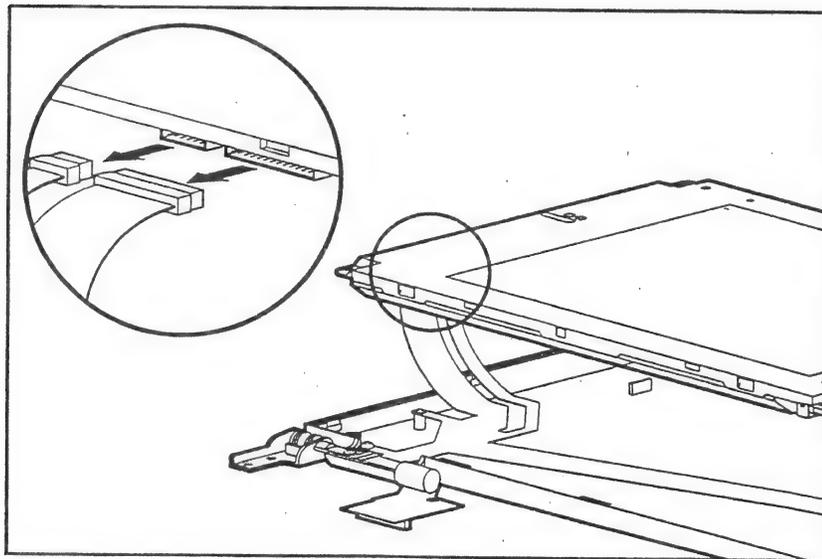
Figure 2-17.   Removing the Two Display Cables

5.   Lift the LCD panel out of the display enclosure.
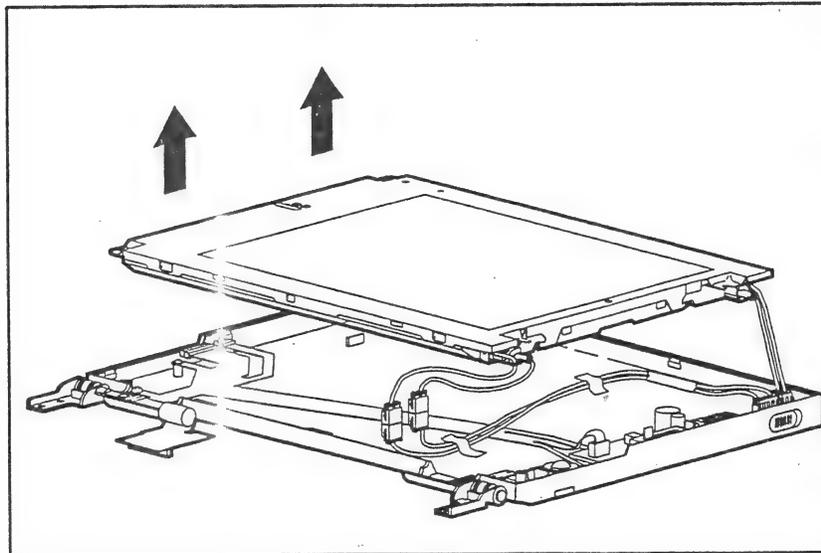
Figure 2-18.   Removing the LCD Panel

6.   Disconnect the four LIF connectors that secure the backlights (Figure 2-19).
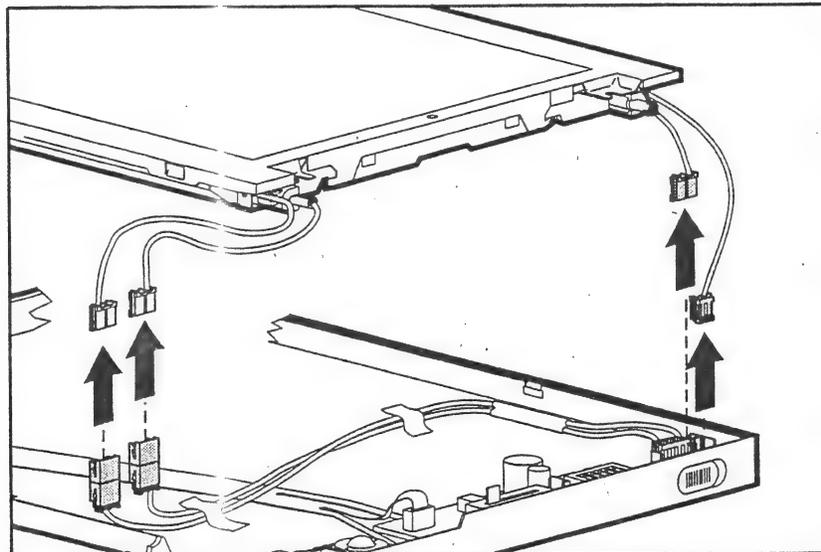
Figure 2-19.   Disconnecting the Four LIF Connectors

NOTE: When replacing the LCD panel, be sure to insert the terminal lug before you connect the ground cable (attached to the trackball) to the LCD panel (Figure 2-20).
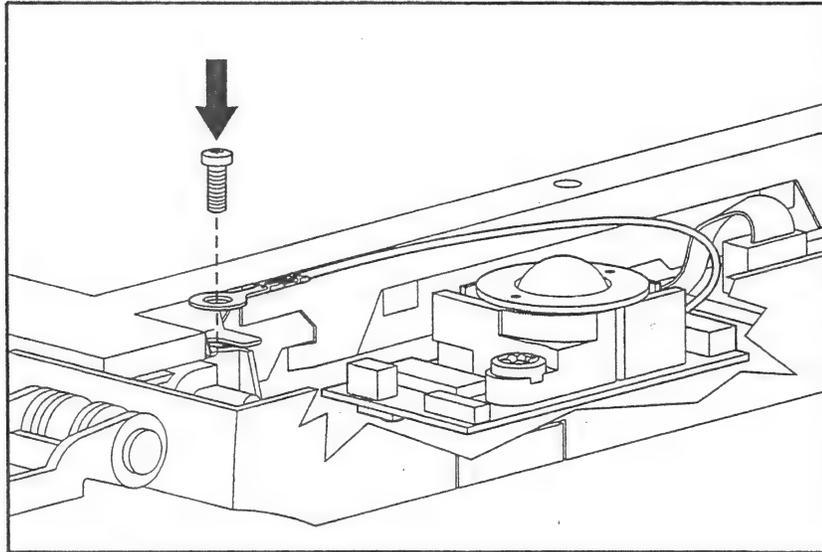
Figure 2-20. Replacing the Terminal Lug

Display Inverter Board

To remove the display inverter board, complete the following steps:

1. Remove the display bezel and LCD panel.

2. Remove the power supply harness (Figure 2-21).
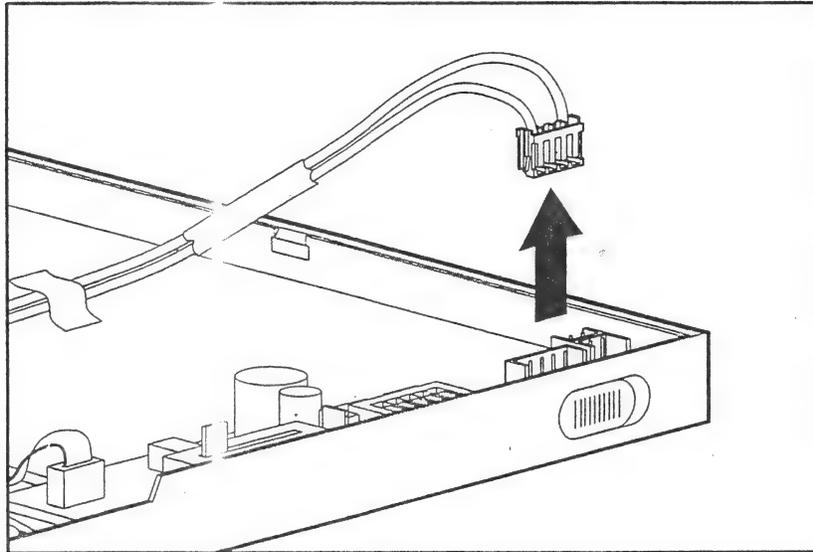
Figure 2-21.   Removing the Power Supply Harness

3. Using a JIS-0 screwdriver, remove the two screws that secure the display inverter board (Figure 2-22).
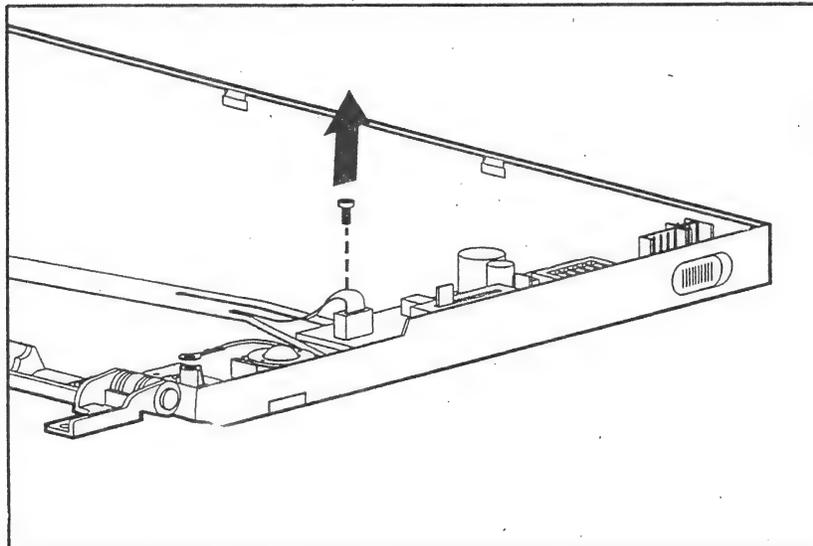
Figure 2-22.   Removing the Display Inverter Board Screw

4. Disconnect the display cable from the inverter board (Figure 2-23).
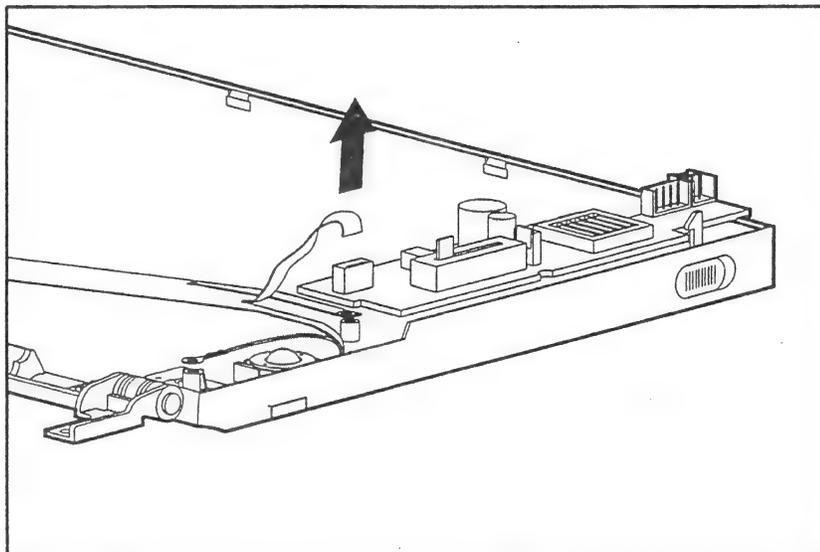
Figure 2-23. Removing the Display Cable

EasyPoint Trackball

NOTE: Under normal circumstances, wipe the case and trackball with a dry soft cloth. If the cursor begins to skip or move abnormally, remove and clean the trackball.

To clean the trackball, complete the following steps:

1. Turn off the computer.

2. Tilt the display assembly until it is flat.

3. Place the removal tool over the retaining ring, and turn it counter clockwise one quarter-inch (Figure 2-24). This loosens the retaining ring.
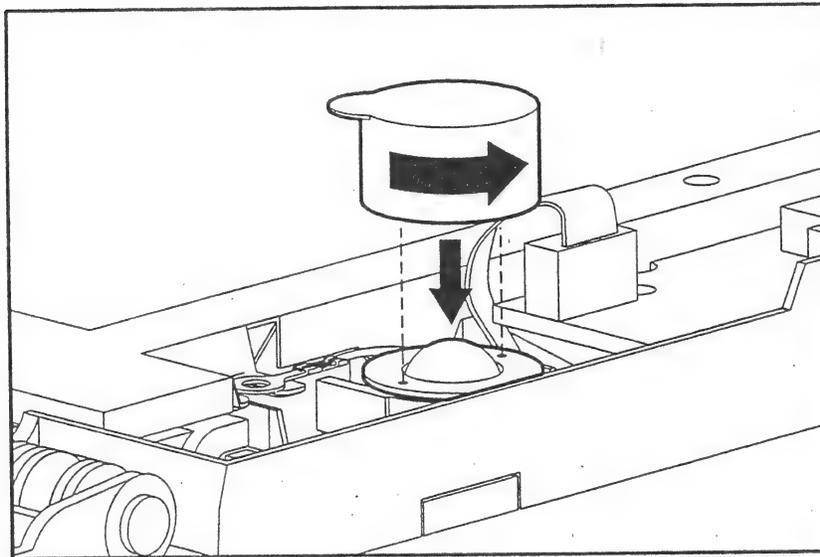
Figure 2-24. Removing the Trackball for Cleaning

4. Remove the retaining ring (Figure 2-25). (If the copper gasket comes off with the retaining ring, return it its original position.)
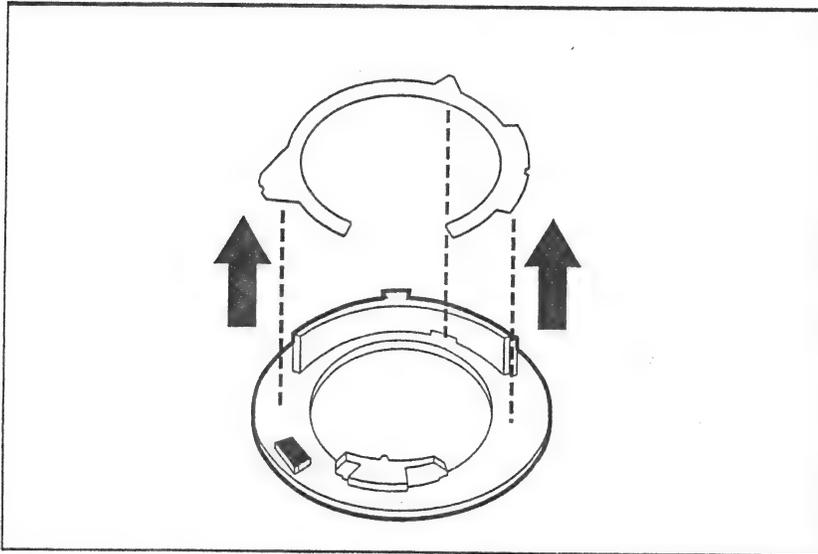
Figure 2-25. Removing the Retaining Ring

5. Remove the ball from the ball cage by tilting the display forward so that the ball falls out into your hand.

6. Clean the ball with tap water. Dry it with a lint-free cloth.

7. Remove the dust from the ball cage by blowing into it. Remove build-up accumulated on the rollers or tracking posts with a cotton swab dipped in rubbing alcohol.

To replace the trackball back into the ball cage, complete the following steps:

1. Put the ball back into the ball cage.

2. Replace the retaining ring by aligning the notches; then use the removal tool to turn it clockwise one quarter turn until it snaps into place.

