NECHE UltraLite Laptop Computer

UltraLite Maintenance And Service Manual

Notice

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception.

It has been type tested and found to comply with Part 68 and the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

If the equipment does cause interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorientate the receiving antenna

- Relocate the computer with respect to the receiver

- Move the computer away from the receiver

- Plug the computer into another outlet so that the computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the US Goverment Printing Office, Washington, D.C., 20402.

Warning

This equipment has been certified to comply with 68 and the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with Class B limits may be attached to this computer. Operations with non-certified peripherals is likely to result in interference to radio and television reception.

Interconnecting Cables

The AC Adapter enclosed in the UltraLite box must be used to connect the UltraLite Personal Computer to an AC power source. For connecting peripherals to the Ultra-Lite, the following cables must be used:

- Modem cables with RJ-11 connectors

- Shielded RS-232C Cable (PC-17-97S) with ferrite toroid installed on one end

Operation without cables described above could violate FCC rules and regulations.

FCC Requirements

Type of Service

Your UltraLite is designed to be used on standard device telephone lines. Connection to a coin-service telephone (central-office implemented system) provided by a telephone company is prohibited. Connection to party lines service is subject to state tariffs.

Telephone Company Procedure

The telephone company may occasionally make changes to their equipment, operations, or procedures. If these changes affect your service or the operation of your equipment, the telephone company will give you notice, in writing, to allow you to make the necessary changes to maintain uninterrupted service.

If you have any questions about your telephone line, the telephone company will provide you with the information on request. In certain circumstances, it may be necessary for the telephone company to request information from you concerning the equipment you have connected to your telephone line. Upon the telephone company's request, please provide the FCC registration number and the ringer equivalence number (REN) of the equipment which is connected to your line. Both of these items are listed on the equipment label. The sum of all the RENs on your telephone lines should be less than five in order to provide service from the telephone company. In some cases, a sum of five may not be used on a given line.

If Any Problems Arise

If any of your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, it may temporarily discontinue service. When practical, the telephone company will notify you in advance of such disconnection. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem, and you will be informed of your fight to file a complaint with the FCC.

For more information, please contact:

NEC Home Electronics

1255 Michael Drive

Wood Dale, IL 60191-1094

Software License

NEC Home Electronics (U.S.A.) Inc. ("NECHE") grants to the customer a non-exclusive and non-transferable license to use the following software ("The SOFTWARE") which is contained in or delivered with the UltraLite.

The SOFTWARE

- ROM BIOS Copyright ©1984-1986 Phoenix Technologies Ltd.
- MS-DOS Manager Copyright ©1988 Microsoft
- LAP-LINK Copyright ©1988 Traveling Software
- SETUP Copyright ©1986,1987 NEC Corporation
- EXTENDED BIOS Copyright ©1986,1987 NEC Corporation

The SOFTWARE means the above computer programs contained in the UltraLite in ROM (read only memory) format and the manuals which are delivered with the UltraLite.

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Some states or countries do not allow the execution or limitiation of liability for consequential or incidental damages so the above limitation may not apply to you.

1. Introduction

1.1. Features

The NEC UltraLite is a truly personal computer. Like other PC compatible computers, the UltraLite runs standard MS-DOS software. It reads and writes to the same type 3.5" diskettes used by the IBM PS/2 family and most all popular laptops, including NEC MultiSpeed family of portables.

Many of the features of the UltraLite surpass those of current desktop computers and other laptops. They include:

- Built-in MS-DOS 3.3 operating system
- Built-in 1 or 2 MB Silicon Hard Disk
- Easy to use MS-DOS Manager interface
- CPU speeds of 4.92/9.83 MHz
- 4.4 pounds (total weight)
- 2 hour average battery operating time
- Built-in 2400/1200/300 Hayes compatible modem
- Built-in software to exchange files with other computers (LAP-LINK)
- High density 1.44 MB 3.5" floppy drive (optional)
- ROM memory card-based applications software

1.1.1 Built-in Software

In addition to the Silicon Hard Disk, the UltraLite contains permanent Read Only Memory, called the system ROM. All computers have some amount of system ROM, but the UltraLite's ROM, designated Drive D, is quite large. It contains the following built-in software:

- MS-DOS 3.3
- MS-DOS Manager
- Silicon Hard Disk Utility Programs
- SETUP Utility
- LAP-LINK

MS-DOS 3.3

MS-DOS 3.3 is always available on the UltraLite. One of the most useful MS-DOS utility programs is the EDLIN editor. It can be used to edit small files and take notes until a word processor or programming editor is installed.

MS-DOS Manager

MS-DOS Manager is a DOS shell that simplifies using MS-DOS on the UltraLite. It automates many of the tasks performed by DOS commands and provides many features offered by extra cost hard disk management software.

Silicon Hard Disk Utility Programs

Silicon Hard Disk Utility programs are included in the system ROM to re-initialize and format the Silicon Hard Disk and setup MS-DOS Manager. These utility programs are only needed to be used one time, unless the Silicon Hard Disk is erased by a power loss or if it is to be reformatted.

SETUP Utility

The SETUP Utility is a small resident program which allows the user to control the processor speed, screen brightness, and other settings. SETUP can also customize the use of gray levels on the UltraLite LCD screen.

LAP-LINK

LAP-LINK is a file transfer utility used in conjunction with the UltraLite null modem cable to exchange files with another laptop or desktop computer. Although LAP-LINK is built into the UltraLite, it is necessary to install it on the remote computer. When transferring files in LAP-LINK, one of the LAP-LINK floppy disks (3.5" and 5.25") and the cable are required.

1.1.2 A Close Inspection of the UltraLite

To open the unit, pull forward on the cover latches.

Cover Latches

Front

- Electro-luminescent LCD Screen
- LCD Contrast Control
- Power Switch
- Memory Card Cover
- Embedded Key Pad
- Low Battery Indicator
- Fn Key
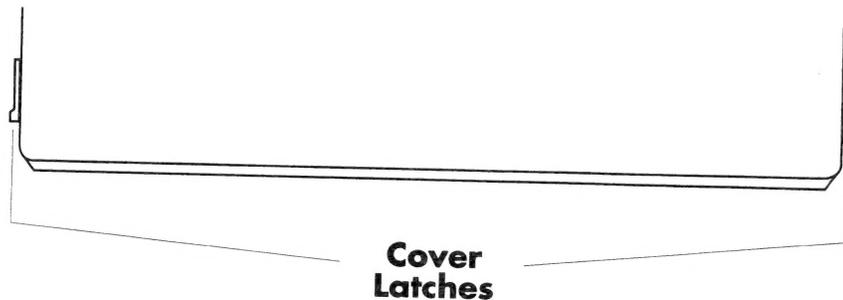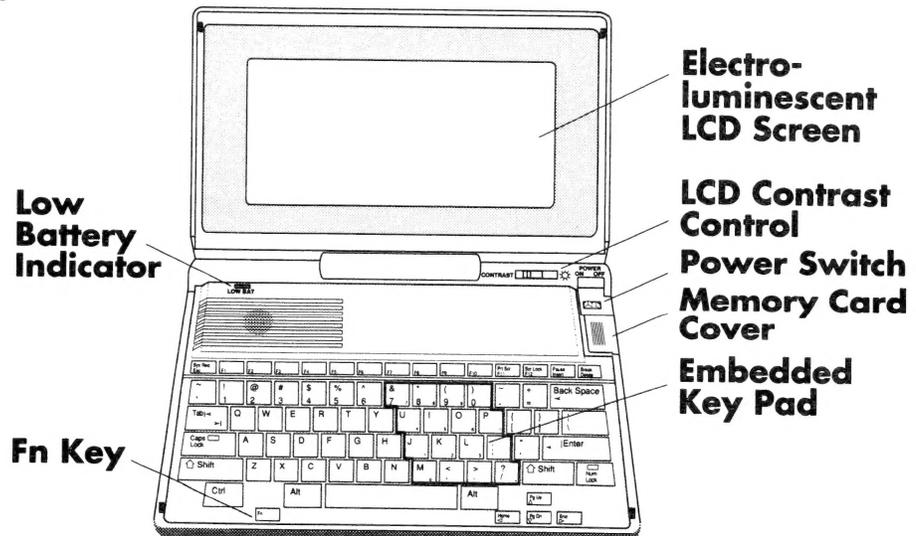
Rear Panel
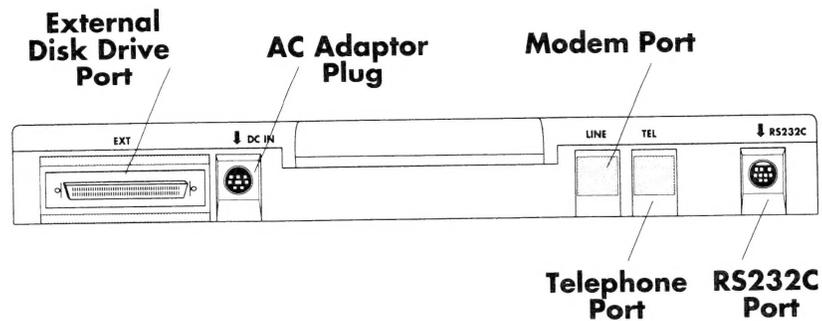
The external disk drive port is an NEC proprietary interface between the UltraLite and the optional external disk drive and parallel port adapter. These devices provide a standard PC parallel port.

The AC Adapter plug is designed to work only with the NEC AC Adapter provided with the UltraLite.

The RJ11 port marked "LINE" is connected to the telephone network, using the NEC modem cable included with the UltraLite. The port marked "TEL" is used to attach a telephone unit for convenience while communicating.

The RS-232C serial port is an NEC proprietary connector that works in conjunction with the NEC cables to provide either a serial port compatible with those found in PC/XT compatible computers or the IBM PS/2, or a null modem connection to a PC/XT or PS/2.

Cables provided with the UltraLite:

- 9-pin DIN to DB25 (Straight) Serial Cable
- Null Modem Adapter (25-pin to 25-pin or 25-pin to 9-pin)

Bottom Side
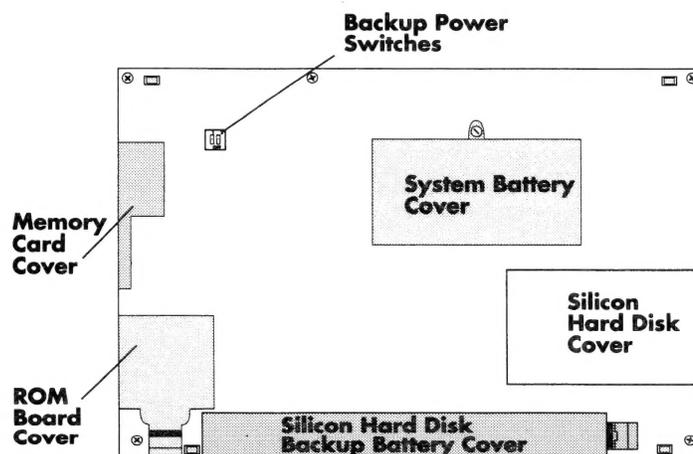
Note the location of the Backup Power Switches (remove protective cover).

Keyboard
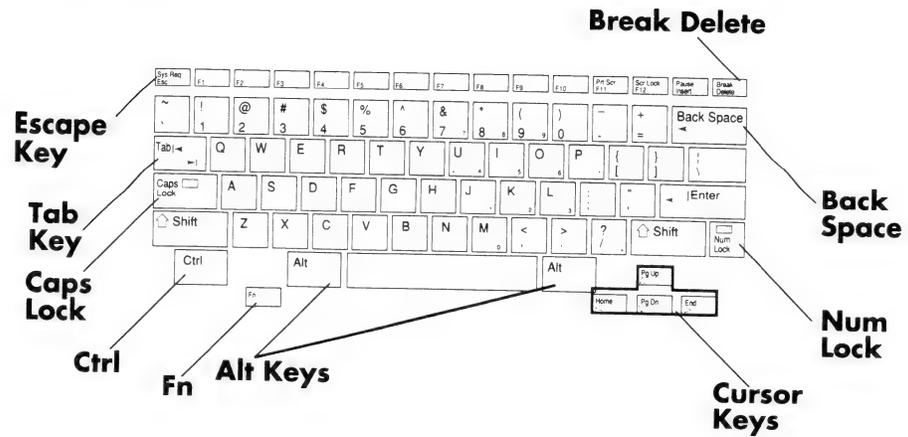
The alphanumeric keys follow the standard QWERTY arrangement, but the placement of controls and function keys may be different from other PC keyboards. To access the built-in numeric key pad, press the NUM LOCK key.

1.1.3   UltraLite Accessories
UltraLite

PC-17-01:   UltraLite, 1 MB Silicon Hard Disk Drive

PC-17-02:   UltraLite, 2 MB Silicon Hard Disk Drive

Accessories

PC-17-31:   Floppy Disk Drive; 3.5" 1.44/720 MB (with parallel printer port)

PC-17-41:   256K RAM Card

PC-17-61:   Parallel Adapter (allows a printer to be hooked up through the expansion port)

PC-17-85:   Carrying Case

PC-17-71:   AC Adapter

PC-17-73:   Molicel Battery Pack

1.1.4 Supplement Documentation

Quick Start Guide

The Quick Start Guide explains how to unpack and setup the UltraLite. It should be read before working with the UltraLite or any of its accessories.

Portable Guide

The Portable Guide is a quick reference guide for all of the features and built-in software for the UltraLite.

Comprehensive User Manual

The Comprehensive User Manual is a detailed reference guide to all of the features and built-in software of the UltraLite. It includes tutorial material and menu-by-menu procedures for the different applications: MS-DOS Manager, LAP-LINK, and SETUP.

1.2. Technical Specifications

CPU/Memory

CPU: NEC V30 (8086); Speed: 4.92/9.83 MHz

Average wait states: 0 wait states

No co-processor support

RAM: 640 K at 120 nanoseconds, memory standard

Display

Screen: Supertwist backlit LCD

Size: 9.5" diagonal, 640 x 200 pixels

Dot Pitch: .33 (W) mm x .54 (H) mm

Dot/inch: 77 (W) x 47 (H)

Mass Storage:

HDD

(Silicon): 2 MB

Unformatted Capacity: 1.9 MB

Access Time: Track to Track 2.4 ms (sequential) and Average 2.0 ms (random)

Transfer Rate: 87 KB/s

Interface: Proprietary 8-bit

HDD Controller: Standard XT

Interleave Factor: 1:1

Logical Configuration: 58 cyl.

    Heads: 4

    Sectors/Track: 17

    Bytes/Sector: 512

    Sectors /Cluster: 8

Read/Write:

    Seek: Typically 120 mA (active)

    Idle: Typically 120 mA (active)

ROM/RAM Card Slot

Accepts optional 256 KB/RAM, 512 KB or 1 MB/ ROM cards

Access Time: Sequential : .025 ms and Random: .025 ms

Transfer Rate: 534 KB/s

Power Comsumption: 10 mA

Portable Floppy Disk Drive (optional)

3.5" 1.44 MB Floppy Disk Drive

Access Time:

Sequential: 192 ms (720K); 193 ms (1.44MB)

Random: 192 ms (720K); 193 ms (1.44 MB)

Data Transfer Rate: 21.6 KB/s

Number of Bytes/Sector: 512 bytes

Size: 4 3/16" (W) x 6 7/8" (D) x 2" (H)

Weight: 1.78 pounds

Ports:

- One 68 pin expansion port (connects to UltraLite)
- One 25 pin parallel printer port

Expansion Port (NEC Proprietary Bus)

Power Supply: +5 V @ 500 mA, 1.2 A (peak Current)

Communications:

Modem: Internal 2400 BPS modem located on the mother board)

Keyboard

Style: Desktop equivalent PS/2 derivative keyboard (without the center section); 78 keys, 12 function, imbedded numeric keypad, separate cursor keypad. LED Indicators: Red indicators are integrated in Caps Lock and NUM Lock keys.

Laptop Ports

- One 68-pin expansion port (FDD)
- One 9-pin serial port (9-pin DIN)
- One DC-IN plug
- Two RJ-11 modem ports (TEL and LINE)
- RAM/ROM card slot

System Software

- MS-DOS 3.3
- LAP-LINK Version 2
- Microsoft DOS Manager Version 2.0
- SETUP

SETUP

SETUP is an NEC proprietary system configuration utility for the UltraLite. It is used to change the following parameters:

1. Drive Section: SETUP allows the user to select the "B" drive as the bootable drive

2. Clock Speed: SETUP allows the user to set the clock speed of the CPU at high (9.83 MHz) or low (4.92 MHz).

3. Screen: SETUP allows the user to set the following parameters:
   - Color Mode: Emulation or Contrast
   - Intensity Mode: Font or Contrast
   - Default Font: Double dot or Single dot
   - Backlight: Auto power down (5 min.) high, or low
   - Palette: SETUP allows the user to select the color pattern

Power Supply:

Modular lightweight 120 V AC Adapter with rechargeable batteries (one Molicel Battery and one NiCd Backup Battery).

AC Adapter:

Input Voltage: 85 to 132 V 50/60 Hz, .25 A

Output Voltages: DC 5.0 V (0.10A), DC 12.0 V (0.77 A), DC 15.6 V (0.08 A)

Size: 5.5" (L) x 2.75" (W) x 1.5" (D)

Weight: 1.20 pounds

Molicel Battery:

Voltage: 12.6 V

Capacity: 800 mAH

Watt-Hours: 6.75

Battery Life/Charge: 2 hours or more depending on use

Recharging Time: 10-12 hours

Total Recharge Cycles: 400

Size: 4" x 2" x 0.5"

Weight: .397 pounds

Location: Compartment on bottom side of the UltraLite

NiCd Backup Battery:

Voltage: 3.6 V

Capacity: 850 mAH

Watt-Hours: 3.06

Battery Life/Charge: 7 Days

Total Recharge Cycles: 300

Size: 7.75" x 5/8" x 5/16"

Weight: 0.213 pounds

Location: Compartment on bottom side of the UltraLite

The UltraLite's disk-based SETUP configuration program allows for intelligent power management. It is possible to set the LCD backlighting to Auto-Power-Down Mode. This programs the UltraLite to turn the backlighting OFF after 5 minutes of keyboard inactivity. The UltraLite can also be programmed to use the LCD with full brightness or with only half the brightness to conserve power.

System Unit

Size: 11.75" (W) x 1.4" (H) x 8.3" (D)

Weight: 4.4 pounds (not including the AC Adapter)

System LED Indicator

LOW POWER Indicator: The LOW POWER indicator is located on the leftside of the LCD screen. It turns ON to indicate low power.

Environment

Storage:

Temperature: 32 deg. F to 122 deg. F (0 deg. C to 50 deg. C)

Humidity: 20% to 80 %

Operation:

Temperature: 41 deg. F to 95 deg. F (5 deg. C to 35 deg. C)

Humidity: 20% to 80%

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2. Unit Operation

2.1. Initial Hardware Setup

2.1.1 Using the UltraLite for the First Time

Note: Plug the AC Adapter into an AC wall outlet, then plug the AC Adapter into the "DC IN" jack on the UltraLite. This starts the process to charge the batteries.

1. Turn ON the UltraLite by depressing the "rocker" switch located on the upper righthand side of the unit. After a Memory Test, MS-DOS Manager is automatically loaded.

To bypass the Memory Test, press the **SPACE BAR**.

If the screen remains too dark or too light, adjust the CONTRAST slide switch, located below the screen, until an image appears.

If the Power On Test reports an error:

A. Turn the UltraLite OFF.

B. Repeat the steps in setting up the UltraLite to ensure the CONFIG switches are set properly.

C. Turn the UltraLite ON and OFF three or four more times. If the error condition continues, see the Troubleshooting chapter in this manual.
2. Adjust the screen contrast for best viewing of the Main Menu.

```
File  Options  Disk  Applications
Disks: [ A: ] [ B: ]
  ┌──────────────┐ ┌─────────────────────────┐
  │ D:\          │ │ LAPLINK                 │
  │              │ │ Initialize Hard Disk    │
  │              │ │ Format System Hard Disk │
  │ ANSI.SYS     │ MANA│ Setup DOS Manager   │
  │ ASSIGN.COM   │ MANA└─────────────────────┘
  │ AUTO         │ MGR.
  │ AUTOEXEC.BAT │ MODE.COM
  │ BACKUP.COM   │ RESTORE.COM
  │ CHKDSK.COM   │ SETUP.EXE
  │ COMMAND.COM  │ SYS.COM
  │ CONFIG.SYS   │ XCOPY.EXE
  │ DISKCOPY.COM │
  │ DSET.BAT     │
  │ EDLIN.COM    │
  │ FORMAT.COM   │
  │ GRAPHICS.COM │
  │ IDISK.COM    │
  │ LABEL.COM    │
  │ LL.EXE       │
  │ MANAGER.EXE  │
  └──────────────┘
```
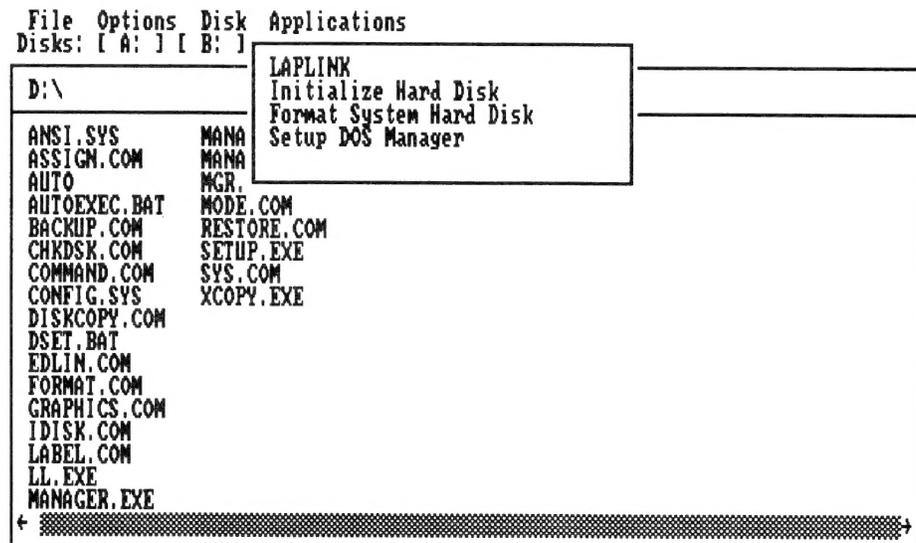
3. The Applications Menu of MS-DOS Manager is highlighted in the center of the screen. The following four programs appear in the menu:

- LAP-LINK
- Initialize Hard Disk
- Format System Hard Disk
- Setup DOS Manager

2.1.2 Formatting the Silicon Hard Disk

To properly setup the silicon hard disk, perform the following procedure:

1. To initialize the silicon hard disk, press the "I" key or press the DOWN ARROW key one time followed by pressing the ENTER key. The following message appears:

```
WARNING,ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with initialize(Y/N)?
```

2. Press the "Y" key and then ENTER to begin initialization.

3. After approximately 30 seconds, initialization is completed, the message "Press any key to continue..." appears in the lower righthand corner of the screen.

4. Press any key to return to MS-DOS Manager. The initial MS-DOS Manager screen is displayed:

```
 File  Options  Disk  Applications
 Disks: [ A: ] [ B: ]
                       ┌─────────────────────────┐
 ┌──────────────────┐  │ LAPLINK                 │ ────────────
 │ D:\              │  │ Initialize Hard Disk    │
 └──────────────────┘  │ Format System Hard Disk │ ────────────
  ANSI.SYS      MANA│  │ Setup DOS Manager       │
  ASSIGN.COM    MANA│  └─────────────────────────┘
  AUTO          MCD
```

5. Press the "F" key, or use the DOWN ARROW key to highlight "Format System Hard Disk", then press ENTER. The format message is displayed:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

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6. Press "Y" and then the ENTER key to begin formatting. Once the Silicon Hard Disk is formatted, the UltraLite automatically returns to MS-DOS Manager:

```
File  Options  Disk  Applications
Disks: [ A: ] [ B: ]
                              ┌──────────────────────────────┐
  ┌──────────────────┐        │ LAPLINK                      │───────────────
  │ D:\              │        │ Initialize Hard Disk         │
  │                  │        │ Format System Hard Disk      │───────────────
  │                  │        │ Setup DOS Manager            │
  │ ANSI.SYS    MANA │        │                              │
  │ ASSIGN.COM  MANA │        └──────────────────────────────┘
  │ AUTO        MGR.
  │ AUTOEXEC.BAT MODE.COM
  │ BACKUP.COM   RESTORE.COM
  │ CHKDSK.COM   SETUP.EXE
  │ COMMAND.COM  SYS.COM
  │ CONFIG.SYS   XCOPY.EXE
  │ DISKCOPY.COM
```

7. Press the "S" key or use the DOWN ARROW key to highlight "SETUP DOS Manager", then press ENTER.

8. "SETUP DOS Manager" transfers certain necessary files to the Silicon Hard Disk.

Note: Because the Silicon Hard Disk tranfers files much quicker than a normal disk drive, the copy messages displayed on the screen are listed too fast for the user to read them.

9. When the preparation of the Silicon Hard Disk is completed, the system automatically returns to the MS-DOS Manager. Press ESC to close the Applications Menu.

10. Simultaneaously press CTRL and "C" to list the files listed on the C: drive (the Silicon Hard Disk).

```
File  Options  Disk  Applications
Disks: [ A: ] [ B: ] [ C: ] [ D: ]
  ┌──────────────────────────────────────────────────────────┐
  │ C:\                                                        │
  ├──────────────────────────────────────────────────────────┤
  │ AUTOEXEC.BAT                                               │
  │ COMMAND.COM                                                │
  │ CONFIG.SYS                                                 │
  │ MGR.INI                                                    │
  │                                                            │
  │                                                            │
  └──────────────────────────────────────────────────────────┘
```

11. Simultaneously press CTRL-ALT-DEL to reboot the system. The UltraLite can now be booted from the Silicon Hard Disk (Drive C:).

