User's Reference Guide

TravelMate™ 4000M Notebook Computer

P/N 9793374-0001, Rev. A

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TEXAS INSTRUMENTS

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Changes may be made periodically to the information in this publication. Such changes will be incorporated in new editions of this manual.

Preface

Your TravelMate 4000M computer comes with a variety of standard features and options that maximize system performance and ease of operation. This manual acts as a reference for software utilities and hardware included with your notebook.

Chapter 1- Shows you the basics of system setup using the supplied Setup programs.

Chapter 2 - Provides information on system software configuration and utility installation.

Chapter 3 - Describes custom Windows utilities.

Chapter 4 - Describes the functionality of Laptop Manager in managing your application programs.

Chapter 5 - Describes Power Saving utilities.

Chapter 6 - Describes utilities designed to enhance and customize your display.

Chapter 7 - Describes Laptop File Manager, a program that helps you manipulate files and directories stored on the hard disk.

Chapter 8 - Describes utilities that allow you to connect an external VGA to your system.

Chapter 9 - Describes miscellaneous utilities for configuration and system enhancement.

Chapter 10 - Describes the Sound utilities provided with your notebook.

Chapter 11 - Describes options you may purchase for your TM4000M computer.

Chapter 12 - Describes the optional Portable CD-ROM Docking System.

Appendix A - Provides system specifications for the TM4000M.

Appendix B - Displays character sets used by the TM4000M.

Appendix C - Displays domestic and international keyboard layouts.

Appendix D - Describes diagnostics and error codes for your TM4000M.

Appendix E - Describes the power consumption values for your TM4000M.

Appendix F - Describes memory configuration for your TM4000M.

Appendix G - Describes connector pin assignments for the TM4000M and Portable CD-ROM Docking System.

Appendix H - Describes screen stardards supported by the TM4000M internal display adapter.

Appendix I - Describes how to custom design your own Help displays.

A *glossary* and *index* are also provided for your reference.

1
Using the Setup Programs

This chapter explains:

- ❑ How to access the Setup Programs
- ❑ How to select and save parameters

Contents

Accessing the Setup Programs

Your computer has three setup programs to assist you in selecting required hardware and software parameters:

- ❑ Disk-based Setup
- ❑ ROM-based Setup
- ❑ Windows-based Setup

Initial Startup Procedure

The first time you boot up your notebook, your system automatically runs Setup. The following questions are asked:

1. You are asked which country your keyboard is designed to support.

Once this information is provided, the Windows Setup program automatically runs.

2. You are prompted for your name and program serial number.

3. You are asked which printer you would like as a default printer.

You exit Windows. System files are automatically unzipped and the system build begins. When complete, a video greeting appears. After it runs, the following options appear:

***No Change** - keep the video and allow it to run each time you boot the computer*

***Remove** - removes the video entry from the startup file so that you keep the video, but it does not run each time you boot the computer*

Delete *- delete the video (the video takes up 12 MB of hard disk space)*

5. Make your selection.

The system reboots to the Startup Menu.

Startup Menu

Each time your system boots, the Startup Menu appears. You have ten seconds to make selections from this menu, otherwise the boot process continues with previously configured parameters. The following is a description of the Startup Menu:

Startup Menu Options

Option	Description
Standard Windows for Workgroups (default)	Loads PCMCIA drivers
Docking System Windows for Workgroups	Loads PCMCIA and CD-ROM (SCSI) drivers
Minimum Windows for Workgroups	No drivers loaded (leaving more memory)
Minimum Docking System Windows for Workgroups	Loads SCSI drivers (leaving more memory)
System Maintenance	Deletes demo games and allows you to create back up system diskettes
Games Demonstration	Allows you to view or play pre-loaded games on the notebook.

To select an option, use the up and down arrow keys or press the number key of the option you desire. This highlights the option. Press Enter to select the desired configuration.

Creating Backup System Diskettes

You should create your back up system diskettes as soon as possible after purchasing your notebook. To create backup system diskettes, complete the following steps:

1. Ensure that you have 17 (for U.S.A.) or 18 (all other countries) high density, 1.4 MB, 3.5" diskettes.

2. Boot your system.

   System startup begins. A DOS Startup Menu appears.

3. Select option 5, **SYSTEM MAINTENANCE AND BACKUP**.

   The system backup menu is displayed. You can select files from the left column to back up by using the up and down arrow keys to highlight the files. As filenames in the left column are highlighted, a description of them appears in the right column and the number of diskettes required for these files is displayed.

4. To begin creating the system backup diskettes, insert the diskette into the floppy drive and press **ENTER** to back up highlighted files. Backing up all files requires 17 to 18 diskettes. Each diskette will automatically be formatted.

You may access the Setup program at a later time to reset previously configured parameters.

System Recovery Diskette

You should have received a System Recovery diskette with your notebook. This is a bootable diskette with backup software and enables you to restore minimum system files. After the computer boots for the first time, you are prompted to insert your System Recovery diskette. Ensure that you make two additional copies of this diskette.

You should keep your System Recovery diskette updated with your latest Windows configuration. To do this, complete the following steps:

1. The first time you complete a new addition or change to Windows (such as adding a new software icon), manually copy all *.GRP and *.INI files to the first copy of the System Recovery diskette. These files are located in the C:\Windows directory.

2. The next time you complete a new addition or change to Windows, you should manually copy over all of the *.GRP and *.INI files to the second copy of the System Recovery diskette.

3. After each subsequent change, you should alternate making the backup of *.GRP and *.INI files to the first and second copy of the System Recovery diskette.

Accessing Disk-Based Setup

This Setup program, which resides on the hard disk under the UTILS directory, defines all default and most user-selectable parameters. Disk-based Setup contains four screens, or pages, with onscreen prompts plus a context-sensitive online help.

From the **C:\>** prompt, you can access Page 1 of disk-based Setup in two ways:

- Press **FN-ESC** (**SETUP**)

- Type **SET_UP** and press **ENTER.**

After Setup has loaded, you can define parameters based on the information in the online help or in this chapter.

Accessing the Setup Programs

Accessing ROM-Based Setup

ROM-based Setup resides in internal ROM. It is identical to disk-based Setup except it does not have any online help.

To access Page 1 of ROM-based Setup, save any work in progress, and press **CTRL-ALT-ESC**. You can then select parameters as you do for disk-based Setup. The system reboots even if changes are not made.

Accessing Windows-Based Setup

To access Windows-based Setup, select the Windows Control Panel in the Main Windows group. Then double-click the WSetup icon. You can then define parameters based on the information in the online help and in this chapter.

Changes to many of the Setup parameters take effect only at system startup. If you change one of these parameters, when you save the new Setup parameters, you are prompted that you need to exit Windows and restart the computer. To put these changes into effect, double-click on the Super Shutdown icon to exit Windows, then press **CTRL-ALT-DEL** to restart the computer.

Defining Setup Parameters

The three Setup Programs adequately describe what you need to do to navigate through the menus, use cursor keys, save parameters, and exit.

Note: The Setup Programs are customized for each model computer and for any given model may not support all of the selections described in the following pages.

Date and Time Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Time	Pressing the space bar when seconds are highlighted resets seconds to 00.	Page 1	Main ⇓ Control Panel ⇓ International ⇓ Time Format
Date	The day-of-week value is set automatically when you set the date.	Page 1	Main ⇓ Control Panel ⇓ International ⇓ Date/Time
Date Display (Time Display)	Determines whether the time is displayed in 12-hour or 24-hour format. **Values:** US (12-hour) (default) European (24-hour)	Page 1	Main ⇓ Control Panel ⇓ International ⇓ Time Format

Disk Drive Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Diskettes Drives Drive A, Drive B	Do not change from defaults unless external floppy drive configured as floppy drive **Values:** 3.5", 1.44 MB (default, Drive A) 3.5" 720 KB, 5.25", 360 KB, 5.25", 1.2 MB Not installed (default, Drive B)	Page 1	Cannot change. Use disk- or ROM-based Setup
Hard Disk 1 & 2	Do not change.	Page 1	Cannot change. Use disk- or ROM-based Setup

Input/Output (I/O) Parameters

The input/output (I/O) parameters define how the computer treats the following I/O devices:

- ❑ SerialPort
- ❑ Parallel port
- ❑ SCSI
- ❑ PCMCIA
- ❑ Game Port
- ❑ PS/2 Port

You can use these parameters to enable and define the ports.

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Standard Comm (Serial Port)g11	Defines whether the port is enabled **Values:** Enabled (default) Disabled	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ Serial Ports
Port	Determines whether port is COM1 or COM2. **Values:** COM1 (default) COM2	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ Serial Ports

Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Baud Rate		Page 4	Refer to your Windows documentation
Data Bits	**Values:** 7, 8 (default)	Page 4	Refer to your Windows documentation
Stop Bits	**Values:** 1 (default), 2	Page 4	Refer to your Windows documentation
Parity	**Values:** Odd, Even, None (default)	Page 4	Refer to your Windows documentation
Parallel Port	Defines whether parallel port enabled **Values:** LPT 1 (default) LPT 2 LPT 3 Disabled	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ Parallel
EPP Mode	**Values:** Disabled SPP (default) EPP and SPP ECP ECP and EPP	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ Parallel Port ⇓ Extended Mode

Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
SCSI BIOS	**Values:** Disable (default) Enable	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ SCSI BIOS
PCMCIA	Selects status for PCMCIA option **Values:** **Hardware-** OFF ON **BIOS-** OFF ON		Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ PCMCIA
Game Port	Selects status for MIDI/Joy Port **Values:** OFF ON		Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ Game Port
PS/2 Port	Selects device for PS/2 port **Values:** Disabled, Mouse, Keyboard Auto (default)=detects whether keyboard or mouse attached	No access. Use Windows-based Setup or the SETKEY command in MS-DOS.	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ PS/2 Port

Keyboard Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Caps Lock	Startup status of Caps Lock indicator **Values:** On Off (default)	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Keyboard ⇓ Lock Key State
Num Lock	Startup status of Num Lock indicator **Values:** On (default) Off	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Keyboard ⇓ Lock Key State
Scroll-Lock	Startup status of Scroll Lock indicator **Values:** On Off (default)	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Keyboard ⇓ Lock Key State
Repeat Rate	Speed at which a character repeats when key pressed and held **Values:** Slow Normal (default) Fast	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Keyboard ⇓ Repeat Rate

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Standard	Do *not* change	Page 1	Cannot change. Use disk- or ROM-based Setup
Shadow ROM	Set to default for maximum performance of BIOS and Extended RAM unless your application requires the 384 KB that Shadow ROM uses. **Values:** Internal (default) All, None	Page 1	Cannot change. Use disk- or ROM-based Setup

Power Management Parameters

If you use your computer frequently on battery power, the amount of productive time you can get out of a single battery charge is important. Although the default values for the Setup parameters do an adequate job of conserving power, you can adjust the values of the parameters to achieve even greater savings and a resulting longer battery life.

Setup has two groups of power management parameters:

- Power-savings parameters that define what the computer does to save power
- Activity-monitoring that determines when the computer goes into and comes out of some of the power conservation modes.

Power Savings

The power-savings parameters define a variety of ways the computer can modify its activity to affect the drain on the battery. There is also a parameter called Power Savings that determines when, if ever, the computer implements the defined power savings.