To remove the trackball and its connector, complete the following steps:

1. Remove the trackball.

2. Remove the display assembly, LCD panel, and inverter board.

3. Using a JIS-0 screwdriver, remove two screws that secure the trackball connector (Figure 2-26).
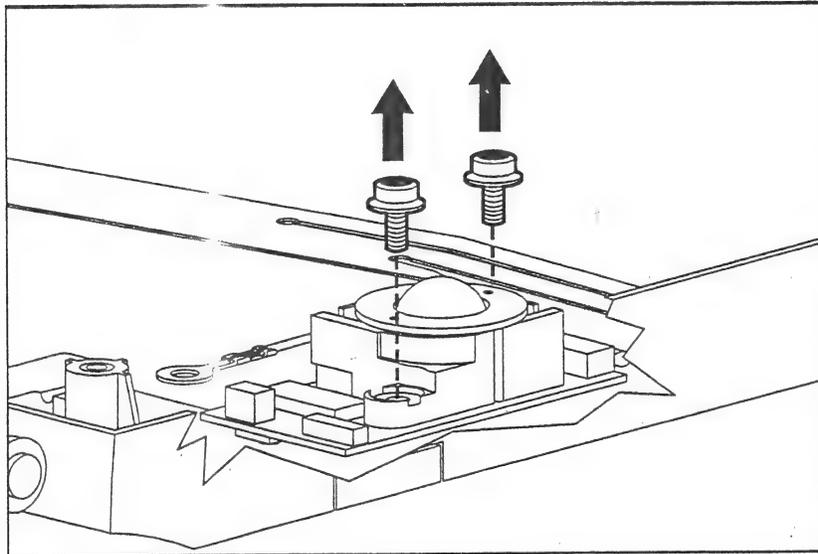
Figure 2-26.   Removing the Trackball Screws

4. Disconnect the trackball connector (Figure 2-27).
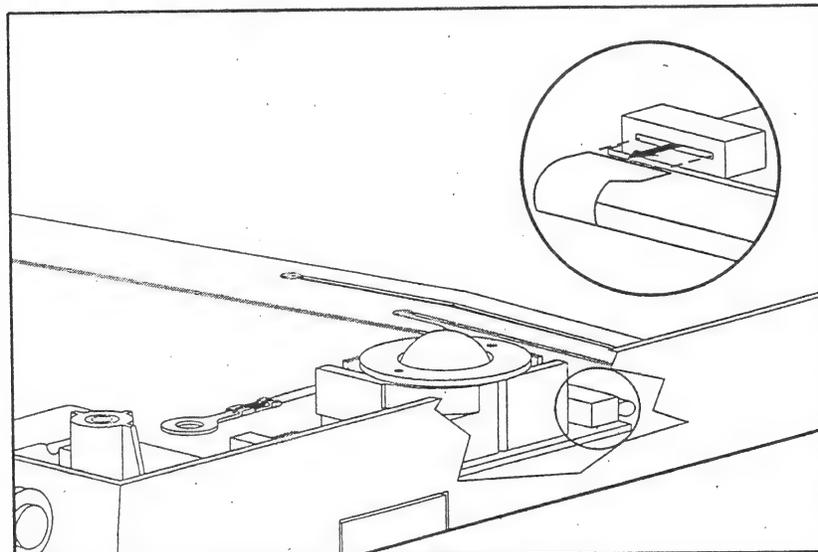
Figure 2-27.   Removing the Trackball Connector

To replace the trackball and its connector, reverse the previous steps.

2.8 VGA MAXLIGHT LIQUID CRYSTAL DISPLAY

To remove the Maxlight Liquid Crystal Display (LCD), complete the following steps:

1. Remove the system unit cover. (To remove the system unit cover, refer to Section 2.6.)

2. Using a Torx T-8, remove the cable ground screw securing the display cable and ground wire (Figure 2-28).

⚠ **CAUTION:** Cables in this unit are fragile and can easily tear. Be careful when disconnecting or reconnecting them. Mishandling the cables can result in irreparable damage to the computer.
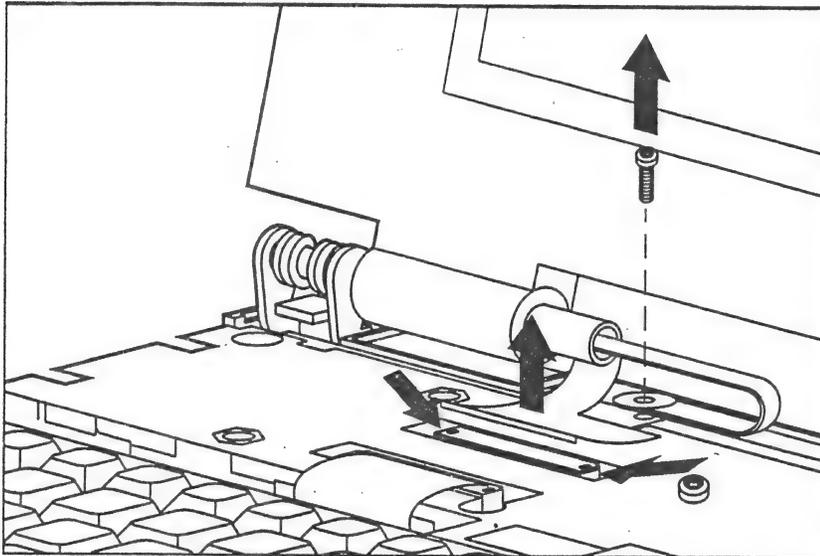
Figure 2-28. Removing the Cable Ground Screw and Unlocking the ZIF Connector

⚠ **CAUTION:** When removing or inserting cables with ZIF (zero insertion force) connectors, do not pull, twist, or apply tension to cables.

3. Using the case utility tool, carefully lift up on the ZIF connector to release the cable; then disconnect the display cable from the system module (Figure 2-28).

IMPORTANT: The display cable is coiled to accommodate the rotation of the display. When this cable is reinstalled, it must be reinserted with the exact number of coils.

4. Using a Torx T-8 screwdriver, remove the four screws that secure the display clutches (Figure 2-29).
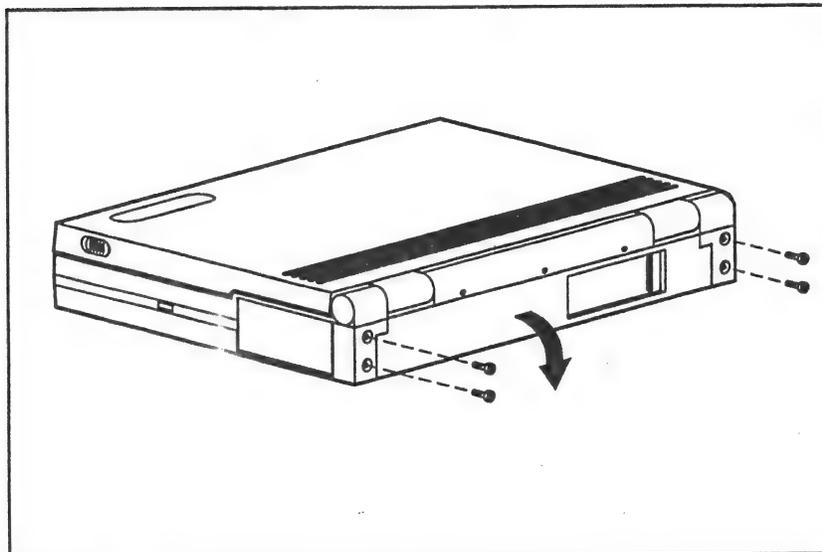
Figure 2-29. Removing the Rear Connector Cover

5. Lift the display out of the computer (Figure 2-30).
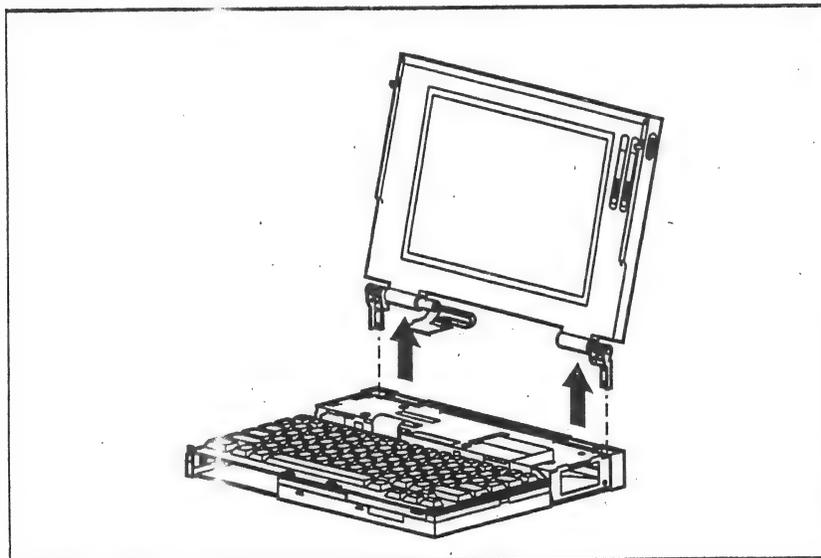
Figure 2-30. Lifting Out the Display Panel

To replace the display panel assembly, complete the following steps:

1. Position the display panel by aligning the display clutches with the CPU base (Figure 2-31).
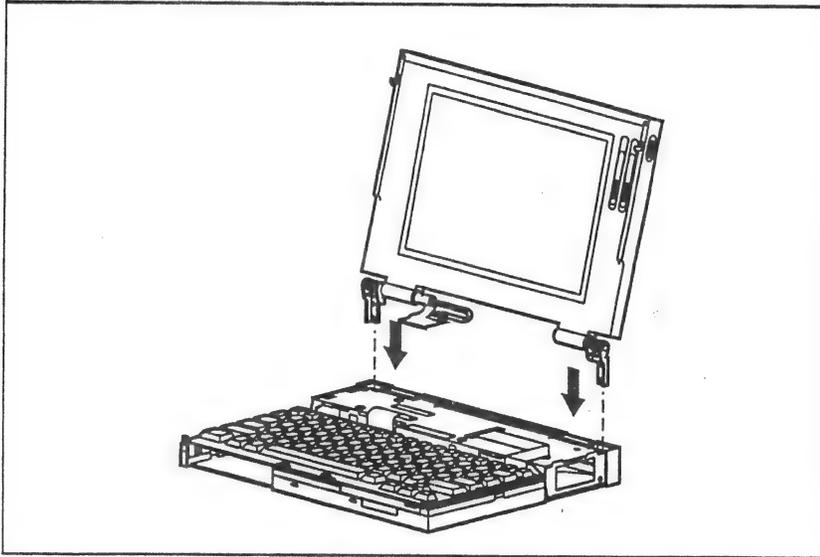
Figure 2-31.   Aligning the Display Panel

2. Replace the four screws securing the display panel to the CPU base.

3. Reconnect the display cable and ground wire to the system module.

4. Replace the display cable screw, securing the display cable wire and ground wire, and press down to lock the ZIF connector.

△   **CAUTION:**   When reconnecting the ground wire, be sure that it is placed on top of the display cable. If it is not properly reinstalled, irreparable damage to the computer may occur.

Display Bezel

To remove the display bezel, complete the following steps:

1. Remove the display assembly (Section 2.8).

2. Remove the two screw covers at the top of the display (Figure 2-32).

3. Using a Phillips P-0 screwdriver, remove the two screws located at the top of the display panel (Figure 2-32).
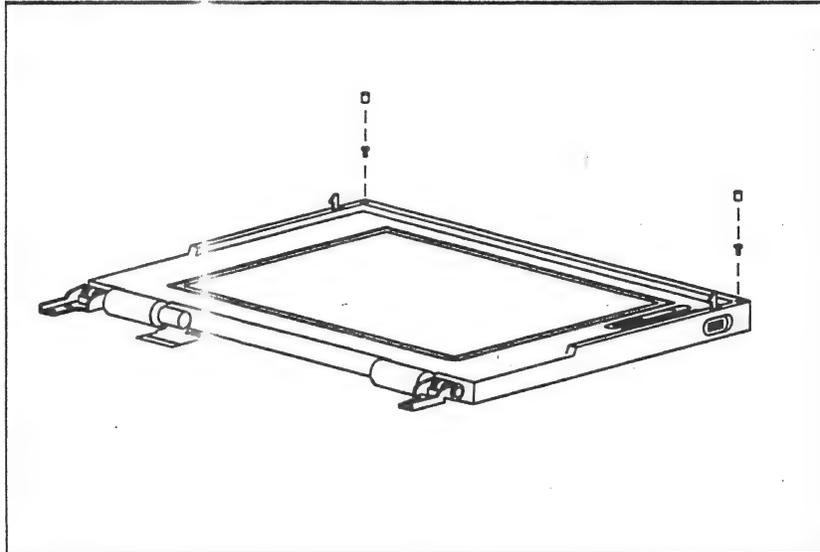
Figure 2-32.   Removing the Two Screw Covers

> ⚠ **CAUTION:**   Handle the display panel carefully. Pressure should be applied equally to both sides when it is being lifted.

4. Remove the display bezel from the display panel by gently pulling the bezel frame and working from the bottom up (Figure 2-33).
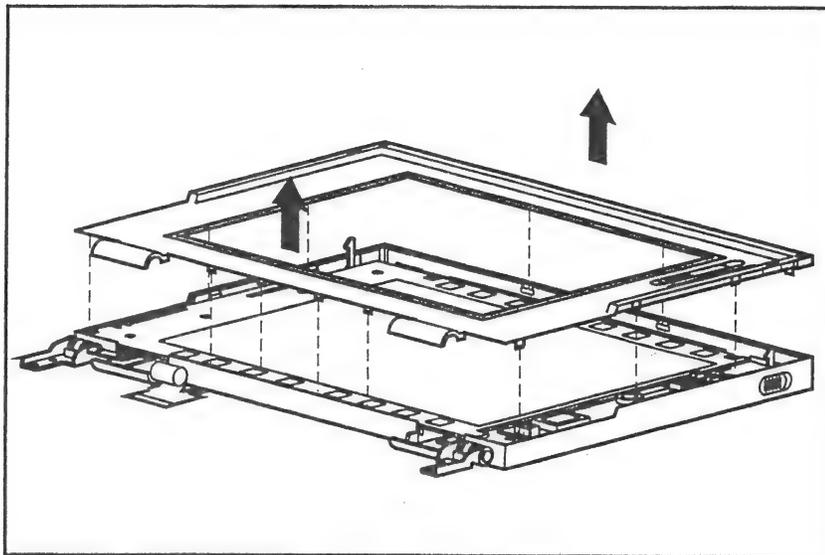
Figure 2-33. Removing the Display Bezel

NOTE: When replacing the display bezel, remove the slide knobs from the display bezel by squeezing the tabs on the underside of the bezel and popping the knobs out. Then replace the bezel and insert the slide actuators, ensuring that they are properly aligned.