12. If the UltraLite was not fully charged, do so now, or the contents of the Silicon Hard Disk may be lost.

Note: When the UltraLite is turned ON, the MS-DOS Manager Application Menu is displayed, offering LAP-LINK and any other applications that were added to the system.

```
 File  Options  Disk  Applications
Disks: [ A: ] [ B: ]┌───────────────────────────┐
 ┌──────────────────┐  │ LAPLINK                   │ ────────────────
 │ C:\              │  └───────────────────────────┘
 │─────────────────────────────────────────────────────────────────
 │ AUTOEXEC.BAT
 │ COMMAND.COM
 │ CONFIG.SYS
 │ MGR.INI
 │
 │
 │
 │
 │
 │
 │
```
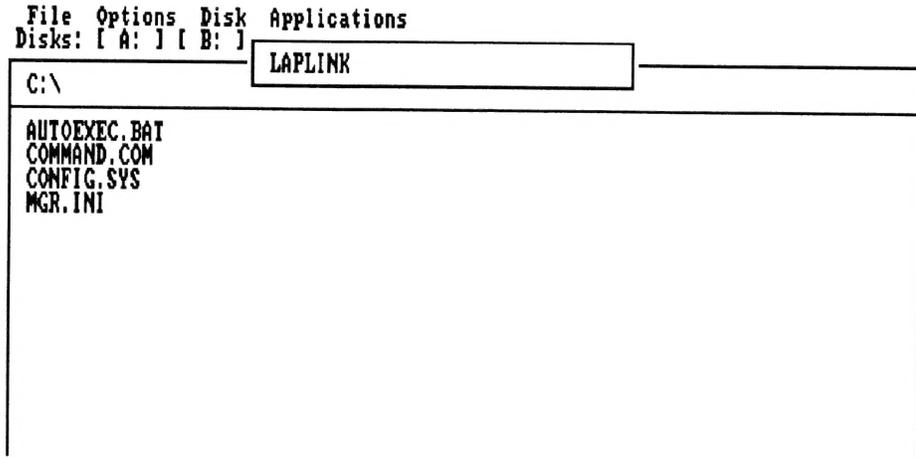
2.1.3 Disk Drive Assignments

The MS-DOS operating system assigns a letter designation to every storage device on the system, treating them all as "disk drives" whether they are actual disk drives or not. MS-DOS Manager, lists four logical disk drives in its disk drive line:

- Drive A: External 3.5" Disk Drive
- Drive B: ROM or RAM Card
- Drive C: Silicon Hard Disk
- Drive D: System ROM (Initial Boot Drive)

External 3.5" Disk Drive

The 3.5" disk drive reads and writes standard MS-DOS disks at densities of 720 K and 1.44 MB. MS-DOS Manager allows 5.25" disk drives to be formatted at 360 K and 1.2 MB, but these disk drives are not currently available for the UltraLite.

DISKCOPY can be used to duplicate disks of the same type using the 3.5" drive, but should never be used to copy files to or from the silicon hard disk, ROM, or RAM Cards.

ROM and RAM Cards

An important point to remember about these cards is that in order to boot from a card, boot tracks must reside on them. Also, neither card effects the main system's memory. Programs are loaded from the RAM and ROM Cards and executed in the main system's memory.

Silicon Hard Disk

The Silicon Hard Disk is initialized through MS-DOS Manager. To properly setup the Silicon Hard Disk, follow the procedure in the section "Formatting the Silicon Hard Disk".

System ROM

The system ROM is the initial boot drive. It contains BIOS information and the UltraLite's version of MS-DOS 3.3. Also, DOS-Manager and LAP-LINK are contained in the system ROM.

2.1.4 CONFIG Switches

Under normal conditions, the CONFIG switches should never need to be changed. Before using the UltraLite, verify the switches are in the default positions (OFF).

The bank of four switches is found on the right side of the computer, in the same recessed compartment as the Memory Card Slot. These four switches control, respectively:

- CPU Clock Speed
- A Built-in Test Program
- Screen Brightness
- Thickness of the characters displayed on the screen (Single-Dot, Double-Dot)

2.2. Using Peripherals

2.2.1   Attaching a Disk Drive

1. Turn the UltraLite OFF.

2. The floppy disk drive (FDD) is connected to the EXT slot on the rear panel of the UltraLite.
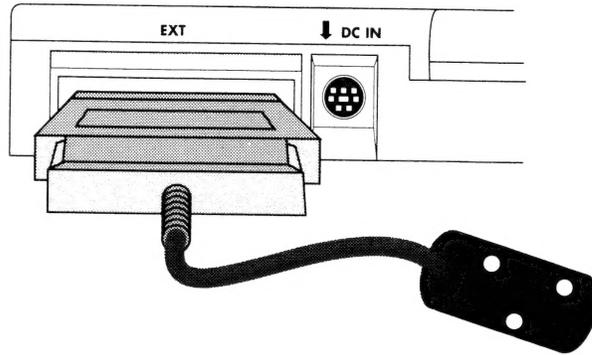
3. Lift the connector cover up to reveal the EXT port, then attach the end of the FDD cable with the core to the UltraLite.

4. Attach the other end to the FDD.

5. Connect the UltraLite AC Adapter to the unit. The external disk drive receives power from the UltraLite. For the external disk drive to function, the UltraLite must be operating from the AC Adapter.

6. Turn the UltraLite ON, but do not insert a diskette into the external disk drive until the MS-DOS Manager screen appears. (If the system finds a diskette in the external disk drive when booting, it will attempt to boot from the external drive.)

```
File  Options  Disk  Applications                          | F1=Help
Disks: [ A: ] [ B: ] [ C: ] [ D: ]                                 9:47AM
┌─ C:\ ──────────────────────────┐┌─ A:\ ──────────────────────────┐
│ ASHEDIT.DOC    NC.INI           ││ FIRSTNU.DOC                     │
│ ASHEDIT2.DOC   NC.MNU           ││ LAPA.IMG                        │
│ AUTOEXEC.BAT   SEAGULL.BAS      ││ LAPB.IMG                        │
│ COMMAND.COM                     ││ LAPC.IMG                        │
│ CONFIG.SYS                      ││ LAPD.IMG                        │
│ FIRSTNU.DOC                     ││ LAPE.IMG                        │
│ GEMCAP.COM                      ││ SHOTA.IMG                       │
│ GEMCAP.DOC                      ││ SHOTB.IMG                       │
│ JU.IMG                          ││ SHOTC.IMG                       │
│ JW.IMG                          ││ SHOTD.IMG                       │
│ JX.IMG                          ││ SHOTE.IMG                       │
│ JY.IMG                          ││ SHOTF.IMG                       │
│ MGR.INI                         ││ SHOTG.IMG                       │
│ MOUSE.COM                       ││ SHOTH.IMG                       │
│ MOUSE.SYS                       ││ SHOTI.IMG                       │
│ NC.EXE                          ││ SHOTJ.IMG                       │
│ NC.EXT                          ││ SHOTK.IMG                       │
│ ←▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓→   ││ ←▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓→   │
└────────────────────────────────┘└────────────────────────────────┘
Press the Alt key to select the menu, or use the cursor keys to select a file
```

Once the system has booted up and the MS-DOS Manager screen appears, the external disk drive is ready to be accessed.

2.2.2 Attaching a Printer (Serial and Parallel)

The UltraLite can print to either a serial or parallel printer, under the control of an application program.

To print from the UltraLite the following items are required:

- UltraLite AC Adapter
- An application which supports the printer being used
- Appropriate printer driver
- Various cables

Using a Serial Printer

To use a serial printer with the UltraLite, also required is one of the following:

- The UltraLite serial port cable
- The optional UltraLite null modem cable adapter
- A serial printer cable (if not part of the printer)

1. Plug the null modem cable into the UltraLite's serial port. To match the printer's connector, a gender reversing (serial cable and adapter) connector is needed to act as a bridge between the 25-pin female connector on the null modem cable and the 25-pin female connector normally found on a serial device.

2. Connect the cable to the printer, following the manufacturer's instructions.

3. Serial communications require both the computer and printer to be operating at the same speed, parity, and data bits. Check the requirements of the serial printer, then set the UltraLite's serial port by using the MS-DOS MODE command.

Using the MODE Command

4. Press the **ALT**, "**F**" , and "**M**" keys in sequence to leave MS-DOS Manager.

5. The UltraLite's serial port is always port 1 (COM1:), and the modem is port 2 (COM2:). The baud, parity, data bits, and stop bits are dependent upon the printer. For serial printers, the syntax of the MODE command is:

MODE COM1:baud, parity,data bits, stop bits,P

Baud can be: 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200

Parity can be even (E) or none (N)

Stop bits are 2 for 110 baud and 1 for all other baud rates.

"P" causes retry on "time out" errors and is required on many laser printers

Note: Many serial printers, such as the Hewlett-Packard LaserJet, operate at 9600 baud, no parity, 8 data bits, and 1 stop bit.

6. Using the parameters above as an example, at the DOS prompt the user would type:

MODE COM1:9600,N,8,1,P

Note: There are no spaces between the characters and the commas.

7. Some software programs automatically assume a parallel printer, called LPT1 under MS-DOS. If the software does not allow this setting to be changed, the printer output can be redirected to the serial port with a second MODE command:

MODE LPT1: = COM1:

This procedure can be automated in two ways:

A. These MODE commands can be entered into a batch file called SETPRN.BAT (or any name the user chooses) and executed under MS-DOS Manager prior to running the application.

B. Add entries in the MS-DOS Manager Applications Menu to do each step.

8. The printer is now set to print.

Using a Parallel Printer

To use a parallel printer with the UltraLite, one of the following is required:
- The external disk drive (the parallel port will be used)
- The parallel port adapter

1. Connect either the external disk drive or the parallel port adapter to the EXT port on the rear panel of the UltraLite.

2. Connect a standard parallel printer cable between the Parallel port and the printer.

3. Enter the application program and print.

Printing Directly From the UltraLite

The MS-DOS PRINT command does not exist in the UltraLite. To print small files directly on either a serial or parallel printer, use the MS-DOS commands COPY filename COM1: or COPY filename LPT:.

2.2.3 Using the Internal Modem

To use the UltraLite's built-in modem, a communications program is required. Virtually any commercial or public domain communications program can be used. Some of the popular communications programs are:
- Crosstalk
- Smart Comm
- Telcom
- ProComm
- QMODEM

These programs have a complete user applications interface and documentation. The interfaces differ widely, but all the programs must do some of the same tasks. The procedures below describe the generic tasks. Specific examples assumes a program is being used that sends the AT command set to the modem.

1. Connect the AC Adapter to the UltraLite.

2. Connect the UltraLite modem cable between the LINE socket on the UltraLite and the telephone. Optionally, the telephone cord and the TEL port can be connected.

Note: Do not use the cords or sockets between the telephone unit and the handset. The connectors are deceptively compatible but don't provide the proper connection. The only exception is if the self-contained hand-set telephone is a wall or desk mounted cradle (i.e. contains no electronics).

3. Start the modem program and select the COM2 as the modem port.

4. Determine if the telephone service is tone (multi-frequency keying) or dial pulse (rotary). Use a "T" for Tone and a "P" for Pulse following the ATDT command (see step 7).

5. Determine if any special access codes are needed to obtain a connection, such as dialing an "8" or "9" to get an outside line. A comma placed in the dialing string inserts a pause to wait for the dial tone of the outside line. One comma causes a two second delay.

Example: AT DT 9,1-XXX-XXX-XXXX

"X" represents an arbitrary number.

6. If the user is planning to place credit card calls or use a service such as MCI or Sprint that requires special identifier codes before making the connection, it might be easier to dial the call manually, then pick up the line with the UltraLite.

An alternative is to set the dialing string with commas to pause for the various tones. The S8 register of the modem controls the length of the pause. To set the pause longer than 2 seconds, type:

AT S8 = n (n being the number of seconds for the pause)

Consult the communications software manual for help.

7. Enter the number that is to be dialed.

AT DT 1-XXX-XXX-XXXX

"X" represents an arbitrary number.

The user will hear the number dialing, the remote ring and answer, and finally, the carrier tone of the two modems before the greeting of the remote system is seen on the screen.

2.2.4 Charging the System Battery and NiCd Backup Battery
Before using the UltraLite and thereafter, the batteries need to be charged. Both the System Battery (Molicel) and the NiCd Backup Battery recharge at the same time.

1. Make sure both of the BACKUP POWER switches on the bottom of the UltraLite are set to ON.

Note: Do not use a pencil to remove the protective cover or to set the switches, as graphite may damage the switches.

Backup Power Switches

UltraLite Bottom
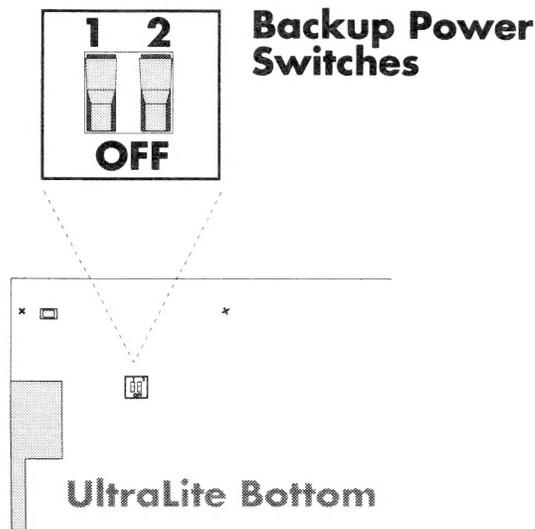
2. Check to make sure the computer is turned OFF.

3. Plug the AC Adapter into the UltraLite first, then into an AC wall outlet.

4. The CHG and POWER indicators on the AC Adapter are ON when the batteries are being charged.

Note: The CHG indicator is only used with the Molicel battery. It is only ON while the Molicel is charging. It is not ON when the NiCd battery needs recharging.

5. When the LOW BATTERY indicator (on the UltraLite) and the CHG indicator turn OFF, charging is completed. The initial charge takes approximately 16 hours, subsequent recharging time requires 7 to 10 hours, depending on the state of the batteries.
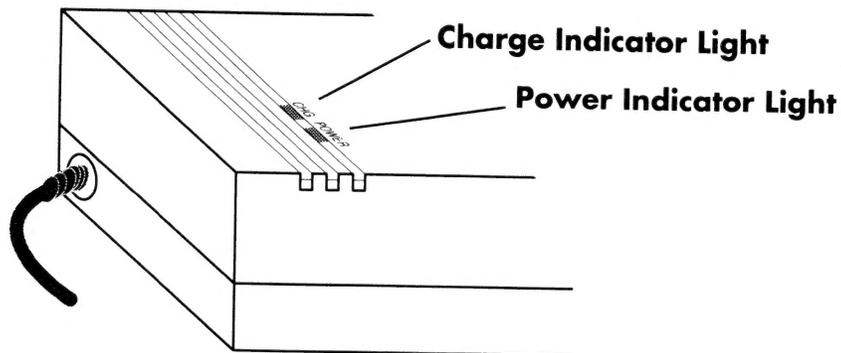
Note: The UltraLite can be in operation when the batteries are recharging.

6. When the batteries are fully charged, disconnect the AC Adapter from the wall first, then from the UltraLite. Turn ON the UltraLite. If the LOW BATTERY indicator turns ON, continue recharging the batteries.

Notes on Battery Operation

The UltraLite has two discrete batteries, a System Battery (Molicel) and a NiCd Backup Battery. The System Battery provides operating power for an average of two hours, depending on the application. The NiCd Backup Battery maintains the content of the Silicon Hard Disk for approximately five to seven days between charges.

When the LOW BATTERY indicator turns ON, the UltraLite should be immediately turned OFF and the AC Adapter should be attached before further use. The UltraLite should be recharged until the LOW BATTERY and CHG indicators turn OFF.

If the UltraLite is left uncharged for more than five to seven days, the contents of the Silicon Hard Disk may be lost. If the user plans to be away from the UltraLite for more than five to seven days, the AC Adapter should be left plugged into the unit.

If the UltraLite will not be used for an extended period of time, the NiCd Backup Battery should be disabled by setting the BACKUP POWER switches (located on the bottom of the unit) to OFF.

The AC Adapter cannot overcharge the batteries. If the UltraLite is needed to be used within a day or two of recharging, the AC Adapter should remain plugged in.

2.3. System Software

2.3.1   LAP-LINK

LAP-LINK is used to transfer files between the UltraLite and another computer. To use LAP-LINK, the following is required:

- UltraLite
- UltraLite Null Modem Cable (Serial Cable and Null Modem Adapter)
- Another PC with a serial port
- The 5.25" and/or 3.5" LAP-LINK diskettes
- Additional cable connectors as required by the other computer.

When not otherwise specified, the local computer is the UltraLite and the remote computer is the other PC.

For a complete description of LAP-LINK, refer to the "Comprehensive User Guide".

To Copy a File Using LAP-LINK

1. With both computers turned OFF, connect the UltraLite null modem cable between the UltraLite RS-232C port and the serial port on the remote PC, XT, or PS/2 computer. If the remote computer is an AT, a 25-pin female to 9-pin female adapter may be needed.
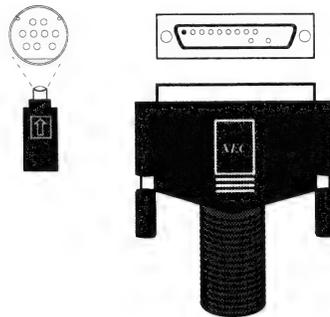
2. Turn both computers ON.

3. Put a LAP-LINK diskette into drive A of the remote computer and copy the "LL.EXE file onto the drive and subdirectory (if any) from which files are to be copied.

Example: If the LAP-LINK program is to reside on drive C, in the subdirectory UTIL, at the command line prompt, type:

COPY A:LL.EXE C:\UTIL

4. Run the program on the remote computer by typing "LL" from drive C, directory UTIL (using the above example).

If LAP-LINK is in the UTIL subdirectory and the user wishes to run it from another directory, enter the command **PATH \UTIL** in the AUTOEXEC.BAT file. This informs the remote computer to look in the UTIL directory. Reboot the remote system.

Complete instructions on installing and running LAP-LINK are found in the UltraLite Comprehensive User's Manual.

5. Run the program on the UltraLite by selecting LAP-LINK from the Applications Menu in MS-DOS Manager.

Press **ALT**

PRESS **"A"**

Press **ENTER** to select LAP-LINK

```
 File  Options  Disk  Applications                    | F1=Help
 Disks: [ A: ] [ B: ]         ┌─────────────┐           9:40AM
 ┌─────────────────────────── LAPLINK ─────────────────────────┐
 │ C:\                        └─────────────┘                    │
 │                                                               │
 │ ASHEDIT.DOC    NC.INI                                         │
 │ ASHEDIT2.DOC   NC.MNU                                         │
 │ AUTOEXEC.BAT                                                  │
 │ COMMAND.COM                                                   │
 │ CONFIG.SYS                                                    │
 │ FIRSTNU.DOC                                                   │
 │ GEMCAP.COM                                                    │
 │ GEMCAP.DOC                                                    │
 │ JV.IMG                                                        │
 │ JW.IMG                                                        │
 │ JX.IMG                                                        │
 │ JY.IMG                                                        │
 │ MGR.INI                                                       │
 │ MOUSE.COM                                                     │
 │ MOUSE.SYS                                                     │
 │ NC.EXE                                                        │
 │ NC.EXT                                                        │
 │ ← ▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓→ │
 └───────────────────────────────────────────────────────────────┘
 Press the Alt key to select the menu, or use the cursor keys to select a file
```

6. The RIGHT ARROW keys may be used on one or both of the computers to establish communications.

```
LAP-LINK (SMALL)  Copyright 1986-88  Traveling Software Inc.  8-02-88  M000000
══ Local Drive (C:) 1576960 Free ══╤══ Remote Drive ( :)        0 Free ══
  ASHEDIT  .DOC   24407 10-06-88   4:05p │
  ASHEDIT2 .DOC   22912 10-06-88   4:07p │
  AUTOEXEC .BAT      62  9-21-88   9:28a │
  COMMAND  .COM   25276  7-24-87 12:00a  │
  CONFIG   .SYS      40  9-21-88   9:43a │
  FIRSTNU  .DOC   27648 10-08-88 12:07p  │
  GEMCAP   .COM    3426  8-24-87   1:38p │
  GEMCAP   .DOC    6660  3-05-88   2:32p │
  JV       .IMG   16416 10-07-88 10:02p  │
  JW       .IMG   16416 10-07-88 10:02p  │  Attempting link to remote system...
  JX       .IMG   16416 10-07-88 10:04p  │    Remote system not active...
  JY       .IMG   16416 10-07-88 10:04p  │          Press +
  MGR      .INI     154  9-22-88   1:31p │
  MOUSE    .COM   14035  3-04-87 12:00p  │
  MOUSE    .SYS   13878  3-04-87 12:00p  │
  NC       .EXE   97634  7-15-88   2:00p │
  NC       .EXT     217  2-02-87   6:00p │
  NC       .INI     434 10-05-88   3:24p │
  NC       .MNU     561  3-02-87   5:25p │
                                         │
══ C:\ ═══════════════════════════════╧══ : ══════════════════════
                                                   COM1: 115200
COMMANDS: Log Copy Wildcopy Group Options View Erase Rename Dos Quit
```

7. On the screen of both computers are the contents of the local drive in the lefthand window and the contents of the remote drive in the righthand window.

```
LAP-LINK (SMALL)  Copyright 1986-88  Traveling Software Inc.  8-02-88  M000000
══ Local Drive (C:) 1576960 Free ══╤══ Remote Drive (C:)18100224 Free ══
  ASHEDIT  .DOC   24407 10-06-88   4:05p │ M286            (DIR) 10-06-88   5:00p
  ASHEDIT2 .DOC   22912 10-06-88   4:07p │ NEC             (DIR) 10-09-88   2:07p
  AUTOEXEC .BAT      62  9-21-88   9:28a │ ADDCRT  .COM     4483  9-04-87 12:00p
  COMMAND  .COM   25276  7-24-87 12:00a  │ ADRS232C.COM     2360  9-08-87 12:00p
  CONFIG   .SYS      40  9-21-88   9:43a │ ANSI    .SYS     1651  9-08-87 12:00p
  FIRSTNU  .DOC   27648 10-08-88 12:07p  │ ASSIGN  .COM     1540  9-08-87 12:00p
  GEMCAP   .COM    3426  8-24-87   1:38p │ ATTRIB  .EXE     8283  9-08-87 12:00p
  GEMCAP   .DOC    6660  3-05-88   2:32p │ BACKUP  .COM    23821  9-08-87 12:00p
  JV       .IMG   16416 10-07-88 10:02p  │ BAD0    .MAP    16384  9-04-87 12:00p
  JW       .IMG   16416 10-07-88 10:02p  │ BAD1    .MAP    16384  9-04-87 12:00p
  JX       .IMG   16416 10-07-88 10:04p  │ BASIC   .COM     3400  9-08-87 12:00p
  JY       .IMG   16416 10-07-88 10:04p  │ BASICA  .COM     3400  9-08-87 12:00p
  MGR      .INI     154  9-22-88   1:31p │ BASICA  .EXE   109968  9-08-87 12:00p
  MOUSE    .COM   14035  3-04-87 12:00p  │ BUTT             984  9-08-87 12:00p
  MOUSE    .SYS   13878  3-04-87 12:00p  │ BUTTERF .BAS     4538  9-08-87 12:00p
  NC       .EXE   97634  7-15-88   2:00p │ CHARACT .BAS     1828  9-08-87 12:00p
  NC       .EXT     217  2-02-87   6:00p │ CHKDSK  .COM    10633  9-08-87 12:00p
  NC       .INI     434 10-05-88   3:24p │ CIRLIN  .BAS     1481  9-08-87 12:00p
  NC       .MNU     561  3-02-87   5:25p │ CLOCK   .BAS     5811  9-08-87 12:00p
                                         │ COLORI  .BAS     5975  9-08-87 12:00p
══ C:\ ═══════════════════════════════╧══ C:\ ════════════════════
                                                   COM1: 115200
COMMANDS: Log Copy Wildcopy Group Options View Erase Rename Dos Quit
```

8. From the UltraLite, use the RIGHT ARROW key to move the highlighted bar to the remote window, and the DOWN ARROW key to move the highlight to the file which is to be copied from the remote computer.

```
LAP-LINK (SMALL)  Copyright 1986-88  Traveling Software Inc.  8-02-88   M000000
=== Local Drive (C:) 1576960 Free ===||=== Remote Drive (C:)18100224 Free ===
ASHEDIT .DOC   24407 10-06-88  4:05p || NC      .INI     184 10-03-88  3:48p
ASHEDIT2.DOC   22912 10-06-88  4:07p || NC      .MNU     247  5-15-86  1:00p
AUTOEXEC.BAT      62  9-21-88  9:28a || PRINT   .COM    8665  9-08-87 12:00p
COMMAND .COM   25276  7-24-87 12:00a || RECOVER .COM    4554  9-08-87 12:00p
CONFIG  .SYS      40  9-21-88  9:43a || REPLACE .EXE    5157  9-08-87 12:00p
FIRSTMU .DOC   27648 10-08-88 12:07p || RESTORE .COM   22447  9-08-87 12:00p
GEMCAP  .COM    3426  8-24-87  1:38p || ROMVER  .COM     911  9-08-87 12:00p
GEMCAP  .DOC    6660  3-05-88  2:32p || SEAGULL .BAS    1275  9-08-87 12:00p
JV      .IMG   16416 10-07-88 10:02p || SELECT  .COM   13441  9-08-87 12:00p
JW      .IMG   16416 10-07-88 10:02p || SETUP   .EXE   19306  9-04-87 12:00p
JX      .IMG   16416 10-07-88 10:04p || SHARE   .EXE    8675  9-08-87 12:00p
JY      .IMG   16416 10-07-88 10:04p || SORT    .EXE    1921  9-08-87 12:00p
MGR     .INI     154  9-22-88  1:31p || SUBST   .EXE    9981  9-08-87 12:00p
MOUSE   .COM   14035  3-04-87 12:00p || SYS     .COM    4983  9-08-87 12:00p
MOUSE   .SYS   13870  3-04-87 12:00p || TREE    .COM    8963  9-08-87 12:00p
NC      .EXE   97634  7-15-88  2:00p || UMGC    .COM    2743  9-08-87 12:00p
NC      .EXT     217  2-02-87  6:00p || VDISK   .SYS    3341  9-08-87 12:00p
NC      .INI     434 10-05-88  3:24p || XCOPY   .EXE    6747  9-08-87 12:00p
NC      .MNU     561  3-02-87  5:25p || XDISK   .SYS    4740  9-08-87 12:00p
                                     || XFORMAT .COM    7384  9-08-87 12:00p
= C:\ =                              || C:\
                                                    COM1: 115200
COMMANDS: Log Copy Wildcopy Group Options View Erase Rename Dos Quit
```

9. Press "C", or use the SPACEBAR to move the highlight in the command line to COPY and press ENTER. The selected file is copied from the remote computer to the UltraLite.

```
Receiving SEAGULL.BAS
10 blocks
10

1 File(s) Copied 100% Error Free.
Copy complete. Press any key to continue...
```

2.3.2   MS-DOS Manager

Overview of Menus

MS-DOS Manager provides pull-down menus that make it easy to use the most common MS-DOS commands. This sections:

- Describes each of the four menus in the menu bar at the top of the screen

- Shows which menu to use depending on the operation which is to be performed

- Explains concepts that should be known before executing commands

The MS-DOS Manager menu bar contains four menus: Files, Options, Disk, and Applications. The name of each menu indicates the type of commands in the menu. When a menu is selected, the commands for that menu appear in a small screen called a pull-down menu.