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Power Savings	Defines how power-savings parameters as a group are enabled **Values:** Auto (default)—Enabled battery only On (or Enable)—Enabled both battery and ac Off (or Disable)—Disabled	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings
Timeout Interval	Number of minutes of inactivity on monitored devices before implementing defined timeout action **Values:** 1, 2 (default), 5, 10, 15, Always on	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ System Timeout ⇓ Interval
Timeout Action	What happens when defined timeout interval exceeded on monitored devices. **Values:** Auto Suspend (Default)—backlight off and goes into low power mode Backlight Off—only backlight off	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ System Timeout ⇓ Action

Power Savings

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Wakeup Interval	Number of minutes in auto-suspend mode before waking up **Values:** *5*, 10 (default), 15, 20	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Auto Wakeup ⇓ Interval
Wakeup Action	What happens when wakeup interval expires and auto-suspend enabled; applies to battery operations only **Values:** Backlight On and CPU normal (default) Backlight Remains Off and CPU normal	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Wakeup Action
Cover Closed Action	What happens when the cover is closed while the computer is on. **Values:** Suspend (default)= backlight and hard disk off and CPU suspended Backlight Off= only backlight off	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Cover Closed Action

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
HDD Motor Timeout	Number of minutes without reads or writes before hard disk off **Values:** 1, 2, 5 (default), 10, Always on Hard disk access may be delayed while the hard disk reaches operating speed. If an application has frequent hard disk access, a low setting may actually use more power because of the power required to bring the hard disk up to speed.	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ HDD Motor Timeout
Default CPU Speed	CPU speed at startup **Values:** Low, Medium, High Auto (default)—high speed for AC and medium speed for battery CPU speed can be changed by pressing **CTRL-ALT-**↑ or **CTRL-ALT-**↓ (except on DX4 models). You can also execute the SPEED utility on all systems.	Page 2	Main ™ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Default CPU Speed
LCD Power	Defines brightness of backlighting; the lower the setting, the dimmer the backlighting and the lower the power requirements. This parameter is not supported on color units. **Values:** Low, Medium, High Auto (default)—high for AC and medium for battery	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ LCD Power
Advanced OS Power	On (default) Auto Off	Page 2	

Power Savings

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Power Level	Level of savings activated under BatteryPro utility. **Values:** Disabled 1–Low 2–Medium (default) 3–High 4–Maximum	No access. Use SETPOWER command in MS-DOS.	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Power Level

Activity Monitoring

The computer can monitor activity on up to three groups of devices depending on the model:

- ❑ Comm—includes the standard serial port
- ❑ Disks—includes the hard disk, floppy drive, and CD-ROM
- ❑ External PS/2 keyboard, numeric keypad, or mouse connected to the PS/2 port

If no activity occurs on the monitored devices for the defined **Timeout Interval**, the computer implements the defined **Timeout Action**. The computer resumes full operation automatically as soon as activity occurs on any of the monitored devices.

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Pointing Device	Yes (default) No	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Activity Monitor ⇓ Pointing Device
Disks	Monitors hard disk and floppy drive **Values:** Yes (or On) No (or Off) (default)	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Activity Monitor ⇓ Disks

Activity Monitoring

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Comm	Monitors COM port **Values:** Yes (or On) (defaut) No (or Off)	Page 2	Main ⇓ Control Panel ⇓ WSETUP ⇓ Power Savings ⇓ Activity Monitor ⇓ Comm

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Reverse	Specifies startup status of video **Values:** On= White on black for text and graphics Off (default)=Black on white for text and graphics Text Only= Text only Graphics Only= Graphics only Not supported on color models	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Reverse
Expanded Mode	Specifies whether all video modes can use the entire video area. **Values:** On (default) Off In some video modes, *Off* restricts the viewing area at the top and bottom of the display area.	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Expanded Mode
Block Cursor	Specifies whether the cursor is always a block cursor, regardless of the application. **Values:** On (default) Off	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Block Cursor
Display	Selects the display device. **Values:** LCD= All display output on the LCD CRT= All display output on an external monitor; defaults to LCD if no external monitor (default) Both=Simultaneous display on the LCD and on the external monitor; defaults to LCD if no external monitor	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Display

Screen Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Monitor Type	Selects the monitor device driver appropriate for your external monitor and application. **Values:** VGA, 8514 Compatible, Super VGA, Ext. Super VGA (default), Multifrequency, Extended Multifrequency, Super Multifrequency, Ext. Super Multifrequency Must match external monitor	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Monitor Type
LCD Palette	Specifies the startup palette. **Values:** Default Palette 0=Standard Palette 0 (default) 1=Text Palette 2=Standard Palette 1 3=Standard Palette 2 4=User Palette 1 5=User Palette 2 (default on some color models)	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ Screen ⇓ Palette
User Palette 1,2	Can be changed with RPAL utility or PALSET		

System Configuration Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Battery Alarm	Defines whether the alarm sounds for low-battery condition **Values:** On (default) Off Can be delayed in Windows with Power utility	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ System Configuration ⇓ Alarms ⇓ Battery Alarm
Cover Alarm	Defines whether the alarm sounds when the cover closed **Values:** On (default) Off	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ System Configuration ⇓ Alarms ⇓ Cover Alarm
Speaker (Standard)	Defines whether the speaker is on or off. **Values:** Enabled (default) Disabled	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ System Configuration ⇓ Speakers

System Configuration Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Speakers (Multimedia)	**Values:** Enabled (default) Disabled	Page 4	Main ⇓ Control Panel ⇓ WSETUP ⇓ I/O Ports ⇓ System Configuration ⇓ Speakers
Quick Boot	Defines extent of self-test performed at startup **Values:** On (default)=bypasses some tests, including memory tests Off= runs all self tests	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ System Configuration ⇓ Quick Boot
Internal Cache	Defines cache memory **Values:** On (Enabled) (default) Off (Disabled)	Page 3	Main ⇓ Control Panel ⇓ WSETUP ⇓ System Configuration ⇓ Internal Cache

2
Installing and Using Applications

This chapter explains:

- ❑ Guidelines for loading IBM AT-compatible application programs
- ❑ How to set up a password
- ❑ How to restore MS-DOS system files

Contents

Guidelines for Installing Applications

Your TravelMate Computer is fully compatible with IBM AT computers. All applications written for AT computers will execute on your computer. However, consider these guidelines before installing applications.

Installation Considerations

The following configuration items will influence how you install application programs.

Display

When installing an application, select the highest-resolution monitor configuration possible. This depends on your usage of the internal LCD or external analog monitor, since an external monitor can support higher resolutions.

Keyboard

The computer keyboard emulates all functions of an IBM AT-101 enhanced keyboard. When installing an application, select the IBM 101- or AT-enhanced keyboard configuration.

The Point

The Point is compatible with the Microsoft PS/2 mouse. When installing an application, select the Microsoft PS/2 mouse configuration.

Guidelines for Installing Applications

Processing Speed

Some applications cannot execute at the high speed available with your computer. Check the application documentation for the required processing speed and, if necessary, change the speed using one of the following methods:

- ❑ Setup Program (see instructions in this manual)
- ❑ **CTRL-ALT-↑** or **CTRL-ALT-↓** (*except on DX4 models*)
- ❑ SPEED utility

Note: On DX4 models, memory managers such as EMM386 cannot be loaded when using the SPEED utility.

- ❑ Laptop Manager Change menu

Note: Some applications may require the internal cache to be disabled. This is done through the System Setup program.

You can configure Laptop Manager to load the programs with necessary speed settings. Then you do not have to change the Setup Program settings each time you load an application that requires a different processing speed.

Memory

A standard computer has 4 MB of memory, 640 KB of system memory, plus extended memory. You may purchase optional memory to upgrade your system to 8 or 20 MB of memory.

AUTOEXEC.BAT File

The AUTOEXEC.BAT file configures system software automatically when you boot the computer. If your

application requires additions or changes to the AUTOEXEC.BAT file, carefully consider the consequences.

Please read and understand this file before you change it. (See the *MS-DOS User's Guide and Reference* furnished with your computer for more details on constructing this file and its significance.)

Note: If you need to restore the default AUTOEXEC.BAT file to your hard disk, it is included on the System Recovery diskette.

Each line of the default AUTOEXEC.BAT file and its purpose are defined in the following file listing and table. Since this file changes, the following example and your file may look slightly different.

Guidelines for Installing Applications

```
1.  @ECHO OFF
2.  REM ==============================
3.  PROMPT $P$G
4.  PATH=C:\WINDOWS;C:\DOS;C:\UTILS;C:\JAZZ;C:\PCMPLUS
5.  SET TEMP=C:\WINDOWS\TEMP
6.  SET COMSPEC=C:\DOS\COMMAND.COM
7.  SET MFILE=C:\UTILS
8.  SET BLASTER=A220 I5 D1 H5 T4
9.  SET MOUSE=C:\MOUSE

10. C:\WINDOWS\SMARTDRV.EXE /L
11. C:\MOUSE\MOUSE.EXE /Q

12. GOTO %CONFIG%

13. :G
14. REM =======GAMES/DEMONSTRATIONS===========

15. CD DEMOS
16. EXECUTE
17. REBOOT

18. :SM
19. REM =======SYSTEM MAINTENANCE============

20. CD IMAGES
21. EXECUTE
22. REBOOT

23. :S
24: REM =======SCSI DRIVERS/UTILS==============

25. :SP
26. REM ====SCSI AND PCMCIA DRIVERS/UTILS==========
27. C:\SCSI\MSCDEX.EXE /D:ASPICDO /M12

28. :P
29. REM =======PCMCIA DRIVERS/UTILS============
30. DOSKEY

31. :N
32. REM =======NO SYSTEM DRIVERS/UTILS==========

33. WIN
```

TravelMate 4000M Factory Default AUTOEXEC.BAT File

Line	Purpose
1	turns off echoing (displaying) of commands on screen
2	comment block
3	tells MS-DOS to display the current drive and directory
4	defines the directories and order in which to search for files entered on the command line; you can add additional directories to this line as required
5	tells MS-DOS where to find the temporary files
6	tells MS-DOS where to find the command processor
7	tells MS-DOS where to find the Laptop Manager data file
8	sets interrupt and DMA parameters for sound compatibility
9	tells MS-DOS where to find the mouse driver
10	installs memory manager device driver
11	loads the mouse driver
12	selects the setting selected in CONFIG.SYS
13	sends the user to the games/demonstrations utility
14	comment block describing games/demonstrations
15	goes to the demos directory
16	displays a games/demonstrations menu
17	reboots the system
18	sends the user to the system maintenance utility
19	comment block describing system maintenance utility
20	goes to the images directory
21	displays a system maintenance menu

22	reboots the system
23	loads system and PCMCIA drivers
24	comment block describing SCSI drivers/utilities
25	loads system, PCMCIA, and SCSI drivers
26	comment block describing SCSI and PCMCIA drivers/ utilities
27	executes the MSCDEX so the CD-ROM is accessed
28	loads system and PCMCIA drivers
29	comment block describing PCMCIA drivers/ utilities
30	edits command lines, recalls MS-DOS command, and creates macros
31	tells the system the user doesn't want to load any drivers or
32	comment block that says there are no system drivers or utilities to be loaded
33	runs Windows

Default CONFIG.SYS Files

If your application requires additions or changes to the CONFIG.SYS file, carefully consider the consequences. The factory-installed (default) file is listed and described in this section. Please read and understand this file before you change it. (See the *MS-DOS User's Guide and Reference* for more details on constructing this file and its significance.)