Maxlight Liquid Crystal Display Panel

To remove the Maxlight Liquid Crystal Display (LCD) panel, complete the following steps:

1. Remove the display bezel.

2. Remove the two screws that secure the display mounting tabs to the clutches (Figure 2-34).
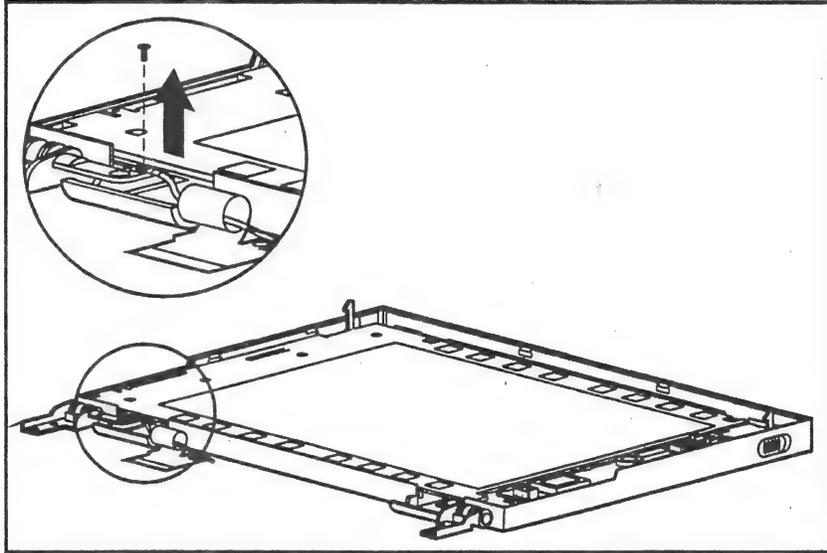
Figure 2-34. Removing the Two Screws

3. Remove the nine screws that secure the LCD panel (Figure 2-35).
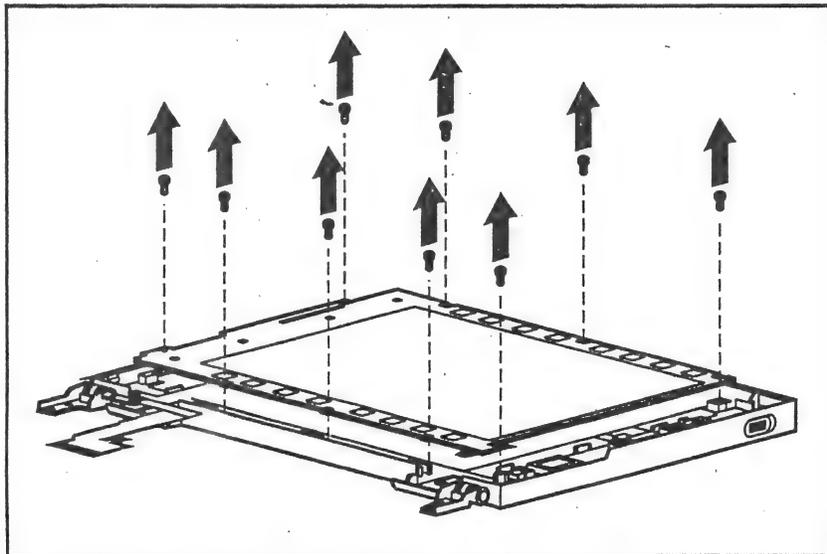
Figure 2-35. Removing the Nine Screws

4.   Rotate the LCD panel out of the display enclosure (Figure 2-36).
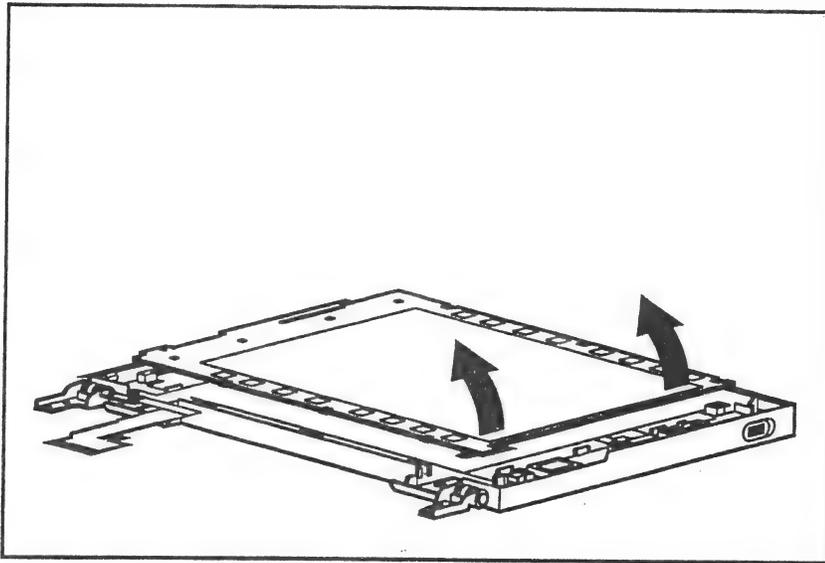
Figure 2-36.   Removing the LCD Panel

5.   Using the case utility tool, pull out on the ZIF connector to release it; then disconnect the display cable (Figure 2-37).
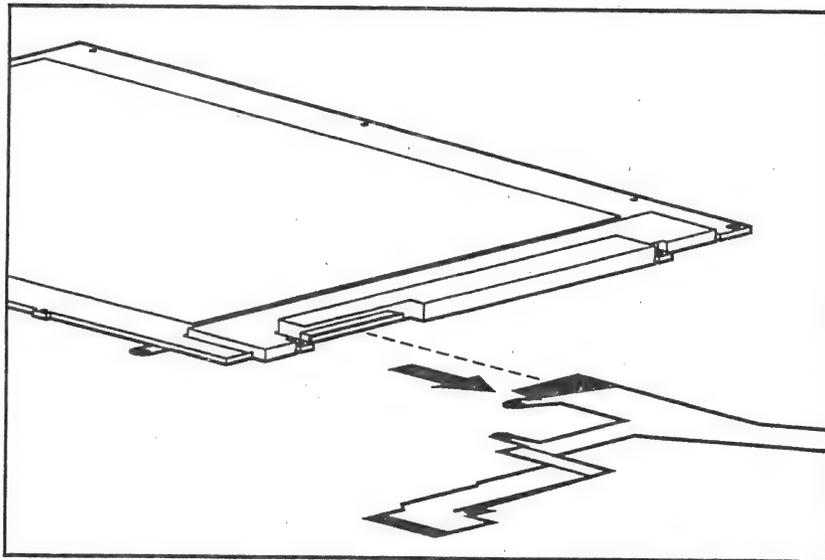
Figure 2-37. Disconnecting the LCD Display Cable

Backlight Panel

To remove the backlight panel, complete the following steps:

1. Remove the display bezel.

2. Remove the display panel (Section 2.8).

3. Disconnect the backlight cable from the display inverter board (Figure 2-38).
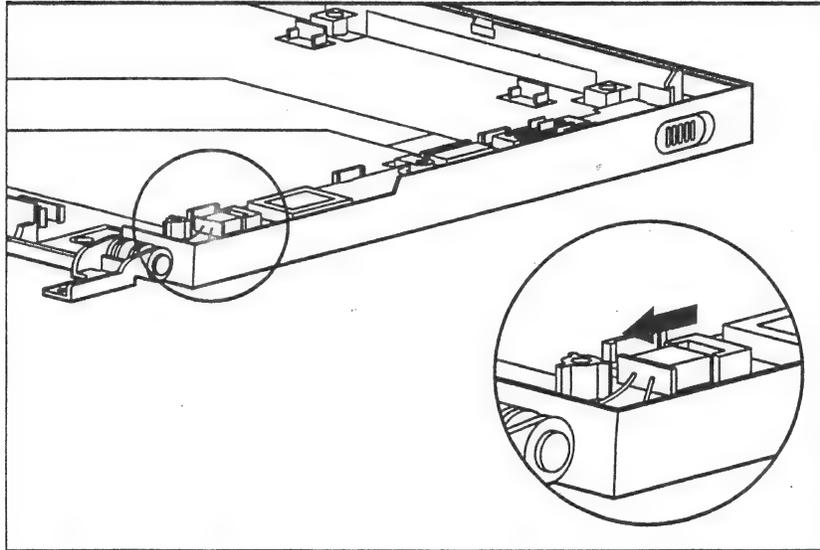
Figure 2-38.   Disconnecting the Backlight Cable

4. Lift the backlight out of the display enclosure (Figure 2-39).
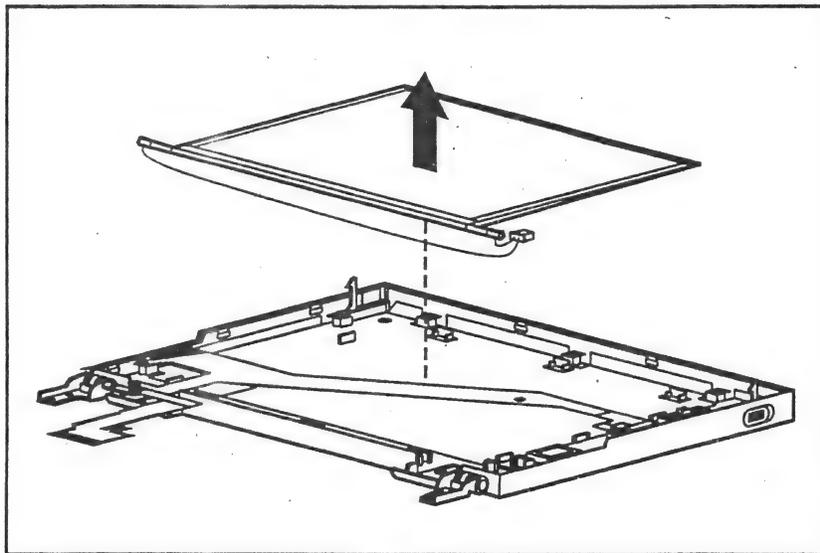
Figure 2-39.   Removing the Backlight

Display Inverter Board

To remove the display inverter board, complete the following steps:

1. Remove the display bezel, etc.

2. Using a Phillips P-0 screwdriver, remove the display cable screw securing the ground cap, cable tab, and display inverter board (Figure 2-40).
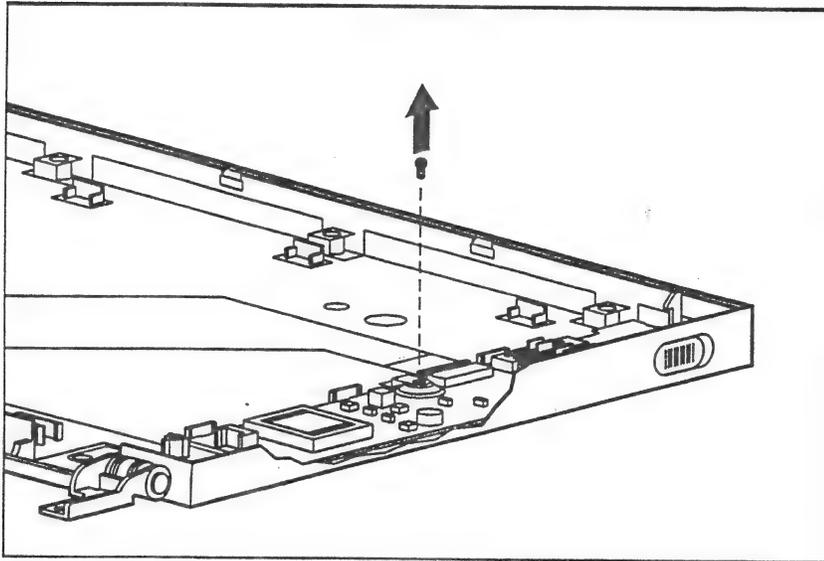
Figure 2-40. Removing the Display Cable Screw

3. Pull out on the display inverter board ZIF connector to disconnect the cable (Figure 2-41).
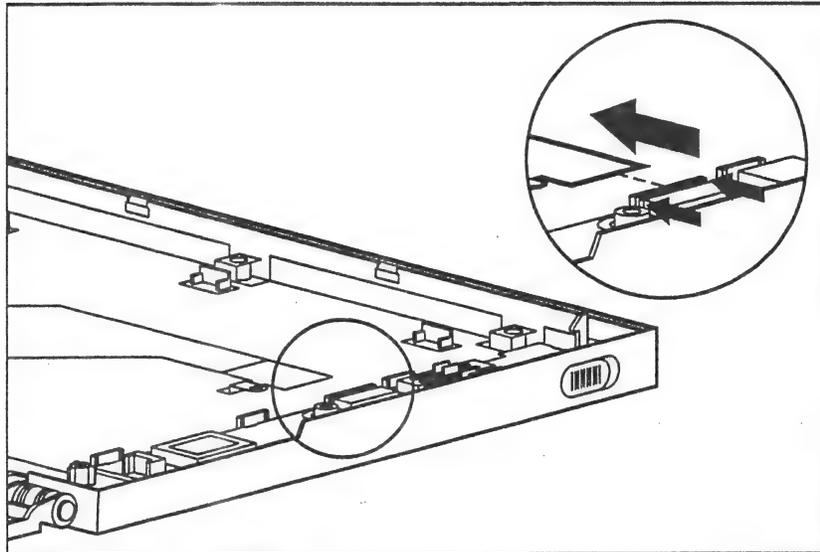
Figure 2-41. Disconnecting the Display Inverter Board ZIF Connector

4. Lift the display inverter board out of the display enclosure (Figure 2-42).
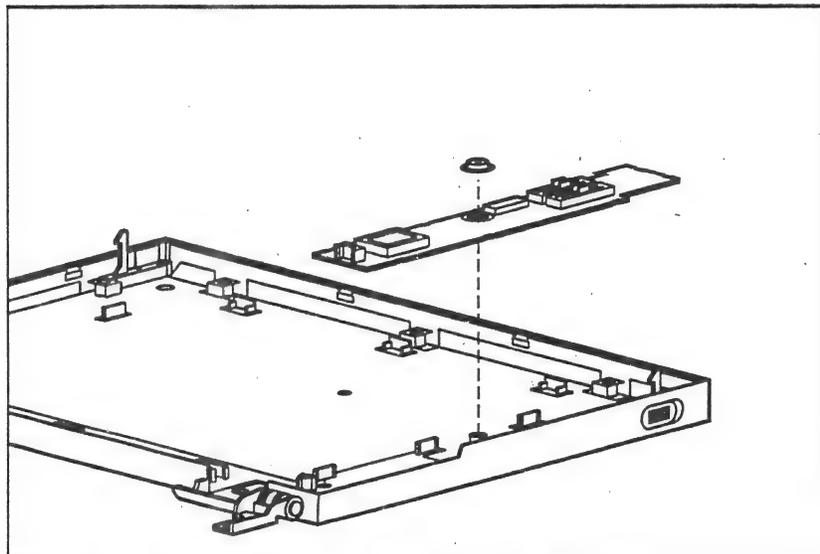
Figure 2-42. Removing the Display Inverter Board

To reassemble the display, reverse the previous steps.

NOTE: When replacing the display inverter board, ensure that the board is properly seated and aligned with the alignment posts in the upper-right and lower-left corners of the board.

IMPORTANT: When reassembling the display, insert the upper-left screw first; then, insert the bottom-right screw for proper alignment of the display. The other seven screws can then be reinserted.

Latches

To remove and replace the latch from either side of the display enclosure, complete the following steps:

NOTE: The latches, including the springs, are designated left and right parts. The latches used on the COMPAQ LTE Lite Family of Personal Computers are labeled L (left) and R (right). When removing the latches, keep the left parts and right parts separate to ease replacement.

1.   Remove the display bezel. Refer to the "Display Bezel" section.

2.   Remove the slide knobs by pressing the latch retainers from inside of the display enclosure (Figure 2-43).

3.   Remove the latches and springs (Figure 2-43).
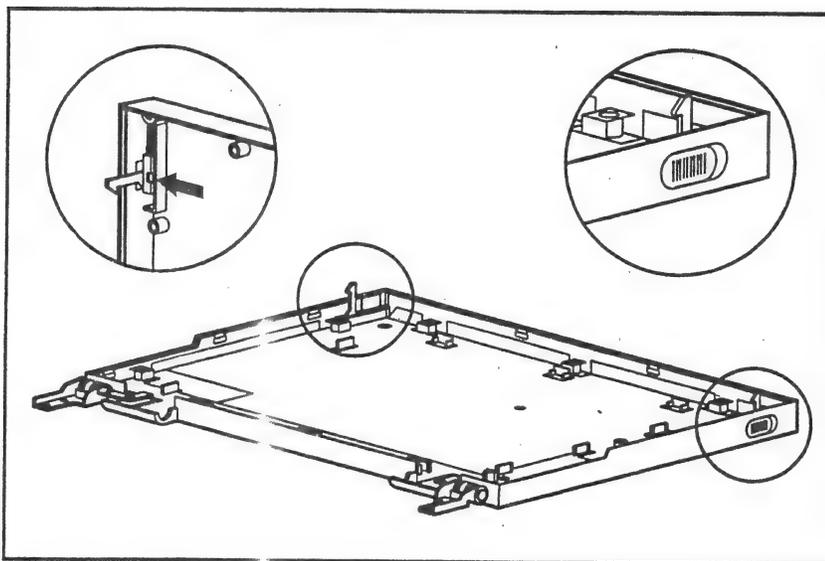
Figure 2-43.   Locating the Display Panel Latches, Springs, and Slide Knobs

To replace the latches, follow these steps:

1.   Position the latch and spring.

2.   Snap in the right and left slide knobs.

2.9   KEYBOARD

To remove the keyboard, complete the following steps:

1. Remove the system unit cover.

2. Using the case utility tool, carefully lift up on the ZIF connector to release the cable; then disconnect the keyboard cable from the system module (Figure 2-44).
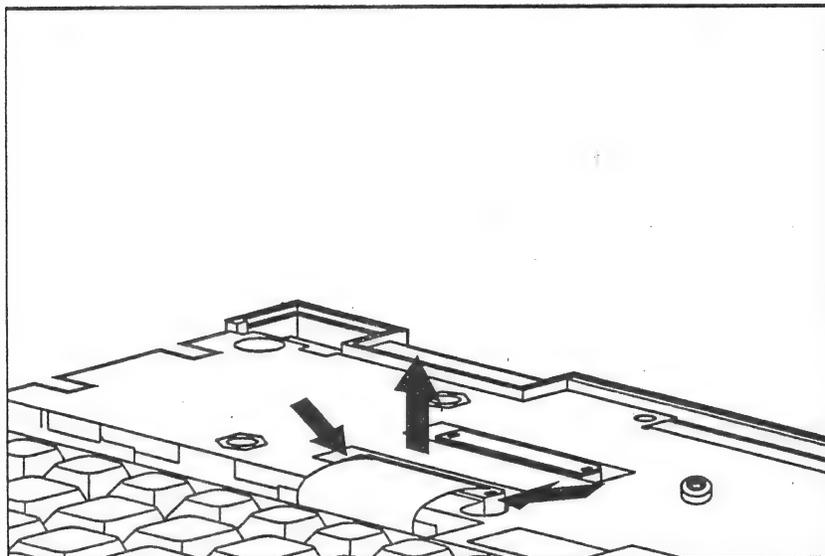
Figure 2-44.   Removing the Keyboard Cable

3. Using a Torx T-8 screwdriver, remove the eight screws that secure the keyboard in place (Figure 2-45).
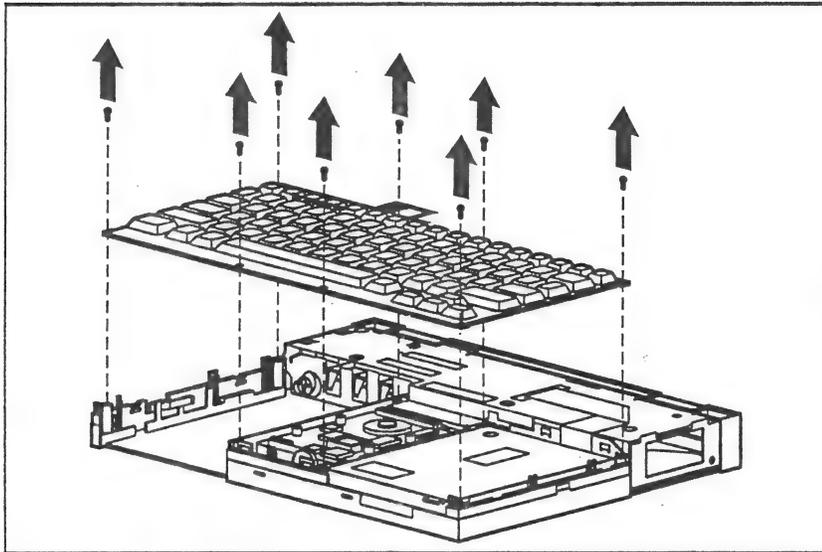
Figure 2-45. Removing the Keyboard Screws

4. Carefully lift the keyboard out of the computer (Figure 2-45).

2.10   DISKETTE DRIVE

To remove the diskette drive, complete the following steps:

1. Remove the keyboard (Section 2.9).

2. Disconnect the diskette drive cable from the ZIF connector located on top of the system module (Figure 2-46).
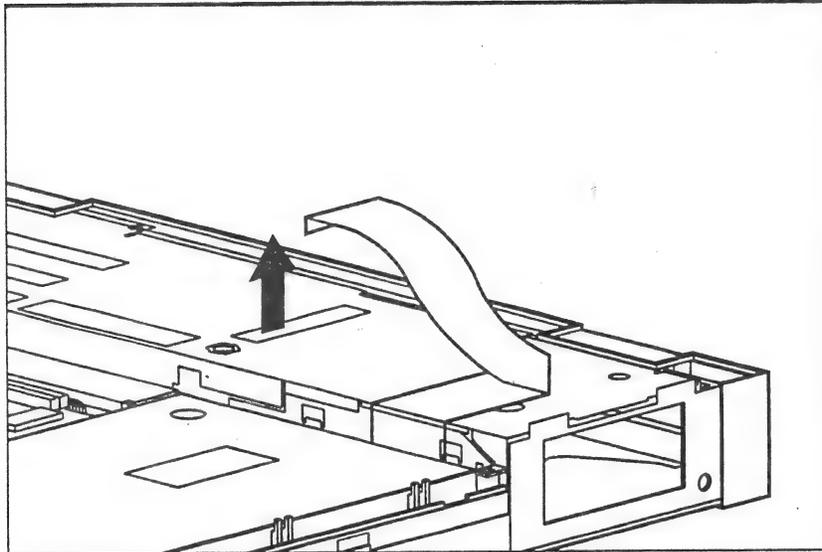
Figure 2-46.   Removing the Diskette Drive Cable and ZIF Connector

3. Carefully lift the diskette drive out of the CPU base (Figure 2-47).
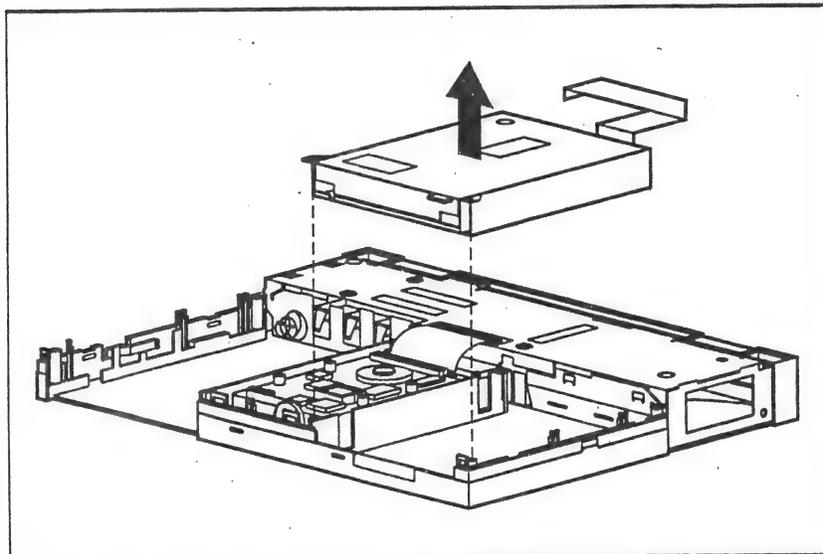
Figure 2-47.   Removing the Diskette Drive

To replace the diskette drive, reverse the previous steps.

2.11   HARD DRIVE

To remove the hard drive, complete the following steps:

1.   Remove the keyboard (Section 2.9).

2.   Pulling up on the pull tab, gently disconnect the hard drive/speaker cable from the system module (Figure 2-48).
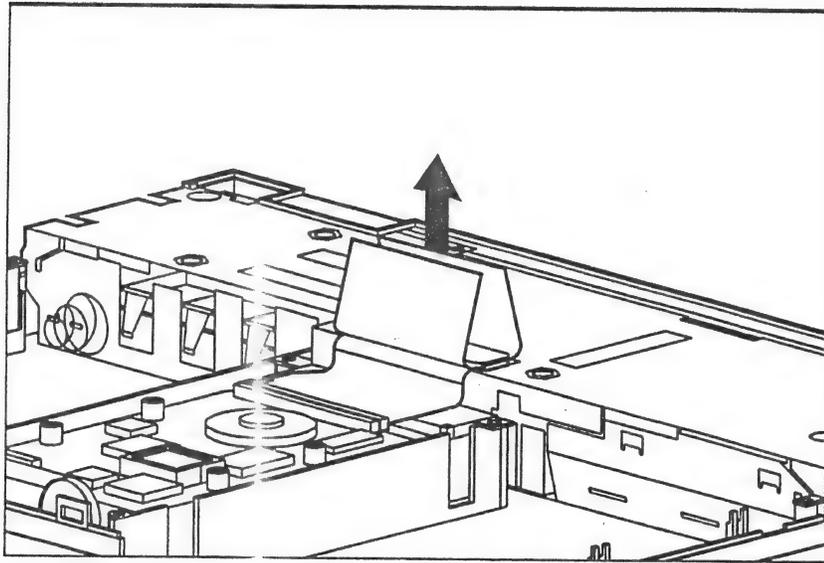
Figure 2-48.   Disconnecting the Hard Drive/Speaker Cable

3. Lift the hard drive and cable out of the CPU base (Figure 2-49).

IMPORTANT: Be careful not to damage or tear the speaker cable.
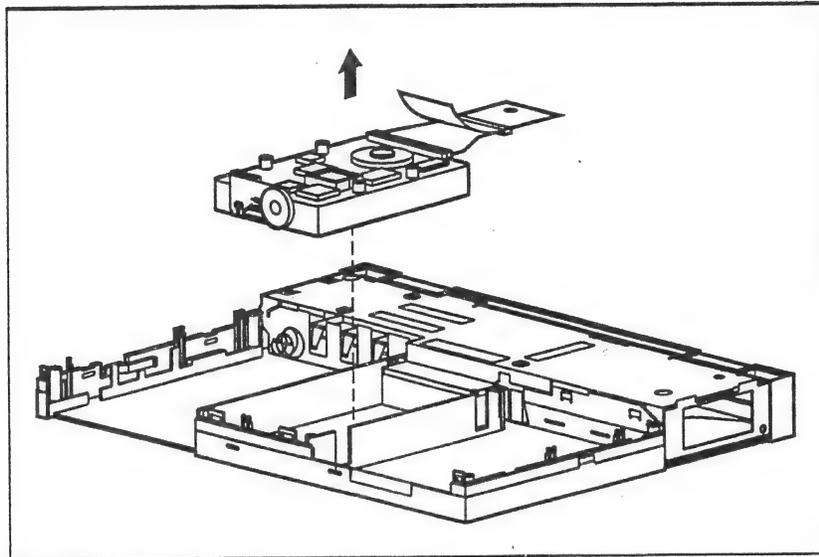
Figure 2-49. Removing the Hard Drive

To replace the hard drive, reverse the previous steps.

NOTE: Be sure to properly position the speaker in its recess in the CPU base.

2.12   SYSTEM MODULE

The system module contains the system boards, power supply, option slots, and auxiliary battery. After the keyboard, display panel assembly, battery pack, hard drive, and diskette drive are removed, the system module can then be rotated up at the front and lifted out of the computer (Figure 2-50). It should be removed completely from the computer.

IMPORTANT: When reinstalling the system module, begin with the back of the module, ensuring proper engagement of the two tabs in the CPU base and the alignment groove close to the expansion connector. Then rotate the front of the system module down. Ensure proper positioning of the system module before reassembling the system.
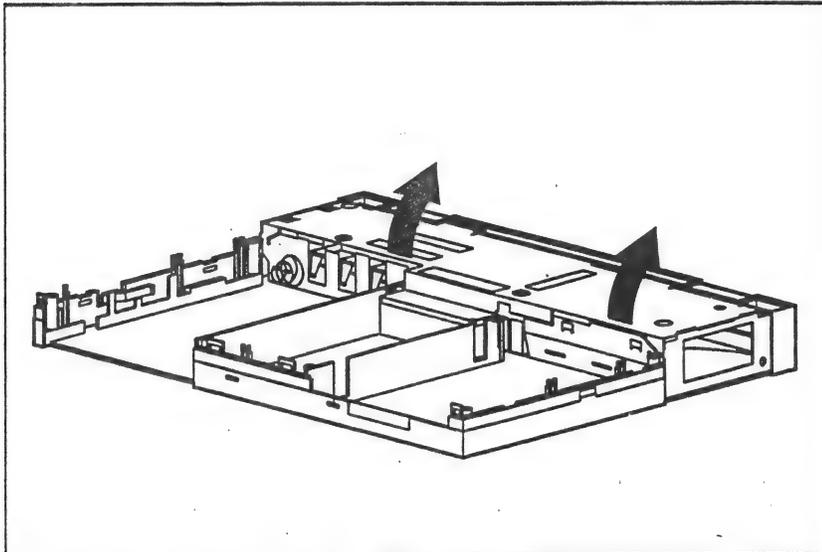
Figure 2-50.   Removing the System Module

2.13   COPROCESSOR AND REAL-TIME BATTERY

The coprocessor socket is located on the system board (Figure 2-51). It is visible through an opening in the bottom of the system module.

Without disassembling the system module, the real-time battery can also be replaced through the opening in the bottom of the system module (Figure 2-51).
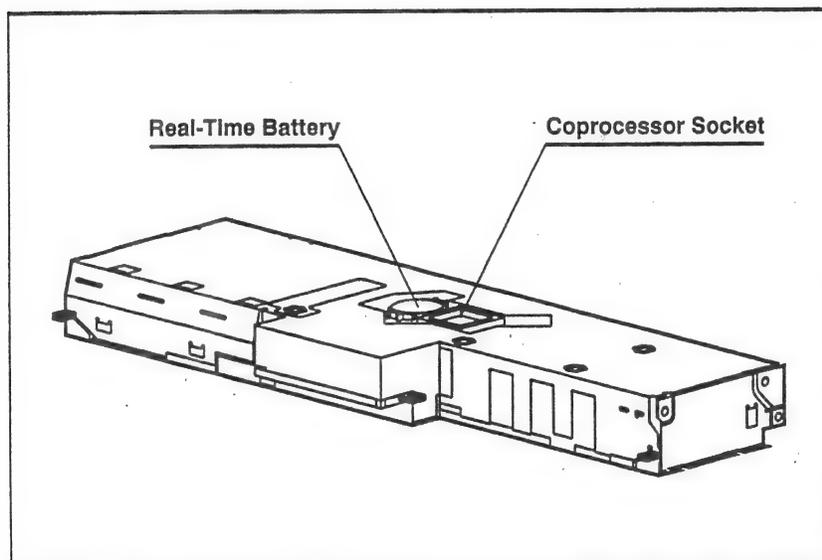
Figure 2-51.   Coprocessor Socket

Do not remove the screws on the system module. It has been designed so that the coprocessor can be installed through the opening on the bottom. Refer to the *Coprocessor Installation Guide* for more information about the 80387SX or 387SL Coprocessors used on the COMPAQ LTE Lite Family of Personal Computers.

The following procedures provide instructions for removing a coprocessor from the COMPAQ LTE Lite Family of Personal Computers. These computers are structurally similar and the procedure is the same for both.

1.   Remove the battery pack (Section 2.5).

2.   Remove the CPU cover (Section 2.6).

3.   Remove the display assembly (Section 2.7 or 2.8).

4.   Remove the keyboard (Section 2.9).

5.   Remove the diskette drive (Section 2.10).

6.   Remove the hard drive (Section 2.11).

7.   Remove the system module (Section 2.12).

NOTE: When you remove each subassembly, remove it from the work area to prevent damage.

⚠ **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Ensure that you are properly grounded before beginning these procedures.

Installation

To install the coprocessor in the COMPAQ LTE Lite/25c, COMPAQ LTE Lite/25, or COMPAQ LTE Lite/20 Personal Computers, follow these steps:

1. Position the coprocessor and the socket so that the beveled or notched edges are properly aligned (Figure 2-52).
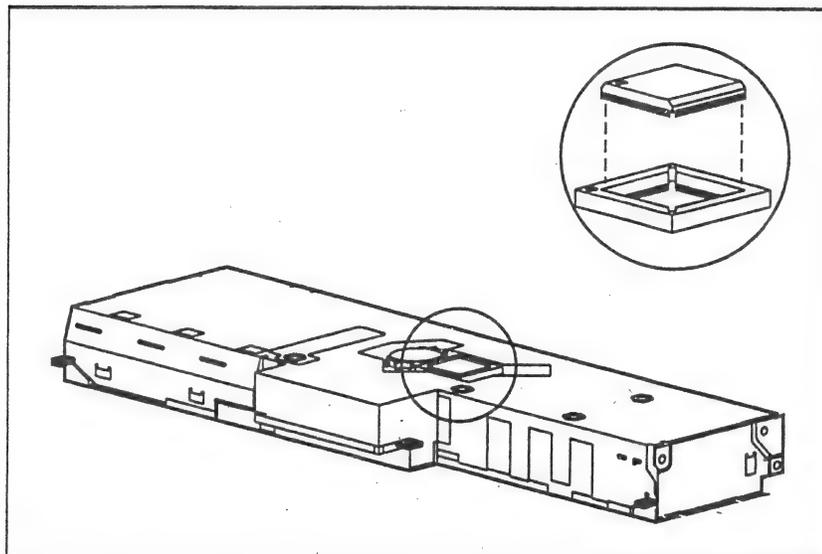
Figure 2-52. Aligning the 80387SX or 387SL Coprocessors

⚠ **CAUTION:** Be sure to align the coprocessor over the pin. An incorrectly aligned coprocessor may damage either itself or the computer.