The File Menu

With the File Menu, you can organize and store work files and exit MS-DOS Manager.

From the File Menu, the following commands can be accessed:

- RUN
- COPY
- DELETE
- MOVE
- RENAME
- LOCATE
- or get information about a file located on any of the file devices connected to the UltraLite.

To copy files to or from another computer, use the LAP-LINK program. To use additional MS-DOS commands, exit MS-DOS Manager. Some of the File commands can also be used to work with directories.

The Options Menu

The Options Menu allows you to change the way the screen and files appear and the way copy and delete operations are performed.

The Options Menu is used to set the date and time on the computer or add a second window to the screen. This menu also saves any changes made to the options or to the applications list.

The Disk Menu

The Disk Menu allows you to create or change directories, copy or get information about a disk, or format a disk.

The Applications Menu

The Applications Menu starts applications directly from MS-DOS Manager. Tedious jobs like setting up a serial printer using the MODE command can be automated from the Applications Menu. Modify Options on the Options Menu allows you to add to, delete from, and edit the Applications Menu.

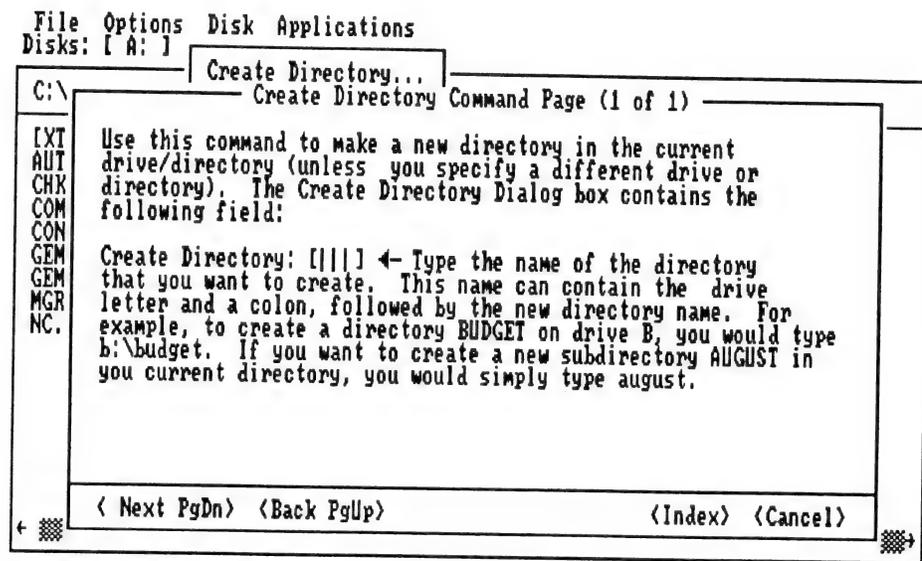The following table shows which menu to use for specific operations.

Selecting the Right Menu

What You Want to Do	Which Menu to Use
Work with your files:	**File menu**
Copy	
Delete	
Get information about a file's size in bytes, and the date and time you created it or last updated it	
Locate	
Move	
Rename	
Run (executable files)	
Type (the contents of a file)	
Work with your directories:	**File or Disk menu**
Change directories	Disk menu
Copy	File menu
Create	Disk menu
Delete	File menu
Locate	File menu
Rename	File menu
Install or modify your applications	**Options menu**
Split your screen	**Options menu**
Specify how files are shown:	**Options menu**
Whether files should be listed alphabetically, by date, by extension, or by size	
Which files should be listed	
Whether files should be listed in short or long format	
Safeguard against overwriting by mistake	**Options menu**
Safeguard against deleting by mistake	**Options menu**
Verify copy operation automatically	**Options menu**
Specify certain Help options	**Options menu**
Set the date and time	**Options menu**
Exit to MS-DOS	**File menu**

Getting Help

Pressing the **F1** function key gives help information for the operation being performed. MS-DOS Manager responds by displaying a help screen.

For Example, if the Create Directory command was being used and the F1 function key was pressed, MS-DOS Manager would respond with the following screen:

```
File  Options  Disk  Applications
Disks: [ A: ]
                  ┌─ Create Directory... ──┐
  C:\             │───── Create Directory Command Page (1 of 1) ─────
  ┌──────┬────────────────────────────────────────────────────┐
  │ [XT  │ Use this command to make a new directory in the current
  │ AUT  │ drive/directory (unless  you specify a different drive or
  │ CHK  │ directory).  The Create Directory Dialog box contains the
  │ COM  │ following field:
  │ CON  │
  │ GEM  │ Create Directory: [|||]  ←─ Type the name of the directory
  │ GEM  │ that you want to create.  This name can contain the  drive
  │ MGR  │ letter and a colon, followed by the new directory name.  For
  │ NC.  │ example, to create a directory BUDGET on drive B, you would type
  │      │ b:\budget.  If you want to create a new subdirectory AUGUST in
  │      │ you current directory, you would simply type august.
  │      │
  │      │
  │      │ ⟨ Next PgDn⟩  ⟨Back PgUp⟩              ⟨Index⟩  ⟨Cancel⟩
  └──────┴────────────────────────────────────────────────────┘

Press Return for more help or press Esc to resume
```

Accelerator Keys

By pressing the **ALT** key or looking at any of the pull-down menus, it can be seen that one letter in the name of each menu, command, or application is highlighted. The corresponding key on the keyboard is called the accelerator key. By pressing the accelerator key, that menu or command is selected.

A selection can be made from a menu or a pull-down menu by pressing the accelerator key.

Dialog Boxes

If MS-DOS Manager needs to know more information about a selected command or application, a dialog box appears on the screen.

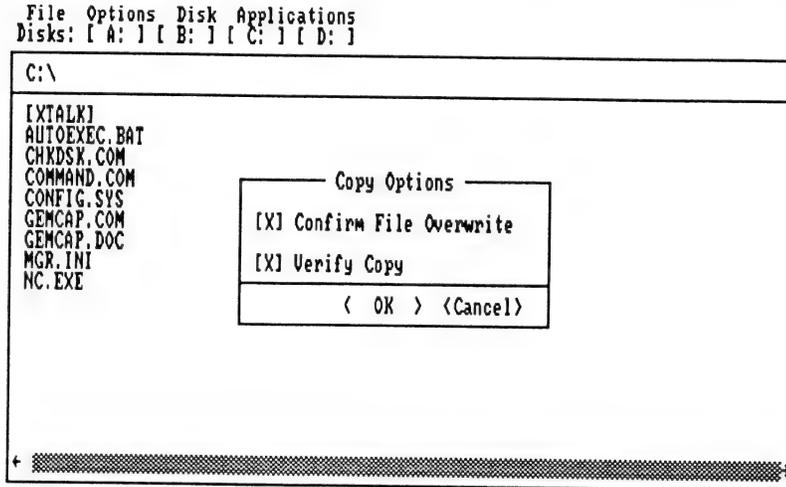A Dialog Box asks the user to do one of the following:

- Type in information
- Select one of several options from a list
- Set or clear an "on/off" option
- Confirm a command

Type In Information

A Dialog Box may ask the user to type in the name of a file, directory, drive, or path.

For example, the COPY Dialog Box asks the user to supply the new name for the file being copied:

```
File Options Disk Applications
Disks: [ A: ] [ B: ] [ C: ] [ D: ]
┌──────────────────────────────────────────────────────────────┐
│ C:\                                                            │
├──────────────────────────────────────────────────────────────┤
│ [XTALK]                                                        │
│ AUTOEXEC.BAT                                                   │
│ CHKDSK.CO┌─────────────────────── Copy ───────────────────┐   │
│ COMMAND.C│                                                 │   │
│ CONFIG.SY│  Copy:   [XTALK|||||||||||||||||||||||||||||||| ]│  │
│ GEMCAP.CO│                                                 │   │
│ GEMCAP.DO│  To:     [||||||||||||||||||||||||||||||||||||| ]│  │
│ MGR.INI  │                                                 │   │
│ NC.EXE   ├─────────────────────────────────────────────────┤  │
│          │                          〈  OK  〉 〈Cancel〉    │  │
│          └─────────────────────────────────────────────────┘  │
│                                                               │
│                                                               │
│ ←▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒→  │
└──────────────────────────────────────────────────────────────┘
```

Select One of Several Options From a List

This type of Dialog Box asks the user to choose from a list of options.

For example, the File View Options Dialog Box asks the user to choose the format the files should be listed in:

```
File Options Disk Applications
Disks: [ A: ] [ B: ] [ C: ] [ D: ]
┌──────────────────────────────────────────────────────────────┐
│ C:\              ┌─────────── File View Options ──────────┐   │
│                  │                                        │   │
│ [XTALK]          │ Sort By.......: (•) Name               │   │
│ AUTOEXEC.BAT     │                 ( ) Kind               │   │
│ CHKDSK.COM       │                 ( ) Date               │   │
│ COMMAND.COM      │                 ( ) Size               │   │
│ CONFIG.SYS       │                                        │   │
│ GEMCAP.COM       │ File Type.....: (•) All                │   │
│ GEMCAP.DOC       │                 ( ) Programs           │   │
│ MGR.INI          │                 ( ) Partial[*.*||||||||]│  │
│ NC.EXE           │                 ( ) None               │   │
│                  │                                        │   │
│                  │ Display Format: (•) Short              │   │
│                  │                 ( ) Long               │   │
│                  ├────────────────────────────────────────┤   │
│                  │                  〈  OK  〉 〈Cancel〉   │   │
│                  └────────────────────────────────────────┘   │
│ ←▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒→  │
└──────────────────────────────────────────────────────────────┘
Select the options and press Return or press Esc to cancel
```

Set or Clear an "ON/OFF" Option

This type of Dialog Box gives a yes/no choice on one or more options.

For example, the Copy Options Dialog Box lets the user set or clear the Confirm File Overwrite Option:

```
 File  Options  Disk  Applications
Disks: [ A: ] [ B: ] [ C: ] [ D: ]
┌──────────────────────────────────────────────────────────────┐
│ C:\                                                            │
├──────────────────────────────────────────────────────────────┤
│ [XTALK]                                                        │
│ AUTOEXEC.BAT                                                   │
│ CHKDSK.COM                                                     │
│ COMMAND.COM       ┌──────── Copy Options ────────┐            │
│ CONFIG.SYS        │                              │            │
│ GEMCAP.COM        │ [X] Confirm File Overwrite   │            │
│ GEMCAP.DOC        │                              │            │
│ MGR.INI           │ [X] Verify Copy              │            │
│ NC.EXE            ├──────────────────────────────┤            │
│                   │        < OK >  <Cancel>      │            │
│                   └──────────────────────────────┘            │
│                                                                │
│                                                                │
│ ←░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░→    │
└──────────────────────────────────────────────────────────────┘
```

Confirm a Command

This type of Dialog Box asks the user to confirm a command.

For example, the MS-DOS Manager Dialog Box asks the user to confirm whether or not you want to exit to the MS-DOS Manager command line:

```
 File  Options  Disk  Applications
Disks: [ A: ] [ B: ] [ C: ] [ D: ]
┌──────────────────────────────────────────────────────────────┐
│ C:\                                                            │
├──────────────────────────────────────────────────────────────┤
│ [XTALK]                                                        │
│ AUTOEXEC.BAT                                                   │
│ CHKDSK.COM                                                     │
│ COMMAND.COM   ┌──────────────────────────────────────────┐   │
│ CONFIG.SYS    │                                          │   │
│ GEMCAP.COM    │ This will end your MS-DOS Manager session│   │
│ GEMCAP.DOC    │                                          │   │
│ MGR.INI       │                                          │   │
│ NC.EXE        ├──────────────────────────────────────────┤   │
│               │           < OK >  <Cancel>               │   │
│               └──────────────────────────────────────────┘   │
│                                                                │
│ ←░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░→        │
└──────────────────────────────────────────────────────────────┘
Press Return to finish the MS-DOS Manager session or press Esc to cancel
```

UltraLite Maintenance and Service Manual
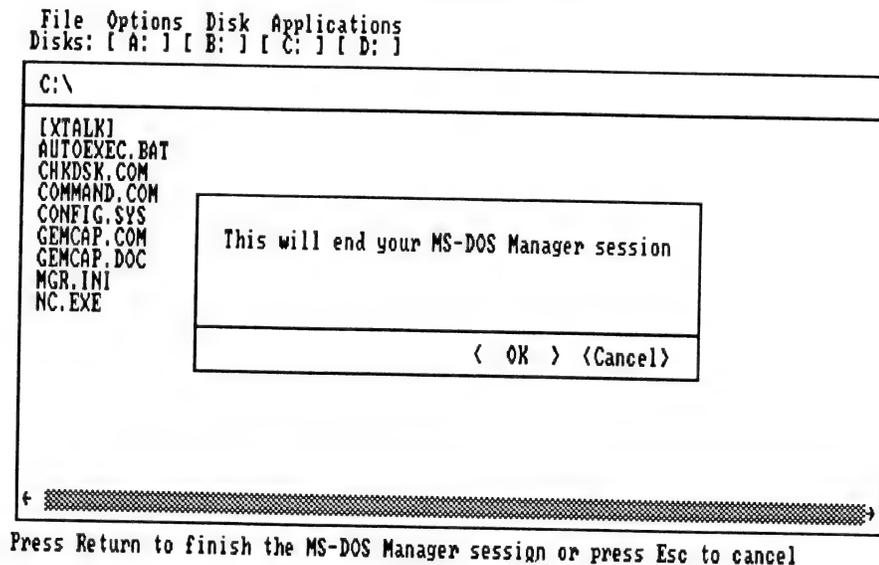
Executing Commands

To execute any of the MS-DOS Manager commands explained in the following menus, the user may need to perform up to four steps:

1. Select a file or directory.

2. Select a menu.

3. Choose a command or application from the pull-down menu.

4. Complete the dialog box (if necessary).

Step 1: Select a File or Directory

Step 1 is used if a command that operates on files and directories (COPY, DELETE, or MOVE) is used. Otherwise, proceed to Step 2.

1. If the current directory does not contain the file or directory wanted, change to the directory where it is located.

To change directories, use the CHANGE DIRECTORY command in the Disk Menu.

2. Select the desired file or directory by using the ARROW keys to move the highlighted bar over the file or directory name.

Keyboard Shortcut

Move the highlighted bar over the desired file or directory by pressing the first letter of the file or directory name.

Pressing the letter key once, the highlighted bar moves to the first filename that begins with that letter. To continue moving the bar down, press the key again or use the ARROW keys.

Selecting Multiple Files

To select more than one file to move, copy, or delete:

1. Using the ARROW keys, move the highlight to the first desired file.

2. Hold down the SHIFT key and press the **UP** or **DOWN ARROW** key to select a file or files above or below the highlighted one.

3. Choose the desired command that is to be carried out on all of the selected files from the File Menu.

4. Press **ENTER** to execute the command.

To select multiple files not listed one right after the other:

1. Use the ARROW keys to highlight the first file.

2. Hold down the SHIFT key while:
   - Using the ARROW keys to select the files listed right after each other.
   - Pressing the **SPACEBAR** to remove the highlight from a file that is not to be selected.
   - Using the ARROW keys to move to the next desired file.
   - Pressing the **SPACEBAR** again to resume selecting files.

The SPACEBAR acts as a toggle switch, alternating the highlight ON and OFF.

Step 2: Select a Menu

This step "pulls down" one of the four MS-DOS Manager Menus on the screen.

1. Press **ALT**.

2. Highlight the desired menu bar by using the RIGHT and LEFT ARROW keys.

3. Press **ENTER**.

The pull-down menu appears on the screen.

Keyboard Shortcut

1. Press **ALT**.

The menu bar is activated.

2. Press the first letter of the desired menu.

The pull-down menu appears on the screen.

Step 3: Choose a Command

This step informs the MS-DOS Manager which command or application is to be used.

1. Highlight the desired selection in the pull-down menu by using the UP and DOWN ARROW keys.

2. Press **ENTER**.

OR

Press the accelerator key for the command (or application) desired.

Cancelling a Command

To cancel a command and return to the MS-DOS Manager, press **ESC**.

After a choice is made from the pull-down menu, the MS-DOS Manager does one of the following:

- Executes the command selected.
- Starts the application selected.
- Displays a dialog box asking for more information.

Step 4: Complete the Dialog Box

When a Dialog Box appears, MS-DOS Manager needs more information from the user; select one of several options from a list, set or clear an ON/OFF option, or confirm a command.

It may be necessary to move between fields to complete a Dialog Box.

A Dialog Box can have several parts, or fields. To move from one field to another, one of the following options is used:

Moving between fields

To move	Do this
To the next field	Press TAB.
To the previous field	Press SHIFT and TAB at the same time.
To any field	Press ALT. One letter in each field of the dialog box is highlighted; type the highlighted letter in the field you want to move to.

Entering Information

There are four ways to enter information in a Dialog Box:

1. Type in the text.

2. Select on of several options in a list.

3. Set or clear an ON/OFF option.

4. Confirm a command.

Typing Text in a Dialog Box

The keyboard is used to type text in a Dialog Box, such as a filename.

Selecting One of Several Options From a List

In a Dialog Box showing a list of options that can be set or cleared, the currently selected option shows an asterisk (*). To choose a different option in a Dialog Box:

1. Position the highlighted bar over the desired option.

Use the UP and DOWN ARROW keys, or if the option has a highlighted letter, just type that letter.

2. Set or clear an option by pressing the **SPACEBAR**.

Setting or Clearing an ON/OFF Option

In a Dialog Box showing options that can be turned ON or OFF, if the option is selected, an "X" appears in the brackets next to the option.

To either set or clear an option:

1. TAB to the desired option. Press the **SPACEBAR**.

2. If the brackets are empty, an "X" appears and the option is set. If there is already an "X" in the brackets, the "X" disappears and the option is cleared.

Confirming a Command

When MS-DOS Manager displays a Dialog Box asking to confirm a command, the user can either execute or cancel it at that point by executing or cancelling the Dialog Box.

To execute a Dialog Box, press **ENTER**.

To cancel a Dialog Box, **TAB** to the cancel field and press **ENTER** or press **ESC**.

To Scroll Through a List of Files and Directories

The scroll bar (at the bottom or to the right of the screen) contains a highlighted rectangular box that shows where the user is in the list of files or directories as they scroll. This box is the Scroll Bar Indicator. It shows the relative position in the directory. A mouse can be used to move the Scroll Bar, although the mouse is not recommended for use with the UltraLite.

See the table below for ways to view files on the UltraLite.

To scroll through a list of files

To move	Do this
Up or down one line at a time.	Use the arrow keys.
Up or down one screen at a time	Use the PG UP and PG DN keys
To the beginning or end of the file list	Use the HOME and END keys.
Moving Around in Your Directory System	You can move around in the multilevel system by starting at the root and traveling through directories and subdirectories to find a particular file. Conversely, you can start anywhere within the file system and travel toward the root.

Changing Directories

There are three ways to change the current directory:

1. Use the Change Directory in the Disk Menu.

2. Select the MS-DOS or EXIT commands (from the File Menu) to get to the MS-Dos system prompt. Type "**CD**" and the pathname at the system prompt.

3. Use the ARROW keys.

If the disk in the floppy drive is changed, MS-DOS Manager must be informed. To do this, hold down the CONTROL key and press the key corresponding to the drive letter. The MS-DOS Manager displays the files and directories on the new floppy disk.

To change to	Do this
Subdirectory of Current Directory	Use the arrow keys to highlight the name of a subdirectory listed on the screen. Press ENTER.
Parent Directory of Current Directory	From the screen showing the list of files in your current directory, press the BACKSPACE key.
Last Current Directory on Another Drive	Hold down the CTRL key and press the drive letter of the other drive.

The following table is a summary of the functions performed in MS-DOS Manager by specific keys or key combinations.

Important keys

Key	Function
ARROW Keys	(Cursor or Directional Keys) used to move around on the screen one space at a time.
SPACEBAR	used as a toggle switch to turn highlight on or off while selecting multiple files or to set or clear options in dialog boxes.
TAB	used to move around in jumps. If you hold down the SHIFT key while pressing the TAB key, cursor jumps back.
INSERT	inserts the text held in the buffer in the place indicated by the cursor.
DELETE	removes highlighted text to a holding buffer. Text is held only until the next use of the DELETE key.
HOME	moves cursor to the start of the line. Hold down the Fn key while pressing the HOME key to activate.
END	moves the cursor to the end of the line. Hold down the Fn key while pressing the END key to activate.
ENTER	used to start carrying out a command.
ESC	(Escape) used to cancel something.
ALT	(Alternate) used to alter the function of a key. In MS-DOS Manager, pressing ALT highlights a key letter in the menu to allow selection of a command.
CTRL	(Control) also alters the function of a key. To change drives quickly, hold down the CTRL key and press letter of desired drive.
Fn	(Function) used to activate the functions printed in red on certain keys (HOME, END, PAGE UP, PAGE DOWN, etc.).
Function Keys	(F1, F2, F3,...,F12) Each key has an associated function used as a shortcut to enter DOS commands. See sections above for more information.

2.3.3 SETUP

SETUP is a utility built into the UltraLite. Its purpose is to allow the user to alter certain parameters, such as the processor's clock speed, how colors are displayed on the LCD screen, and the drive sequence for booting the operating system.

The UltraLite is preset with most of the common settings, they may not need to be altered. However, certain application programs may require a slower clock speed or different characteristics.

Starting SETUP

SETUP is loaded automatically from the AUTOEXEC.BAT file when the UltraLite is turned ON or rebooted. To activate it, a special "hot key" combination (**CTRL-ALT-S**) must be pressed.

To activate SETUP:

Press the **CTRL-ALT-S** keys simultaneously. The following screen appears:

```
╔═══ SETUP 1.00 ══════════════════════════════ SETUP MAIN SCREEN ═══
║ <BOOT FROM B:>      Yes     No
║ <CLOCK SPEED>       High    Low
║ <SCREEN>
║   Color mode            Emulation     Contrast
║   Intensity mode        Font          Contrast
║   Default font          Doubledot     Singledot
║   Backlight             Auto(5min)    High           Low
║
║   Palette       [  0 1 3 4 2 5 4 6 0 1 3 4 2 5 4 6  ] (Intensity level)
║
║                      **** Color Pattern ****
║
║          00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
║          10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
║          20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
║          30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
║          40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
║          50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
║          60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
║          70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F
╚════════════════════════════════════════════════════════════════
```

The current settings are displayed within the box of double lines. Directly beneath the box is the Command Line, a Help Line which explains each command, and a Prompt Line which reminds the user of the current options.

To Select a Command

1. Either press the first letter of the command, or use the **SPACEBAR** or **BACKSPACE** keys to highlight the specific commands. As each command is highlighted, the Help Menu offers a brief description of it.

2. Press **ENTER** to select a highlighted command.

SETUP Command Descriptions

BOOT

The BOOT command changes the MS-DOS boot sequence, allowing the UltraLite to boot either from drive B, the RAM Card, or drive C (Silicon Hard Disk). In any case, if the external drive A is connected and it contains an MS-DOS System Diskette, the UltraLite will always boot first from drive A.

In most cases, the users wants the system to boot from drive C (Silicon Hard Disk). The system can only boot from drive B if the 256 KB RAM Card is present, and it contains the MS-DOS system files. If no card is inserted, the UltraLite will attempt to boot from drive C.

```
30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F
```

```
Boot from Drive B: ? Yes No
 Select "No" to set the boot sequence A:->C:->D:
Select "Yes" or "No" and press ENTER.            ...
```

Note: Do not change this setting to "Yes" unless the Memory Card Slot contains a RAM Card with MS-DOS system files installed on it.

Recovering From Boot Error

If an attempt to boot from drive B is made, and the Memory Card Slot contains a ROM Card or a RAM Card without system files, the following error message appears:

"Non-System Disk or Disk Error.

Replace and strike any key when ready."

If a RAM Card with MS-DOS system files is available, turn the UltraLite OFF and replace the Memory Card. Otherwise, the UltraLite will have to be reset and return all of the parameters to their default settings by simultaneously pressing **CTRL-ALT-DEL**.

CLOCK

The CLOCK command toggles CPU speeds. High speed is 9.83 MHz and low speed is 4.92 MHz. Very few applications require the lower clock speed anymore, some older applications might.

Note: If the clock speed is changed from the SETUP Menu, keep in mind that the CONFIG SW 1 overrides this setting upon rebooting or power-up. For example, to set the clock permanently to the lower speed, CONFIG SW 1 must always be set to ON.

```
10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F
```

```
CPU clock speed: High Low
```

Press "H" for High or "L" for Low in order to change the clock speed.

Note: To toggle between clock speeds without entering the SETUP Program, press CTRL-ALT-H to select the high speed or CTRL-ALT-L to select the low speed at any time.