Each line of the default CONFIG.SYS file and its purpose are defined in the table following the file listing. You can add commands required by your application, but **do not** delete the existing default commands.

```
1. [MENU]
2. MENUCOLOR=11,0
3. MENUITEM=P,STANDARD WINDOWS FOR WORKGROUPS
4. MENUITEM=SP,DOCKING SYSTEM WINDOWS FOR WORKGROUPS
5. MENUITEM=N,MINIMUM WINDOWS FOR WORKGROUPS
6. MENUITEM=S,MINIMUM DOCKING SYSTEM WINDOWS FOR WORKGROUPS
7. MENUITEM=SM,SYSTEM MAINTENANCE AND BACKUP
8. MENUITEM=G,GAMES DEMONSTRATION
9. MENUDEFAULT=P,10
10. [COMMON]
11. DEVICE=C:\WINDOWS\HIMEM.SYS /TESTMEM:OFF
12. DEVICE=C:\WINDOWS\EMM386.EXE /NOEMS
13. DOS=HIGH,UMB
14. FILES=40
15. BUFFERS=30
16. STACKS=9,256
17. LASTDRIVE=D
18. SHELL=C:\DOS\COMMAND.COM /P
19. [P]
20. INCLUDE=SYD
21. INCLUDE=PD
22. [S]
23. INCLUDE=SYD
24. INCLUDE=SCD
25. [SP]
26. INCLUDE=SYD
27. INCLUDE=PD
28. INCLUDE=SCD
29. [SYD]
30. REM ========SYSTEM DRIVERS================
31. DEVICE=C:\WINDOWS\SMARTDRV.EXE /DOUBLE_BUFFER
32. DEVICE=C:\UTILS\BATTERY.PRO /L2
33. DEVICE=C:\JAZZ\JAZZ.SYS P220 I5 D1 E5 T330 Q2
34. DEVICE=C:\WINDOWS\IFSHLP.SYS
35. [PD]
36. REM ========PCMCIA DRIVERS================
37. DEVICE=C:\PCMPLUS\PCMSS.EXE
38. DEVICE=C:\PCMPLUS\PCMCS.EXE
39. DEVICE=C:\PCMPLUS\PCMRMAN.EXE
40. DEVICE=C:\PCMPLUS\PCMSCD.EXE
41. [SCD]
42. REM ========SCSI DRIVERS=================
43. DEVICE=C:\SCSI\ASPI2DOS.SYS /D /Z
44. DEVICE=C:\SCSI\ASPICD.SYS /d:ASPICD0
45. [SM]
46. REM ======SYSTEM MAINTENANCE DRIVERS=========
47. DEVICE=C:\DOS\RAMDRIVE.SYS 2048 /E
48. [N]
49. REM =======NO SYSTEM DRIVERS==============
50. [G]
51. REM =======GAMES/DEMONSTRATIONS==============
52. DEVICE=C:\JAZZ\JAZZ.SYS P220 I5 D1 E5 T330 Q2
```

Factory Default CONFIG.SYS File (Modify but do not delete these command lines)

Line	Purpose
1	calls the menu subroutine and displays
2	sets the color of the menu
3 - 8	displays the menu
9	if no menu item is selected after 10 seconds, the p subroutine is called
10	calls the common subroutine that is run each time the system boots
11	loads Windows into high memory
12	doesn't allocate memory for expanded memory
13	loads MS-DOS into extended memory
14	tells MS-DOS how many files can be open at any one time. You can adjust the value as required by your application
15	tells MS-DOS how many buffers are used for file input/ output. You can adjust the value as required by your application to maximize processing speed
16	reserves memory for MS-DOS to process hardware interrupts
17	displays the last valid drive number
18	calls the command.com file
19 - 21	the p subroutine calls the subroutines for system drivers and PCMCIA drivers
22-24	the s subroutine calls the subroutines for system drivers and SCSI drivers
25-28	the sp subroutine calls the subroutines for system, PCMCIA, and SCSI drivers

29-30	defines the system driver subroutine
31	assigns memory manager to a double buffer space for more efficient performance
32	runs BatteryPro utility?
33	sets the IRQ and DMA for the sound driver
34	a device driver that loads Network software
35-36	defines the PCMCIA driver subroutine
37-40	runs PCMCIA drivers
41-42	defines the SCSI driver subroutine
43-44	runs SCSI drivers
45-46	defines the System Maintenance driver subroutine
47	installs RAM-resident disk space
48-49	defines the No System Drivers subroutine
50-52	defines the Games/Demonstrations subroutine

Setting Up a Password

The computer provides the Password utility to limit access to your computer to only those who know the password. The password is valid until you remove or change it.

Be sure to select a password that you can remember. If you forget your password, you will not be able to access files. If this occurs, contact TI Technical Support. You will be required to send your computer to the TI manufacturing facility for service. This service is not covered by warranty.

Loading the Password Utility

1. The Password utility is located on the System Recovery diskette provided with your notebook. To load this utility, insert the diskette into the floppy drive and go to the MS-DOS A: prompt. Type

INST_PW

The password is automatically installed in the following directory:

C:\UTILS\PASSWORD

2. At the MS-DOS **C:\>** prompt, type

UTILS\PASSWORD\PW

and press **ENTER**. The Password Utility menu appears. From this menu you can install, change or remove a password, or you can exit the menu.

3. To select a Password command, press the initial character of the prompt, or press ↑ or ↓ to highlight to the desired command, and then press **ENTER**.

Setting Up a Password

Installing a Password

1. Highlight *Install Password* on the Password Utility menu and press **ENTER**. You are prompted for a password.

2. Type a password of up to eight characters, and press **ENTER**.

3. Press **ENTER** again to install the new password, or press **ESC** to cancel the action and return to the Password Utility menu.

If you have already installed a password, when you select *Install Password*, the computer displays the following message:

Password already exists

Press any key on the keyboard to return to the Password Utility menu.

Changing a Password

1. Highlight the *Change Password* command on the Password Utility menu and press **ENTER**. The Change Password menu appears.

2. Type the current password, and press **ENTER**.

   If you type the correct password, the message

   Password check OK

   displays on the next line, and you are prompted to enter a new password.

   If you type the wrong password, the message

   Incorrect Password

displays on the next line, and you are prompted to press any key to return to the Password Utility menu. You can try to change the password again, or you can exit the Password Utility menu by selecting **EXIT**.

3. Type a new password of up to eight characters, and press **ENTER**.

4. Press **ENTER** again to install the new password, or press the **ESC** key to abort the process and return to the Password Utility menu.

Removing a Password

1. Highlight the *Remove Password* command on the Password Utility menu, and press **ENTER**. The Remove Password menu appears.

2. Type the current password, and press **ENTER**. If you type the correct password, the message

   Password check OK

   displays on the next line. Press **ENTER** to remove the current password, or press **ESC** to abort the process and return to the Password Utility menu.

   If you type the wrong password, the message

   Incorrect Password

   displays on the next line, and you are prompted to press any key to return to the Password Utility menu. You can try to remove the password again, or you can exit the Password Utility menu by selecting **EXIT**.

Setting Up a Password

Entering the Password

Once you install the password, you will be prompted to enter a password each time you start the computer. See the *User's Guide*.

Caution: Be sure to select a password that you can remember. If you forget your password, you will not be able to access files. If this occurs, contact TI Technical Support at 1-800-TI-TEXAS. You will be required to send your computer to the TI manufacturing facility for service. This service is not covered by warranty.

Setting Up a Non MS-DOS Environment

To install an operating system other than MS-DOS, you must complete the following steps:

1. At the MS-DOS prompt, press **FN+ESC** or type

C:\UTILS\SET_UP.EXE

The Setup Program appears.

2. Press **FN+PGDN** to go to the page that displays Advanced OS Power: ON.

3. Using the Up and Down arrow keys, select the Advanced OS Power field.

4. Using the Left and Right arrow keys, select the word OFF.

5. Press **ESC**.

6. Press **F4** to save the change.

The system reboots.

7. Continue loading your operating system according to documentation that came with your software. For any additional drivers, call 1-800-TI-TEXAS.

Restoring MS-DOS System Files

You cannot restore system files without having first created the backup diskettes. If your system is down, you cannot create these diskettes. It is very important to create backup system diskettes as soon as possible after the purchase of your computer. Refer to Chapter 1, *Creating Back Up System Diskettes*.

The MS-DOS files COMMAND.COM, IO.SYS, EXTMSDOS.SYS, and MSDOS.SYS are necessary for the operation of your computer. If any of these files is accidentally deleted or modified, your computer will not function as designed. This section describes the procedure for restoring these files without affecting the applications and data files that may be on your hard drive.

If you need more information, see the *MS-DOS User's Guide and Reference*.

Note: IO.SYS, EXTMSDOS.SYS, and MSDOS.SYS are hidden files. You will not see these files if you view a directory of drive C using the DIR command.

If COMMAND.COM is Missing

If COMMAND.COM is missing from your hard disk, the screen displays this message during the boot process:

```
Bad or missing Command Interpreter
```

The computer then becomes inactive. Complete the steps in the next section to restore COMMAND.COM to your hard disk.

If .SYS Files are Missing

If the IO.SYS, EXTMSDOS.SYS, and/or the MSDOS.SYS files are missing from your hard disk, the screen displays the following message during the boot process:

Non-System disk or disk error
Replace and press any key when ready

This message is repeated when any key is pressed.

Complete the following steps to restore the .SYS files to your hard disk:

1. Turn off the computer, and insert the 3.5-inch *Microsoft MS-DOS, Disk 1* floppy into the floppy drive.

2. Turn on the computer and when the computer displays the "Welcome to Setup" menu, press **ENTER**, and follow the directions.

You will be asked to verify date/time, country and keyboard layout, and the directory to which you will be installing DOS.

3. Press **ENTER**.

DOS begins installing and prompts you for all three diskettes. A supplemental DOS diskette is provided. This diskette includes optional utilities such as AccessDOS, keyboard utilities, and MS-DOS 6.2 utilities.

4. To install the supplemental DOS diskette, insert it into do drive A and type

A:SETUP

During installation of the fourth diskette, the system will prompt you for a directory in which to place system files.

5. Type:

C:\DOS

Restoring MS-DOS System Files

Restoring Windows

After you restore the MS-DOS files, you will be instructed to restore the remaining software (Windows, BatteryPro, mouse, SCSI, PCMCIA, and TM4000M display drivers).

1. Place the Windows backup diskette you should have created after you purchased your computer in Drive A and from the MS-DOS **C:\>** prompt type

   A:SETUP

   You are prompted to use either Express Setup (recommended) or Custom Setup and to indicate the directory to which files will be copied.

2. Enter C:\Windows as the default.

   You are prompted to load each of the Windows diskettes.

3. When installation is complete, reboot your computer.

Restoring BatteryPro Utilities

After you restore the MS-DOS and Windows files, install the BatteryPro utilities from the backup diskette you should have created after you purchased your computer:

1. Insert the correct backup diskette into drive A, and at the MS-DOS **A:\>** prompt, type

   INSTALL

   and press **ENTER**.