2. Press the coprocessor into the coprocessor socket. Exert pressure evenly over the surface of the coprocessor. An unevenly seated coprocessor (or one with pins bent) may damage itself or the computer (Figure 2-53).
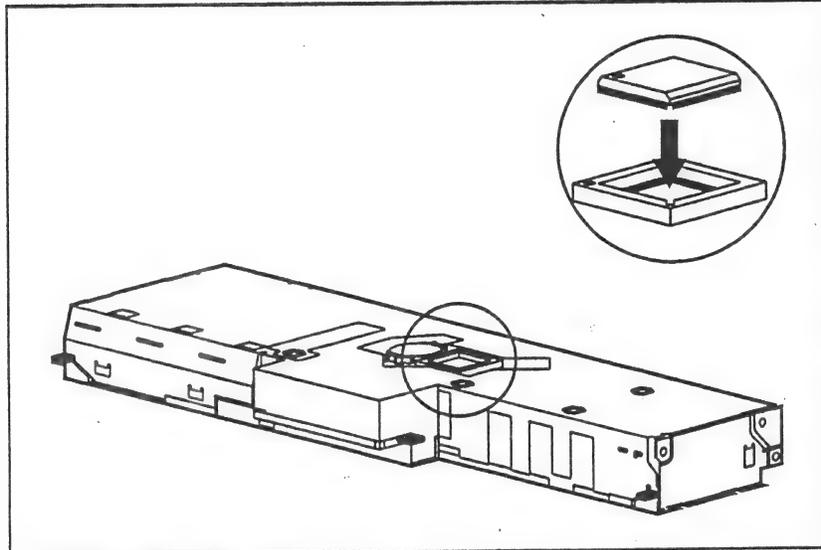
Figure 2-53. Installing the 80387SX or 387SL Coprocessors

NOTE: This coprocessor does not require switch or jumper adjustments. Configuration of the coprocessor is handled through the SETUP program.

To reassemble the computer, reverse the previous steps.

IMPORTANT: After reassembling the unit, you must run the SETUP program to make the coprocessor operable and to clear the error message that adding the coprocessor will generate.

Running SETUP and TEST

The following procedures provide some instructions for running the SETUP and TEST programs.

Using the ROM-Based SETUP

The COMPAQ LTE Lite Family of Personal Computers feature a ROM-based SETUP that allows you to do this during your normal booting procedures. After the memory check has run, you will hear a double beep as the cursor moves to the upper-right corner of the screen. Immediately press the **F10** key. The menus will guide you through the procedure.

Complete instructions for accessing the internal SETUP feature are included in the documentation set that came with your computer.

Using the Diagnostics Utilities

You will use two Diagnostics programs: SETUP and TEST.

Use external AC power during these procedures. A low battery condition could initiate Standby and interrupt the program.

For more information about the SETUP and TEST programs, refer to the *COMPAQ LTE Lite Reference Guide*.

2.14   POWER SUPPLY

To remove the power supply, complete the following steps:

1. Remove the system module. (To remove the system module, refer to the previous steps.)

2. Using a Torx T-8 screwdriver, remove the three screws that secure the chassis end cap to the system module (Figure 2-54).
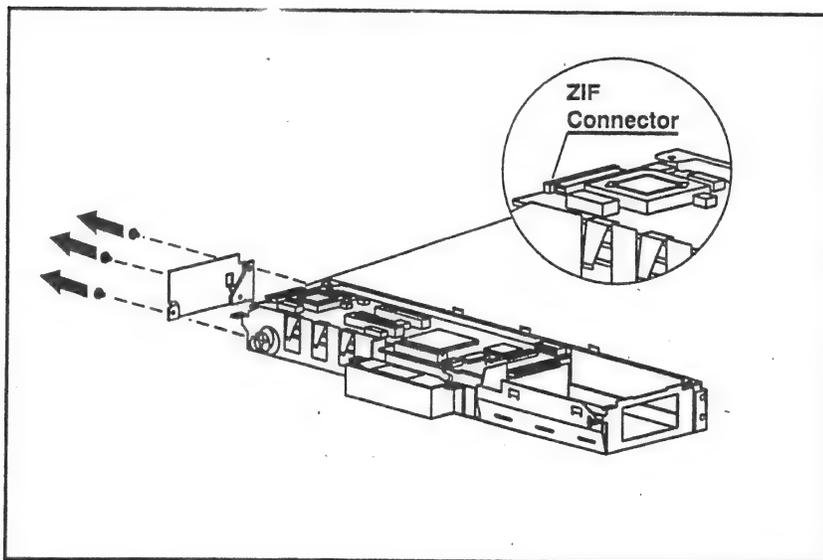
Figure 2-54.   The Power Supply

3. Remove the chassis end cap.

4. Slide open the actuator on the ZIF connector which secures the power supply to the I/O board (Figure 2-54).

5. Slowly pull the white tab underneath the power supply.

    The pull tab moves the power supply about one inch.

IMPORTANT: Be sure that the cable disconnects from its ZIF connector as the power supply is ejected from the system module.

6. Remove the power supply by grasping its edges (Figure 2-55).

Pull Tab
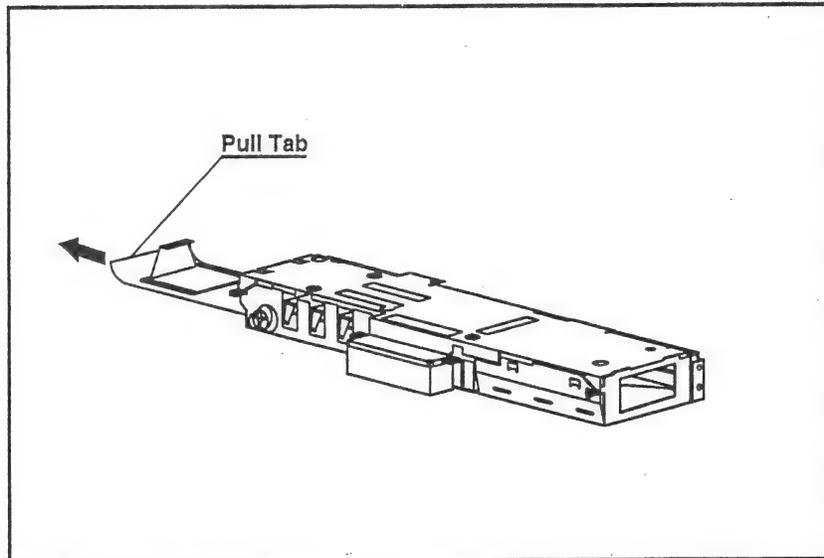
Figure 2-55.   Removing the Power Supply

7. Using a Torx T-8 screwdriver, remove the screw securing the option mounting bracket (Figure 2-56).
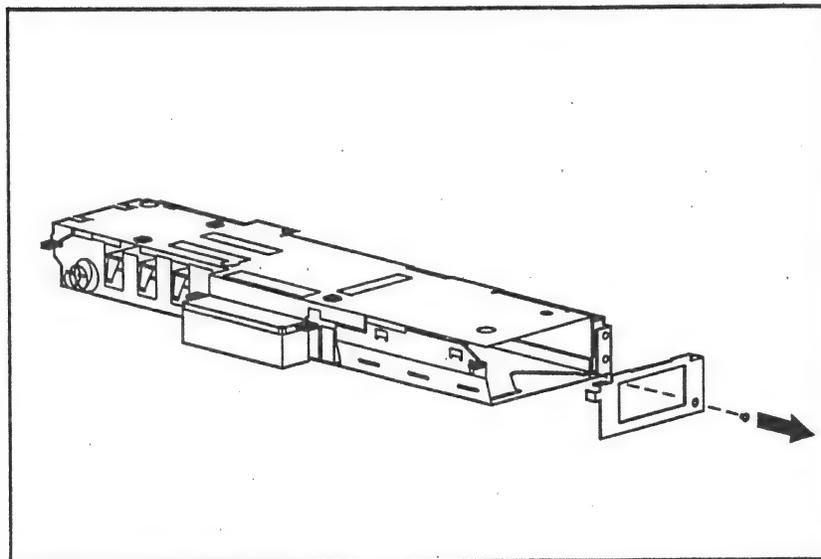
Figure 2-56.   Releasing the Option Mounting Bracket

To replace the power supply, reverse the previous steps.

> ⚠ **CAUTION:** When replacing the power supply cable, ensure that the cable is straight and not pinched. Improper cable placement can cause severe damage to the unit.

IMPORTANT: When replacing the power supply and chassis end cap, be sure that the pull tab is properly positioned so that it will continue to assist with subsequent removal of the power supply.

2.15 AUXILIARY BATTERY

> ⚠ **CAUTION:** Before touching the auxiliary battery, ensure that you are discharged of static electricity by touching a grounded metal object. Do not use a metal tool or stylus to remove the auxiliary battery.

To remove the auxiliary battery, complete the following steps:

1. Remove the system module. (To remove system module, refer to the previous steps.)

2. Using a Torx T-8 screwdriver, remove two short screws and four long screws from the system module cover (Figure 2-57).
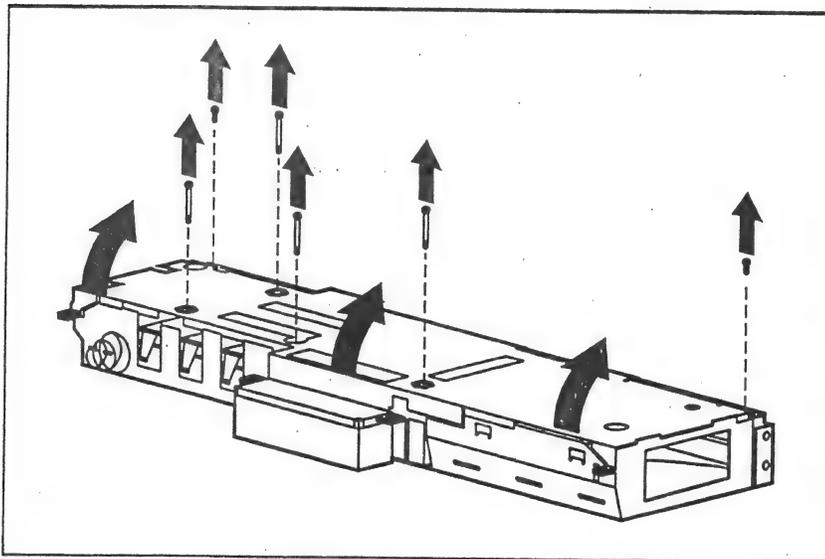
Figure 2-57. Opening the System Module

⚠️ **CAUTION:**   Damage may occur if you insert these long screws in the wrong place.

3.   Remove the system module cover (Figure 2-57).

4.   Disconnect the auxiliary battery cable from the I/O board (Figure 2-58).

5.   Gently lift the auxiliary battery out of the system module (Figure2-58).
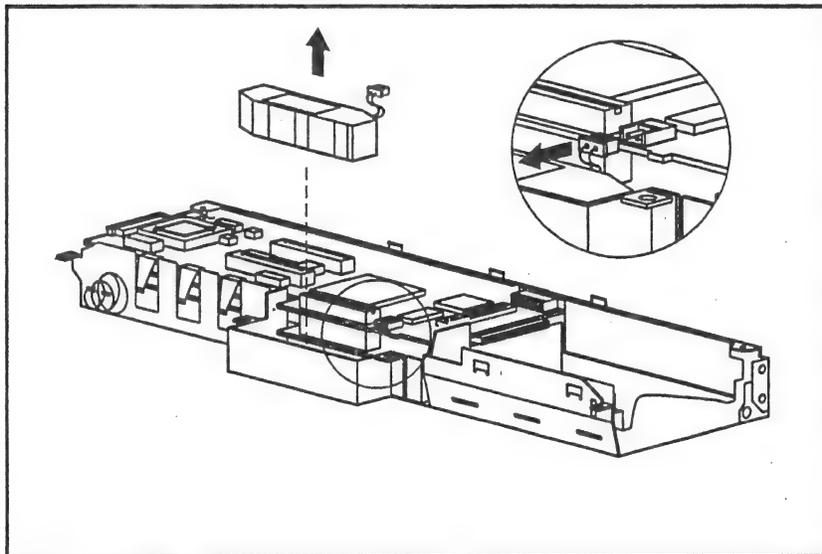
Figure 2-58.   Removing the Auxiliary Battery

To replace the auxiliary battery, reverse the previous steps.

2.16   MEMORY EXPANSION

Memory expansion alternatives for the COMPAQ LTE Lite/25c, COMPAQ LTE Lite/25, and COMPAQ LTE Lite/20 Personal Computers are shown in Tables 2-3 and 2-4. One 2-, 4-, or 8-, 16-megabyte memory card can be added to the COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20 Personal Computers.

Table 2-3
Memory Expansion for COMPAQ LTE Lite/25c and
COMPAQ LTE Lite/25 Personal Computers

System Memory	Memory Card(s) Added to Slot	Total Memory
4 MB	None	4 MB
4 MB	2 MB	6 MB
4 MB	4 MB	8 MB
4 MB	8 MB	12 MB
4 MB	16 MB	20 MB

Table 2-4
Memory Expansion for COMPAQ LTE Lite/20 Personal Computer

System Memory	Memory Card(s) Added to Slot	Total Memory
2 MB	None	2 MB
2 MB	2 MB	4 MB
2 MB	4 MB	6 MB
2 MB	8 MB	10 MB
2 MB	16 MB	18 MB

2.17   ERASABLE/REPROGRAMMABLE FLASH ROM

The flash memory chip (flash ROM) provides the capability for COMPAQ users to reprogram nonvolatile (in conjunction with the ROMPaq utility) read-only memory (ROM) on the COMPAQ LTE Lite Family of Personal Computers. The ROM can be instantly reprogrammed to update system firmware. This flash ROM also provides increased system functionality without purchasing or installing a new ROM chip. The flash ROM features include the following:

■   Write-protected against computer viruses (keyboard controller logic).

■   Exhibits a high endurance for multiple reprogramming cycles.

■   Employs CMOS circuitry for systems requiring high-performance access speeds, low power consumption, and immunity to noise.

■   Proves to be rugged and highly reliable, even in harsh environments.

The ROMPaq utility features include the following:

■   Erases and reprograms the system ROM in seconds.

■   Eliminates the need to disassemble a unit to replace the ROM.

■   Reduces potential damage to a chip by eliminating the ROM chip removal and replacement.

■   Provides on-screen instructions for implementing the flash ROM upgrade.

NOTE: The ROMPaq diskette contains the code to erase and reprogram a flash ROM to the most recent level of system functionality. This diskette includes the on-screen instructions for implementing the flash ROM upgrade program.
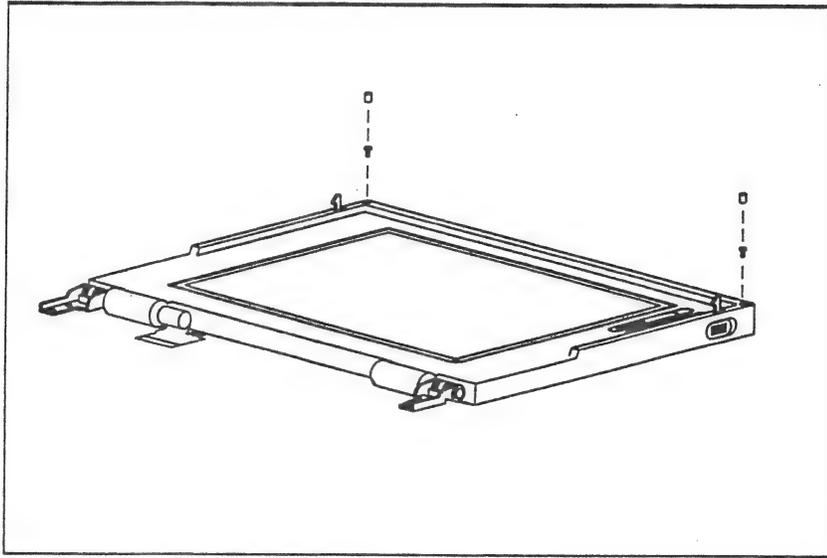
Figure 2-58.   Removing the Two Screw Covers

⚠ **CAUTION:**   Handle the display panel carefully. Pressure should be applied equally to both sides when it is being lifted.