EXIT

The EXIT command exits from the SETUP program, and saves the changes made. Before exiting, a question concerning leaving SETUP and saving the changes is asked.

Press "E" for EXIT.

QUIT

The QUIT command exits from the SETUP program without saving the changes. Parameters set before the current session remain in effect. Before quitting, a question concerning quitting SETUP without saving the changes is asked.

Press "Q" for QUIT.

SCREEN

The SCREEN commands affect the way in which graphics, text, and colors are displayed on the UltraLite screen. The SCREEN command brings up a submenu with six submenu commands:

```
╔═ SETUP 1.00 ══════════════════════════ SCREEN ═══╗
║<COLOR MODE>      Emulation    Contrast            ║
║<INTENSITY MODE>  Font         Contrast            ║
║<DEFAULT FONT>    Doubledot    Singledot           ║
║<BACKLIGHT>       Auto(5min)   High        Low     ║
║<PALETTE>    [ 0 1 3 4 2 5 4 6 0 1 3 4 2 5 4 6 ] (Intensity level) ║
║                 **** Color Pattern ****          ║
║        00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F ║
║        10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F ║
║        20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F ║
║        30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F ║
║        40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F ║
║        50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F ║
║        60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F ║
║        70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F ║
╚══════════════════════════════════════════════════╝
```

The current choices for screen display characteristics are displayed within the box of double lines.

During any application, simultaneously pressing **CTRL-ALT-S**, goes into SETUP. Screen parameters can be changed and then resuming to the current application allows the new screen parameters to be seen.

Note: SETUP is a TSR program (Terminate and Stay Resident). Not all applications work with TSR programs and some TSR programs do not work with each other. Test the CTRL-ALT-S combination with an application. If the application "hangs-up" when SETUP tries to pop up, reboot the sytem.

SCREEN Submenu Commands

BACKLIGHT

The BACKLIGHT command effects the brightness of the screen and also the time the UltraLite can operate using the built-in battery.

Press "B" for BACKLIGHT.

Auto is the default setting, it allows the screen to operate at full backlighting while in use and switches automatically to the "energy-saving" low backlighting after five minutes of keyboard inactivity. Pressing any key brings the screen back to full brightness.

High setting keeps the screen at full brightness all the time. Best used when operating from the AC Adapter.

Low setting keeps the screen at a constant low brightness, for maximum energy savings. Using this setting can extend battery life.

```
╔══ SETUP 1.00 ══════════════════════════════ SCREEN ══════════╗
║        <COLOR MODE>        Emulation      Contrast            ║
║        <INTENSITY MODE>    Font           Contrast            ║
║        <DEFAULT FONT>      Doubledot      Singledot           ║
║        <BACKLIGHT>         Auto(5min)     High        Low     ║
╚══════════════════════════════════════════════════════════════╝
```

To select Auto, High, or Low, press the first letter (**A**, **H**, or **L**).

COLOR

The COLOR command emulates a color screen (CGA resolution) in order to work with the greatest array of MS-DOS software (but can't actually display colors). The COLOR command allows the selection of Emulation or Contrast mode.

Press "C" for COLOR.

Emulation

In the Emulation mode, pixels are either ON or OFF, and are at a uniform brightness level. This means the colors in the color software are displayed with simple alternatives, such as reverse video, single dot characters, white background, and bold. Emulation is sufficient when working with text and black/white graphics.

Contrast

In the Contrast mode, colors are individually mapped into different intensities or "grey" shades. Using the PALETTE command, a level from 0 to 6 can be assigned to any of 16 colors. If the application demands a realistic representation of different colors, the Contrast mode should be used.

To select the Emulation or Contrast mode, press the first letter of the mode (**E** or **C**).

Checking the Software

Many software publishers now recognize the wide-spread use of laptop computers, and their software may have a laptop or black/white screen mode. Before experimenting with the SETUP SCREEN commands to improve legibility, check the software manual. Also the term "monochrome" usually refers to an MDA or a Hercules-compatible controller which drives a monochrome monitor and does not pertain to the UltraLite.

EXIT

The EXIT command goes back to the original SETUP Menu, a level above the Screen Menu.

Note: The changes selected will become permanent only when exiting from SETUP.

Press "E" for EXIT.

FONT

The FONT command allows the UltraLite to display standard characters in double-dot or single-dot fonts.

Press "F" for FONT.

Double-Dot

Characters are composed of lines of two pixels in width. Text in Double-Dot will look darker on the screen than in Single-Dot.

Single-Dot

Characters are composed of lines of one pixel in width.

To select Double-Dot or Single-Dot, press the first letter of the desired font (**D** or **S**).

INTENSITY

The INTENSITY command controls how to display emphasized and colored text characters.

Press "**I**" for INTENSITY.

FONT allows the alternative font, Double-Dot or Single-Dot, to represent an emphasized character.

Contrast is equivalent to "Contrast" in the COLOR command. All emphasized characters are assigned shades of darkness, or contrast, and the font remains unchanged. The darkness level can be changed with the PALETTE command.

To select Font or Contrast, press the first letter of the desired INTESITY command (**F** or **C**).

PALETTE

The PALETTE command allows the UltraLite to emulate a CGA color monitor, which may be useful when displaying business graphics.

For example, in graphics which use a number of colors that are not easily distinguishable on the UltraLite display, the PALETTE command can be used to increase the contrast among the colors.

Note: The PALETTE command cannot be activated when the Emulation Color mode is selected.

The PALETTE command allows the intensity level to be assigned between 0 to 6, 0 being the darkest and 6 being the lightest, to each of 16 colors, numbered hexidecimally 0 to F.

```
 ┌══ SETUP 1.00 ══════════════════════════ SCREEN ═══════
 │     <COLOR MODE>        Emulation    Contrast
 │     <INTENSITY MODE>    Font         Contrast
 │     <DEFAULT FONT>      Doubledot    Singledot
 │     <BACKLIGHT>         Auto(5min)   High           Low
 │
 │     Palette number     : 0 1 2 3 4 5 6 7 8 9 A B C D E F
 │     ----------------------------------------------------------------
 │     Intensity(0..6)    : 0 1 3 4 2 5 4 6 0 1 3 4 2 5 4 6    EXIT
```

The Palette Number line never changes and serves as a reference to the Intensity line, which has a user assigned value of 0 to 6, 0 being the darkest and 6 being the lightest.

The following table shows the which CGA colors correspond to which palette number and their default intensity.

Palette Color Intensity Table

Palette #	CGA Color	Intensity (default)
0	black	0
1	blue	1
2	green	3
3	cyan	4
4	red	2
5	magenta	5
6	brown	4
7	light gray	6
8	dark gray	0
9	light blue	1
A	light green	3
B	light cyan	4
C	light red	2
D	light magenta	5
E	light yellow	4
F	white	6

Adjusting Intensity Level

1. Press "**P**" for Palette.

2. Use the **SPACEBAR** and **BACKSPACE** keys to move the highlight bar from one palette number to another.

3. The ARROW keys are used to raise or lower the highlighted value between 0 and 6.

4. After adjusting the contrast, press "**E**", or move the highlighted bar to Exit and press **ENTER**.

Color Patterns

The Color Pattern table demonstrates how two "colors" will appear together. When any values in the Palette/Intensity Line are changed, the result is in the Color Pattern table. The left digit indicates the background color and the right digit indicates the foreground color.

```
               **** Color Pattern ****

     00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
     10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
     20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
     30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
     40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
     50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
     60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
     70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F
```

2.3.4   MS-DOS Manager 3.3
Initial AUTOEXEC.BAT file

The initial AUTOEXEC.BAT file is as follows:

> **PATH D:**
>
> **SETUP**
>
> **SET COMSPEC = D:\\COMMAND.COM**
>
> **MANAGER C:MGR.INI**

Notes:

PATH D: - Searches the D drive and the current directory for all executable files.

SETUP - Loads the TSR program used to set the processor speed, change the backlight brightness, and other features. SETUP is activated by hitting the ALT-CTRL-S keys.

SET COMSPEC = D:\\COMMAND.COM - Specifies the path to reload COMMAND.COM when necessary.

MANAGER C:MGR.INI - Starts MS-DOS Manager every time the UltraLite is powered up or reset. If MS-DOS Manager was used before, the parameters are saved in MGR.INI.

UltraLite DOS vs MS-DOS 3.3

Several of the MS-DOS 3.3 files are not used by the UltraLite. Most of these files refer to devices not supported by the UltraLite. Also, any commands, such as DISKCOMP, are not used by the UltraLite because the "disk drives" are not similar devices.

All of the normal internal commands (DIR, CD, TYPE, etc.) are available. The UltraLite has some files not found in MS-DOS 3.3. These files are located on the D drive (System ROM) and cannot be deleted.

MS-DOS files not found in the UltraLite

APPEND.EXE	FIND.EXE	REPLACE.EXE
ATTRIB.EXE	GRAFTABL.COM	SELECT.COM
COMP.COM	JOIN.EXE	SHARE.EXE
COUNTRY.SYS	KEYB.COM	SORT.EXE
DEBUG.COM	KEYBOARD.SYS	SUBST.EXE
DISKCOMP.COM	MORE.COM	TREE.COM
DISPLAY.SYS	NLSFUNC.EXE	VDISK.SYS
DRIVER.SYS	PRINT.COM	EGA.CPI
FASTOPEN.EXE	PRINTER.SYS	LCD.CPI
FDISK.COM	RECOVER.COM	4201.CPI
		5202.CPI

The following table lists all of the MS-DOS files and programs available on the UltraLite. These files are on the system ROM and cannot be deleted or altered.

UltraLite MS-DOS files

File name	Function or task
ANSI.SYS	standard screen driver
ASSIGN	redirects disk drives
AUTO	* batch file for drive C
AUTOEXEC.BAT	* batch file for drive D
BACKUP.COM	standard backup utility
CHKDSK.COM	check disk status
COMMAND.COM	system file
CONFIG.SYS	* copied to drive C
DISKCOPY.COM	useful for backing up 3.5" diskettes
DSET.BAT	* installation file
EDLIN.COM	text editor
FORMAT.COM	formats 3.5" diskettes
GRAPHICS.COM	screen print
IDISK.COM	* similar to FDISK
LABEL.COM	display or alter volume label
LL.EXE	LAP-LINK file transfer program
MANAGER.EXE	MS-DOS Manager program
MANAGER.HLP	MS-DOS Manager help files
MANAGER.INI	* system file
MGR.INI	* copied to drive C
MODE.COM	redirects output
RESTORE.COM	used with BACKUP command
SETUP.EXE	* memory resident utility program
SYS.COM	system file
XCOPY.EXE	copies files by directories
DUMMY1	(hidden file)
DUMMY2	(hidden file)
IO	(hidden file)
MSDOS	(hidden file)

* = unique to UltraLite

2.4. ROM and RAM Cards

Many popular software programs are available from NEC on ROM cards. By far, a ROM card is the most convenient way to carry and install software in the UltraLite. Diskless software is always available and cannot be erased from memory.
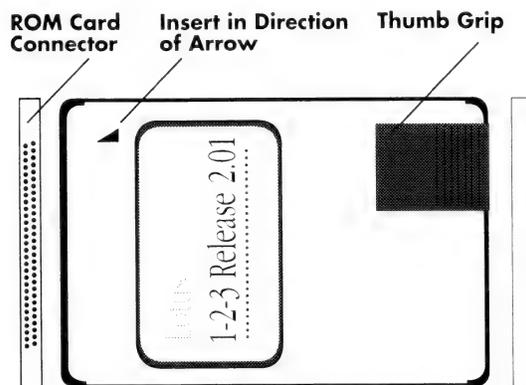
Another way to carry files without a disk drive is the 256 KB RAM Card. Software can be loaded onto the RAM Card. The RAM Card can also be used to temporarily backup the Silicon Hard Disk.
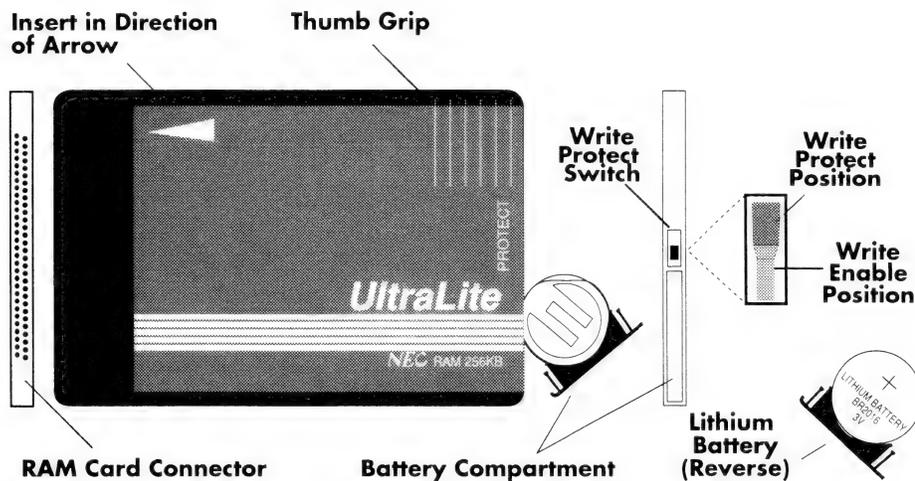
Inserting a ROM Card

When inserting a ROM Card, the UltraLite may be ON or OFF. The card is always inserted with the thumb grips to the right of the slot. This allows for easy removal of the card from the unit.

1. Remove the Card Slot Cover from the UltraLite by pulling gently.
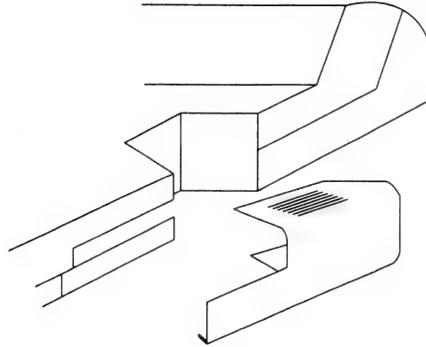
2. Carefully handle the ROM Card, avoiding touching the metal contacts. Insert the card into the slot until the connectors "catch".
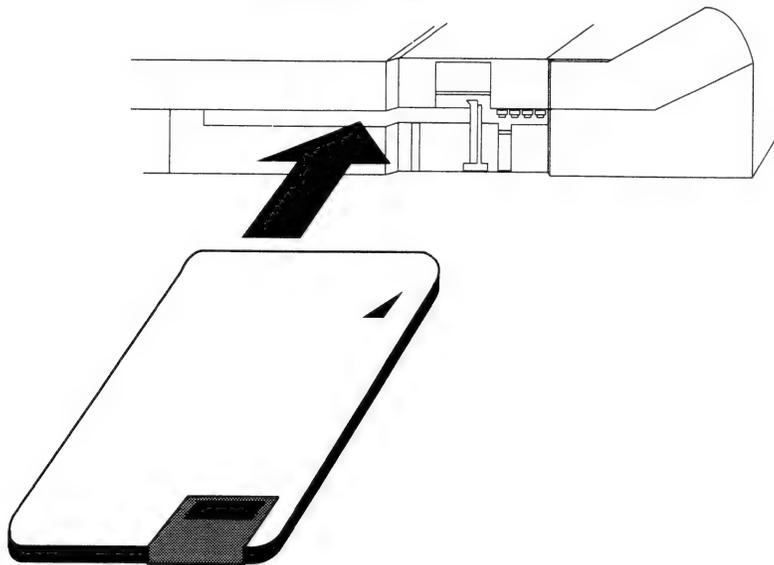
3. From the MS-DOS command line, type **B:(Program Name)** to run the program. Or, install it in the Applications Menu of MS-DOS Manager, following the instructions in the MS-DOS Manager.

Inserting a RAM Card

Follow the same steps as inserting the ROM Card.

**RAM Card
in Position**
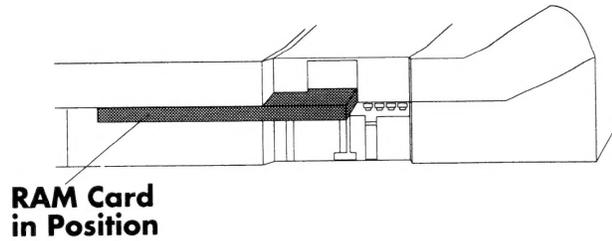
Write-Protecting the RAM Card

Data or programs stored on a RAM Card can be protected by "write-protecting" it. The card will then be "read only", and new data cannot be written to the RAM Card.

1. Removal of the RAM Card from the UltraLite is not necessary when write-protecting it.

2. Using a pen tip or small instrument, move the small white switch on the end of the card from the left to the right.

**Write
Protect
Position**

**Write
Enable
Position**

**Write
Protect
Switch**
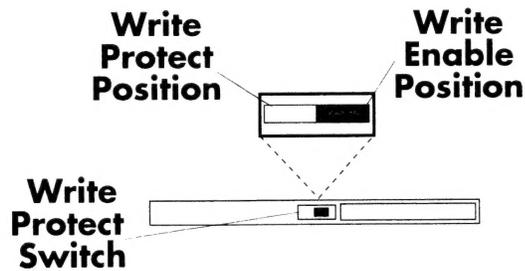
Replacing the RAM Card Battery.

The lithium battery in the RAM Card is guaranteed for six months, but may last longer. Always replace the lithium battery with the same or equivalent battery type.

1. When replacing the battery, there is only 10 seconds to work with before data on the card is lost. Replacement should take approximately 2 or 3 seconds.

2. Turn OFF the computer and remove the RAM Card.

3. Using a small screwdriver, remove the battery case from the card.

Groove
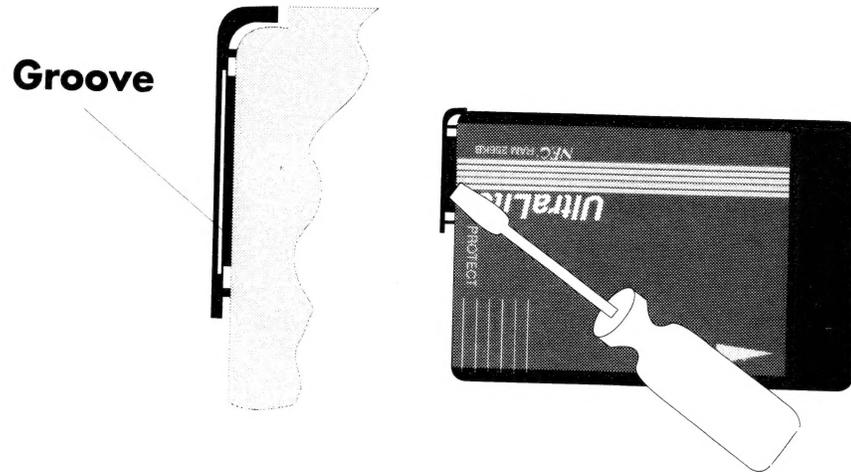
4. Place the new battery in the case with the top, or flat, side exposed and the rounded bottom side seated in the case.

3V Lithium Battery

Top

Bottom
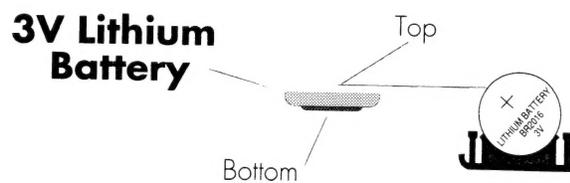
5. Insert the case back into the card, making sure it is not upside down. (The rounded edge is to the outside.)
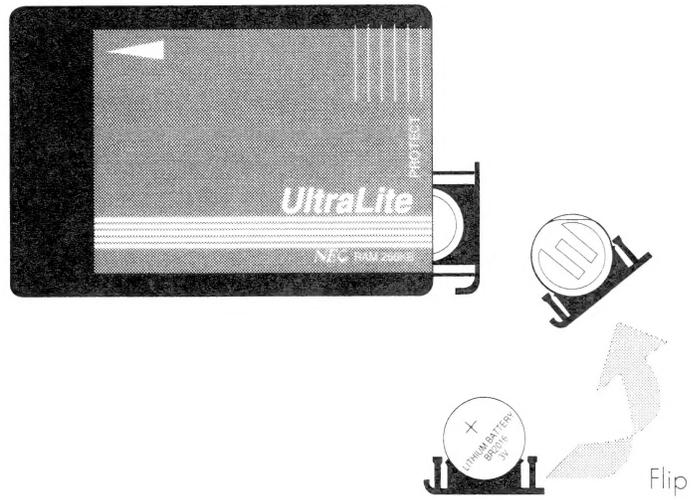
6. Insert the RAM Card into the card slot, keeping the thumb pads to the right.
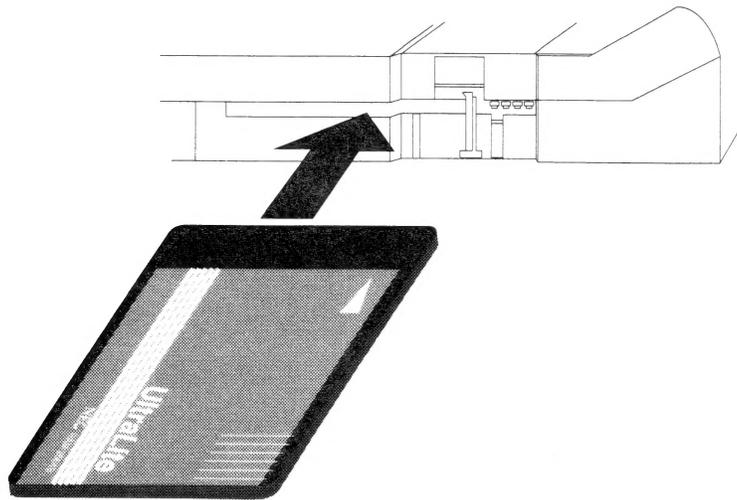
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3. Theory of Operation and Troubleshooting

3.1. Circuit Board Description

MAIN PWB

The MAIN PWB contains the V-30 CPU, 640K RAM, Interrupt, Serial, Parallel, LCD Controller, and the Internal 2400BPS Modem circuits. Also contained on the MAIN PWB is a "soldered-on" circuit board (Power Control PWB). The Power Control PWB controls both batteries and the sensing of low power. When replacing the MAIN PWB. it is not required to remove the Power Control PWB.

ROM PWB

The ROM PWB contains the 512K system ROM, where the BIOS information, MS-DOS 3.3, DOS Manager, and LAP-LINK are located.

Silicon Hard Disk (MMC-253)

The Silicon Hard Disk is available in 1-Megabyte (PC-17-01) or 2-Megabyte (PC-17-02) versions. The Silicon Hard Disk is accessed as the logical C: Drive and is backed up by the NiCd Battery. Data can be held on the Silicon Hard Disk for 5 to 7 days. The 1-Megabyte version is identified by p/n HMC-253C and the 2-Megabyte version is identified by p/n HMC-253B.

KEYBOARD ASSEMBLY

The KEYBOARD Assembly is a full 78-key keyboard with 12 function keys and an enbedded keypad. There is a separate pad to control the cursor (ARROW Keys). Also on the keyboard is a key labeled "Fn", which is used to activate the functions printed in red on the keys (HOME, END, PAGE UP, PAGE DOWN, etc.) All of the control logic for the keyboard is contained on the keyboard. The keyboard is equivalent to a PS/2 derivative keyboard.

RAM and ROM Cards

The 256 K RAM Card (PC-17-41) and the ROM Card can be accessed as the logical B: Drive.

Note: The system files must be on the card in order to boot from the card.

The RAM Card contains a lithium battery which backs up the data for at least six months. The voltage rating on the lithium battery is +3 V. It consumes less than 10 uA.

Data on the card can be protected by setting the WRITE-PROTECT switch. The switch is located on the end of the RAM card and the WRITE PROTECT mode is activated by moving the switch from the left to the right.

Molicel Battery Pack

The Molicel Battery Pack is also referred to as the system battery. It provides operating power to the UltraLite for approximately 2 hours, when properly charged. See the Operation section, "Recharging the Batteries" for proper recharging procedures.

Initially, recharging may take as long as 16 hours, but subsequent recharging requires only 7 to 10 hours.

NiCd Battery Pack

The NiCd Battery Pack is also refered to as the Back-up Battery. It provides power to the silicon hard disk and lasts for approximately 5 to 7 days between charges. The recharging procedure for the NiCd Battery Pack is the same as for the Molicel Battery Pack. Since the life of the battery is 5 to 7 days of power, if the UltraLite will not be used for an extended period of time, the AC Adapter should be connected.

Note: The AC Adapter cannot overcharge the batteries. Also, use of the UltraLite is permitted when the batteries are being recharged.

LCD Panel

The LCD Panel is a supertwist backlit LCD, with a 640 x 200 resolution (CGA standard). It also has a double-dot font capability which doubles the thickness of the characters. Through SETUP, the AUTO-POWER-DOWN Mode can be set. This is a power saving mode. In this mode, after 5 minutes of keyboard inactivity, the backlight will power down. Also in SETUP, the LCD Panel can be configured to be used at full brightness or half brightness.

Power Supply (DC/DC Converter)

The Power Supply converts the input voltages from the AC Adapter to $+5$ V, -5 V, $+10$ V, -10 V, and -24 V. These voltages are used for logic ($+5$ V), modem circuits ($+10$ V, -1V), and driving the LCD panel (-24 V). Also $+10$ V is used to develop approximately 200 V AC required to drive the backlit EL Panel.

EL Inverter Assembly

The EL Inverter Assembly converts the inputted DC voltage to approximately 200 VAC. The AC voltage is then used to power the backlit EL Panel.

EL Inverter Transformer

The EL Inverter Transformer is used in conjuction with the EL Inverter Assembly to develop the 200 VAC for the backlit EL Panel.