   You will be asked to verify the default directory of C:\UTILS and to specify files to be installed.

2. Follow the instructions on the screen.

See more information on the BatteryPro utilities elsewhere in this manual.

3
Custom Windows Utilities

This chapter tells you about

- ❑ Utilities designed for your computer to enhance your performance while using Windows

Contents

Contents

Overview of Windows Utilities

The TravelMate 4000M Series custom Windows utilities are accessible from Windows by double-clicking individual icons. Most of these utilities are found in the Notebook Group, but some are in the Startup Group, and still others are in the Control Panel of the Main Windows Group.

The Windows utilities can be divided into the following categories:

- ❑ Information
- ❑ Productivity
- ❑ Video
- ❑ Cursor

Information Utilities

The information utilities provide you information you need quickly. Your computer has the following information utilities:

Battery Level (Wbattery)

Double-click on Wbattery in the Notebook Group to display the battery level dialog box for your TravelMate computer. This dialog box displays the approximate charge left in your computer based on user-specified settings. You may customize Battery Level settings by selecting **SETTINGS** from the Control-Menu box in the upper left-hand corner of the Battery Level dialog box. This displays the Battery Level Settings dialog box. At this point, you may modify the following parameters:

- ❑ The position of your Battery Level dialog box or Battery Level icon
- ❑ The elapsed time (in seconds) before the Battery Level dialog box reappears automatically on your screen
- ❑ Use of color or monochrome
- ❑ Minimizing the application

Selecting **OPTIONS** from the Battery Level Settings dialog box allows you to specify when the application should indicate low battery levels (for instance, when the battery reaches 50% power).

BatteryPro APM

Double-click on this icon in the Notebook Group to display information about the battery-savings software in your computer: Texas Instruments BatteryPro Power Management software and Microsoft Advanced Power Management (APM) software.

Battery Saving Tips (Battips)

Double-click on this icon in the Notebook Group for information about actions you can take to maximize the life of a battery charge.

Dosnotes

Double-click the Dosnotes icon in the Notebook Group to run the NBHELP program that describes many of the the DOS-level utilities.

Productivity Utilities

The productivity utilities help you function more efficiently while in the Windows environment. The computer has the following productivity utilities.

Alarms Off (Walarms)

Double-click the Walarms icon in the Notebook Group to disable the cover-closed alarm and the low-battery alarm.

Drop N' Go

Drop N' Go takes advantage of the Drag and Drop capabilities of Windows. To learn more about Drop N' Go, refer to the *Drop N' Go Utility* section of this chapter.

Change Cursor Icon

Double-click on this icon in the Notebook Group to optimize the Windows cursors. To learn more about the Change Cursor Utility, refer to the *Change Cursor Utility* section of this chapter.

Laptop Manager

Double-click on the Laptop Manager icon in the Notebook Group to load the Laptop Manager (LM) utility. LM is a DOS-level program that manages access to DOS-level applications. LM is described elsewhere in this manual.

To return to Windows from the LM main menu, press **Esc**.

LFM (Laptop File Manager)

Double-click the LFM icon to load the Laptop File Manager utility. LFM is a DOS-level program that helps you manage, view, and edit directories and files on the hard disk or on floppies. LFM enables you to copy, delete, edit, print, rename, and perform other common file management functions using single-key commands. LFM is described elsewhere in this manual.

To return to Windows from the LFM main menu, press **Q**. You are asked if you are sure you want to Exit. Enter **Y**.

Power Icon

Double-click the Power icon in the Control Panel of the Main Windows Group to access the interface to Microsoft's Advanced Power Management (APM) and Texas Instruments BatteryPro Power Management system.

Super Shutdown Icon

Double-click the Super Shutdown icon to exit Windows faster than the standard Windows exiting procedure. If you have made any changes to Windows applications, they display "save" prompts that ask if you want to update your files before exiting the Windows session. Refer to the *Super Shutdown Utility* section of this chapter.

Note: Shutdown is unable to close DOS applications. If any DOS applications are active, the application will be brought to the foreground and the user will be prompted to close it.

PCMCIA Information

This icon is located in the Control Panel window and provides status on the PCMCIA slots in the notebook. For further information on PCMCIA, refer to your *Phoenix PCMCIA User's Manual*.

Sound Mapper

This icon is located in the Control Panel window. Double-click on the icon to display the Sound Mapper Configuration screen. From the Sound Mapper Configuration screen, you can:

- ❑ configure, change, disable, and get information about sound drivers

- ❑ indicate preferred playback and recording file formats
- ❑ specify whether to use preferred devices only

For further information, refer to online Help provided with this application.

MIDI Mapper

This icon is located in the Control Panel window. Double-click on the icon to display the MIDI Mapper screen. From the MIDI Mapper screen, you can:

- ❑ select a MIDI setup for a sound device
- ❑ create a new setup
- ❑ edit existing key maps, patch maps, and channel mappings

For further information, refer to online Help provided with this application.

Video Utilities

The display utilities allow you to customize your notebook display for your operating environment. The following utilities are available from the Notebook group menu:

- Panel - sends output to the panel on the notebook
- CRT - sends output to an external VGA monitor
- SIMUL - Sends output to both panel and CRT

Drop N' Go Utility

Drop N' Go is an application that allows you to display frequently run applications as icons on your desktop or as menu items under the File Manager application. This bypasses the usual file-finding process and keeps your most useful applications at your fingertips. Applications loaded in Drop N' Go appear as boxed icons to differentiate them from normal Windows icons.

Basic Operations

The following sections cover adding/changing, deleting, copying, and other application-specific functions relating to Drop N' Go. To start Drop N' Go, select the Exit button from the Drop N' Go Setup menu and follow any instructions that appear on the screen.

Adding/Changing Applications

To **Add or Change** applications listed in Drop N' Go, complete the following steps:

1. Double click on the Drop N' Go icon in the Notebook group on your desktop.

The Drop N' Go Setup menu appears.

2. If you are adding an application, place the cursor under Icon Applications and single click. If you are changing an application, single click on the application you want to change.

3. Select the **ADD** or **CHANGE** button.

The Icon Application dialog box appears.

4. Enter required information on the application you wish to add. This very similar to the Run... dialog box used in the Program Manager.

Note: The quickest way to **Add or Change** applications is to select the down arrow next to the Title box. Selecting from the list that appears quickly and automatically places all information.

---

5. Select **OK**.

6. To add the application as a menu item in File Manager, select Enable Menu from the Drop N' Go Setup menu.

7. Place the cursor under Menu Title, click, and type the title of the menu you wish to use in File Manager (for instance, Drop N' Go).

8. If you are adding an application, place the cursor under Menu Applications and single click. If you are changing an application, single click on the application you want to change.

9. Select the **Add or Change** button.

10. Enter required information on the application you wish to add. This very similar to the Run... dialog box used in the Program Manager

11. Select OK.

12. Close the Icon Application Setup dialog box.

A message appears stating that your menu changes will not take effect until File Manager is restarted.

13. Close and reopen File Manager.

You should now see the selected applications as icons on your desktop. When you open File Manager, you should see the menu created in steps 6 through 9.

Deleting Applications

You can delete applications from Drop N' Go by completing the following steps:

1. From the Drop N' Go Setup menu, select the application you want to delete by clicking on the filename under Icon Applications or Menu Applications

2. Select the **DELETE** button.

A message appears asking if you want to delete the specified file.

3. Select **OK**.

The file is deleted from the list.

Copying Applications

Normally you will want to have the same applications listed under Menu Applications that are listed under Icon Applications. The simplest way to set this up is to add or change applications under either Menu Applications or Icon Applications and select the Copy button. For instance, if you add Calendar under Icon applications, you can select the Copy button to automatically copy the application to the Menu Applications list (or vice versa)

Enable/Disable Menu

This feature of Drop N' Go allows you to enable/disable the menu you created for the File Manager (see *Adding/ Changing Applications*). To enable or disable the menu, select the Enable or Disable Menu button and restart File Manager.

Icon Placement

You can control Icon placement on your desktop through Drop N' Go as follows:

Single click on the Drop N' Go icon and select Save All Positions to save all icon positions as they currently appear on your desktop.

From the Drop N' Go Setup menu, select Stay on Top so that your icon always appears on top of open windows.

Change Cursor Utility

The Change Cursor utility in the Notebook Group lets you design or edit the shape and appearance of the following seven cursors used by Windows:

- **The arrow** is the primary pointer when using a pointing device
- The **hourglass** signals that Windows is saving work, loading a program, or otherwise performing work that cannot be interrupted
- The **I-beam**, called a *selection cursor*, indicates where your typing or drawing will appear. Usually the I-beam can be moved using your pointing device or mouse
- The four double-arrow cursors are used by Windows to denote box sizing. The cursors east-west, north-south, northeast-southwest, and northwest-southeast are named for the directions to which they point.

Note: Custom cursors designed specifically for the TravelMate 4000M Series automatically load when Windows loads. Although these cursors were designed for visibility on the LCD, you can use the default cursors furnished by Windows instead.

Change Cursor Menu

On the Notebook Group menu, double-click the Change Cursor icon, and Windows displays the Change Cursor menu, described in the following subsections.

Detail Window — The left half of the Change Cursor menu is a 32-by-32 element grid, called the *detail window*, on which you can create your own new cursors or edit cursors that you then can use instead of the default cursors

Left Button Box — The two stacked boxes to the right of the detail window, labeled *Left Button* and *Right Button*, let

you assign one of four editing functions to the left and right buttons on your pointing device. Clicking on the circles within the boxes causes the following when you subsequently move the pencil-shaped editing cursor to the detail window.

White causes the button to change the grid element to white

Black causes the button to change the grid element to black

Screen causes the button to change the grid element to the current screen background color: dark gray on the LCD or blue on a color display or an external color monitor. Used to cancel a changed element

Inverse causes the button to change the grid element to display the inverse of the current screen background color: darker gray on the LCD or green on a color display or monitor

Note: The current setting of the computer's standard/reverse video switch may cause the images to appear reversed.

At the far right of the menu is a stack of eight boxes of various shades of gray (in color if you are using an external color monitor or a color notebook), called the *preview window*. You can move the cursor you are editing or designing into the boxes to judge the cursor's appearance against different backgrounds.

Creating a New Cursor

Creating a cursor involves three primary processes:

- ❑ Using the File menu to open a new file or load a previously designed cursor. You may also recall default cursors from the Cursor menu.

- ❑ Drawing new cursor(s) on the detail window or editing existing cursor(s)

- ❑ Using the Configure menu to install (or remove) the new cursor(s) to load automatically when you load Windows

You can start creating a new cursor as soon as you load the Change Cursor menu. Move the cursor into the detail window—it then assumes the shape of a pencil. Now click the left or right pointing device button on the grid elements you want to color. After you have completed designing the cursor to your satisfaction, you can save it by using the File menu described later in this section.

If you want to restore a grid element to its original shade or color, click on the *Screen* option. Move your pencil cursor to the grid element you want to erase, and click to the left or right button you just changed to a *Screen*.

You can also select one of the seven default cursors from the Change Cursor menu bar (described below) and edit it to create a new cursor shape.