Chapter 3

POWER-ON SELF-TEST (POST)

This chapter lists the assemblies checked by the Power-On Self-Test (POST) and briefly describes the types of error codes that can occur. The chapter also includes problem isolation procedures and a flowchart for quick reference.

3.1 POST

POST is a series of diagnostic tests that run automatically on the COMPAQ LTE Lite Family of Personal Computers when the system is turned on.

POST checks the following assemblies to ensure that the computer system is functioning properly:

- System Module
- I/O Board
- Memory Cards
- Keyboard
- Controller Circuitry
- VGA Maxlight Liquid Crystal Display
- Active Matrix Color VGA Display
- Hard Drives
- Diskette Drive

POST also detects the type of mass storage devices installed in the computer.

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. See Chapter 4, "Error Messages and Codes," for an explanation of the error codes and a recommended course of action.

3.2   PRELIMINARY STEPS

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

1. Turn off the computer. Do not remove the battery pack.

2. Disconnect any external devices (leave the AC Adapter attached). Do not disconnect the printer if you want to test it or use it to log error messages.

3. Install all appropriate loopback plugs and terminating plugs for complete testing.

4. Clear the power-on password, if it is preset by the user.

   You will know that the power-on password is set when a key icon ($\bigcirc$⋇ᴛᴨ) appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password immediately followed by a backslash (\ ) and press the **Enter** key.

   If you do not have access to the password, you must disable the power-on password. Refer to Section 3.3, "Clearing Power-on Password," for information on how to disable the power-on password.

5. Position the brightness and contrast controls approximately in the center of their range.

6. Insert the Diagnostics diskette into drive A.

7. Turn on the computer.

8. Follow the procedures of the Problem Isolation Flowchart, Section 3.4.

Refer to Chapter 4, "Error Messages and Codes," for detailed information on problem isolation.

3.3   CLEARING POWER-ON PASSWORD

IMPORTANT: When performing a routine service event, make sure that the user has unlocked the primary hard drive because Diagnostics cannot be run on a locked drive. Diagnostics can be run on other assemblies.

To clear the power-on password feature, you must disable the power-on password by removing the clock/calendar battery from the system module, waiting at least 60 seconds, then replacing it. To do so, complete the following steps:

1.   Disconnect the AC power.

2.   Disassemble the unit.

3.   Remove the system module.

4.   Locate the clock/calendar battery on the system module (Figure 3-1).

5.   Remove the battery by inserting a nonconductive probe into the battery holder and push back on the battery to release it.

When the battery is removed, wait at least 60 seconds to clear CMOS; then replace the battery.
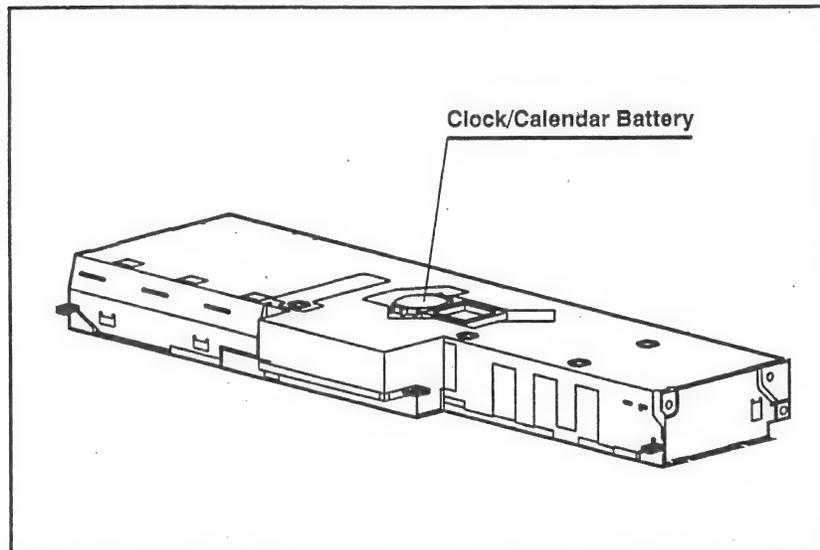
Figure 3-1.   Clock/Calendar Battery on the COMPAQ LTE Lite Family of Personal Computers

6. Reassemble the computer (refer to Chapter 2, "Removal and Replacement Procedures") then, reconnect the AC power.

7. Turn on the computer and allow it to complete POST. If the key icon (○⅃⁊) does not appear when POST completes, the power-on password has been erased.

⚠️   **WARNING:**   The clock/battery contains lithium. Do not abuse, disassemble, recharge or dispose of lithium battery cell in fire. It may explode if mishandled. Disposal of the lithium battery cell should be done in compliance with local regulations. Use only replacement battery packs supplied by Compaq Computer Corporation (spare part number 129948-001 or 129894-001).

3.4   PROBLEM ISOLATION FLOWCHART

The problem isolation flowchart provides a quick reference for identifying and correcting problems that may occur during POST. The flowchart gives troubleshooting procedures for identifying malfunctions. It also directs you to the *Maintenance and Service Guide Support Software* and to Chapter 4, "Error Messages and Codes," for more detailed troubleshooting information.

Complete the
preliminary steps
(section 3.2)

Turn on the computer.

Did the
power-on LED
light? —No→ To A

Yes

Did the
cursor appear on
the display? —No→ To B

Yes

Was the
memory count
correct? —No→ To C

Yes

Was drive A
accessed? —No→ To D

Yes

Did the
system emit two
short beeps?* —No→ To E

Yes

Did an error
code appear on
the display? —Yes→ See Chapter 4
"Error Messages and
Codes", then continue.

No

Did the
diagnostics menu
appear on the
display? —No→ To F

Yes

The system has started
normally. Proceed with
Diagnostics (see the
Support Software guide).

* Beeps can be disabled by the user during the SETUP program or
through the PWRCON Utility from the USER PROGRAMS diskette.

A

Turn off the computer.

Plug in the
AC Adapter.

Connect the AC Adapter
to a suitable power source
(100/120/220/240 VAC,
50-60 Hz.)

Turn on the computer.

Replace the AC Adapter
and restart.

Did the
power-on LED
light with the
second AC
Adapter?

No

Replace the
Internal Power
Supply and restart.

Did the
power-on LED
light?

No

Yes

Did the
power-on LED
on the second
AC Adapter
light?

No

To G

Yes

Did the
cursor appear on
the display?

No

To B

Yes

```
  ( A )  ─→  ◇ Was the          No
 Continued      memory count  ─────→  ( To C )
                correct? ◇

                   │ Yes
                   ▼

              ◇ Was drive A      No
                accessed? ◇  ─────→  ( To D )

                   │ Yes
                   ▼

              ◇ Did the          No
                system emit two ─────→  ( To E )
                short beeps? ◇

                   │ Yes
                   ▼

              ◇ Did an error     Yes    ┌─────────────────────┐
                code appear on ─────→    │ See Chapter 4       │
                the display? ◇           │ "Error Messages and │
                                         │ Codes", then continue.│
                   │ No                  └─────────────────────┘
                   ▼

              ◇ Did the          No
                diagnostics menu ─────→  ( To F )
                appear on the
                display? ◇

                   │ Yes
                   ▼
        ┌─────────────────────┐
        │ Recharge the battery,│
        │ then proceed with testing.│
        └─────────────────────┘
```

B

Increase the display
brightness control to
maximum.

Does the
display panel
glow? — No → To F

Yes

Did the
cursor appear on
the display? — No → To G

Yes

Did
Diagnostics
load
normally? — No → To G

Yes

Proceed with
Diagnostics (see
Support Software guide).

E

Turn off the computer.

Replace the Speaker Cable Assembly and restart.

Replace the System Module and restart.

Did the system emit two short beeps? — No → To G

Yes

Did Diagnostics load normally? — No → Replace the Speaker Cable Assembly and restart. → Did Diagnostics load normally?

Yes

Proceed with Diagnostics (see Support Software guide).

Yes

Replace the System Module and restart.

```
                        ( D )
                          |
                          v
              +-----------------------+
              |  Turn off the computer.|
              +-----------------------+
                          |
                          v
              +-----------------------+
              | Verify or replace the |
              | diskette drive cable. |
              +-----------------------+
                          |
                          v
              +-----------------------+
              |  Restart the computer.|
              +-----------------------+
                          |
                          v
```

```
    Was drive A      No    Replace the drive    Was drive A      No    Replace the Speaker Cable
    accessed?        -->   and restart.   -->   accessed?        -->   Assembly and restart.
        |                                           |                          |
       Yes                                         Yes                         v
        |<------------------------------------------+
        v                                                               Was drive A
    Did                                                                 accessed?
    Diagnostics      No                                                     |
    load             -->   ( To G )                                        No
    normally?                                                               |
        |                                                                   v
       Yes                                                           Replace and Restart.
        v
    Proceed with
    Diagnostics (see
    Support Software guide).
```

```
                        ( C )
                          │
                          ▼
            ┌─────────────────────────┐
            │   Turn off the computer. │
            └─────────────────────────┘
                          │
                          ▼
            ┌─────────────────────────┐
            │       Remove any         │
            │  optional memory cards.  │
            └─────────────────────────┘
                          │
                          ▼
            ┌─────────────────────────┐
            │   Restart the computer.  │
            └─────────────────────────┘
                          │
                          ▼
                    ◇─────────◇                        ┌──────────────────────────┐                 ◇─────────◇
                   Was the        No                   │  Replace the Speaker Cable│                 Was the
                   memory count  ────────────────────▶ │   Assembly and restart.   │ ──────────────▶ memory count
                   correct?                             └──────────────────────────┘                 correct?
                    ◇─────────◇                                                                        ◇─────────◇
                          │                                                                                 │ No
                         Yes                                                                                 ▼
                          ▼                                                                      ┌──────────────────────────┐
                    ◇─────────◇                                                                  │   Replace the System      │
                     Did           No                                                           │   Module and restart.     │
                     Diagnostics ──────▶ ( To G )                                                └──────────────────────────┘
                     load
                     normally?
                    ◇─────────◇
                          │
                         Yes
                          ▼
            ┌─────────────────────────┐
            │     Proceed with         │
            │   Diagnostics (see       │
            │  Support Software guide).│
            └─────────────────────────┘
```

(F)

Replace the following devices
in the sequence listed below:

- Active Matrix Color Display or
  VGA Edgelit Display
- Speaker Cable Assembly
- System Module

Restart the computer after
each replacement and check
for the appearance of
the cursor.

(G)

Replace the Speaker Cable
Assembly.
Restart after each replacement
and check for the appearance
of the cursor.

(H)

Replace the System Module.

Restart after each replacement
and check for the appearance
of the cursor.

Chapter 4

ERROR MESSAGES AND CODES

This chapter contains Power-On Self-Test (POST) messages, Diagnostic error codes, and memory error codes.

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

4.1 POWER-ON SELF-TEST MESSAGES

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

Table 4-1 lists the messages for POST, the audible (beep) message, probable cause, and recommended action.

Table 4-1
Power-On Self-Test Messages

Message	Beeps*	Probable Cause	Recommended Action
101-ROM Error	1L, 1S	ROM Checksum option	1. Inspect the ROM placement. 2. Verify the correct ROM. 3. Replace the ROM.
101-I/O ROM Error	1L, 1S	System ROM	1. Inspect the ROM placement. 2. Verify the correct ROM. 3. Replace the ROM.
102-System Board or System Memory Failure	None	System module	Replace the system module.
162-System Options Error	2S	Configuration error	Run SETUP.
162-System Options Not Set	2S	Configuration incorrect	Run SETUP.
163-Time & Date Not Set	2S	Invalid time or date configuration memory	Run SETUP.

* L = long beep; S = short beep

Continued

Table 4-1   *Continued*

Message	Beeps*	Probable Cause	Recommended Action
164-Memory Size Error	2S	Configuration memory incorrect	Run SETUP.
167-RTC Lost Power	2S	Real-time clock/ calendar battery	Replace the clock/ calendar battery.
XX000Y ZZ** 201-Memory Error	None	RAM failure	1. Replace the memory card. 2. Replace the system module.
XX000Y ZZ**	None	RAM failure	Replace the system module.
205-Memory Error	None	Cache Memory érror	Run Diagnostics.
301-Keyboard Error	None	Keyboard	Replace the keyboard.
301-Keyboard Error or Test Fixture Installed	None	Keyboard	Replace the keyboard.
303-Keyboard Controller Error	None	System module keyboard controller	Replace the system module.
304-Keyboard or System Unit Error	None	Keyboard	1. Replace the keyboard. 2. Replace the system module.
601-Diskette Controller Error	None	Diskette Controller circuitry	1. Check and/or replace the cable. 2. Run Diagnostics. 3. Replace the system module.
605-Diskette Drive Error	None	Mismatch in drive type	Run SETUP.
610-External Storage Device Failure Press **F1** when ready	None	External Storage Module connected but turned off	Turn on external storage module or disconnect from the computer.

*   L = long beep; S = short beep
** Beeps can be disabled by the user during the SETUP program.

Continued

Table 4-1   *Continued*

Message	Beeps*	Probable Cause	Recommended Action
702-Coprocessor Detection Error	None	Coprocessor problem; added or removed the coprocessor	1. Run SETUP. 2. Check the coprocessor installation. 3. Replace the coprocessor.
1125-Internal Serial Port Failure	None	Defective internal port	Replace the system module.
1150-Comm Port Configuration Error	2S	Added or removed modem, or second serial interface board	Run SETUP.
1771-Primary Disk Port Address Assignment	2S	The external primary fixed disk controller is detected on the bus, but the internal controller is not disabled	Run Diagnostics.
1780-Disk 0 Failure	None	Fixed disk drive/ format error	1. Run Diagnostics. 2. Replace the drive.
1781-Disk 1 Failure	None	Fixed disk drive/ format error	1. Run Diagnostics. 2. Replace the drive.
1782-Disk Controller Failure	None	Fixed disk drive controller error	1. Run Diagnostics. 2. Replace the drive.
1790-Disk 0 Error	None	Fixed disk error	1. Run Diagnostics. 2. Replace the drive.
1791-Disk 1 Error	None	Fixed disk drive 1 error	1. Run Diagnostics. 2. Replace the drive.
XX000Y ZZ Parity Check 2	None	Parity RAM failure	Run Diagnostics.
Audible	1S	Power-on successful	None.
Audible	2S	Power-on successful	None.
(RESUME = **F1** key)	None	As indicated to continue	Press **F1** key.

* L = long beep; S = short beep
** Beeps can be disabled by the user during the SETUP program.
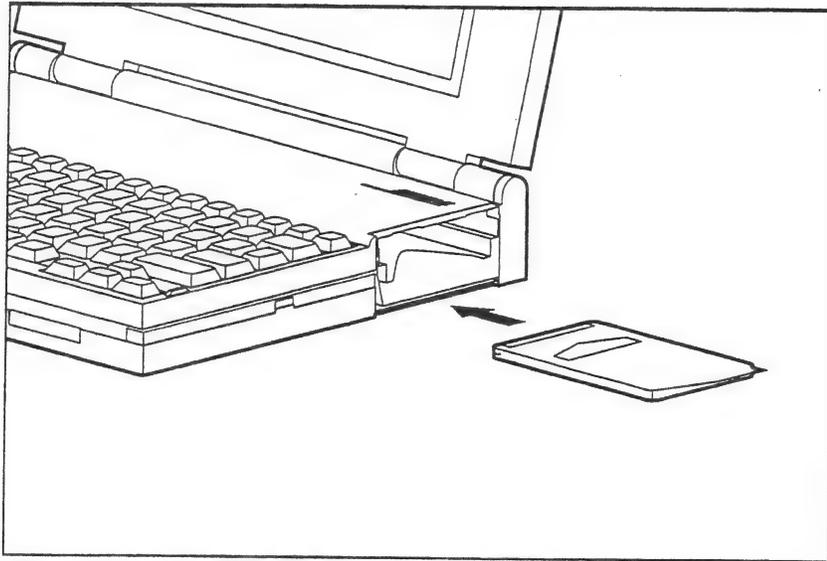
Figure 4-1. Memory Card Location

4.2 DIAGNOSTIC ERROR CODES

Diagnostic error codes occur if the system recognizes a problem while running the Diagnostics program (refer to the *Maintenance and Service Guide Support Software* for additional information on running the Diagnostics software). These error codes help identify possible defective subassemblies. Tables 4-2 through 4-12 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

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

The error codes appear in an AYY-XX or AAYY-XX format.