UltraLite System
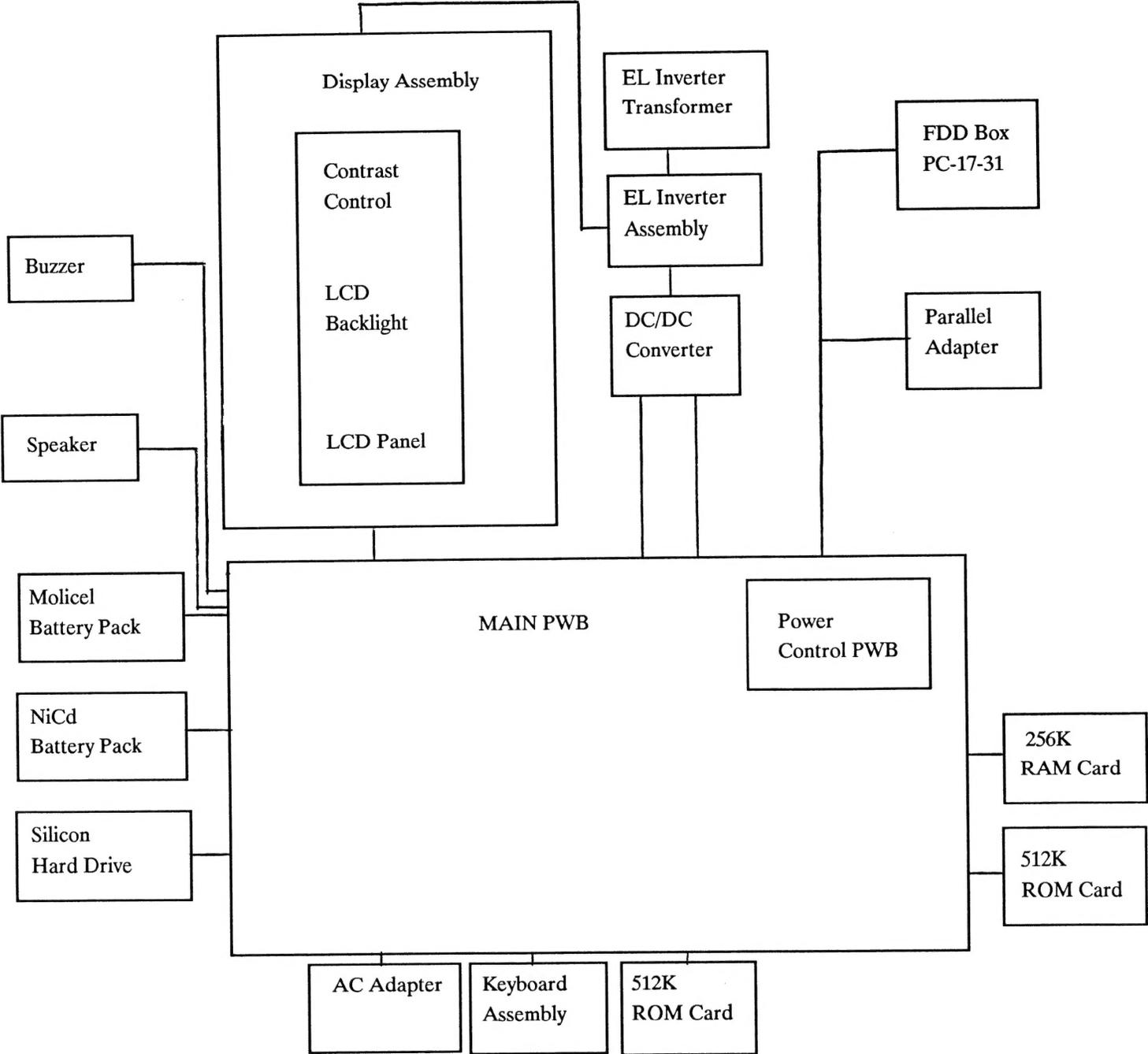
3.2. Troubleshooting Guide

The UltraLite Troubleshooting Guide is divided into three sections:

- Troubleshooting the DC/DC Converter and Power Circuits

- Troubleshooting the LCD Assembly

- Other Common Error Conditions and Solutions

This guide also contains Power-On-Self-Test (Post) errors, an explanation of battery messages, and other basic troubleshooting techniques.

3.2.1 Troubleshooting the DC/DC Converter and Power Circuits

This section explains some of the situations that may occur when a unit is defined as having "no power". The following topics are discussed:

- How to identify which PWB in the power supply circuit is defective

- How to identify which battery is defective and how to test that battery

- How to identify a defective LCD Assembly

- How to charge the batteries correctly

If the unit is running on the AC Adapter, check that the voltage outputs of the adapter are correct. The output voltages should measure 12 VDC at pin 1 and 5 VDC at pin 3. The CHG line, pin 2, should measure approximately 16 V.

Note: The CHG indicator will turn ON only when the system battery (Molicel) is depleted. However, the LOW BATTERY indicator will turn ON when either the system battery or the backup battery (NiCd) is too low.

Check to make sure the batteries are properly charged:

1. Set the BACKUP POWER switches to ON. They are located on the bottom of the unit.

2. Check to make sure the unit is turned OFF.

3. Plug in the AC Adapter.

4. While the batteries are charging, both the CHG and POWER lights should be ON.

Note: The CHG indicator will always be ON when the AC Adapter is not connected to the unit. It will only turn OFF when the AC Adapter is plugged in and the batteries are fully charged.

5. When the LOW BATTERY indicator, located on the UltraLite, and the CHG indicator, located on the AC Adapter, turn OFF, charging is completed. This may take 16 hours initially, and subsequent charges may take 7 to 10 hours. The unit may be used while the batteries are being charged.

Identifying a Defective Battery

If a battery is suspected to be defective, follow the above steps to recharge the batteries.

NiCd Battery

The NiCd battery is also referred to as the Backup Battery. It provides power to the Silicon Hard Disk. The charge in the battery will last approximately 5 to 7 days. If the NiCd battery is suspected to be defective, check the data on the Silicon Hard Disk. If the data is destroyed in any way, or if it is gone completely, replace the NiCd battery pack. When the unit is not in use, the NiCd battery should be charged after every 5 to 7 hours of use.

Molicel Battery

The function of the Molicel battery is to provide power to the system. The charge in the Molicel battery lasts approximately 2 hours. Initially, the battery may take 16 hours to charge. Check to make sure it was charged properly. The Molicel battery has an output of 12.6 V, 600 mA. A symptom of a defective Molicel battery is that the LOW BATTERY indicator never turns OFF, even after the CHG indicator has gone OFF. Another symptom is that the unit does not power up after proper charging or that the CHG indicator never turns OFF.

Note: If the unit still does not charge the batteries properly, check to make sure the insulating tape and covers have been installed on the bottom of the MAIN PWB, and the top of the EL transformer. If these protective covers are not present, the batteries may draw excessive current, and damage the batteries.

Measure the output of the internal DC/DC Converter. The output voltages should be $+/- 5$ V, $+/- 10$ V, and -24 V. Measure these voltages at pins 1 through 7 of connector PWROUT. This connector is located under the Keyboard Assembly.

3.2.2   Troubleshooting the LCD Assembly

Some of the sypmtoms of a defective LCD Assembly are:

- No backlight

- No display

- No brightness or poor brightness control

No Backlight

Before performing extensive troubleshooting, check the following items:

- Loose connections at the EL Inverter Transformer

- Loose input/output connector on the EL Inverter Assembly

The LCD Assembly requires approximately 200 VAC to operate the backlight feature. This high voltage is developed at the EL Inverter Assembly and the EL Inverter Transformer. Check the voltages into the EL Inverter Assembly (PWB). The connector that should be checked is from the DC/DC Converter to the EL Inverter Assembly. For convenience, measure the voltages from the top to the bottom. The following are acceptable voltage levels:

- $+5$ V

- $+5$ V

- $+9$ V

- $+30$ V

If any of these voltages are not present, check for broken or disconnected cables. If there are no loose connections, replace the DC\DC Converter. If replacement of the DC\DC Converter doesn't solve the problem, replace the EL Inverter.

To check the EL Inverter Transformer for 200 VAC, VERY CAREFULLY measure to see if the 200 VAC exists on the cable from the EL Inverter Assembly to the LCD Assembly. If the 200 VAC is not present, replace the EL Inverter Transformer.

3.2.3 Common Error Conditions and Solutions

The following is a list of the more common failures that are possible in the UltraLite along with solutions.

BLUE SCREEN WITH A WHITE LINE DOWN THE MIDDLE OF THE SCREEN

- Defective or disconnected ROM PWB.

ONLY BACKLIGHT FUNCTION OPERATES, BUT UNIT APPEARS TO BOOT UP

- Defective or disconnected LCD cable.

- Loose CONTRAST control.

CHG INDICATOR ALWAYS ON

- Check/replace Molicel Battery.

CHG INDICATOR TURNS OFF, BUT LOW BATTERY INDICATOR REMAINS ON

- Check/replace Molicel Battery and/or NiCd Battery.

UNIT FAILS TO POWER UP USING BATTERY POWER

- Check/replace Molicel Battery.

The following is a list of error messages (and possible solutions) that are displayed with a note "Error, press F1" whenever a hardware error is detected. To reboot the system, press the **ALT-CTRL-DEL** keys simultaneously. This resets the computer to its default parameters and may clear up any temporary problems.

NO SCANCODE FROM KEYBOARD (XXh = SCANCODE, CHECK KEYBOARD)

- Check/replace Keyboard Assembly or Keyboard cable.

BAD DMA PORT = XX

- Check/replace MAIN, ROM PWBs.

ROM BAD CHECKSUM

- Check/replace MAIN, ROM PWBs.

TIMER CHIP COUNTER 2 FAILED

- Reset the unit. This error may occur if the unit is turned ON, OFF, and then back ON again quickly.

- Check/replace MAIN PWB.

DISK BAD

- Defective diskette/disk drive.

- Check/replace cables.

DISKETTE DRIVE 0 SEEK FAILURE

- Check/replace disk drive.

- Check/replace cables.

BAD RAM AT XXXX = XXH, EXPECTED = XX

- Check/replace MAIN PWB.

TIMER OR INTERRUPT CONTROLLER BAD

- Reset the unit. This error may occur if the the unit is turned ON, OFF, and then back ON again quickly.
- Check/replace MAIN PWB.

HARD DISK INITIALIZATION FAILURE HAS BEEN NOTED ...

- Check/replace Silicon Hard Disk.

INVALID PARTITION TABLE. ERROR LOADING OPERATING SYSTEM. MISSING OPERATING SYSTEM

- Check/replace Silicon Hard Disk.

DISK BOOT FAILURE. NON-SYSTEM DISK OR DISK ERROR. REPLACE AND STRIKE ANY KEY WHEN READY

- Defective diskette/disk drive.
- Disk (RAM Card) is without boot tracks.

Low Battery Messages

The following two messages are displayed when the system battery is too depleted to continue operation. The first message appears when the computer is turned ON; the second message appears during operation. When both messages appear, simply plug in the AC Adapter.

POWER FAILURE HAS OCCURRED.

PLEASE RECHARGE THE BUILT-IN BATTERY WITH THE AC ADAPTER.

PRESS THE F1 KEY TO CONTINUE ...

POWER FAILURE HAS OCCURRED.

SAVE ALL DATA FILES IMMEDIATELY. PLEASE RECHARGE THE BUILT-IN BATTERY WITH THE AC ADAPTER.

PRESS THE F1 KEY TO CONTINUE ...

Note: If the first message appears immediately after powering up, check that the BACKUP BATTERY switches are both in the ON position. If they are in the OFF position, the same error appears, even if the batteries are fully charged.

Troubleshooting Hints

The following troubleshooting hints refer to the internal 2400 BPS Modem, LAP-LINK, and basic steps that should be performed.

- Disconnect all peripherals.
- When using the internal 2400 BPS modem, check to make sure the RJ11 cable is plugged into the wall jack and the LINE Port and the telephone equipment cable is plugged into the TEL Port.
- If problems occur when using LAP-LINK, check the cable hookup and the floppy disk (formatted properly and the Write-Protect switch is set to UNPROTECTED).
- Check the CONFIG switches.

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4. Disassembly, PC Board Identification, and Assembly

Note: When working with an UltraLite unit, the technician should ALWAYS be grounded to an antistatic mat. Place the antistatic mat on the work bench and set the UltraLite on the mat. The strap should be attached to the technician's wrist and to the mat.

Required Equipment

- Flat Head Screwdriver
- Phillips Screwdriver
- Long Nose Pliers
- Small Flat-Blade Screwdriver

4.1. Disassembly

Removing the Port Covers

1. Turn the UltraLite over (bottom side facing up)

2. Remove the following Port Covers:
   - ROM Board Cover
   - SI-HDD Cover
   - Telephone Interface Covers (2)

ROM Board Cover

Si-HDD Cover

Telephone Interface Covers (2)

Removing the ROM PWB and the Silicon Hard Disk

1. Pulling upward, remove the ROM PWB.

2. To remove the Silicon Hard Disk, hold the end of the Silicon Hard Disk, pull the Silicon Disk Drive upward slowly.

ROM PWB

Silicon Hard Disk
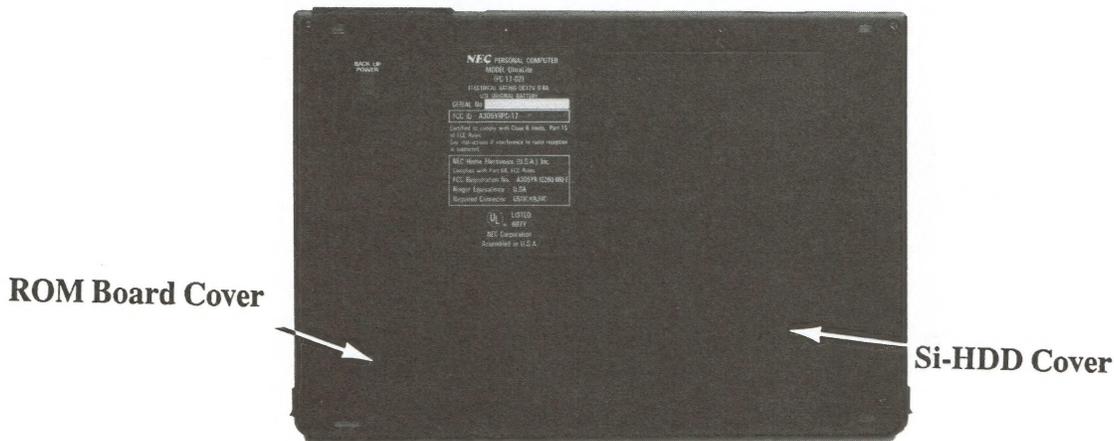
Removing the LCD Assembly

1. Remove both Battery Covers and the batteries (NiCd Battery and Molicel).

Molicel Battery

Battery

NiCd Battery
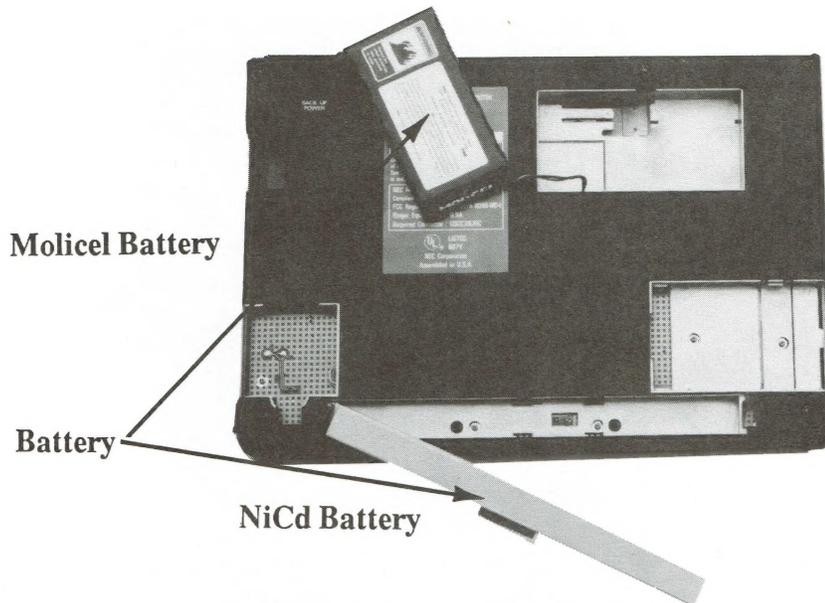
2. Remove the eight black screws on the Bottom Cabinet.

Screws (4)

Screws (4)
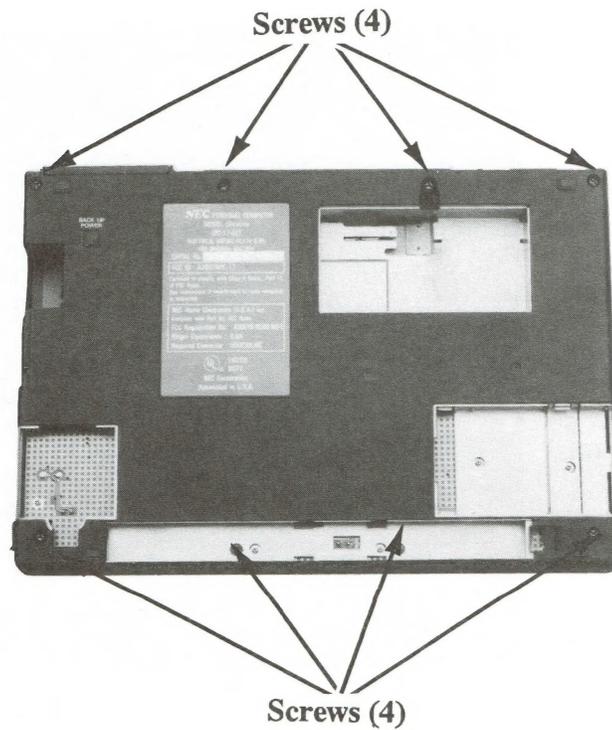
3. Turn the unit over, open the LCD, and remove the RAM/ROM Slot Cover. Then, carefully lift up the Top Cover.

Note: The Top Cover cannot be removed completely at this time.

Top Cover
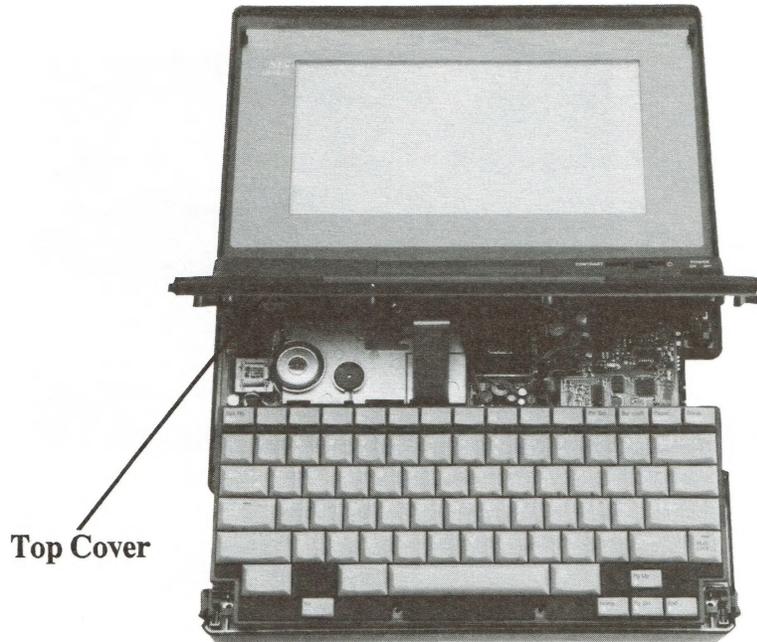
4. Remove the Keyboard Mounting screw and the green connector. At this time the Keyboard can be removed along with the RAM/ROM Card Guide.

Green Connector

Keyboard Mounting Screw
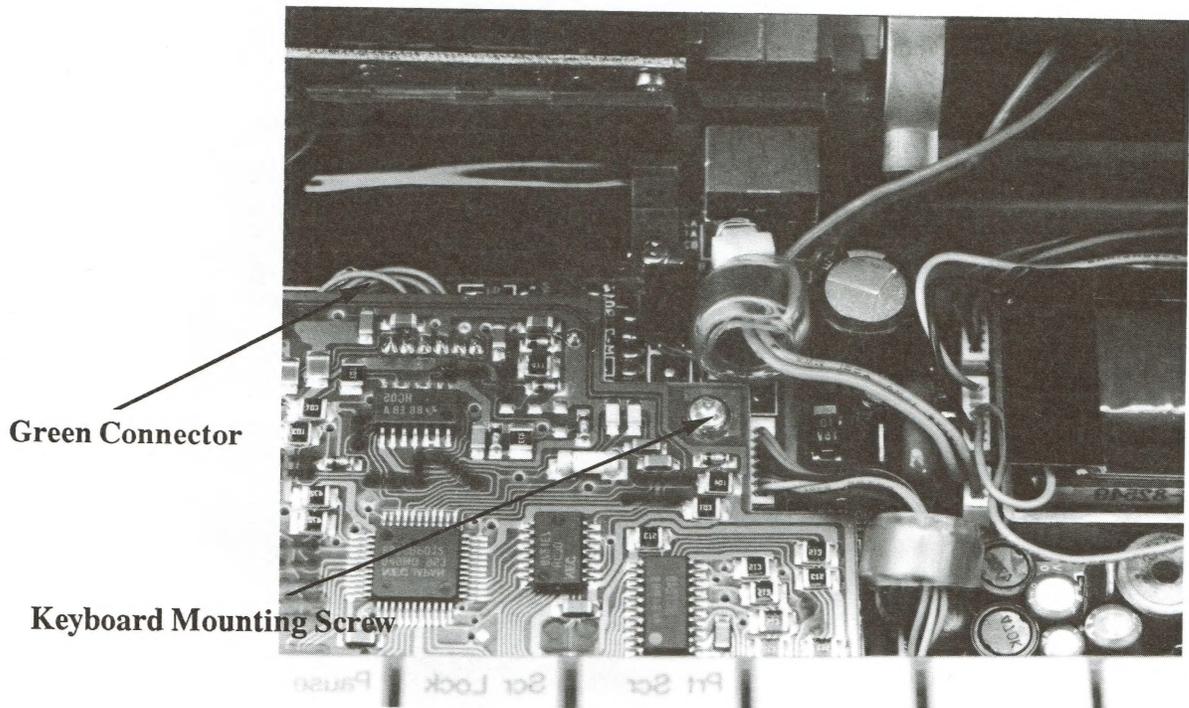
5. Slide the white LCD ribbon cable lock out, pull out the LCD ribbon cable. Disconnect the red connector.

Red Connector

LCD Ribbon Cable
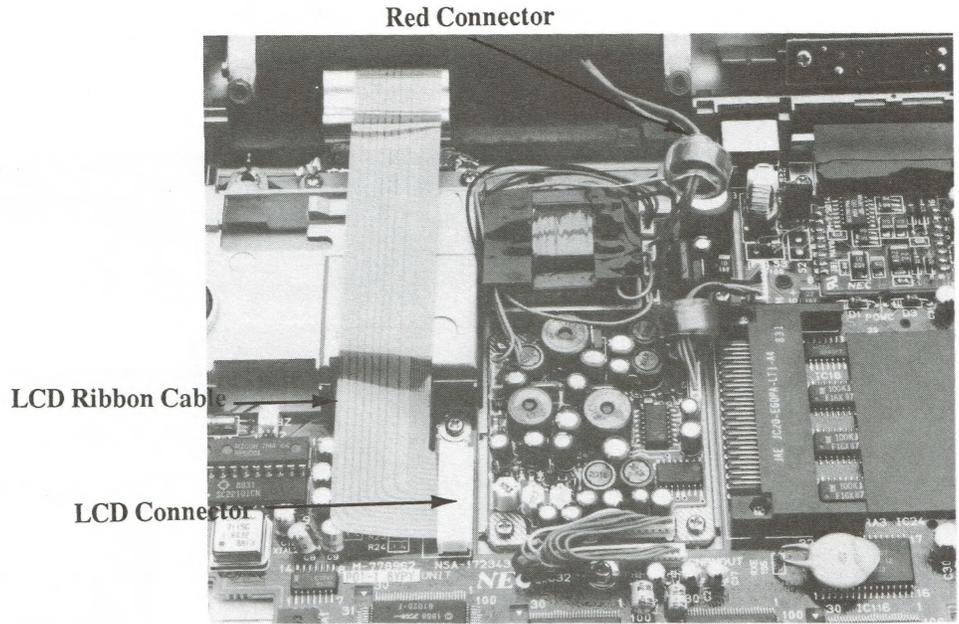
LCD Connector

6. Disconnect the Contrast Control Connector.

Contrast Control Connector

7. Remove the two Ground Plate screws, then remove the Ground Plate. Carefully, lift up the Ground Sheet. At this point the LCD Assembly can be removed.

Caution: Be careful with the Cabinet Latches, do not remove them from the Cabinet Bottom.

Ground Sheet

Ground Plate

Ground Plate Screws

8. Disconnect and remove the Speaker and Buzzer. These connectors are difficult to remove, use extra care in order not to damage the connectors. The small flat blade screwdriver may be useful when removing the connectors.