Note: Change Cursor must always run in background so the custom cursors are available for other Windows applications. Always exit the Change Cursor menu by clicking on the Exit command in the File menu. This keeps Change Cursor running in the background. Do not use the Close command in the Control menu box unless you want to stop running Change Cursor and revert to the Windows default cursors.

After you complete your cursor, you can save it as a new cursor under a new filename and/or install it as one of the active cursors as described under "File Menu" and "Configure Menu" later in this chapter.

Note: The Mouse control panel can override the Change Cursor selection in other pointer options, such as "growing cursor."

Change Cursor Menu Bar

Select Cursor at the Change Cursor menu bar to display the Cursor menu. The following items are available at this menu.

Note: Changes made to the cursors are temporary unless you save them to a file using the File command on the menu bar.

Set hotspot sets the exact spot where the cursor actually points, defined on the detail window as an x. Select this item and a block cursor with a +(cross) in its center appears on the detail window instead of the pencil. Move the + cursor to the square in the detail window where you want the hot spot and click once. The x then appears on that square.

Use this cursor as ... saves the cursor displayed in the detail window as the indicated cursor, no matter what shape you have made it.

Get default . . . displays in the detail window the factory default for the indicated cursor.

File Menu

The File menu provides several options for manipulating the cursor files.

New erases any cursor currently in the detail window and displays a clean grid.

Open displays a menu at which you can type a new filename at the Open File Name box, or double-click the filename of a previously designed cursor.

Save saves the cursor shown in the detail window under its existing filename. If you have not yet named the file, the program displays the Save As menu described below.

Save As displays a menu where you can type a new filename for your cursor, or you can double-click an existing filename listed in the *Files:* window. If you select an existing filename, the program displays a menu asking you to verify that you want to replace (overwrite) an existing cursor file. Click on the OK button if you still want to replace an existing file.

Exit minimizes the Change Cursor program (runs it in background) and returns control to Windows. If you have created or edited a cursor without saving it, the Exit command displays a menu asking if you want to save current changes. If you click on Yes, the program displays the Save As menu described above if the cursor is new or saves the changes if the file already existed.

Configure Menu

The Configure command enables you to save and install the cursor using the following options.

Save cursor settings displays a dialog box listing the filename and path for the seven cursors used with Windows. If the listing is correct, click on the OK button.

Load cursor settings restores cursor settings after you save them and automatically loads them for use in Windows. This function is automatically done if you use the *Install for automatic setup* option described next.

Install for automatic setup modifies Windows so that it always boots (if CHCURSOR also is loaded) with the cursor(s) you select, either the default cursors or your own design. Clicking on this option presents a display asking you to OK or cancel the action.

Uninstall Change Cursor removes the CHCURSORutility from Windows, which then uses the default cursors.

Scheduling relates to power-savings features. Do not change the value unless advised by your authorized TI representative.

Super Shutdown Utility

Super Shutdown is an automatic shutdown configuration utility available from the Notebook group. With this utility, your system exits Windows faster than the standard Windows exit procedure. You can also select from a variety of user-specified shutdown features that will customize the way your computer shuts down and reboots. Examples include automatically closing all Windows and DOS applications as well as saving files.

To use Super Shutdown, single-click on the Super Shutdown icon so that the Shutdown Configuration Menu appears.

Note: If the Super Shutdown icon did not automatically load when entering Windows, you may need to re-install it from the BatteryPro backup diskettes you should have created after you purchased your system.

This menu allows you to set the following as defaults for system shutdown:

- ❑ Options that allow customized software configuration upon system shutdown
- ❑ The position you want the Shutdown icon to appear on the LCD
- ❑ Options that customize the LCD
- ❑ Use of the Dynamic Data Exchange (DDE) to communicate with Windows applications that support it
- ❑ Schedule times for automatic system shutdown

- ❑ Maximum power savings for your computer during battery operation

Shutdown Options

Shutdown options allow you to:

- ❑ Terminate Windows applications unconditionally
- ❑ Terminate DOS applications unconditionally

Caution: These two methods may result in files not being closed properly and could cause disk errors.

- ❑ Allow any applications that support DDE (such as Microsoft EXCEL) to save and close any open files.
- ❑ Send keystrokes to DOS and Windows applications to close and save any open files.

Icon

The icon options allow you to select whether or not you want the Shutdown icon to stay on top of any overlapping windows or to automatically appear in the position in which it was located at the time of system shutdown.

Passwords

You may set, enter, or change a password using the Super Shutdown Utility.

Setting Passwords

You may set or reset a password for Super Shutdown. To set or reset a password, complete the following steps:

1. Select **PASSWORD PROTECTED** on the Shutdown Configuration menu.

2. Select the **SET PASSWORD** button.

   The Change Password dialog box appears.

Entering a Password

To enter a new password,

1. Type the new password at the New Password line.

2. Retype the new password in the Retype New Password line.

3. Press **ENTER**.

Changing a Password

To change a password,

1. Type the old password in the Old Password line.

2. Type the new password at the New Password line.

3. Retype the new password in the Retype New Password line.

4. Press **ENTER.**

Exit Modes

To select an exit mode for Shutdown:

- Single-click on the Super Shutdown icon and select the exit mode from the menu, or

- Select the Default Exit Mode from the Shutdown Configuration menu

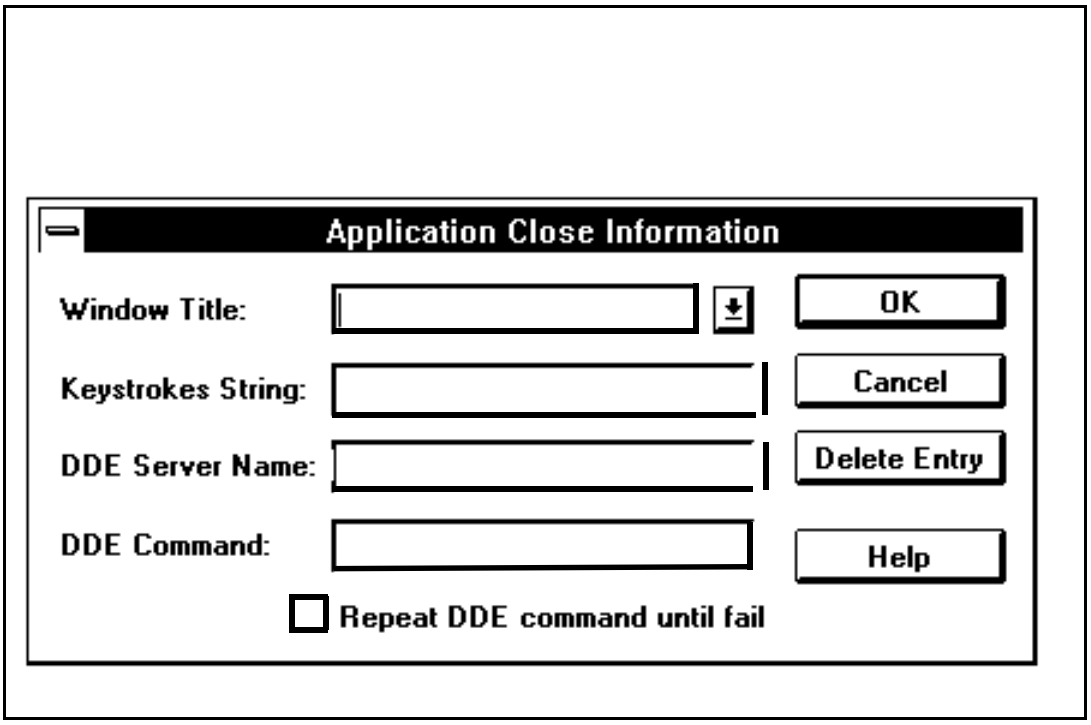
The following table explains exit modes available from the Super Shutdown Utility:

Shutdown Method

Shutdown Method	Description
Exit to MS-DOS (default)	Takes you to the MS-DOS prompt after shutdown
Suspend	Enters the power saving mode
Exit to MS-DOS and Suspend	Takes you to the MS-DOS prompt and enters the power saving mode
Exit to MS-DOS and Eject	Takes you to the MS-DOS prompt and then ejects the notebook from the Docking Station.
Restart Windows	Exits and then restarts Windows (useful when configuration changes have been made or application errors must be cleared.
Reboot System	Exits Windows and reboots the system

Application Setup

The Application Setup button allows you to use the Dynamic Data Exchange (DDE) to communicate with Windows applications that support it. Such applications are called DDE Servers. When selected, the Application DDE Information dialog box appears as shown in the following figure.



Application DDE Information Dialog Box

From this dialog box, the following information is required:

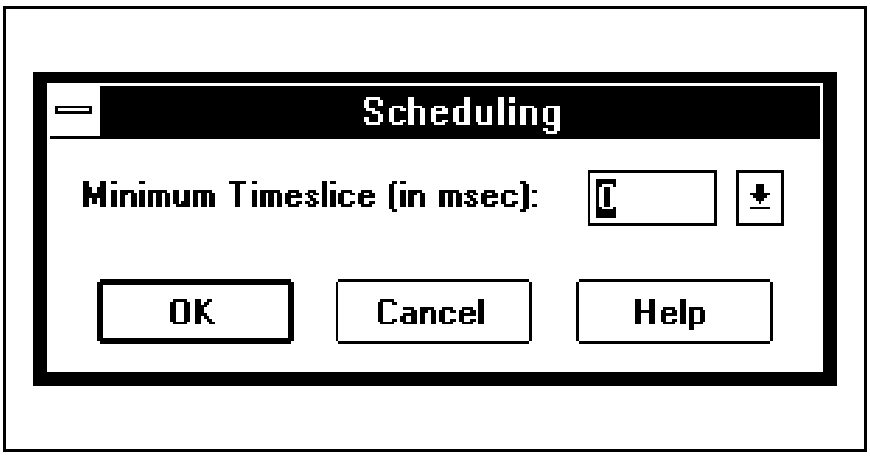
Application Setup

Selection	Description
Window Name	The window title that appears in the title bar. Clicking on the button next to the text box in the Application Close Information dialog box drops down a list of applications that are currently set up.
Keystrokes String	The DDE command or the string of keystrokes used to close any open files. For instance, to close an open Winword file, the keystrokes are **ALT+F4**.
DDE Server Name	The name that the application responds to for DDE communication (such as Winword).
DDE Command	The command sent to the DDE from the application. The Application Close Information dialog box checks this line if Keystrokes String does not function. To obtain DDE Command information, refer to the User's Manual for your specific application or call the manufacturer.

The DDE Server and command string must be specified by the application software. If this is not documented in the software applications user manual, contact the software vendor for this information

Scheduling

The Scheduling feature of Shutdown is used during battery operation of your computer. If a power savings driver is active on your computer, Shutdown works with it to reduce power consumption while running Windows. The lower the value, the greater the savings. See the following figure for an example of the Scheduling dialog box.



Scheduling Dialog Box

Suggested Values:

- Microsoft Word for Windows v 1.1 or lower or Microsoft PowerPoint - value = 100
- Games - value = 130 to 200

4
Laptop Manager

This chapter tells you about

- How to use the Laptop Manager utility to supervise your application programs
- How to configure the Laptop Manager utility to load your application programs at the touch of a key

Contents

Laptop Manager Features

The Laptop Manager (LM) utility is an application control program that provides quick access to your applications. LM has two submenus on one screen on which you can list the names of applications installed on the hard disk. You can then load applications from one of the submenus with a function key, and from the other submenu using the arrow keys and **Enter**.