A or AA = number that represents faulty assembly

YY = test or action that failed

XX = a specific problem

For assistance in the removal and replacement of a particular subassembly, refer to Chapter 2, "Removal and Replacement Procedures."

Table 4-2
Processor Test Error Codes

Error Code	Description	Recommended Action
101-01	CPU test failed	Replace the system module and retest for error code 101-01.
102-01	Coprocessor initial status word incorrect	The following steps apply to error codes 102-xx: 1. Run SETUP. 2. Replace the coprocessor and retest. 3. Replace the system module and retest.
102-02	Coprocessor initial control word incorrect	
102-03	Coprocessor tag word not all ones	
102-04	Coprocessor tag word not all zeros	
102-05	Coprocessor exchange command failed	
102-06	Coprocessor masked exception incorrectly handled	
102-07	Coprocessor unmasked exception incorrectly handled	
102-08	Coprocessor wrong mask bit set in status register	
102-09	Coprocessor unable to store real number	
102-10	Coprocessor real number calculation test failed	
102-11	Coprocessor speed test failed	
102-12	Coprocessor pattern test failed	
102-15	Coprocessor is inoperative or socket is unoccupied	
103-01	DMA page registers test failed	Replace the system module and retest for error codes 103-xx through 114-xx.
103-02	DMA byte controller test failed	
103-03	DMA word controller test failed	
104-01	Interrupt controller master test failed	
104-02	Interrupt controller slave test failed	
104-03	Interrupt controller software RTC is inoperative	

Continued

Table 4-2   *Continued*

Error Code	Description	Recommended Action
105-01	Port 61 bit 6 not at zero	Replace the system module and retest for error codes 103-xx through 114-xx.
105-02	Port 61 bit 5 not at zero	
105-03	Port 61 bit 3 not at zero	
105-4	Port 61 bit 1 not at zero	
105-05	Port 61 bit 0 not at zero	
105-06	Port 61 bit 5 not at one	
105-07	Port 61 bit 3 not at one	
105-08	Port 61 bit 1 not at one	
105-09	Port 61 bit 0 not at one	
105-10	Port 61 I/O test failed	
105-11	Port 61 bit 7 not at zero	
105-12	Port 61 bit 2 not at zero	
106-01	Keyboard controller self-test failed	
107-01	CMOS RAM test failed	
108-02	CMOS interrupt test failed	
108-03	CMOS interrupt test CMOS not properly initialized	
109-01	CMOS clock load data test failed	
109-02	CMOS clock rollover test failed	
109-03	CMOS clock test, CMOS not properly initialized	
110-01	Programmable timer load data test failed	
110-02	Programmable timer dynamic test failed	
111-01	Refresh detect test failed	
112-01	Speed test slow mode out of range	

Table 4-2 *Continued*

Error Code	Description	Recommended Action
112-02	Speed test mixed mode out of range	Replace the system module and retest for error codes 103-xx through 114-xx.
112-03	Speed test fast mode out of range	
112-04	Speed test unable to enter slow mode	
112-05	Speed test unable to enter mixed mode	
112-06	Speed test unable to enter fast mode	
112-07	Speed test system error	
112-08	Speed test unable to enter auto mode	
112-09	Speed test unable to enter high mode	
112-10	Speed test high mode out of range	
112-11	Speed test auto mode out of range	
113-01	Protected mode test failed	
114-01	Speaker test failed	

Table 4-3
Memory Test Error Codes

Error Code	Description	Recommended Action
201-01	Memory machine ID test failed	The following steps apply to error codes 201-xx through 202-xx:
202-01	Memory system ROM checksum failed	1. Replace the system ROM and retest. 2. Replace the system module and retest.
202-02	Failed RAM/ROM map test	
202-03	Failed RAM/ROM protect test	
203-01	Memory write/read test	The following steps apply to error codes 203-xx through 211-xx:
203-02	Error during saving program memory in write/read test	1. Replace the memory card and retest. 2. Replace the system module and retest.
203-03	Error during restore of program memory in write/read test	
204-01	Memory address test failed	
204-02	Error during saving program memory in address test	
204-03	Error during restore of program memory in address test	
204-04	A20 address test failed	
204-05	Page hit address test failed	
205-01	Walking I/O test failed	
205-02	Error during saving program memory in walking I/O test	
205-03	Error during restore of program memory in walking I/O test	
210-xx	Increment Pattern Test	
211-xx	Random Pattern Test	

Table 4-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-01	Keyboard short test, 8042 self-test failed	The following steps apply to error codes 301-xx through 304-xx:
301-02	Keyboard short test, interface test failed	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard.
301-03	Keyboard short test, echo test failed	2. Replace the keyboard and retest. 3. Replace the system module and retest.
301-04	Keyboard short test failed	
302-01	Keyboard long test failed	
303-01	Keyboard LED test, 8042 self-test failed	
303-02	Keyboard LED test, reset test failed	
303-03	Keyboard LED test, reset test failed	
303-04	Keyboard LED test, LED command test failed	
303-05	Keyboard LED test, LED command test failed	
303-06	Keyboard LED test, LED command test	
303-07	Keyboard LED test, LED command test failed	
303-08	Keyboard LED test, command byte restore test failed	
303-09	Keyboard LED test, LEDs failed to light	
304-01	Keyboard typematic test failed	
304-02	Unable to enter mode 3	
304-03	Incorrect scan code from keyboard	
304-04	No make code observed	
304-05	Unable to disable typematic feature	
304-06	Unable to return to normal mode	

Table 4-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-01	Printer failed or not connected	The following steps apply to error codes 401-xx through 498-xx:
402-01	Printer data register failed	1. If a printer is connected, be sure it is turned ON and in the ONLINE mode.
402-02	Printer control register failed	2. Replace the printer and/or the printer cable and retest.
402-03	Printer data and control register failed	3. Replace the system module and retest.
402-04	Printer loopback failed	
402-05	Printer loopback and data failed	
402-06	Printer loopback and control register failed	
402-07	Printer loopback, data, and control register failed	
402-08	Printer interrupt test failed	
402-09	Printer interrupt and data register failed	
402-10	Printer interrupt and control register failed	
402-11	Printer interrupt and loopback failed	
402-13	Printer interrupt loopback, and data register failed	
402-14	Printer interrupt, loopback, and control register failed	
402-15	Printer interrupt, loopback, data, and control register failed	
402-16	Printer unexpected interrupt received	
403-01	Printer pattern test failed	
498-00	Printer failed or not connected	

Table 4-6
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed	The following steps apply to error codes 600-xx through 610-xx:
601-xx	Diskette format failed	1. Replace the diskette and retest.
602-xx	Diskette read test failed	2. Check and/or replace the drive cable and retest.
603-xx	Diskette write, read, compare test failed	3. Replace the diskette drive and retest. 4. Replace the system module and retest.
604-xx	Diskette random seek test failed	
605-xx	Diskette ID media failed	
606-xx	Diskette speed test failed	
607-xx	Diskette wrap test failed	
608-xx	Diskette write protect test failed	
609-xx	Diskette reset controller test failed	
610-xx	Diskette change line test failed	
01	Exceeded maximum soft error limit	
02	Exceeded maximum hard error limit	
03	Previously exceeded maximum soft error limit	
04	Previously exceeded maximum hard error limit	
05	Failed to reset controller	
06	Fatal error while reading	
07	Fatal error while writing	
08	Failed compare of write/read buffers	
09	Failed to format a track	
10	Failed sector wrap test	
20	Failed to get drive type	
21	Failed to get change line status	
22	Failed to clear change line status	
23	Failed to set drive type in ID media	
24	Failed to read diskette media	

Continued

Table 4-6 *Continued*

Error Code	Description	Recommended Action
610-25	Failed to verify diskette media	The following steps apply to error codes 600-xx through 610-xx:
26	Failed to read media in speed test	1. Replace the diskette and retest.
		2. Check and/or replace the drive cable.
27	Failed speed limits	3. Replace the diskette drive and retest.
		4. Replace the system module and retest.
28	Failed write protect test	
697-00	Diskette type error	The following steps apply to error codes 697-xx through 698-xx:
698-00	Diskette drive speed not within limits	1. Replace the diskette and retest.
		2. Check and/or replace the diskette drive cable and retest.
		3. Replace the diskette drive and retest.
		4. Replace the system module and retest
699-00	Diskette drive/media ID error, rerun SETUP	1. Replace the media.
		2. Run SETUP.

Table 4-7
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-01	Serial Port Test; UART DLAB bit failure	The following steps apply to error codes 1101-xx through 1109-xx:
1101-02	Serial Port Test; line input or UART fault	1. Replace the modem and retest. 2. Check the modem line. 3. Replace the system module and retest.
1101-03	Serial Port Test; address line fault	
1101-04	Serial Port Test; data line fault	
1101-05	Serial Port Test; UART control signal failure	
1101-06	Serial Port Test; UART THRE bit failure	
1101-07	Serial Port Test; UART DATA READY bit failure	
1101-08	Serial Port Test; UART TX/RX buffer failure	
1101-09	Serial Port Test; INTERRUPT circuit failure	
1101-10	Serial Port Test; COM1 set to invalid interrupt	
1101-11	Serial Port Test; COM2 set to invalid interrupt	
1101-12	Serial Port Test; DRIVER/RECEIVER control signal failure	
1101-13	Serial Port Test; UART control signal interrupt failure	
1101-14	Serial Port Test; DRIVER/RECEIVER data failure	
1109-01	Clock register initialization failure	
1109-02	Clock register rollover failure	
1109-03	Clock reset failure	
1109-04	Input line or clock failure	
1109-05	Address line fault	
1109-06	Data line fault	

Table 4-8
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem Internal Loopback Test	The following steps apply to error codes 1201-xx through 1210-xx:
01	UART DLAB bit failure	1. Refer to the modem documentation for SETUP procedures and retest.
02	Line input or UART failure	2. Check the modem line.
03	Address line fault	3. Replace the modem and retest.
04	Data line fault	
05	UART control signal failure	
06	UART THRE bit failure	
07	UART DATA READY bit failure	
08	UART TX/RX buffer failure	
1201-09	INTERRUPT circuit failure	
10	COM1 set to invalid interrupt	
11	COM2 set to invalid interrupt	
12	DRIVER/RECEIVER control signal failure	
13	UART control signal interrupt failure	
14	DRIVER/RECEIVER data failure	
15	Modem detection failure	
16	Modem ROM; checksum failure	
17	Tone detection failure	
1202-xx	Internal Modem Test	
01	Modem timed-out waiting for SYNC (local loopback mode)	
02	Modem time-out waiting for response (local loopback mode)	
03	Modem exceeded data block retry limit (local loopback mode)	
11	Modem timed-out waiting for SYNC (analog loopback originate mode)	
12	Modem timed-out waiting for modem response (analog loopback originate mode)	
13	Modem exceeded data block retry limit (analog loopback originate mode)	

Continued

Table 4-8   *Continued*

Error Code	Description	Recommended Action
1202-13	Modem timed out waiting for SYNC (analog loopback answer mode)	The following steps apply to error codes 1201-xx through 1210-xx:
22	Modem timed out waiting for modem response (analog loopback answer mode)	1. Refer to the modem documentation for SETUP procedures. 2. Check the modem line. 3. Replace the modem and retest.
23	Modem exceeded data block retry limit (analog loopback answer mode)	
1203-xx	Modem External Termination test	
01	Modem external TIP/RING failure	
02	Modem external DATA TIP/RING failure	
03	Modem line termination failure	
1204-xx	Modem Auto Originate test	
1205-xx	Modem Auto Answer test	
1206-xx	Dial Multifrequency Tone test	
1210-xx	Modem Direct Connect test	
01	Modem timed out waiting for SYNC	
02	Modem timed out waiting for response	
03	Modem exceeded data block retry limit	
04	RCV exceeded carrier lost limit	
05	XMIT exceeded carrier lost limit	
06	Time-out waiting for dial tone	
07	Dial number string too long	
08	Modem timed out waiting for remote response	
09	Modem exceeded maximum redial limit	
10	Line quality prevented remote connection	
11	Modem timed out waiting for remote connection	
17	Tone detection failure	

Table 4-9
Hard Drive Test Error Codes

Error Code	Description	Recommended Action
1700	Fixed disk ID drive types test failed	The following steps apply to error codes 1700-xx through 1719-xx:
1701-xx	Fixed disk format test failed	1. Replace the fixed disk drive and retest.
1702-xx	Fixed disk read test failed	2. Replace the system module and retest.
1703-xx	Fixed disk write/read compare test failed	
1704-xx	Fixed disk random seek test failed	
1705-xx	Fixed disk controller test failed	
1706-xx	Hard drive ready test failed	
1707-xx	Hard drive recalibrate test failed	
1708-xx	Fixed disk format bad track test failed	
1709-xx	Fixed disk reset controller test failed	
1710-xx	Fixed disk park head test failed	
1714-xx	Fixed disk file write test failed	
1715-xx	Fixed disk head select test failed	
1716-xx	Fixed disk conditional format test failed	
1717-xx	Fixed disk ECC* test failed	
1719-xx	Hard drive power mode test	
01	Exceeded maximum soft error limit	
02	Exceeded maximum hard error limit	
03	Previously exceeded maximum soft error limit	
04	Previously exceeded maximum hard error limit	
05	Failed to reset controller	
06	Fatal error while reading	
07	Fatal error while writing	
08	Failed compare of write/read/compare	
09	Failed to format a track	
10	Failed sector wrap test	
19	Controller failed to deallocate bad sector	

* Error Correction Code

Table 4-9 *Continued*

Error Code	Description	Recommended Action
1719-40	Failed cylinder 0	The following steps apply to error codes 1700-xx through 1719-xx:
41	Drive not ready	1. Replace the fixed disk drive and retest.
42	Recalibrate failed	2. Replace the system module and retest.
43	Failed to format bad track	
44	Failed disk controller diagnostics	
45	Failed to get drive parameters from ROM	
46	Invalid drive parameters found in ROM	
47	Failed to park heads	
48	Failed to move disk table to RAM	
49	Failed to read media in file write test	
50	Failed file I/O write test	
51	Failed file I/O read test	
52	Failed file I/O compare test	
53	Failed drive/head register test	
54	Failed digital input register test	
55	Failed cylinder 1	
56	Fixed disk drive controller RAM diagnostics failed	
57	Hard drive controller to drive test failed	
58	Failed to write sector buffer	
59	Failed to read sector buffer	
60	Failed to compare sector buffer	
61	Failed uncorrectable ECC* error	
62	Failed correctable ECC* error	
63	Failed soft error rate	
65	Exceeded maximum bad sector per track	
66	Failed initial drive parameter	

* Error Correction Code

Continued

Table 4-9 *Continued*

Error Code	Description	Recommended Action
1719-67	Failed to write long	The following steps apply to error codes 1700-xx through 1719-xx:
68	Failed to read long	1. Replace the fixed disk drive and retest.
69	Failed to read drive size from controller	2. Replace the system module and retest.
70	Failed translate mode	
71	Failed nontranslated mode	
72	Bad track limit exceeded	
73	Previously exceeded bad track limit	
74	Failed sleep mode	
75	Failed idle mode	
76	Failed standby mode	
77	Failed to change mode	
78	Exceeded spinup time limit	