Speaker

Buzzer

Removing the DC-DC Converter and MAIN PWB

1. Remove the three connectors attached to the DC/DC Converter.

2. Remove one connector and the EL Inverter Transformer.

DC/DC Converter

Connectors

Connector

EL Inverter Transformer
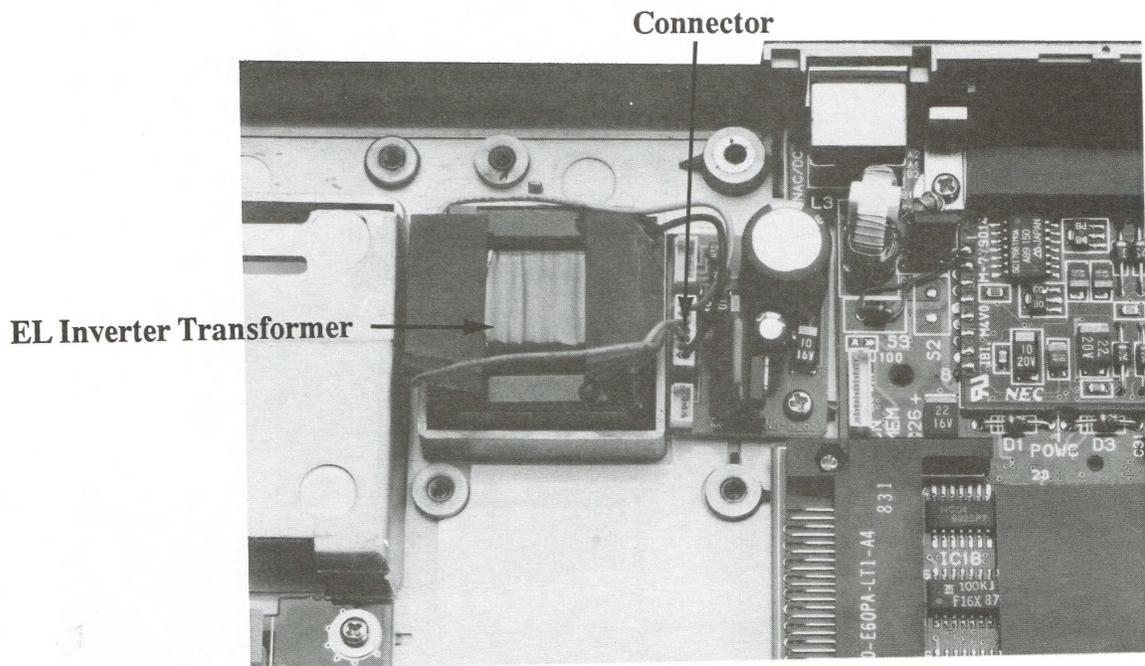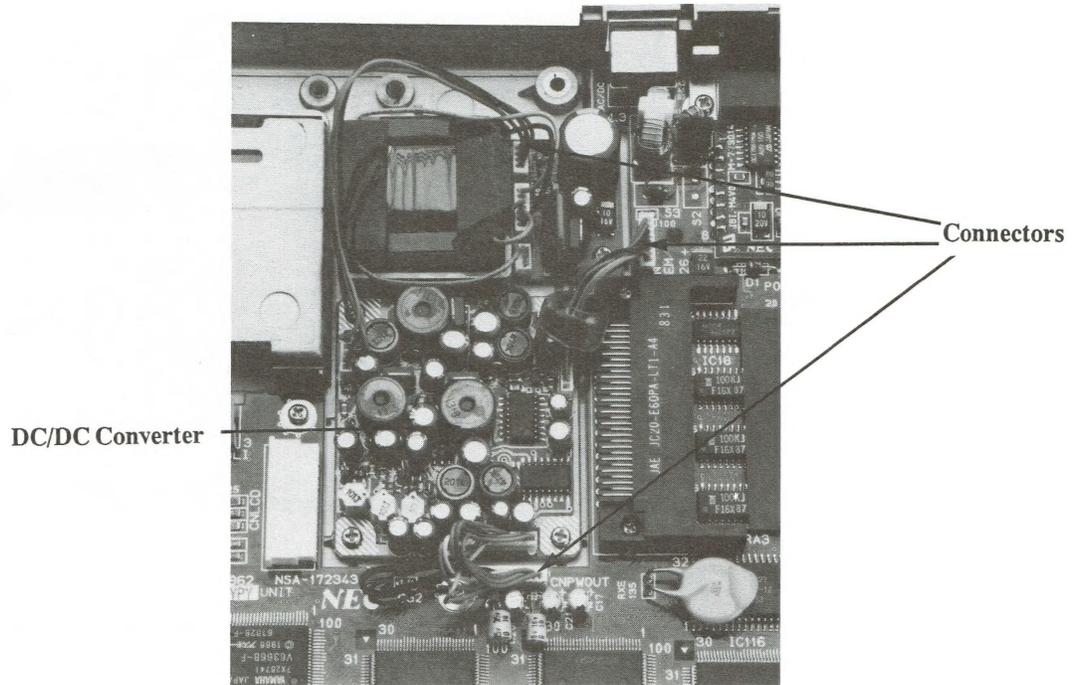
3. Remove the nine screws attaching the MAIN PWB to the Bottom Cabinet, lift the MAIN PWB out of the Bottom Cabinet.
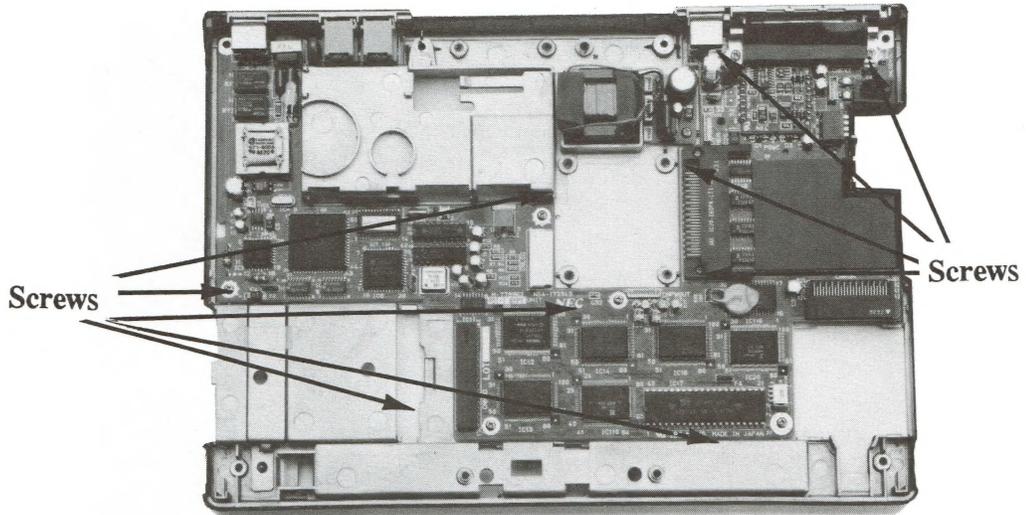
4. Remove the four screws attaching the DC/DC Converter to the Bottom Cabinet, lift the DC/DC Converter out of the Bottom Cabinet.
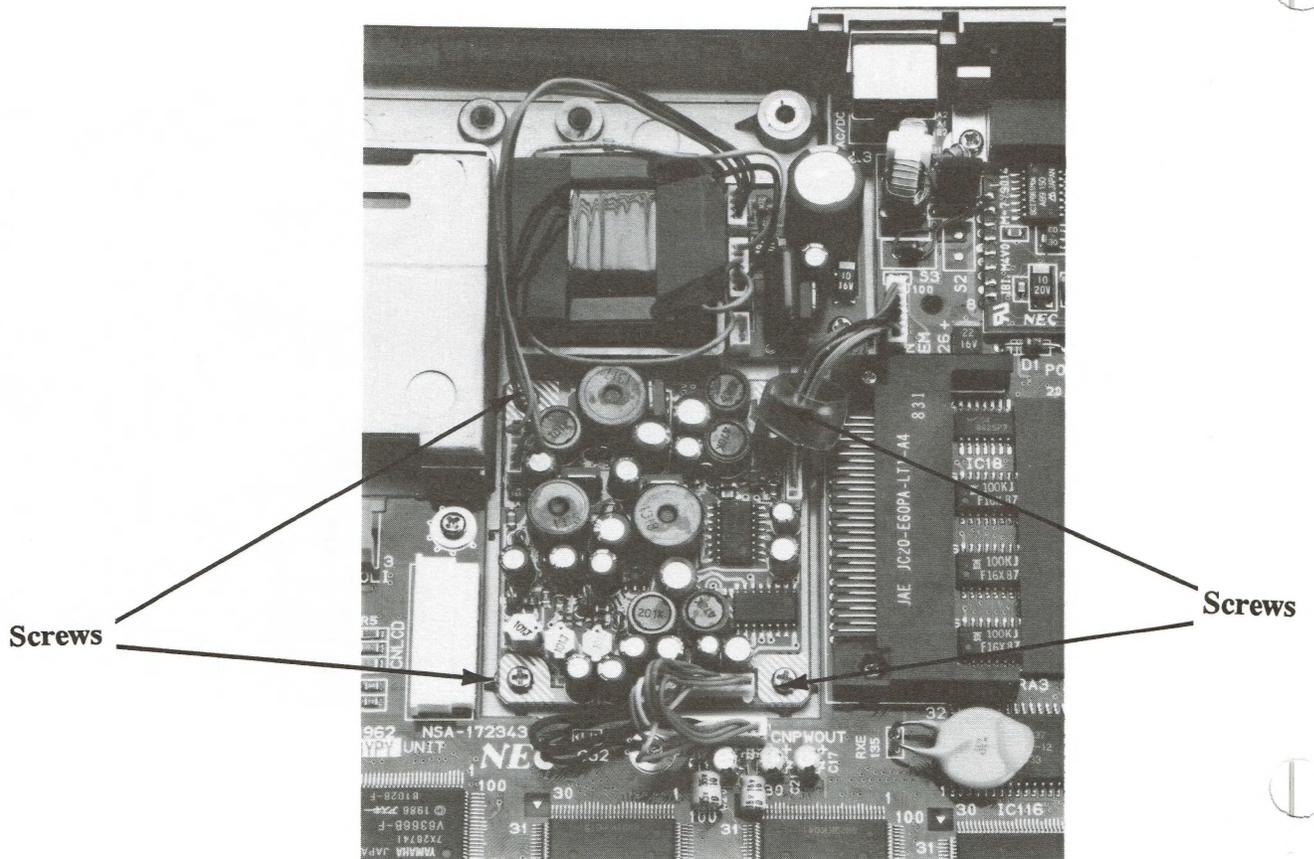
5. Remove the one screw attaching the EL Inverter to the Bottom Cabinet, lift out the EL Inverter.

EL Inverter Assembly

Screw
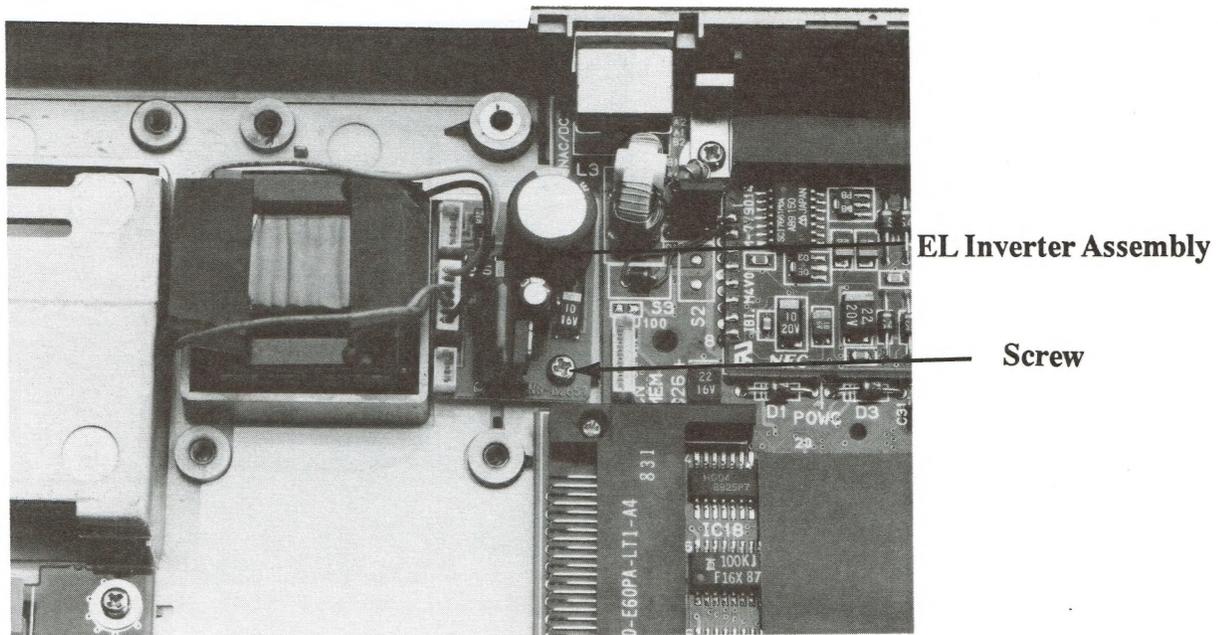
4.2. Assembly

Note: When re-installing the MAIN PWB, make sure the ROM Card Protector is seated inside the Bottom Cabinet.

ROM Card Protector
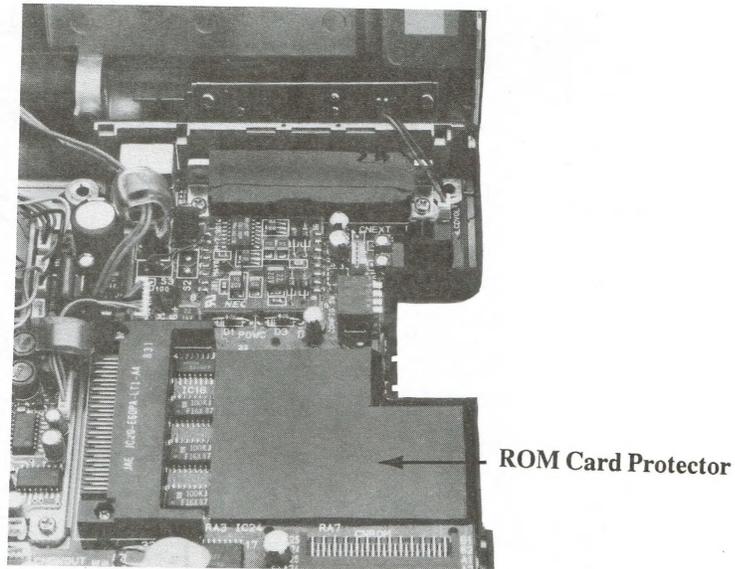
Installing the DC/DC Converter and MAIN PWB

1. When installing the MAIN PWB, first install the Phone Jack connectors, then insert the MAIN PWB into the Bottom Cabinet. Fasten the MAIN PWB into the Bottom Cabinet with nine screws.
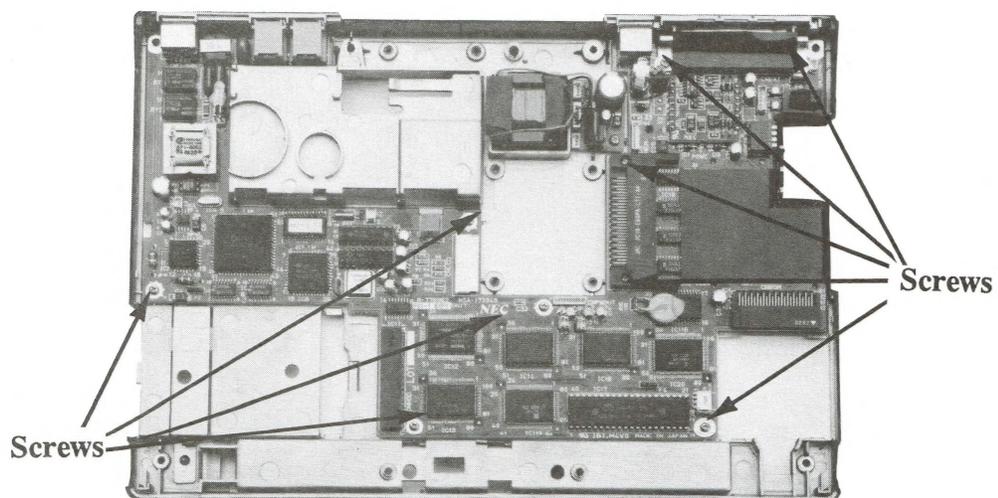
Screws

Screws

2. Insert the DC/DC Converter into the Bottom Cabinet, fasten it to the Bottom Cabinet with four screws. Attach "PWR IN" and "PWROUT" connectors to the MAIN PWB.

Screws

DC/DC Converter
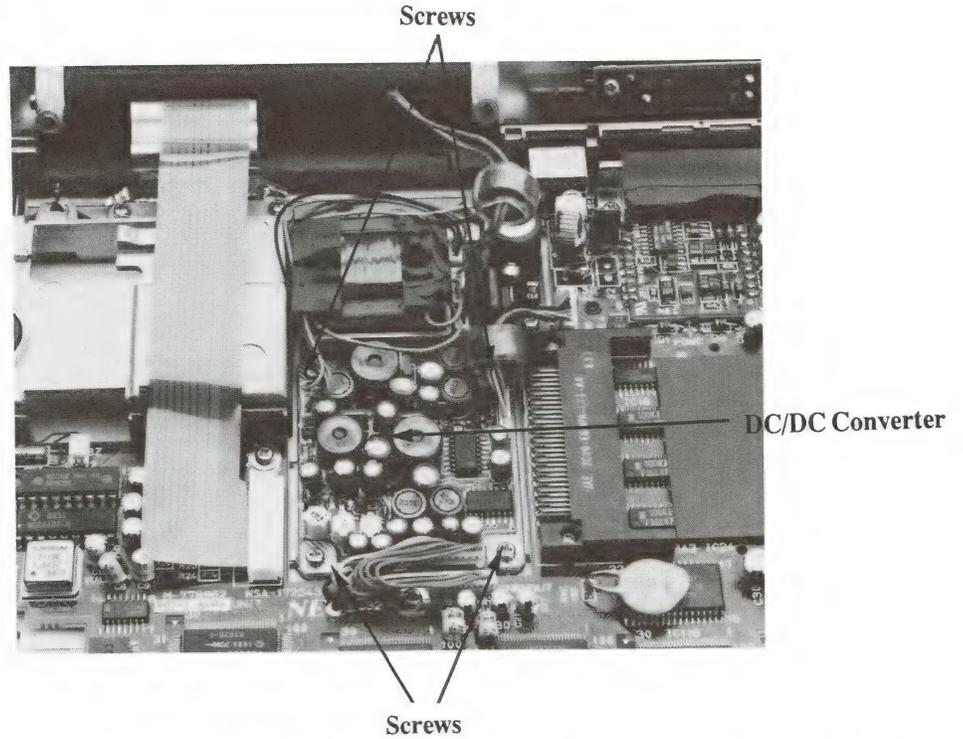
Screws

3. Insert the EL Inverter into the Bottom Cabinet, use one screw to fasten it to the Bottom Cabinet. Connect the wire from the DC/DC Converter board.

EL Inverter Assembly

Screw
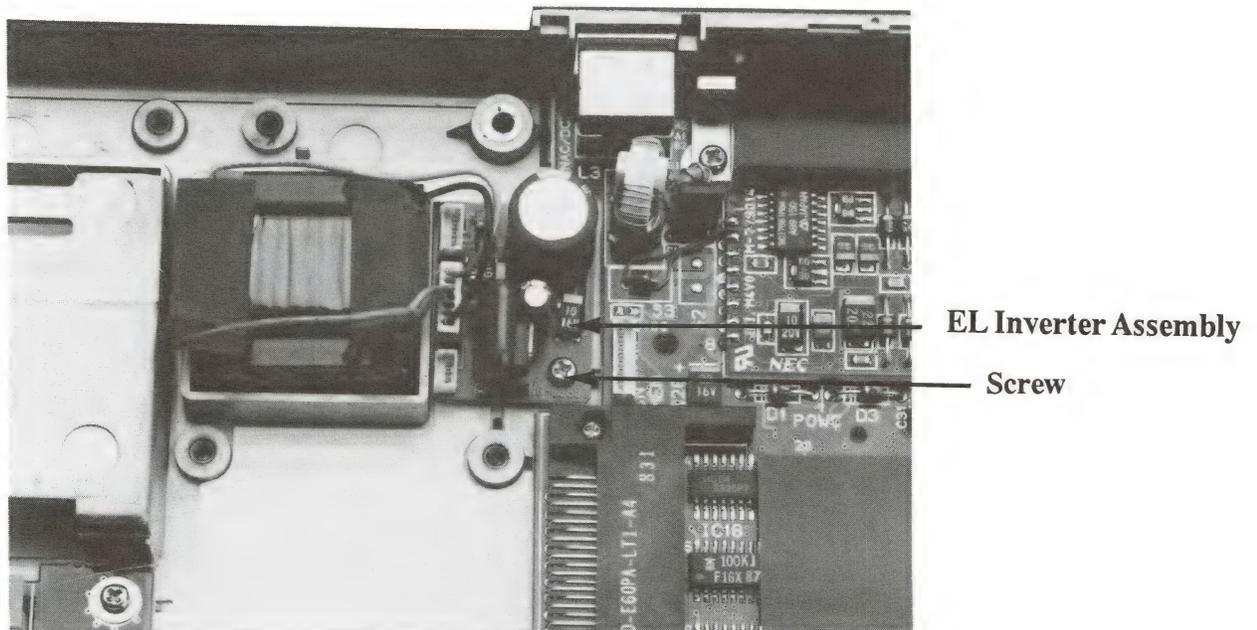
4. Install the Transformer and connect the cable.

Connector

EL Inverter Transformer
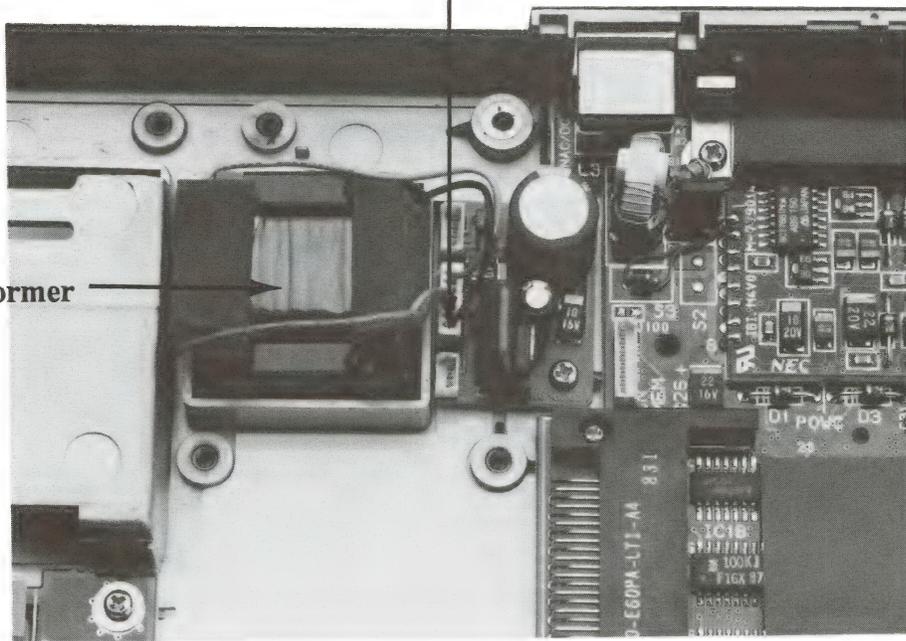
Installing the LCD Assembly

1. Install the Speaker and Buzzer. Use extreme care when attaching the connectors. A long-nose pliers may be useful when attaching the connectors.
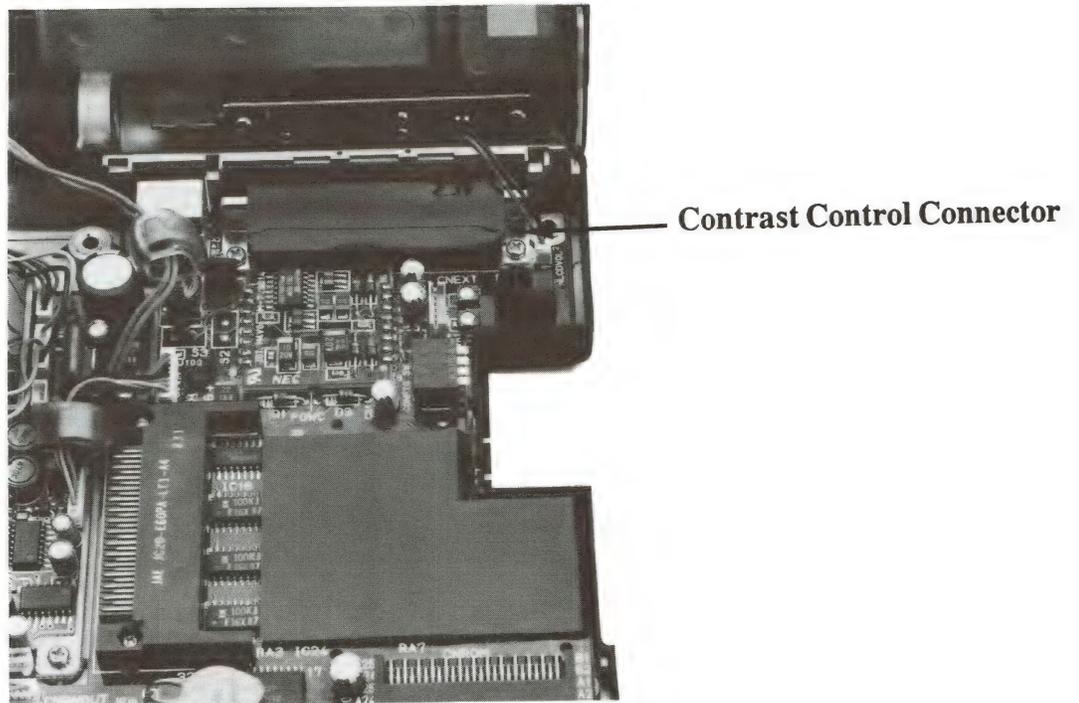
Buzzer