LM enables you to specify unique operating parameters for each application under its control:

- ❑ Fixed and prompted parameters that are passed to the application as it loads
- ❑ Working directory
- ❑ Password protection, to any or all applications
- ❑ Individual color palettes for each application
- ❑ Power-savings level for each application
- ❑ Screen background during execution (not available on color models)
- ❑ CPU processing speed for each application

Using these features you can select the parameters and operating environment that maximize battery-charge life and performance for each application you load under LM.

Note: Do not confuse LM with the Laptop *File* Manager (LFM) utility also furnished on your computer and described elsewhere in this manual.

LM is installed on the hard disk at the factory and is also stored on the the backup diskettes you should have made after you purchased the notebook. LM displays its main menu when you load it from the Windows Notebook group menu or from the MS-DOS prompt.

Loading LM

You can load LM from the Windows Notebook group menu by double-clicking the Laptop Manager icon.

You also can load LM at the MS-DOS **C:\>** prompt by typing

LM

and pressing **ENTER**. LM loads and displays its main menu.

The main menu enables you to select your application. Procedures for adding items to the Applications list and Quick Commands box are described later in this chapter.

Pressing **F12** at the LM main menu loads the Change Menu screen. It enables you to add, delete, or modify items on the main menu. Procedures for using the Change Menu screen are provided later in this chapter.

Exiting LM

You can exit LM and return to Windows control by pressing **ESC** at the LM main menu. Or if you entered LM from the MS-DOS prompt, the MS-DOS prompt reappears.

Quick Commands Box

You can select applications added to the Quick Commands box by pressing the assigned function keys (**F5** to **F11**).

The following utilities are installed on the computer at the factory:

- ❑ F1 — Help screens
- ❑ F2 — (Laptop) File Manager
- ❑ F3 — Save Config(uration) described under the SETCMOS utility elsewhere in this manual
- ❑ F4 — Reset Config(uration), which is part of the SETCMOS utility

Single-Character Quick Commands

At the bottom of the LM menu Quick Commands box are two commands:

- ❑ Pressing **D** (for *DOS* command) causes LM to display a prompt at the bottom of the screen where you can enter MS-DOS commands of up to 67 characters. Pressing **ENTER** starts the command. When the command is executed, pressing any key returns you to the LM main menu.
- ❑ Pressing **P** (for *path*) causes LM to display a prompt at the bottom of the screen where you can change drives or directories. For example, you can change from the **C:** (root directory) to the **C:\UTILS** directory by pressing **P**, typing C:\UTILS, and pressing **ENTER**.

  You can change from the **C:** drive to the **A:** drive by pressing **P** and **A**, and then pressing **ENTER**.

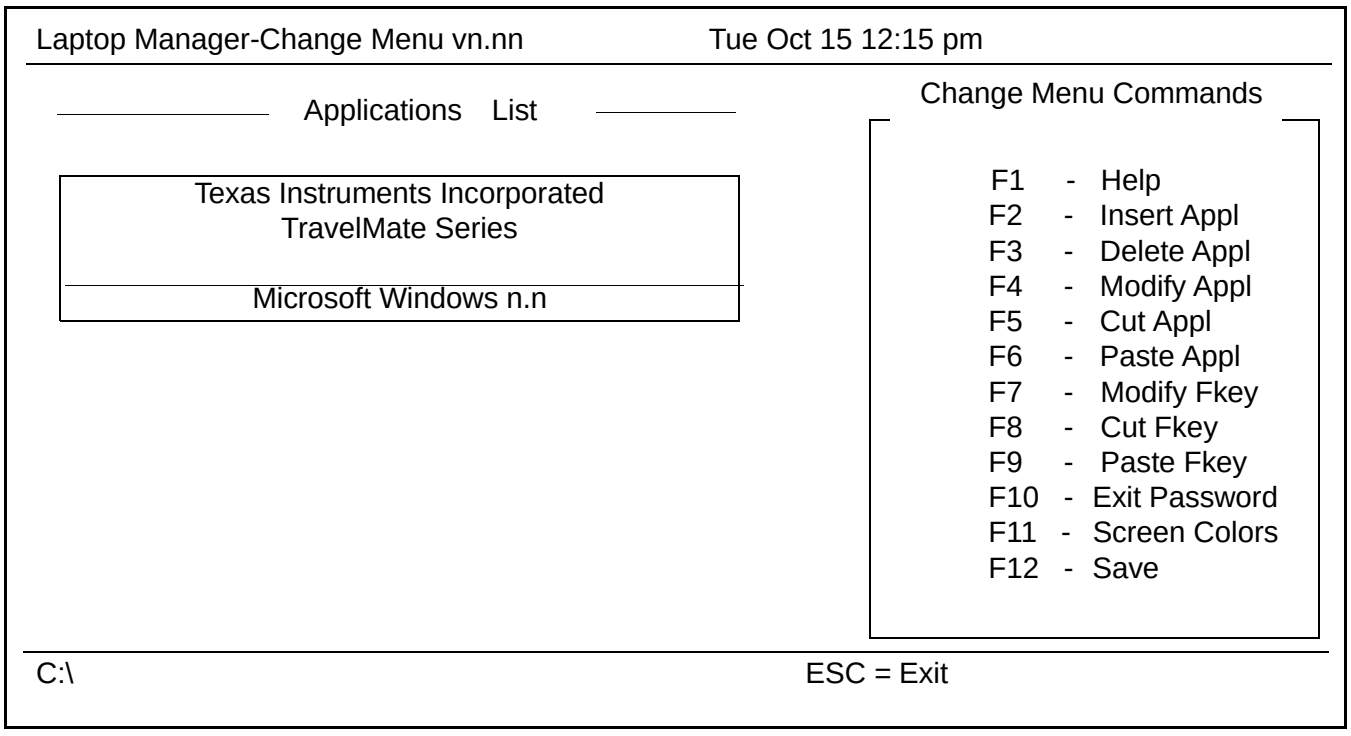
Adding Applications to the Menu

You can add your own IBM AT-compatible applications to the LM main menu for easier access; you can also alter or move current menu items. After you have installed your own applications on the hard disk, you are ready to insert listings into the Laptop Manager menu.

You can put the application name into either the *Application*s list or the *Quick Commands* box. Put the applications you use most often into the *Quick Commands* box. Put less frequently used programs and those requiring a longer name under the *Applications* list.

Quick Commands Program Setup Menu

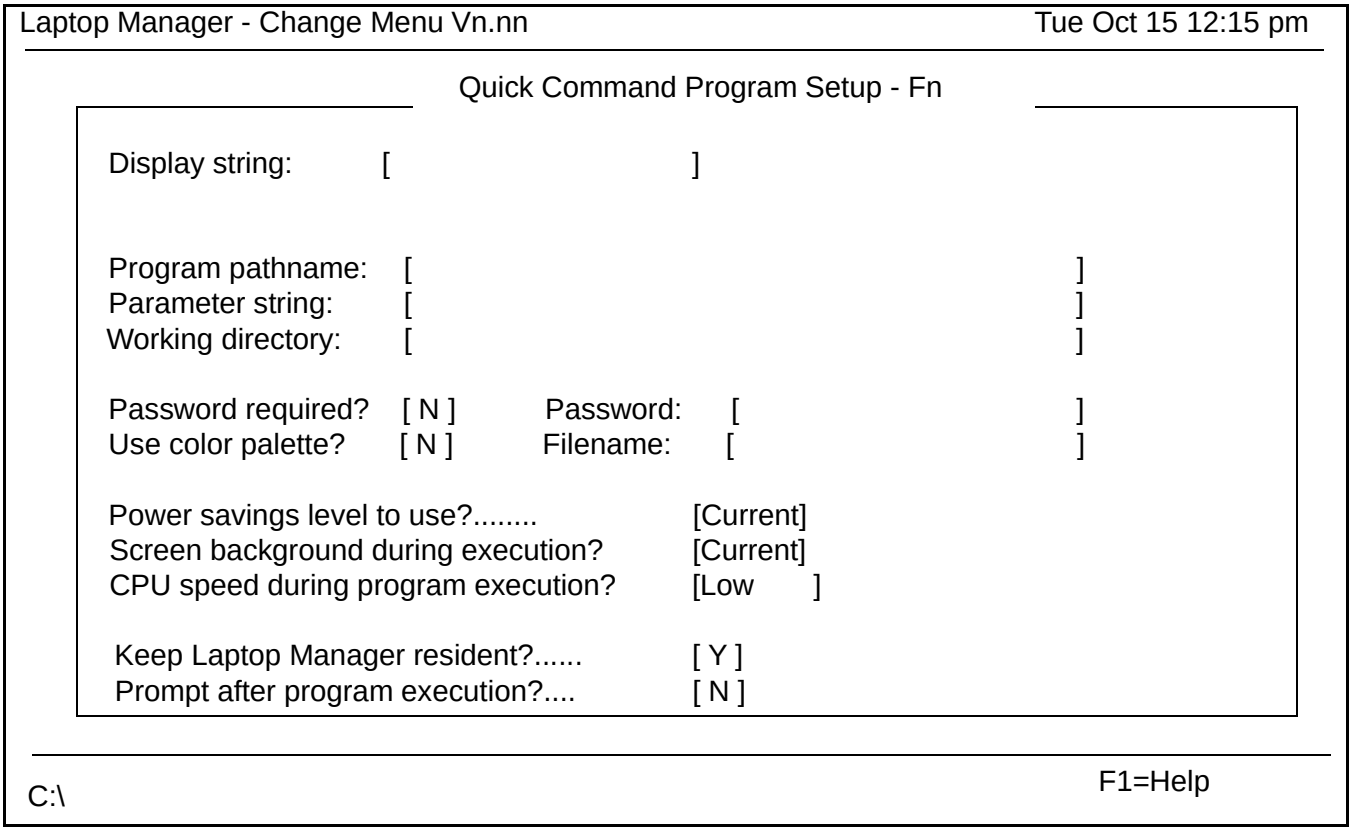
1. At the LM main menu, press **F12.** LM displays the Change Menu screen.



2. Press **F7** to access the *Modify Function Key*.

3. In response to the *Modify Function Key* prompt, press the function key (**F5** through **F11**) you want to assign to your application.

LM then displays the Quick Command Program Setup menu.



The Quick Command Program Setup menu helps you configure the Quick Commands box on the LM main menu. Press **ENTER** after you answer each prompt.

Display String

Type up to 15 alphanumeric characters (including spaces) to identify the name you want displayed beside your selected function key on the main menu. For example, type

Communication

and press **ENTER**. Thereafter, the word *Communication* will be displayed in the main menu Quick Commands box, opposite the function key number you selected.

You also can type line graphics characters to appear on the function key display. (Press **F1** for a list of graphic characters you can use.) Press and hold **FN-ALT**, and then type the three digits for each graphic character on the embedded numeric keypad (blue key fronts). Then release **FN-ALT**.

Program Pathname

In response to the *Program pathname* prompt, type up to 67 characters for your application pathname. This is the command your application tells you to use to load the program at the MS-DOS **C:\>** prompt.