Table 4-10
Tape Drive Test Error codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed	The following steps apply to error codes 1900-xx through 1906-xx:
1901-xx	Tape servo write failed	1. Replace the tape cartridge and retest.
1902-xx	Tape format failed	2. Check and/or replace the signal cable and retest.
1903-xx	Tape drive sensor test failed	3. Replace the tape drive and retest.
1904-xx	Tape BOT/EOT test failed	4. Replace the system module and retest.
1905-xx	Tape read test failed	
1906-xx	Tape write/read/compare test failed	
01	Drive not installed	
02	Cartridge not installed	
03	Tape motion error	
04	Drive busy error	

Continued

Table 4-10   *Continued*

Error Code	Description	Recommended Action
1906-05	Tape write protected error	The following steps apply to error codes 1900-xx through 1906-xx:
07	Tape already servo written	1. Replace the tape cartridge and retest.
08	Unable to servo write	2. Check and/or replace the signal cable and retest.
09	Unable to format	3. Replace the tape drive and retest.
10	Format mode error	4. Replace the system module and retest.
11	Drive recalibration error	
12	Tape not servo written	
13	Tape not formatted	
14	Drive time-out error	
15	Sensor error flag	
16	Block locate (block ID error)	
17	Soft error limit exceeded	
18	Hard error limit exceeded	
19	Write (probably ID) error	
20	NEC fatal error	
21	Received servo pulses second time but not first	
22	Never got to EOT after servo check	
23	Change line not set	
24	Write protect error	
25	Unable to erase cartridge	
26	Cannot identify drive	
27	Drive not compatible with controller	
28	Format gap error	
30	Exception bit not set	
31	Unexpected drive status	
32	Device fault	
33	Illegal command	
34	No data detected	
35	Power on reset occurred	
91	Power lost during test	

Table 4-11
Video Test Error Codes

Error Code	Description	Recommended Action
2402-01	Video memory test failed	The following steps apply to error codes 2402-xx through 2432-xx: Replace the system module and retest.
2403-01	Video attribute test failed	
2404-01	Video character set test failed	
2405-01	Video 80x25 mode 9x14 character cell test failed	
2406-01	Video 80x25 mode 8x8 character cell test failed	
2407-01	Video 40x25 mode test failed	
2408-01	Video 320x200 mode color set 0 test failed	
2409-01	Video 320x200 mode color set 1 test failed	
2410-01	Video 640x200 mode test failed	
2411-01	Video screen memory page test failed	
2412-01	Video gray scale test failed	
2414-01	Video white screen test failed	
2416-01	Video noise pattern test failed	
2418-01	Video memory test failed	
2418-02	Video shadow RAM test failed	
2419-01	Video ROM checksum test failed	
2420-01	Video attribute test failed	
2421-01	Video 640x200 graphics mode test failed	
2422-01	Video 640x350 16 color set test failed	
2423-01	Video 640x350 64 color set test failed	
2424-01	Video monochrome text mode test failed	
2425-01	Video monochrome graphics mode test failed	
2431-xx	Video 640x480 graphics mode test failed	
2432-xx	Video 320x200 graphics mode test failed	

Table 4-12
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
3601-xx	Pointing Device Interface test	1. Replace with a working pointing device and retest. 2. Replace the system module and retest.

Chapter 5

SPECIFICATIONS

This chapter provides physical, environmental, and performance specifications for the following COMPAQ LTE Lite Family of Personal Computers subsystems:

- System Unit

- Active Matrix Color VGA Display

- VGA Maxlight Liquid Crystal Display

- 3 1/2-Inch 1.44 Megabyte Diskette Drive

- Hard Drives

- Internal Power Supply

- AC Adapter

- Battery Pack
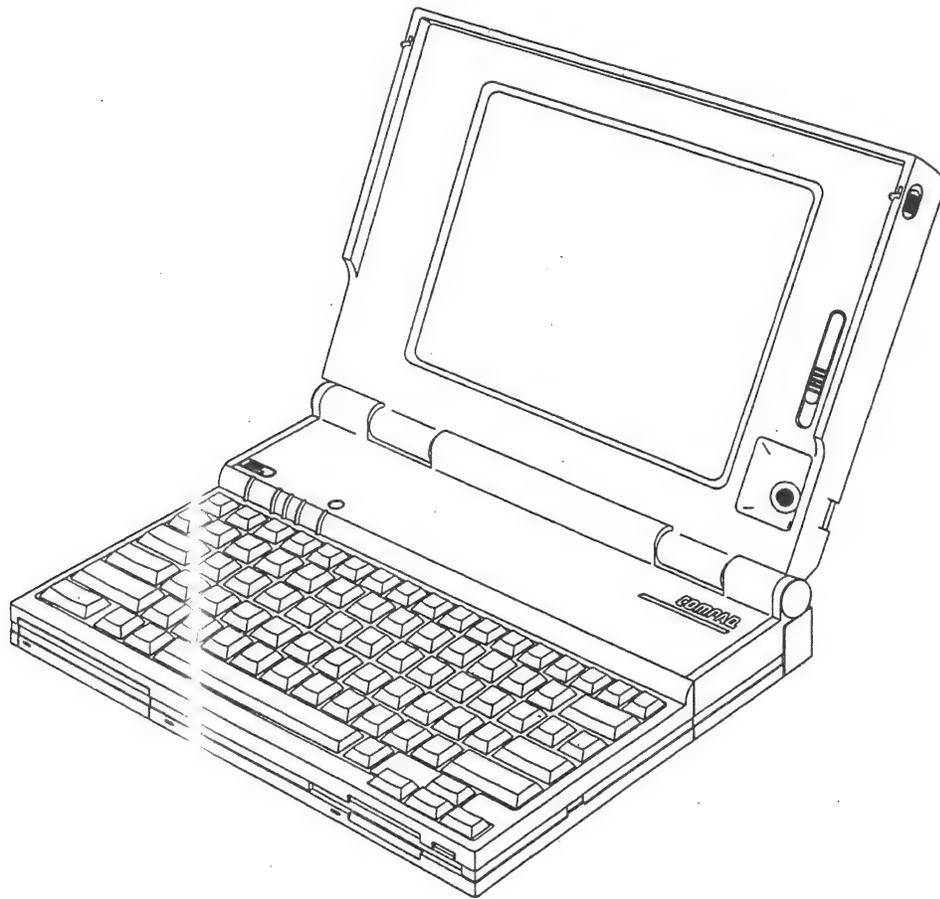
Figure 5-1 COMPAQ LTE Lite/25c Personal Computer
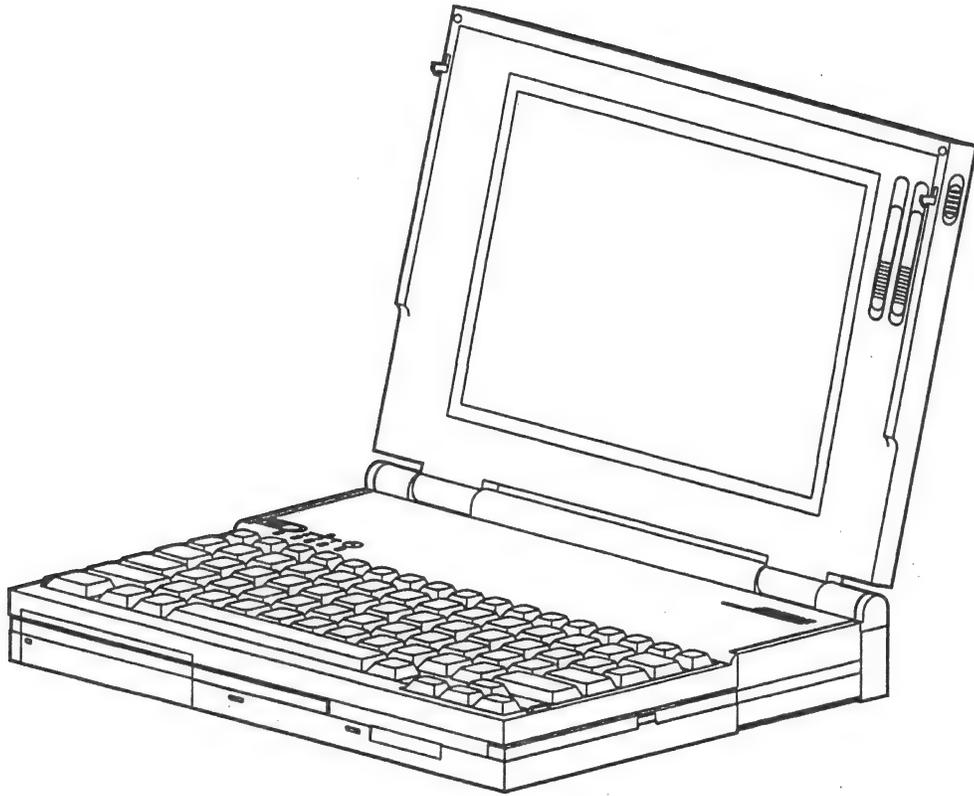
Figure 5-2.   COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20
Personal Computers

5.1 SYSTEM UNITS

Dimensions		
COMPAQ LTE Lite/25c		
Height	8.5 in	21.6 cm
Width	11.0 in	27.9 cm
Depth	2.0 in	5.1 cm
Dimensions		
COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20		
Height	8.5 in	21.6 cm
Width	11.0 in	27.9 cm
Depth	1.75 in	4.4 cm
Weight		
COMPAQ LTE Lite/25c		
Model 120	6.50 lb.	2.95 cm
Model 84	6.50 lb.	2.95 cm
Weight		
COMPAQ LTE Lite/25 and COMPAQ LTE Lite/20		
Model 120	6.0 lb	2.7 kg
Model 84	6.0 lb	2.7 kg
Model 60	6.0 lb	2.7 kg
Model 40	6.0 lb	2.7 kg

Stand-Alone (Battery Pack) Power Requirements	COMPAQ LTE Lite/25c	COMPAQ LTE Lite/25 COMPAQ LTE Lite/20
Nominal Operating Voltage	12 VDC	12 VDC
Average Power	14.2 W	10 W
Peak Power	32.3 W	21 W

Environmental Requirements		
Temperature		
Operating	10° to 40° F	10° C/Hr
Nonoperating	−20° to 60° F	20° C/Hr

Relative Humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%*	

Acoustic Noise		
Power	3.7 Bels (A)	4.8 Bels (A)
Pressure	33 dBA	42 dBA

Shock and Vibrations	
Shock	10 G, 11 ms, half sine (operating)
	60 G, 11 ms, half sine (nonoperating)
Vibration	0.25 G, 5-500 Hz $^1/_2$ octave/min sweep (operating)
	1.0 G, 5-500 Hz $^1/_2$ octave/min sweep (nonoperating)

Maximum Unpressurized Altitude		
Operating	10,000 ft	3,048 m
Nonoperating	40,000 ft	12,192 m

Heat Output	149 BTU/hr (calculated maximum)

* 38.7° maximum wet bulb.

5.2   VGA Maxlight LIQUID CRYSTAL DISPLAY

Dimensions (Image area)		
Height	5.7 in	14.1 cm
Width	7.6 in	19.2 cm
Diagonal Size	9.5 in	24.1 cm
Mounting	Internal	
Display	Edgelit compensated supertwist LCD	
Gray Scales	16 in (640 x 480 resolution) 64 in (320 200 resolution)	
Brightness/Contrast	Adjustable	
Maximum Pixel Resolution	640 x 480	
Character Display	80/40 x 25	
Horizontal Frequency	30 kHz	
Vertical Frequency	70 Hz	
Display Inverter Board		
Operating Voltage	350 Vrms typical @ 3.0 W, 25°C	
Maximum Input Power	3.0 W	
Maximum Output Power	3.0 W	

5.3   ACTIVE MATRIX COLOR VGA DISPLAY

Dimensions (Image area)		
Height	5.1 in	12.9 cm
Width	6.7 in	17.0 cm
Diagonal Size	8.4 in	21.3 cm
Mounting	Internal	
Display Type	TFT (Thin Film Transistor)	
Pixel Pitch	.27 mm	
Modes Supported	VGA, EGA, CGA	
Maximum Pixel Resolution	640 x 480	
Colors	256 in (640 x 480) (VGA) from a palette of 4,096	
Character Display	80/40x25	
Brightness	Adjustable	
Horizontal Frequency	30 kHz	
Vertical Frequency	70 Hz	

5.4   DISKETTE DRIVE

	1.44 MB
Diskette Size	3 1/2 in
Light Indicators Read/Write (high density) Read/Write (low density)	Green Orange
Capacity Per Diskette (high/low)	1.44 MB/720 KB
Drives Supported	One
Drive Rotation (rpm)	300
Transfer Rate (bps) (high/low)	500 K/250 K
Bytes Per Sector	512
Sectors Per Track (high/low)	18/9
Tracks Per Side (high/low)	80/80
Access Times Track-to-Track (ms) Average (ms) Settling Time (ms) Latency Average (ms)	3/6 80/60 15 100
Cylinders (high/low)	80/80
Read/Write Heads	2

5.5   HARD DRIVES

	120 MB	84 MB	60 MB	40MB
Standard Configurations	Model 120	Model 84	Model 60	Model 40
Light Indicators	Green	Green	Green	Green
Formatted Capacity Per Drive				
Physical	121.79	85.37 MB	64.00 MB	42.68 MB
Logical	121.41	84.34 MB	63.81 MB	42.65 MB
Drives Supported	One	One	One	One
Drive Type	50	27	60	53
Transfer Rate (Mbits/sec)				
Head	18	12	12	12
Interface	6.5	6.5	4.5	6.5
Sector Interleave	1:1	1:1	1:1	1:1
Bytes Per Sector	512	512	512	512
Sectors Per Track				
Physical	54	39	39	39
Logical	38	38	38	38
Number of Surfaces				
Physical	4	4	4	2
Logical	8	6	4	4
Access Times (including settling)				
Track-to-Track (ms)	5	5	5	5
Average (ms)	17	19	19	19
Maximum (ms)	40	40	40	40
Physical Cylinders	1122	1097	823	1097
Physical Read/Write Heads	4	4	4	2
Logical Cylinders	760	832	820	548
Logical Read/Write Heads	8	6	4	4

5.6   INTERNAL POWER SUPPLY

Input Requirements
Input Voltage	10-20 Vdc
Standby	6.5-8.5 Vdc
Input Fuse	5.0 A

Power Output
Steady State	18.5 W
Peak	21 W

Cooling Convection

VDC Output:

Nominal Voltage	Current Minimum	Nominal Continuous Current Maximum	Maximum Peak Current	Regulation Tolerance	Average Power
+ 5.075	0.0 A	2.56 A	3.3 A	± 3%	14.2

5.7   AC ADAPTER

Dimensions
Height	1.4 in	3.56 cm
Width	3.3 in	8.38 cm
Depth	5.3 in	13.46 cm

Weight
	0.8 lb	.3 kg

Power Supply
Operating Voltage	100-120/220-240 VAC
Maximum Output Voltage	18 V
Maximum Output Current	2.5 A
Maximum Output Power	35 W
Operating Current	0.8/0.4 A
Frequency	50-60 Hz

5.8 NiMH POWER SMART PACK

Dimensions		
Height	.8 in	2.0 cm
Depth	5.6 in	14.3 cm
Width	3.8 in	9.6 cm
Weight	1.2 lb	.5 kg
Power Supply		
Nominal Open Circuit Voltage	12 VDC (14.0 fully charged)	
Capacity	2.2 Ah	
Power (Wh)	26.4	
Environmental Requirements		
Temperature		
Operating	50° F to 104° F	10° C to 40° C
Nonoperating	-4° F to 86° F	-20° C to 30° C (no time limit)
	-4° F to 104°F	20° C to 40° C (<3 months)
	-4° F to 122° F	-20° C to 50° C (<1 month)

5.9 ENHANCED NiCd POWER SMART PACK

Dimensions		
Height	.8 in	2.0 cm
Depth	5.6 in	14.3 cm
Width	3.8 in	9.6 cm
Weight	1.2 lb	.5 kg
Power Supply		
Nominal Open Circuit Voltage	12 VDC (14.0 fully charged)	
Capacity	2.2 Ah	
Power (Wh)	26.4	
Environmental Requirements		
Temperature		
Operating	50° to 104° F (10° C to 45° C)	
Nonoperating	-4° to 86° F (-20° C to 30° C)	

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