Speaker
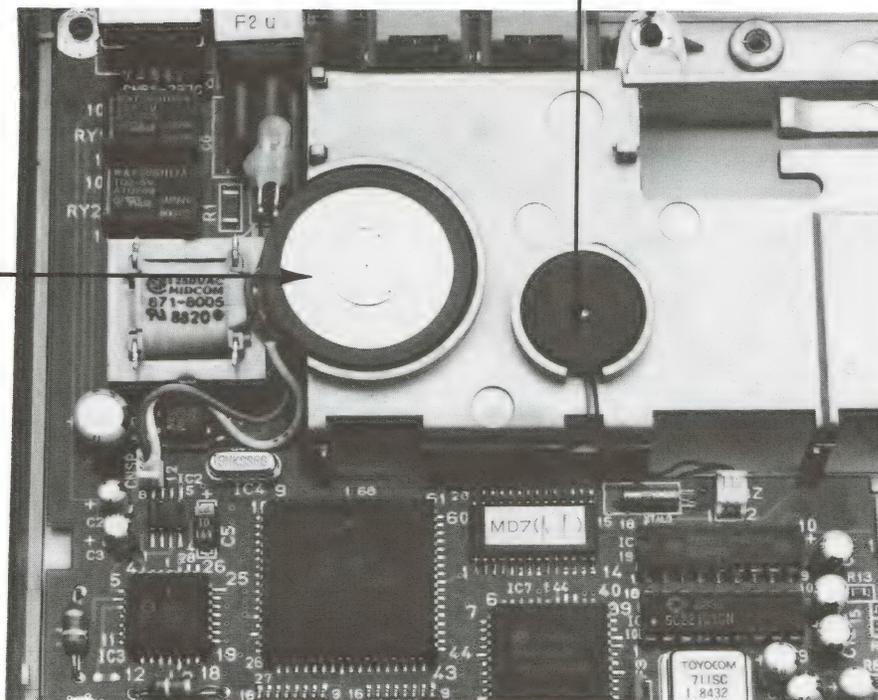
2. Install the Ground Sheet and Ground Plate, fasten them with two screws. (Re-install the Cabinet Latches to the Bottom Cabinet, if necessary.)
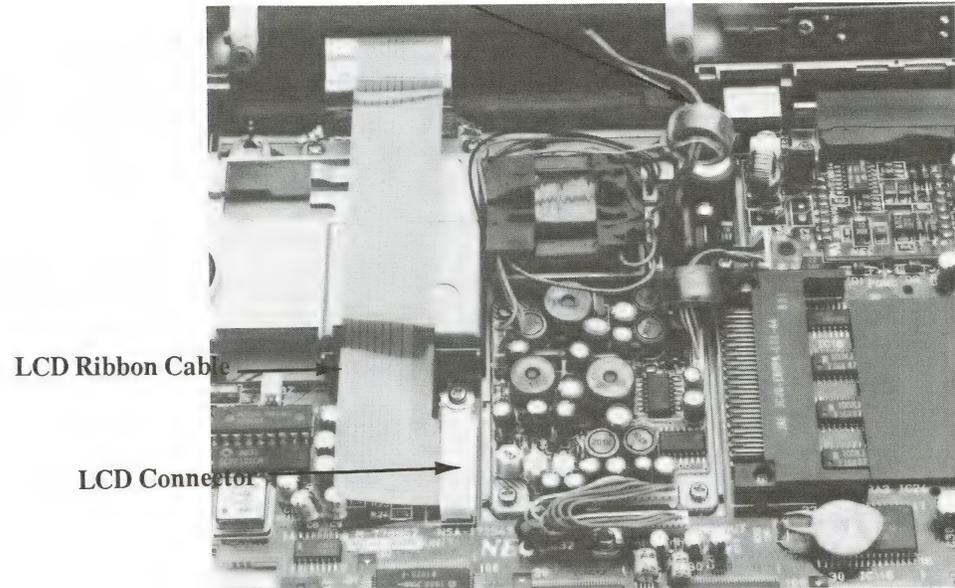

Ground Sheet
Ground Plate
Ground Plate Screws
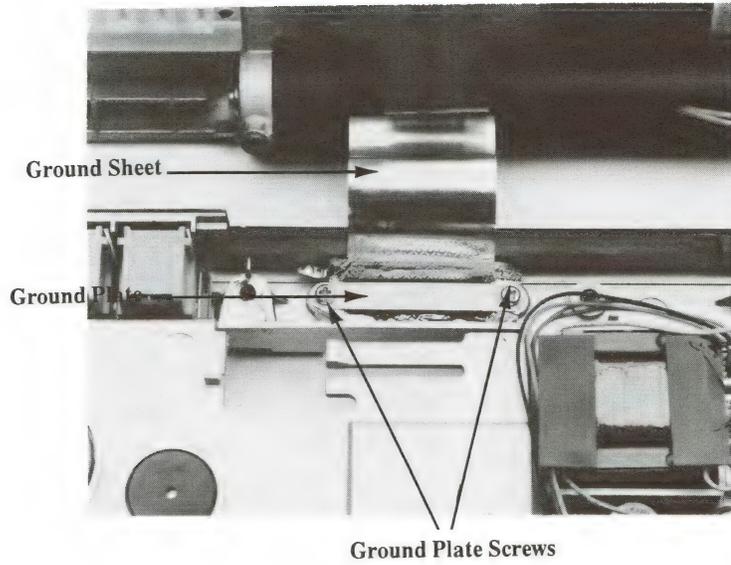
3. Attach the Contrast Control Connector.

Contrast Control Connector

4. Insert the LCD ribbon cable into the connector and slide the white portion of the connector in.

Red Connector

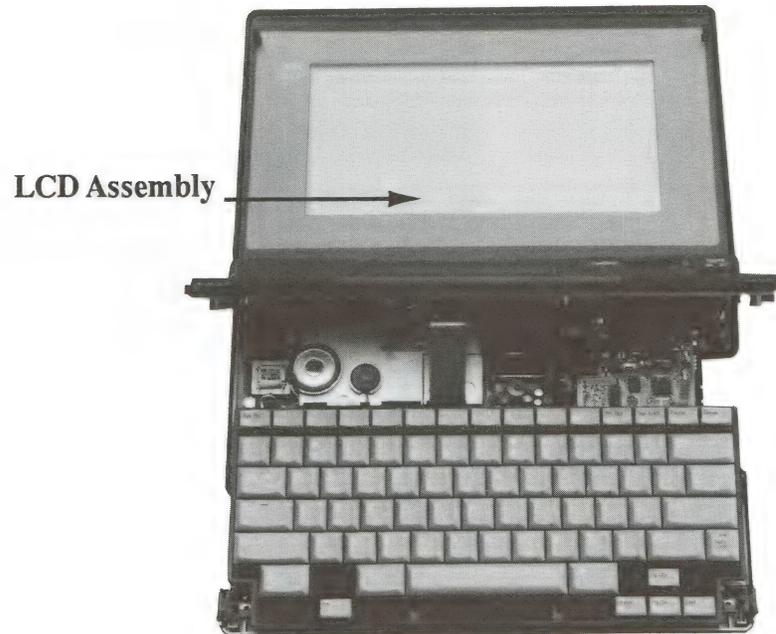LCD Ribbon Cable

LCD Connector

5. Install the Keyboard and RAM/ROM Card Guide, use one screw to fasten the Keyboard. Attach the green connector.


Green Connector

Keyboard Mounting Screw
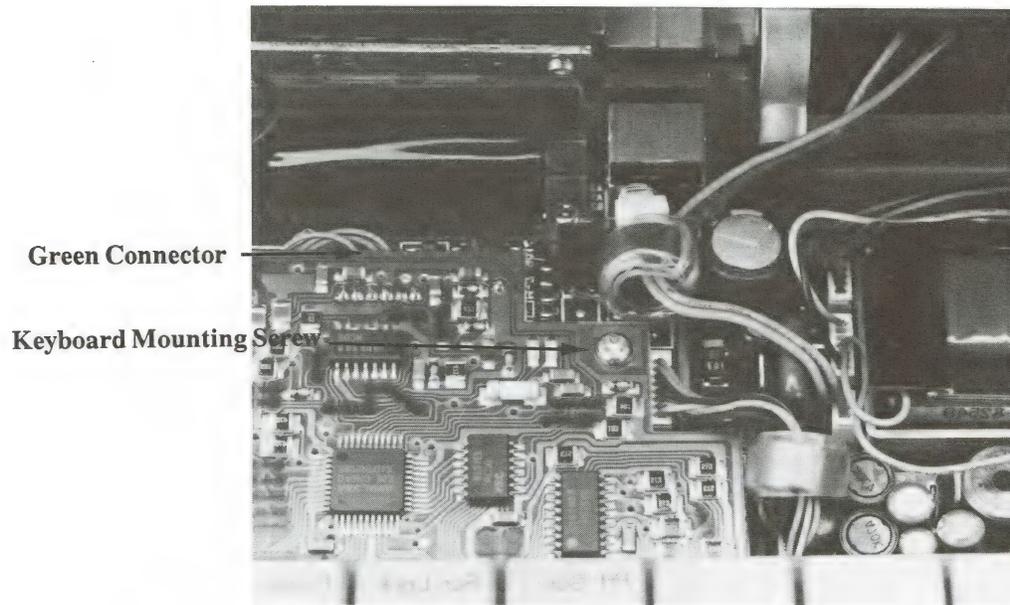
6. Snap the LCD Assembly to the Bottom Cabinet and carefully turn the unit over. Make sure the springs of the cabinet latches are installed properly. (They should be straight, not bent.)

LCD Assembly

7. Fasten the LCD Assembly to the Bottom Cabinet with the eight black screws. Also replace the RAM/ROM Card Slot cover.

Screws

Screws
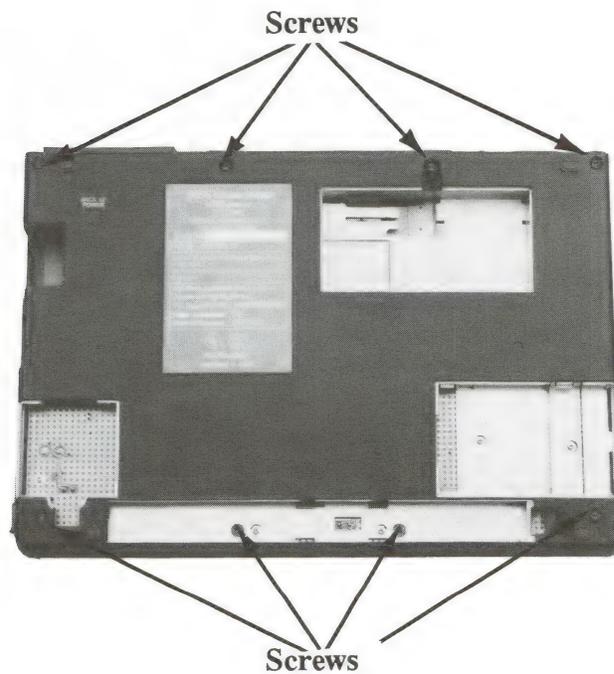
8. Install the batteries and battery covers (NiCd and Molicel Batteries).

Molicel Battery ————

NiCd Battery ————
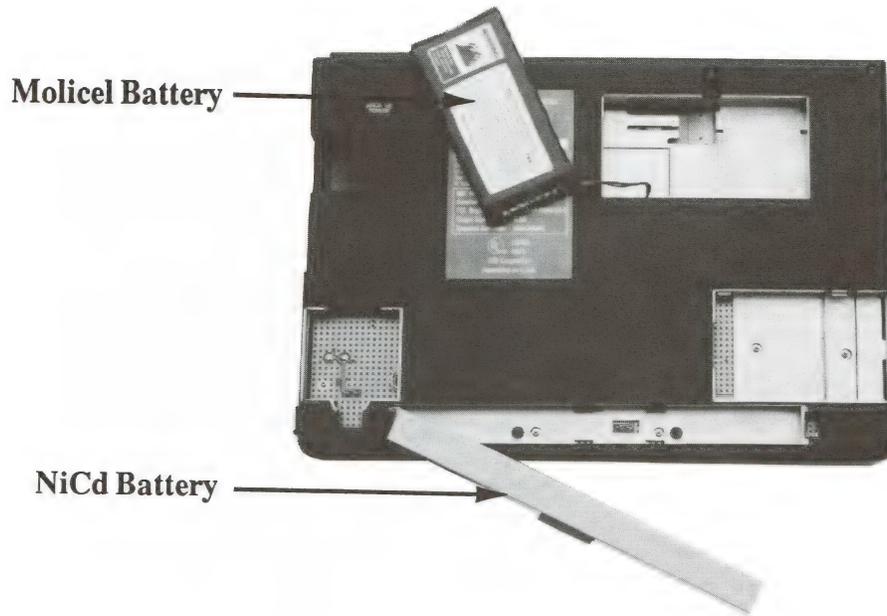
Installing the ROM PWB and Silicon Hard Disk

1. Slide the Silicon Hard Disk into the Silicon Hard Disk Slot.

ROM PWB ————   ———— **Silicon Hard Disk**

2. Slide the ROM PWB into the ROM PWB Slot.

Silicon Hard Disk
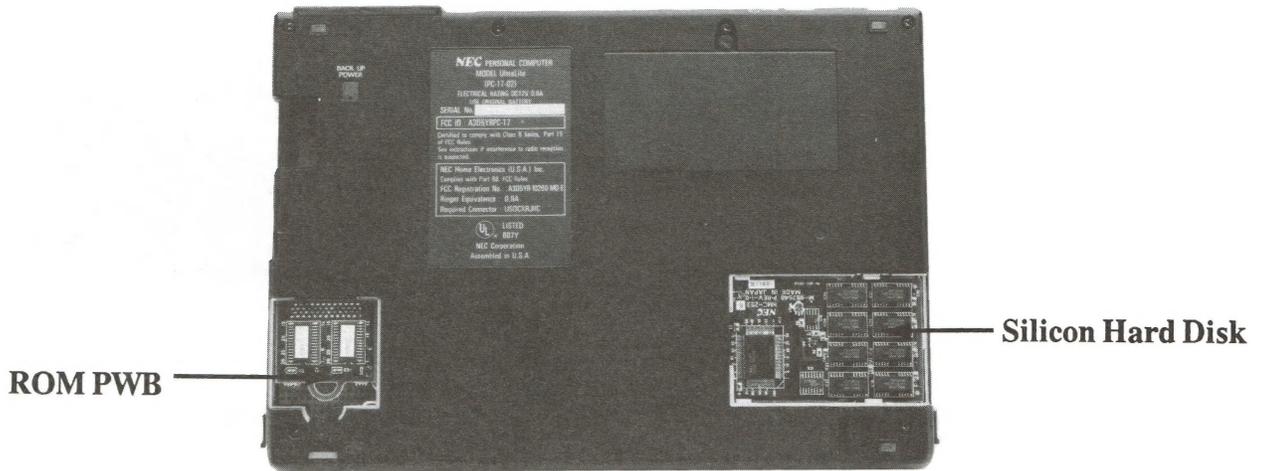
ROM PWB

Installing the Port Covers

Replace the following Port Covers:
- ROM PWB Cover
- Silicon Hard Disk Cover

Si-HDD Cover

ROM Board Cover
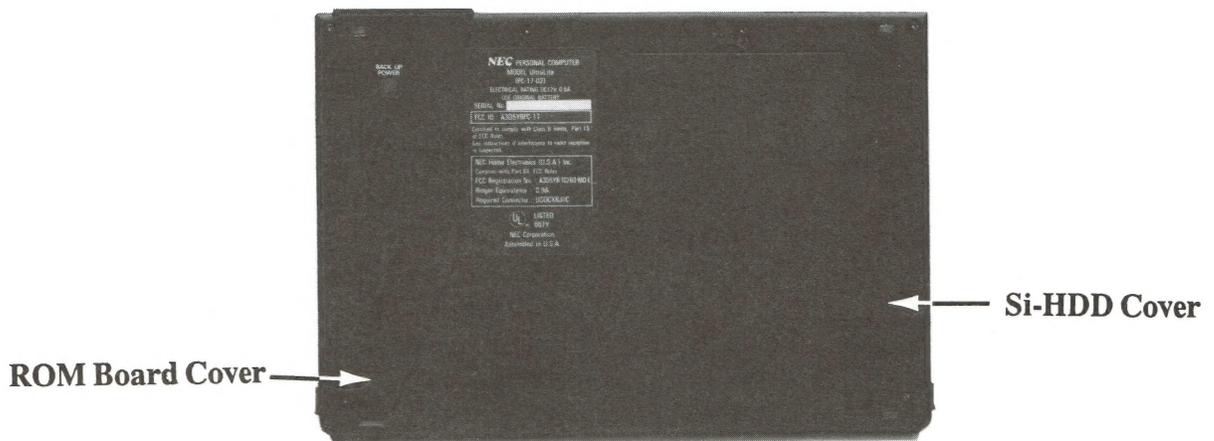
● Telephone Interface Covers (2)
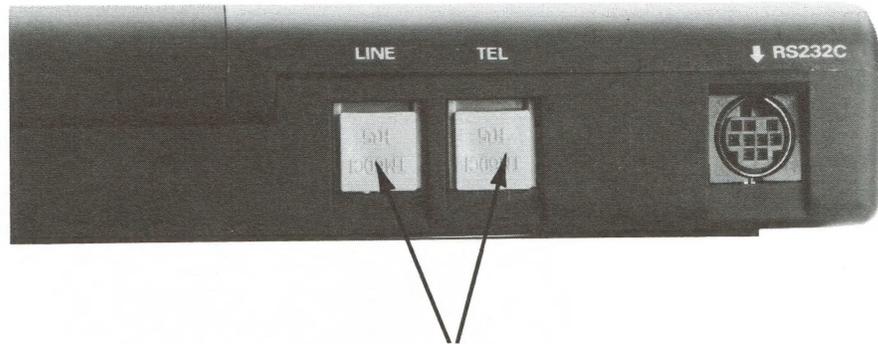
Telephone Interface Covers (2)

4.3. UltraLite Parts List

Sub-Assemblies

Description	P/N
MAIN PWB Assembly	A73-190133-5
Keyboard Assembly	A73-160670-0
Display Assembly (LCD)	A73-190135-5
DC/DC Converter	A73-152237-5
EL Inverter Assembly	A73-152251-5
EL Inverter Tramsformer	A73-152238-5
Speaker Assembly	A73-198698-5
Buzzer Assembly	A73-778376-5
ROM PWB	A73-190134-5
1-MB Si-HDD (HMC-253C)	
2-MB Si-HDD (HMC-253B)	A73-180698-0

Cosmetic Parts

Description	P/N
Bottom Cabinet	A74-778861-5
HD Cover	A74-778283-5
Battery Cover (A)	A74-778280-5
Battery Cover (B)	A74-778281-5
ROM Cover	A74-778282-5
Memory Card Cover	A74-778479-5
External Connector Covers	A74-778299-5
Stopper Knob (L)	A74-778290-5
Stopper Knob (R)	A74-778303-5
Stopper Spring (2)	A74-778295-5

Accessories and Miscellaneous Parts

Description	P/N
256K RAM Card	PC-17-41
3V Lithium Battery (RAM Card)	
AC Adapter	A73-198687-5
RS-232C Cable (Special)	A73-167059-5
Parallel Adapter	PC-17-61
Molicel Battery	A73-160667-5
NiCd Battery	A73-160668-5
3.5" Floppy Drive	PC-17-31
Phone Connector Covers	A73-167056-5
TEL Cable (A)	A73-167057-5
TEL Cable (B)	A73-167058-5
Diagnostics	
Maintenance and Service Manual	
Quick Start Guide	79060484
Portable Guide	79060485
Comprehensive User's Guide	79060483

Appendix A: I/O Connectors

EXT Connector

NUMBER	SIGNAL	FUNCTION
A1,B1 A3,B3 A4,B4 A5,B5 A6,B6 A7,B7	GND	Signal Ground
A2,B2	+5VDS	EXT Equip. detect signal
A8,B8	+5V	+5V Power to Ext from UltraLite
A9	DBM7	
A10	DBM6	
A11	DBM5	
A12	DBM4	I/O Data Bus
A13	DBM3	
A14	DBM2	
A15	DBM1	
A16	DBM0	
A17	GND	Signal Ground
A18	AB9	
A19	AB8	
A20	AB7	
A21	AB6	
A22	AB5	AB0 ~ 9
A23	AB4	Address Bus (negative)
A24	AB3	
A25	AB2	
A26	AB1	
A27	AB0	
A28.29	NC	
A30,B30	GND	Signal Ground
A31,B31 A33,B33	NC	
A32,B32	+5VACDC	+5V Power to EXT Equip. comes from AC adaptor through UltraLite
A34,B34	GND	Signal Ground

NUMBER	SIGNAL	FUNCTION
B9	RSTP	Reset
B10	IRQ2	Active Low Interrupt Request Level 2 Active High
B11	NC	
B12	IRQ6	Interrupt Request Level 6 Active High
B13	IRQ7	Interrupt Request Level 7 Active High
B14	GND	Signal Ground
B15	IOW	I/O Write Active High
B16	IOR	I/O Read Active High
B17	DRQ1	DMA Request Level 1 Active High
B18	DACK1	DMA Acknowledge Level 1 Active High
B19	DRQ2	DMA Request Level 2 Active High
B20	DACK2	DMA Acknowledge Level 2 Active High
B21	GND	Signal Ground
B22	MCLK	V30 System Clock High Speed 9.8304MHZ (duty 50%) Low Speed 4.9152MHZ (duty 50%)
B23	T/C	Terminal Count (DMA) Active High
B24	I/O CHCK	I/O Channel Check Active High
B25	I/O CHRDY	I/O Channel Ready High---CPU Wait Low---CPU Ready
B26	CPUAEN	Address Enable High---CPU Mode Low---DMA Mode
B27	DSRR	Recognition of EXT Equip. I/O Port 1A2h (Read Only) D7 = H: Exist 　　　L: None
B28	DSSEL	UltraLite Bus Buffer Control Active High
B29	NC	

Modem Port

6-Pin Dupont BERG Modular Jack

PIN NUMBER	SIGNAL LINE	REMARKS	I/O
1		Not Connected	
2	A		I/O
3	RING		I
4	TIP		O
5	A1		I/O
6		Not Connected	

Telephone Port

6-Pin Dupont BERG Modular Jack

PIN NUMBER	SIGNAL LINE	REMARKS	I/O
1		Not Connected	
2	A		I/O
3	RING		I
4	TIP		O
5	A1		I/O
6		Not Connected	

UltraLite RS-232 Connector

PIN	FUNCTION
1	RI (RING INDICATOR)
2	TxD (TRANSMIT DATA)
3	RxD (RECEIVE DATA)
4	RTS (RETURN TO SEND)
5	CTS (CLEAR TO SEND)
6	DSR (DATA SET READY)
7	SG (SIGNAL GROUND)
8	DCD (DATA CARRIER DETECT)
9	DTR (DATA TERMINAL READY)

Memory Card (RAM/ROM) Connector

PIN	SIGNAL	FUNCTION
1	GND	
2		
3	BC	Battery Check
4	CD	Card Signature
5	CE	Card Enable
6	WE	Write Enable
7	OE	Output Enable
8		
9		
10	UB/LB	Upper/Lower
11	VCC	
12	Vpp	
13	D0	Data 0
14	D1	Data 1
15	D2	Data 2
16	D3	Data 3
17	D4	Data 4
18	D5	Data 5
19	D6	Data 6
20	D7	Data 7
21		
22	D8	Data 8
23	D9	Data 9
24	D10	Data 10
25	D11	Data 11
26	D12	Data 12
27	D13	Data 13
28	D14	Data 14
29	D15	Data 15
30		

PIN	SIGNAL	FUNCTION
31	GND	
32	GND	
33	A0	Address 0
34	A1	Address 1
35	A2	Address 2
36	A3	Address 3
37	A4	Address 4
38	A5	Address 5
39	A6	Address 6
40	A7	Address 7
41	A8	Address 8
42	A9	Address 9
43	A10	Address 10
44	A11	Address 11
45	A12	Address 12
46	A13	Address 13
47	A14	Address 14
48	A15	Address 15
49	VCC	
50		
51	A16	Address 16
52	A17	Address 17
53	A18	Address 18
54	A19	Address 19
55	A20	Address 20
56	A21	Address 21
57	A22	Address 22
58	A23	Address 23
59	END	
60		

ROM PWB Connector

PIN	SIGNAL	FUNCTION
A1,B1	GND	Signal Ground
A2,B2	+5V	Host Romboard +5V Power
B3	AB1	
A3	AB2	
B4	AB3	
A4	AB4	
B5	AB5	
A5	AB6	Address Bus
B6	AB7	
A6	AB8	
B7	AB9	
A7	AB10	
B8	AB11	
A8	AB12	
B9	AB13	
A9	DB0	
B10	DB1	
A10	DB2	
B11	DB3	
A11	DB4	Lower Data Bus
B13	DB5	
A13	DB6	
B14	DB7	
A12,B12	GND	Signal Ground
A14	DB8	
B15	DB9	
A15	DB10	
B16	DB11	
A16	DB12	
B17	DB13	
A17	DB14	
B18	DB15	
A18	MERD	Memory Read

PIN	SIGNAL	FUNCTION
B19	SRAB14	Address for OTP or MASK ROM
A19	SRAB15	
B20	SRAB16	Add F4000 FFFFF
A20	SRAB2	CPU Address
B21	SRAB3	Add F0000 ~ F3FFF
A21	SRAB4	-I/O port OE4H Data
A22,B22	EPROMCS	OTP ROM Enable Low Active
B23	MROMCS	MASK ROM Enable Low Active
A23	SELECT	OTP/MASK Select OTP: Open MASK: End
B25,A25	GND	Signal Ground
A24,B24	NC	Reserved
B2	+5V	Host +5V
B3	IOR	I/O Read Active Low
B4	IOW	I/O Write Active Low
B5	DACK3	DMA Acknowledge Level 3 Active Low
B6	DREQ3	DMA Request Level 3 Active High
B7	DBM7	
B8	DBM6	
B9	DBM5	
B10	DBM4	
B11	DBM3	I/O Data Bus 8-bit
B12	DBM2	
B13	DBM1	
B14	DBM0	
B15	CK9.8304M	Clock 9.8304MHZ (Duty 50%)
B16	CHRDY	Channel Ready High--- CPU Ready Low---CPU Wait

Appendix B: Configuration Switches

The bank of four switches is found on the right side of the computer, in the same recessed compartment as the Memory Card Slot. These four switches control, respectively

- CPU Clock Speed
- Built-in Test Program
- Screen Brightness
- The thickness of the characters displayed on the screen

To verify the switch settings:

1. Remove the Memory Card Slot cover by pulling gently.

2. Make sure all switches are in the UP (Off) position.

CONFIG switch summary

switch	controls	default (UP)	alternate
1	CPU Speed	High (9.83MHz)	Low (4.92 MHz)
2	Test Loop	Off	Running
3	screen	bright	Dim
4	characters	thick	thin

CONFIF SW 2 makes the computer inoperable, it places the system in a continous test loop when in the down (ON) position.

The CPU clock speed, screen brightness, and character thickness can also be set with the built-in SETUP program. To avoid conflicts, it is recommended to use the SETUP program to change these settings. Under normal circumstances, the CONFIG Switches should never be changed. Before using the UltraLite, verify the switches are in their default positions.