For example, if your communication program (named *COMPROG*) is installed under the UTILS directory on the hard disk (drive C), to load the program you would type UTILS\COMPROG at the **C:\>** prompt. Therefore, you would type that same command at the Change Menu *Program pathname* prompt:

C:\UTILS\COMPROG

and press **ENTER**.

The more complete your pathname, the faster LM can find and load your program.

Refer to the *MS-DOS User's Guide and Reference* for discussions of *paths*, *pathnames*, and *directories*. See your application documentation for directions on how to install the program on the hard disk and what command to use to load the program.

Parameter String

The *Parameter string* prompt enables you to set up your menu so it does more than call applications. It enables you to define parameters passed to the program when it is loaded.

For example, if your communications program requires a telephone number as a parameter when the program loads, you would type the number at the *Parameter string* prompt.

In addition, you can create a prompt to solicit a typed input that is passed to the application as a parameter by using the string flag %S. In the previous example, you would type the *Parameter string* as:

```
%S,"Enter phone number to call:"
```

When you press the selected function key, the prompt

```
Enter phone number to call: [              ]
```

displays at the bottom of the LM menu. You would then type a phone number between the square brackets. When you press **ENTER**, LM loads the program into memory and passes the telephone number to the program.

If you want the data you type *in response to the prompt* stored and used as a default value each time you load the program from LM, you can use the buffer flag %A in the *Parameter string*. In the previous example, you would type the *Parameter string* as

```
%S="%A","Enter phone number to call:"
```

With the buffer string in the *Parameter string*, the telephone number you typed is saved in the %A buffer and used as the default value the next time you load the program from LM.

You can use up to four optional parameter string buffers (%A, %B, %C, and %D); however, the %D buffer is assigned for use by the LM single-character command D (DOS). You can use all four, but the information in the %D buffer will change every time you enter a string for either the application or the D (DOS) command.

Working Directory

A *working directory* is one that is currently in use. Many applications require that the program reside in the current directory if it is not in the path. The *Working Directory* prompt enables you to change the working directory to meet the program's requirements.

This prompt's primary purpose is for use with applications that use data files (for example, Lotus 1-2-3®, Microsoft Excel®, and most word processing programs) so you can name the directory that stores the associated data files. For example, if you are installing a word processing program named LETTERS and it might store data files under a directory you call DOC under the LETTERS directory on the hard disk, your working directory prompt could be

```
C:\LETTERS\DOC
```

Note: If your application does not need or use a data-file working directory, leave the *Working Directory* prompt absolutely empty; that is, be sure there are no spaces or characters in the prompt field.

Password Required?

In response to the *Password required?* prompt, select *Yes* or *No* by pressing **Y** or **N**. If you choose not to use a password, the highlight skips the *Password* prompt.

Password

If you choose to assign a password, type up to 19 alphanumeric characters (including spaces) for the password you want to use. To protect the secrecy of the password you type, the characters are not displayed; asterisks are displayed. Carefully memorize your password, and record it in a secure place away from where you store or use your computer.

If you change your mind and decide to delete the password (before exiting the Setup menu), press **Del** until all asterisks are erased.

Caution: Once you assign a password, you have to use it every time you want to run the application to which the password is assigned. This caution is particularly pertinent if you assign a password to the *Exit to DOS* function (the *Exit Password* — F10 — key choice on the setup menu). If you forget the password for this function, you cannot get to the MS-DOS prompt or the Change Menu screen.

Case is important in your password; to be accepted, a password must be typed exactly the way you entered it during setup. For example, if your password is all uppercase letters, you must type it that way to gain access to your program.

Use Color Palette?

If you have used the RPAL utility (see instructions elsewhere in this manual) to create individual color or gray-shades settings for each of your applications and stored them in data files, select *Y(es)* at the *Use color palette?* prompt and press **ENTER**.

Then, at the *Filename* prompt, type the pathname of the palette data file associated with this application, and press **ENTER**.

Note: Your UTILS directory has several color palette files configured as examples for use with individual applications. These files end with the .PAL extension (for example, the sample palette for Lotus 1-2-3 3.0™ is Lotus3.PAL). When you install your applications, examine the UTILS directory for available palette files.

Power-Savings Level to Use?

Note: This prompt does not function if the BATTERY.PRO device driver is omitted from the CONFIG.SYS file.

When operating on battery power, some applications work more efficiently and still conserve battery power at different power-savings levels. If your applications are running satisfactorily at their current power-savings level, choose the *Current* selection at the *Power savings level to use* prompt.

After reviewing instructions about power savings elsewhere in this manual, if you determine that a particular power-savings level works best for an application, press the Space Bar to select the level number (1 – 4). Or you can select 0 (zero) to disable the power-savings feature.

Screen Background During Execution

If you want the screen image reversed from the normal black-on-white image, you can select *Reverse* at this prompt. Select *Normal* for the standard black-on-white image, or select *Current* for the image in effect when you enter the program from LM.

CPU Speed During Program Execution?

In response to the *CPU speed during program execution?* prompt, select the system speed you want to use during program execution by pressing the Space Bar to toggle among *High*, *Low*, and *Auto*. Select *Low* for optimum battery-charge conservation. *Auto* uses high speed if the computer is on AC power or medium speed if the computer is on battery power. Your application may specify a processing speed; check your application documentation. If you are running this application on a DX4 model, ensure that EMM386 or other memory managers are not loaded.

Keep Laptop Manager Resident?

If you want to keep LM in memory (resident) while your application is running, select *Y* in response to the *Keep Laptop Manager resident?* prompt. You may not want to keep LM resident when executing large programs; it uses approximately 130 KB memory space.

You may want to select *Y* if you are running an application that does not use the entire memory and if you want to avoid wasting the time needed to reload LM from the disk after running your application. LM uses only 2.5 KBof memory if not resident.

Prompt After Program Execution?

In response to the *Prompt after program execution?* prompt, select *Y* if you want LM to display the following prompt when you exit your application program:

Press any key to return to Laptop Manager

If you select *N*, the LM main menu automatically returns with no prompt when you exit your application.

Exiting the Quick Command Program Setup Menu

When you complete all your Quick Command Program Setup menu selections, press **Esc**. LM prompts you at the bottom of the screen:

```
Keep changes? [Y]
```

Press **ENTER**, **ESC**, or **Y** if you want to keep your changes or additions. Press **N** if you want to exit the Quick Commands Program Setup menu without keeping the changes you just made. In either case the LM Change Menu returns.

At this point you can either select another Quick Command to program or press **Esc** to exit the Change Menu. If you made changes and previously elected to keep the changes, LM again prompts you at the bottom of the screen:

```
Save changes? [Y]
```

Press **ENTER**, **ESC**, or **Y** if you want to keep your changes or additions. Press **N** if you want to exit the Change Menu without saving the changes you just made. In either case the LM main menu returns.

Testing Your Menu

At the LM main menu, test your new application setup by pressing the newly assigned function key. Does it load the application program for you? If you get an error message, press **F12**, **F7**, and the newly assigned function key again. Check your entries for correctness. Be sure you specified the correct pathname and working directory and that the color palette file exists.

You can add both information display strings and applications to the LM Applications list in the LM main menu.

Adding Items to the Application Menu

The procedure for adding items to the Application menu is the same as described previously for the Quick Command Program Setup menu, except you can use several function keys to insert, delete, modify, or cut and paste an item. On the Applications list, you must also designate whether the item is for display only or is to run an application. Press the Space Bar at the *Application Type* prompt on the Application Setup menu to select *Display Only* or *Application*.

In other respects, the Application Setup menu works the same as the Quick Command Setup menu. You can enter up to 40 characters in response to the *Display string* prompt. If you need more space to enter a label or title than is available on one *Display string* prompt line, you can leave the *Application Type* prompt set to *Display only*, enter the line of type you want to have displayed, and move down a line at time, inserting lines by pressing **F2** (Insert Application) for each line you want to insert.

When finished inserting lines, toggle the *Application Type* prompt to *Application* by pressing the Space Bar when you get to the line on which you want to have LM run the application.

Note: If you press ↓ when the highlighted item is at the bottom of the Application List, the Change Menu automatically appears for you to create another entry.

You can continue inserting entries—at the beginning, end, or between existing lines—in your Applications List up to a total of 255 lines. After you insert the seventeenth line, succeeding lines require you to use **PGDN** or **PGUP** (or ↑ and ↓) to view all lines on your list.

Changing LM Menu Colors

Pressing **F11** at the LM Change Menu causes LM to display the *Screen Color Setup* menu where you can change the colors of the LM menus displayed by an external monitor connected to your computer. This menu also affects the gray shades or colors displayed by the LCD.

The menu is self-explanatory and also provides a Help display.

LM_Setup

This application executes when you press F12 at the Laptop Manager main menu. It allows you to change the current applications list, The Quick Key definitions, or the Screen Colors. Changes made are written to a data file (default is MFILE.DAT). The following table displays selections available from the LM_Setup menu:

Key	Name	Description
F2	Insert Appl	Insert a new application at the current cursor location
F3	Delete Appl	Delete the current application
F4	Modify Appl	Change the currently selected application
F5	Cut Appl	Remove the current application from the list, retaining the information
F6	Paste Appl	Place a previously cut application in a new location
F7	Modify FKey	Modify the data for a function key
F8	Cut FKey	Remove FKey data and place in buffer
F9	Paste FKey	Place FKey data in the buffer in the FKey description
F10	Exit Password	Define or change Exit password
F11	Screen Colors	Modify current screen colors
F12	Save	Save application and FKey updates

5
Power Saving Utilities

This chapter tells you about

- ❑ How to get the most work from a battery charge
- ❑ BatteryPro controls for optimum power savings; and the SETPOWER utility that enables you to control BatteryPro power levels
- ❑ SMARTDRV.EXE, a hard disk drive performance enhancement utility
- ❑ SPEED, which lets you change CPU operating speed for optimum performance and battery power savings

Contents

Optimizing Battery Operation

Your computer has three ways to save battery power:

- ❑ Manually turning off the LCD and hard disk by pressing **STANDBY** or setting up the computer to enter auto-suspend mode
- ❑ Saving power, in real time, while running your applications, through user-selected power-saving levels
- ❑ Specifying hardware and software configurations that best match your applications and battery-savings performance

The following table summarizes the power saving modes; the sections following describe the modes in more detail.

Power Saving Modes Summary

Mode	Activate By	Resume By	Foreground/ Background Tasks Active?	Service Interrupts	Backlight On	HDD/FDD Accesses Drives	Power Used (watts)
Cover Closed Suspend	Closing cover	Opening cover	No	No	No	No	2.0 - 4.2
Standby	**Standby**	**Standby**	No	Yes	No	No	2.0 - 5.0
Auto Suspend	pointing device & keyboard inactivity	Activity	Yes, after wakeup timeout for duration of inactivity timeout	Yes	No, except after wakeup timeout user-specified on/off	Yes, has independent timer	2.5 - 6.0
Typical Operation							
Hard disk on							6.0 - 12.0
Hard disk off							5.0 - 11.0
Max. usage, all functions on							20.5

Mode	Activate By	Resume By	Foreground/ Background Tasks Active?	Service Interrupts	Backlight On	HDD/FDD Accesses Drives	Power Used (watts)
Battery Capacity							28.8 watt-hour

Suspend/Standby Modes

The computer has three suspend/standby modes you can select as needed. The three modes, listed in order of power-saving capabilities, are the cover-closed suspend mode, the manual standby mode, and the auto-suspend mode. All three modes are effective in the two Windows operating modes, including the 386-enhanced mode.