If any of the switches are changed while the computer is ON, the unit must be turned OFF and then ON for the new settings to take effect.
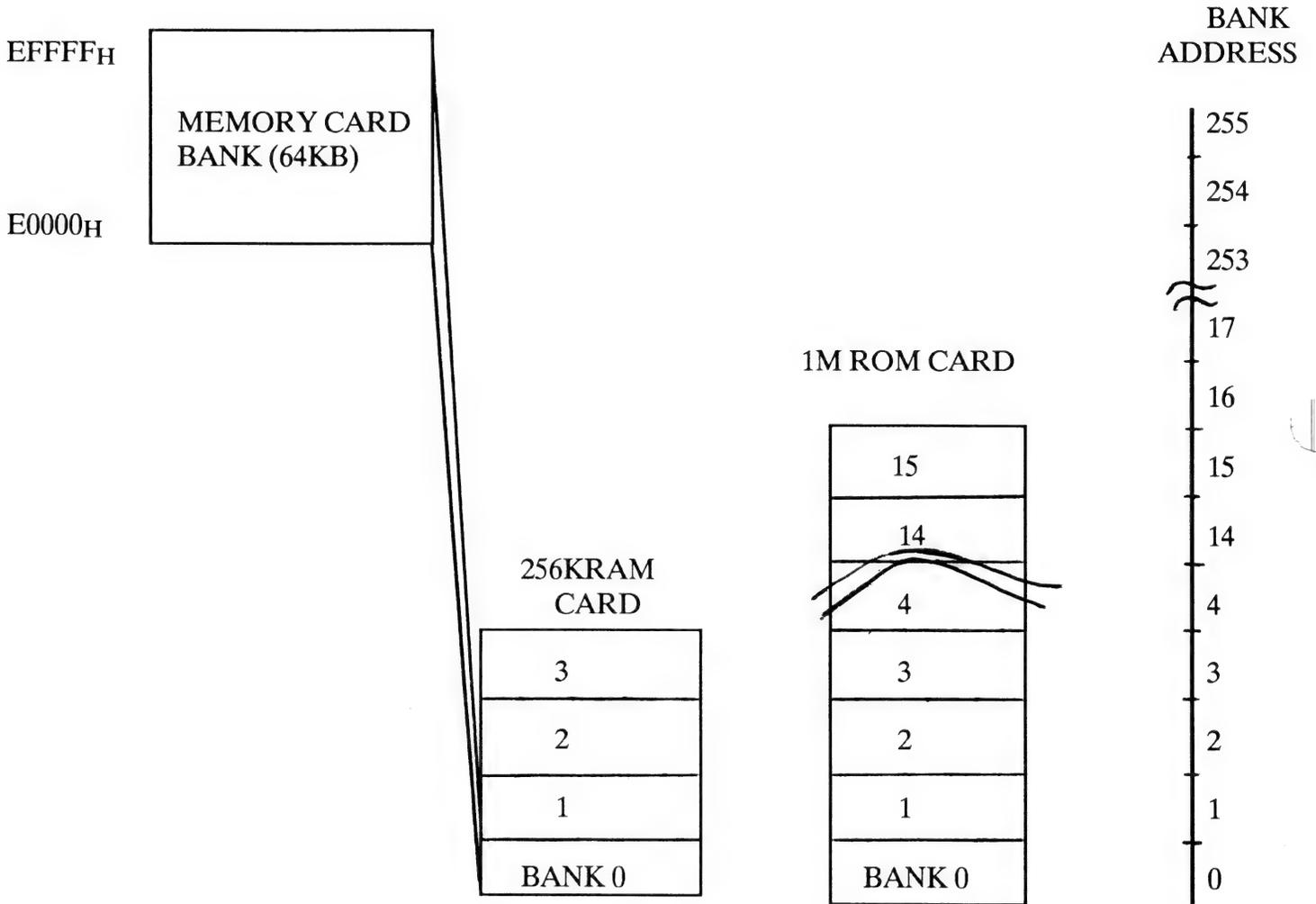
Note: The Configuration switches take precedence over any settings made with the SETUP program.
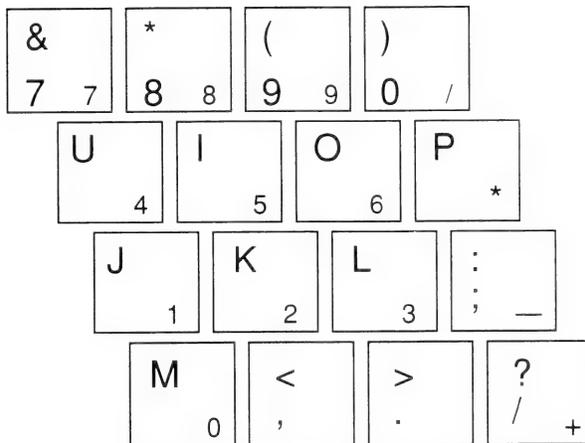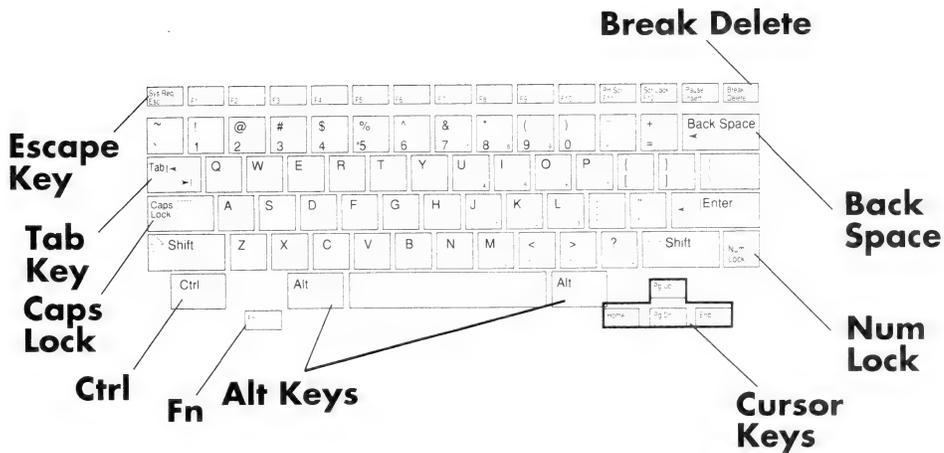
Appendix C: UltraLite Memory Map

FFFFF$_H$

BIOS etc.(48KB)

F4000$_H$

SYSTEM ROM BANK (16KB)

F0000$_H$

MEMORY CARD BANK (64KB)

SEE NEXT PAGE

MASKROM (512KB)

E0000$_H$

C000$_H$

VRAM (16KB)

B8000$_H$

A0000$_H$

MAIN MEMORY (640KB)

00000$_H$

OTPROM(128KB)

IFFFF

| BANK 7 |
| BANK 6 |
| BANK 5 |
| BANK 4 |

C

BIOS

0

80000

BANK 31
∫
BANK 24

60000

BANK 23
∫
BANK 16

A

40000

BANK 15
∫
BANK 8

20000

BANK 7
∫
BANK 4

B

BIOS

0
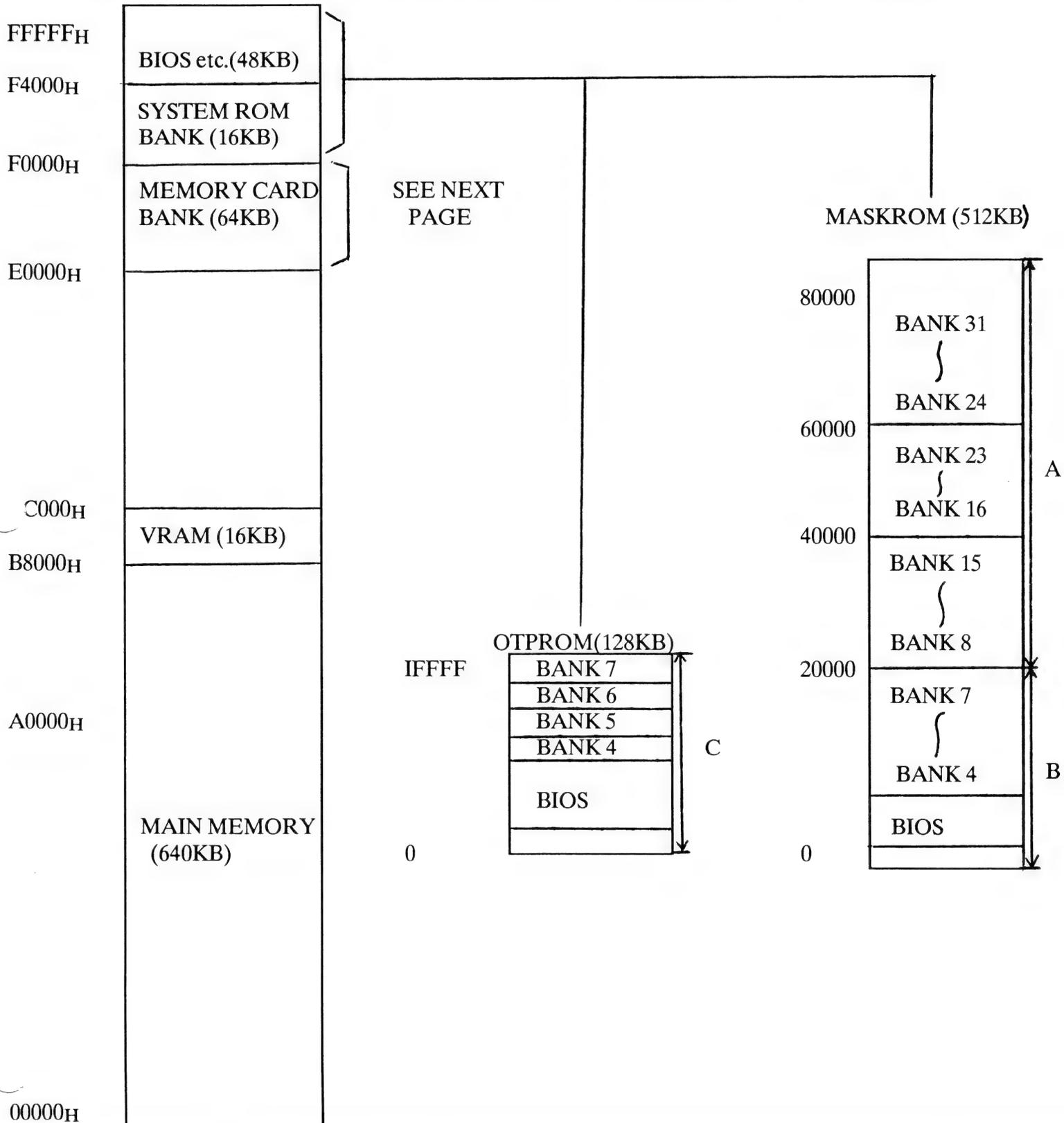
Memory Address Map for Memory Cards

CPU MEMORY MAP

EFFFF_H

```
┌─────────────────────┐
│                     │
│  MEMORY CARD        │
│  BANK (64KB)        │
│                     │
```

E0000_H

255

254

253

17

1M ROM CARD

16

15	15
14	14
4	4

256KRAM
CARD

3	3	3
2	2	2
1	1	1
BANK 0	BANK 0	0

Appendix D: Keyboard Layout

Break Delete

**Escape
Key**

**Tab
Key**

**Caps
Lock**

Ctrl

Fn

Alt Keys

**Back
Space**

**Num
Lock**

**Cursor
Keys**

**Embedded Keypad
(Depress the Num Lock Key to access)**

Appendix E: Internal Software Error Codes

Appendix E contains the error messages generated by the internal software programs.

SETUP Messages

The SETUP program has one error message which appears when the PALETTE command is selected with the Color Parameter set to Emulation Mode. Color must be set to Contrast Mode in order to use the PALETTE command.

You cannot execute this command when Color Mode is set to Emulation. Press any key to continue.

MS-DOS Manager Messages

Note: Press the F1 function key for more information when MS-DOS Manager displays an error message on the screen.

Cannot change directory to dir

The directory specified does not exist in the path specified. Check to make sure the correct path for the directory was entered.

Cannot copy FILENAME to itself

MS-DOS Manager cannot make a copy of a file in the same directory without a new name for the file. A new name probably was not entered. Enter a new name and try to copy the file again.

Cannot copy multiple files to a single destination

MS-DOS Manager cannot copy a set of source files specified with the wildcard character (*) to a single target (or destination) file or to a directory that does not exist. To copy the files to a new directory, first create the directory; then copy the files to that directory using wildcards. Keep in mind, MS-DOS Manager cannot combine more than one file into a single file.

Cannot create directory

The name given for the new directory is either invalid or already exists. Try again using a different directory name.

Cannot create FILENAME

MS-DOS Manager cannot create the file requested either because an invalid filename was specified or the disk is full. Use the DISK INFO command to check the disk for amount of available space. If there is enough space on the disk, try specifying a different name for the new file.

Cannot delete FILENAME

MS-DOS Manager cannot delete the file specified because the file has read-only attributes. The file has read-only protection and is not intended to be modified.

Cannot find FILENAME

MS-DOS Manager cannot locate the file that is to be copied, moved, or renamed. Make sure the correct path was specified for the file, or use the LOCATE command to find the correct pathname.

Cannot move FILENAME

MS-DOS Manager was instructed to move the file to a file that is invalid or already exists. If the file that is to be moved is on a floppy disk, first check to see if the disk is write protected. If not, try using the MOVE command again using a different filename.

Cannot perform this operation on a device

MS-DOS Manager will not allow a device file to be deleted.

Cannot read from drive n:

MS-DOS Manager cannot access a formatted disk in the disk drive specified. Make sure the specified drive contains a formatted disk. Also check to see if the disk or RAM/ROM Card is inserted correctly. Then, try the operation again.

Cannot rename FILENAME

When MS-DOS Manager prompted to rename a file, a filename that was invalid or already existed was used. Try using the RENAME command again with a different filename.

Cannot run FILENAME

A file that is neither executable (it does not have a .BAT, .COM, or .EXE extension) nor has an extension belonging to one of the installed applications was trying to be run. If the file is an application file, use the Modify Application List command to add the filename's extension to that application's list of extensions.

Insufficient disk space for this application

The disk being used for the copy or move operation does not have enough free space for the new file. Free up some disk space by deleting any files on the disk that are not needed anymore, or copy or move the file to a new disk.

Insufficient memory available to complete this operation

MS-DOS Manager cannot complete the command request because there is not enough free space in the computer's internal memory.

Invalid date format

The correct format was not used when the date was entered. Try entering the date again using the format mm-dd-yy, where mm is the month, dd is the day of the month, and yy is the last two numbers in the year.

Invalid time format

The correct format was not used when the time was entered. Try entering the time again using the format hh:mm[AM/PM], where hh is the hour and mm is the minutes.

Please specify a filename at the prompt for this operation

The name of the source file for the operation was not entered. Try the operation again, and enter the name of the source file.

MS-DOS Manager cannot rename a file across disk drives

The RENAME command cannot be used to copy a file to a new disk and be renamed at the same time. Copy or move the file to the new disk, then rename it.

To delete a directory, all files in the directory must be deleted first.

The options are set for directories to be empty before they can be deleted. MS-DOS Manager will not delete a directory if there are any files in it. Either delete the files in the directory before deleting the directory or change the options in the Delete Options command so MS-DOS Manager can delete directories that are not empty.

Write-protect disk in drive n:

The files on the disk cannot be modified (written to or editted) because the disk has been protected. Copy the files that are to be modified to a disk that is not write-protected. Or, disable the write-protection by sliding the plastic tab over the write-protect window in the lower lefthand corner of the disk. On a RAM Card, flip the tiny switch on the back of the card to the correct position.

Lap-Link Messages

There are two kinds of Lap-Link error messages:

- Critical
- Status, Alerts

Critical Error Messages

Three critical errors will pause LAP-LINK and require corrective action. If one of these critical errors is encountered, a message appears on the screen with information concerning the problem and asking for the next steps to be taken: Retry, Ignore? Press R to retry the command or I to ignore the command and resume the program. (I may need to be pressed several times). Critical error messages appear only on the computer at the time the problem occurs.

Drive A: not ready

Retry, Ignore?

Either there is no disk in the drive, the disk is not formatted for that computer, or there is a bad sector on the disk.

Drive x: write protected

Retry, Ignore?

For 5 1/4" disks, remove the write-protect tab. For 3 1/2" disks, move the write-protect tab so the window is closed. For UltraLite RAM Cards, flip the write protect switch on the back of the card. Then, press R to continue.

General failure error

Retry, Ignore?

The most common cause of this message is a bad sector on the disk. Retry once or twice to correct the situation. If that fails, press I until the program resumes; then exit and track down the problem.

Status, Alert Error Messages

The other type of LAP-LINK error messages are status and alert error messages. Most appear in the message line of the LAP-LINK screen, others appear as part of the report LAP-LINK issues while copying files.

Cannot erase default subdirectory

The ERASE-DIR command was used in the directory tree to erase the currently logged directory (highlighted on the screen). Use the LOG command to log onto a different directory and try again.

Cannot erase NAME

NAME is the name of the directory or the designation for either the root directory (.) or the parent directory (..). Like MS-DOS Manager, LAP-LINK will not erase a directory that contains subdirectories. Under no circumstances can the root directory be erased.

Cannot find LL.*EXE. Your Options settings were not saved.

An attempt to save the current settings of the Options Menu was made, but LAP-LINK could not locate its operating program, LL.*EXE, on which the settings must be saved. On a remote floppy disk system, be sure the disk with the working copy of LL.*EXE is in the currently logged drive. On a hard disk or a floppy disk with more than one level of directories, you must be logged onto the directory in which LL.*EXE is stored.

Cannot find path NAME

An attempt to log onto a directory that does not exist was made. Reactivate the LOG command and type the correct drive, pathname, or both. This error also occurs when in the root directory and an attempt is made to move to the parent directory by entering ".." after activating the LOG command.

Cannot rename a subdirectory ...

LAP-LINK doesn't allow subdirectories to be renamed. Use MS-DOS Manager's RENAME command under the File Menu.

Cannot rename FILENAME 1 to FILENAME2

either FILENAME1 or FILENAME2 is an invalid filename or FILENAME2 already exists in the current directory.

Cannot restart. No previous Wildcopy

The WILDCOPY command has already been activated and = r as the file specification was entered without having a Wildcopy process aborted. The = r specification can only be used after a Wildcopy process has been aborted because the ESC key was accidentally pressed or LAP-LINK experienced trouble in the copy process.

Cannot view a subdirectory

The VIEW command only works when the highlighted bar selects a file.

Checksum error on block xxxx

An error occurred while LAP-LINK was attempting to send or receive a block of data. The block will be resent until it is received correctly or until there are 10 consecutive errors, at which time the COPY command will be aborted. This error should not occur often; if it does, the fault may be with the cable (it may be too long) or with one of the serial ports (it may be limited in the baud rate at which it can be operated). Use the BAUD option to lower the baud setting.

Checksum error on header block

An error occurred while LAP-LINK was sending or receiving the header block of a file. (The header block contains the name, size, date, and other information about each file.) The block will be resent until it is received correctly or until there are 10 consecutive errors, at which time the COPY command will be aborted. Retry the operation. If the error persists, try setting a lower baud rate using the Baud option or shorten the LAP-LINK cable.

Copy aborted. Press any key to continue ...

This message appears whenever a copy operation is aborted. If the cause is a full target disk, "Target Disk Full! Use Wildcopy to continue..." also appears.

The ESC key may have been pressed accidentally. The COPY operation can continue where it left off: Press any key to return to the LAP-LINK screen. Insert a new formatted disk if the current disk is full, then press W Y.

Could not erase name

The ERASE command in Group cannot erase a hidden or read-only file. Use the Primary ERASE command to erase the file.

Could not find COM1: (or COM2:) Switching to COM2: (or COM1:)

Press any key to continue ...

The Serial Port specified by the Communications Port option in the Options Menu may be incorrect. The UltraLite port should be COM1:, the port on the remote computer may vary.

Could not find COM2: (or COM1:) Right window switching to Local ...

Press any key to continue ...

This messages appears only after the previous message. It means the computer has no COM1 or COM2 Serial Port. When any key is pressed, the LAP-LINK screen appears, but both the right and left windows will be displaying files only for the local computer. Without either serial ports, only the files on the local computer can be managed. Communications with another computer through LAP-LINK is not possible. This message only occurs on the remote computer.

Could not find DRIVE\PATH\FILENAME

LAP-LINK could not find the specified file or files.

Note: If LAP-LINK has been directed to include subdirectories in a copy, this message appears once for each subdirectory in which the specified file does not exist.

Could not find startup name

After an aborted COPY operation with the WILDCOPY command, the operation has been restarted. But, LAP-LINK cannot find the startup file with which it will resume the operation. LAP-LINK may not locate this file because it has been moved, renamed, or is stored in a subdirectory of the current directory and the COPY FROM SUB-DIRECTORIES is set to NO.

Error on block xxxx

See Checksum error on block xxxx.

File create error

LAP-LINK could not create the file. If the directory is full, either erase files to make room or copy to another directory or disk.

File exists! Overwrite it? (Y/N)N

Through the Confirm Before Overwriting option, LAP-LINK has been instructed not to copy over files of the same name without confirmation. Press Y to copy over the file; press any other key if the file should not be copied over the existing file. To instruct LAP-LINK not to ask for confirmation before overwriting files of the same name, set the Confirmation Before Overwriting option (in the Options command) to NO.

FILENAME is marked as read-only. OK to erase? (Y/N) N

This message is intended to keep read-only filed from accidentally being erased. If a read-only file is to be erased, press Y.

File (s) not within specified time frame. Not copied!

During copying, this message appears for each file that does not fit within the time frame specified by the COPY DATE RANGE and the COPY DATE options. To remove the time frame, activate the OPTIONS command, move the highlighted bar over COPY DATE, press any numeric key, and then press ENTER. As long as mm/dd/yy is listed for this option, files will not be selected by date or time.

LAP-LINK: Not enough memory ...

There must be at least 197,000 bytes of free memory to run LAP-LINK

Press any key to continue ...

To run LAP-LINK, there must be at least 197,000 bytes of free memory on the computer. Use the DOS command CHKDSK. The value for bytes free listed at the end of the status report should read approximately 197,000 or more.

NAK error on block xxxx

See Checksum error on block xxxx.

NAK error on header block

See Checksum error on header block.

No tagged files found ...

The COPY or ERASE commands have been selected within the Group command without having tagged any files.

Not enough room for command processor or COMMAND.COM not found ...

Press any key to continue ...

If the System disk has been removed since booting the computer, replace the disk and try again.

Remote system in control ...

This message appears on the screen of either computer when a primary command has been selected on the other. Each machine regards the other system as remote and itself as local.

Remote system not active ...

There is no communications with the remote computer. There are several possible causes:

- The cable may not be connected correctly.

- The baud setting (Baud Option) may not be the same for both computers or is set too high.

- The designation of the Serial port is incorrect. (Communications Port Option)

- The remote computer may have locked up or has quit out of the program.

Check the ADDRESS and INTERRUPT switches/jumpers on the COMMUNICA-TIONS PWB to ensure the switches/jumpers are set correctly.

Sector error count on block xxxx

A COPY operation failed at the specified block count. LAP-LINK will resend the block until the sector error count is correctly received or until there are 10 consecutive errors, at which time the COPY command will be aborted.

Source file is older than target file. Not copied!

If the COPY NEWER FILES ONLY option is set to YES, this message will appear for each file that is not copied from the source disk because it is older than the copy of the same file on the target disk. Set the COPY NEWER FILES ONLY option to NO to overwrite files on the target disk without considering whether they are newer or older.

Target disk full! Use Group Copy to continue ...

More files that can be copied to the target disk have been tagged. Press a key and insert a formatted disk into the target drive. Remain in the GROUP command and press C to copy files still tagged.

Note: Files already copied to the target disk no longer are tagged.

Target disk full! Use WILDCOPY to continue ...

See COPY aborted. Press any key to continue ...

Target file is read-only. Not Copied!

An attempt to copy a file that already exists on the target disk as a read-only file was made. LAP-LINK will not allow this file to be overwritten.

Target file is unmodified. Not copied!

If COPY NEWER FILES ONLY option is set to YES, this message appears for each file that is not copied from the source disk because it is not different from the copy of that file on the target disk. (The dates and times match exactly, to the nearest two seconds.) Set the COPY NEWER FILES ONLY option to NO to overwrite files on the target disk without considering whether they have been modified.

Timeout error

LAP-LINK did not get a timely response during the copy process. It will try again, up to 10 times, before aborting. This message will appear if the target disk is very slow or if either drive went offline during the copy process.

Modem Error Conditions

Double printing of your keystrokes

The UltraLite is probably set to HALF DUPLEX and the unit is connected to a remote system that is echoing the input. Select FULL DUPLEX from the Communications program.

Call cannot be completed as dialed

Has an outside line been obtained, dialed 1 for long distance, and chosen pulse or tone dialing?

Has the modem directory been reset with the correct area codes to dial from the present location?

No carrier message

The No carrier message appears when the telephone connection between the UltraLite and the remote computer has been broken. This can be due to several causes:

- The remote computer terminated the session normally, because of incorrect passwords, a long period of inactivity on the line, etc.

- The remote computer failed or the telephone connection failed.

- An incoming call under CALL WAITING SERVICE confused the modem program.

UltraLite won't answer incoming call

The modem's S-register, S0, defines when to answer an incoming call. To answer on the first ring, set $S0 = 1$.

Unable to place call

The UltraLite phone cable should connect the LINE socket on the back of the UltraLite to the telephone wall outlet. The cable may be connected to the PHONE socket on the UltraLite or to an incompatible connector.

For more information concerning the internal 2400 BPS modem, see pages 149 -171 in the Comprehensive User's Manual.

Unable to see what was typed

If messages are received from the remote computer, but text typed on the UltraLite cannot be seen, one of two things can be done:

- Select the HALF DUPLEX mode from the communication program.

- Request the remote computer to echo the transmission.