The modes differ in the manner they are enabled and disabled:

- ❑ Task execution
- ❑ Task interrupt servicing
- ❑ LCD
- ❑ Hard disk and floppy drive accessing

Caution: Using the suspend/standby modes for too long can discharge the battery to the point that it can no longer power both the LCD and the hard disk. If this occurs, your computer will not come out of standby mode and you must either recharge your battery or plug in AC power.

Cover-Closed Suspend Mode

This mode, which you can invoke simply by closing the cover, saves the most battery power. In this mode (if enabled in the Setup Program), the computer suspends all tasks, does not service interrupts, and disables the LCD,

hard disk, and floppy drive. This mode overrides other standby/suspend modes.

You also can use this mode to transport the computer short distances without turning it off.

The computer instantly resumes normal operation when you open the cover. All operations continue where left off when suspended; however, time-dependent tasks may have lost time, and tasks dependent on device input/output may have lost data that overflowed buffers.

You may want to avoid this mode with tasks that depend on real time, such as scheduling applications with audible or visual reminders and communication tasks that depend on input/output.

Manual Standby Mode

Pressing **STANDBY** puts the computer into standby mode, which turns off the LCD and both disk drives, suspends all tasks, and activates the orange light on the **PWR** indicator. Use this mode when you want to leave the computer for some time and do not want to turn off or reboot the computer.

This mode saves about as much battery power as cover-closed mode.

To resume normal operation, press **STANDBY** again. The computer displays the data in effect when it entered standby mode and resumes all tasks. This mode also is useful for transporting the computer for short distances.

Auto-Suspend Mode

In this mode the system suspends all tasks and turns off the LCD. The disk drives are controlled by the *Hard Disk Timeout* parameter in Setup, and the system services task interrupts as needed. The **PWR** indicator turns orange in

this mode. The system remains in auto-suspend mode until activity is detected on a monitored device defined in Setup or until the *Auto Wakeup Interval* (selected in Setup) expires.

When the *Auto Wakeup Interval* expires (5 to 20 minutes), the system returns to normal operation for the duration of the selected System Timeout Interval (1 to 15 minutes), at which time the system again enters the auto-suspend mode.

Real-Time Power Savings

Your computer has a special power-saving feature that can activate in real time while you are running your application. This feature is implemented by a special device driver called BATTERY.PRO in the CONFIG.SYS file:

DEVICE=C:\UTILS\BATTERY.PRO (/Ln) (/Sn) (/MAP)

where:

/L***n*** specifies the power-savings level (0 through 4) described elsewhere in this chapter. If the /L*n* switch is omitted, the default value of 2 is used.

/S***n*** similar to /Ln but tells the system what to use under Windows when the computer is powered by AC. Mainly for sound software that doesn't use Application Program Manager (APM).

/MAP moves the extended BIOS data area within the base 640 KB system memory. The upper 1 KB of system memory is mapped to provide a corrective 640 KB of system memory. This switch should be used with applications such as QEMM to enable them to manage the high memory area more efficiently. BATTERY.PRO must be the first device driver in the CONFIG.SYS file to effectively use this switch.

Power-Saving Levels

The power-saving level you should use to optimize battery-charge life depends on the operations you are performing and how the application is written. Use Setup to define power-savings levels.

BatteryPro does not usually conflict with applications. However, some applications may fail or suffer performance degradation. Try your applications at the highest level of savings, and evaluate their performance. If degradation occurs, try the next lower level until performance is satisfactory.

The power-savings levels, 0 through 4, used by the BatteryPro and SETPOWER utilities are defined as follows:

Level 0 Level 0 (zero) disables the battery power-savings feature. BatteryPro performs no real-time active power savings. Some programs that run well at more optimal power-savings levels require level 0 for installation.

Level 1 Level 1 conserves battery power when the processor is idle, for example, when waiting for keyboard activity and device input/output. Level 1 features are also active in levels 2 through 4. Microsoft Excel and Windows perform well using level 1. Operating system enhancement programs such as DESQview™ also work well at level 1.

Level 1 is the highest level you can use without affecting processor performance using Lotus PrintGraph or serial printer interfaces.

Note: Some application programs such as Lotus 1-2-3 do not use standby mode for keyboard and other device inactivity. You must use a level higher than 1 to conserve battery power during keyboard activity.

Level 2 The factory default, level 2, induces more idle time between keyboard activations and MS-DOS access. Performance is degraded slightly, but the difference

should be unnoticeable. This level is the optimum compromise between program performance and battery charge life.

Most applications work well at level 2, for example, Lotus 1-2-3 and Microsoft PaintBrush®, Word, and Works. Many programs that work well at level 1 also work well at level 2 (for example, Microsoft Windows).

Level 3

Level 3 induces less idle time in the keyboard and MS-DOS access areas than level 2 but induces idle time in hard disk and video input/output. This level saves more power overall with applications that access the hard disk often.

Programs with high disk read/write rates increase battery-power consumption. Level 3 "smooths" disk read/write power consumption over longer access periods, thus reducing peak power needs. Using level 3 (and level 4) permits more frequent disk access while using little more power than standby mode.

Note: Generally, use level 3 only if level 4 is not acceptable. Try level 4 first. Levels 3 and 4 function identically, with increased power savings at level 4.

Level 4

Combining all techniques used by the lower levels at a slightly higher value, level 4 produces the highest power savings—from 10 to 30 minutes extra battery life, depending on your application. This level also affects performance more than the other levels, but you do not notice this with most applications.

Note: You can use the Dates or SETPOWER/S utility to display the current power level of BatteryPro.

Configuration Power Savings

Use the Setup Program to configure the system to best meet your power/performance requirements.

Hard Disk Motor Timeout

The hard disk turns off automatically after no activity for the time set for the Hard Disk Motor Timeout interval in the Setup Program. You can change the default 5-minutes setting using the Setup Program.

Note: When the hard disk is off, remember that a slight delay occurs for the disk drive to reach operating speed.

Some word processing and file editing programs save your work to a back-up file automatically, causing frequent access to your hard disk. This could use more power than leaving the hard disk always on. With such programs, set the Hard Disk Motor Timeout to higher values. If you find that the hard disk stays on too much even when you are not accessing it, try a lower setting, such as 1 minute.

CPU Speed

You can set the *CPU Speed* item in Setup to low, medium, high (which also corresponds to power consumption), or auto. The auto option sets CPU speed to high when you operate the computer on AC power or to low on battery power. Use medium if you are using battery power on DX4 models. Set *CPU Speed* to the lowest value acceptable to your application to save battery power.

LCD Power

You can set the *LCD Power* item to low, medium, high (which also corresponds to power consumption), or auto. However, the lower the LCD power, the higher the CPU video update performance. The auto option sets LCD power to high when you operate the computer on AC power or to medium on battery power. Setting the battery power to low, will give you better battery life and font screen updates.

On most models, set *LCD Power* to the lowest acceptable values to save battery power. Some graphics programs do

not display satisfactorily at lower values, so experiment with your particular application. This has no effect on color units.

I/O (Input/Output) Ports

You can individually disable the parallel or serial ports, if not in use, to save battery power.

LCD Brightness Control

The LCD is a major power user in the computer. Reducing the LCD brightness control level even a small amount significantly reduces power usage. Always set the brightness control to the lowest comfortable brightness level, especially in low light conditions (for example, on an airliner where longer battery charge life is important).

SETPOWER Utility

Using the SETPOWER utility, you can also set the BatteryPro power-savings level at any MS-DOS prompt. For example, at the **C:\>** prompt you can type

SETPOWER /Ln

where *n* is the power-saving level (0 through 4) you want to use. You can also include this command line in any batch file (AUTOEXEC.BAT) you create to load an application. Laptop Manager can automatically issue this command if you configure an application's loading process using the Laptop Manager *Change Menu*.

Note: SETPOWER and all other BatteryPro utilities furnished with your computer are loaded on the hard disk at the factory under the UTILS directory with the MS-DOS PATH command already in the AUTOEXEC.BAT file.

If you want to know the current and maximum power levels, at the **C:\>** prompt type

SETPOWER /S

and press **Enter**. SETPOWER displays the current setting, 0 through 4, and the maximum available setting.

Note: You can also use the Dates utility to display the current setting of BatteryPro.

SMARTDRV.EXE Disk Caching Utility

SMARTDRV.EXE is a disk-caching utility that reduces the time and power the computer needs to read data from the hard disk.

SMARTDRV.EXE works best if you use many applications and files at one time. It is particularly effective when the computer runs multiple applications that require swapping, that is, copying applications to and from the hard disk to make room for all of the applications in memory.

Note: Do not use SMARTDRV.EXE with any other disk-caching utilities.

See the *MS-DOS User's Guide and Reference* for a more detailed description of this utility.

SPEED Utility

The SPEED utility enables you to set the current CPU operating speed to low, medium, or high. However, because the faster speeds consume more power, you may want to select the low or medium speed to conserve power when you are operating the computer on its internal battery.

You can change CPU speed in Setup (as described elsewhere in this manual) or by pressing **CTRL-ALT-**↑ or **CTRL-ALT-**↓ (except on DX4 models).

Show Speed Switch

The SPEED command **/S**(how) switch displays the current CPU speed setting if you type at the **C:\>** prompt

SPEED /S

and press **ENTER**. The program displays

Current CPU speed is set to [High, Medium, or Low]

Note: For this utility to work correctly on a DX4 model, EMM386 or other memory managers must not be loaded.

Using the SPEED Utility

You can set the CPU speed to low, medium, or high by typing at the **C:\>** prompt

SPEED (/L) (/M) (/H)

and pressing **ENTER**. The **/L** switch sets CPU speed to low, **/M** to medium, and **/H** to high. The program responds to the command by displaying

Current CPU speed is set to (Low, Medium, or High)

6
Palette Utilities

This chapter tells you about

- ❑ PAL, which controls built-in LCD gray shades and colors as well as external monitor colors
- ❑ RPAL, which enables you to make real-time changes to gray shades or colors on the LCD or color combinations on an external color monitor

Contents

For the monochrome models, the LCD simultaneously displays up to 64 colors as 64 shades of gray (mapped into the 64 VGA standard colors). You can change the shade of gray selected to represent each of the 16 colors to maximize contrast between adjacent gray scale shades when running programs that use particular color combinations. The mapping of gray scales to colors is called a *palette*.

The computer has a default palette (P0) which is suitable for most applications, two alternative fixed palettes (P2 for text display and P3 for graphics), and two user-definable palettes (P4 and P5).

In addition, palette P1 sets the foreground and background shades for text mode displays to give the best contrast. The P2 palette uses gray scales that uniquely match the colors used in a program displaying in text mode. Palette P1 uses a smaller number of gray scales to ensure that the displayed text is always readable on a background of any color combination.

The RPAL utility furnished with the BatteryPro package enables you to modify the two user palettes, P4 and P5. However, in 4-color and 2-color graphics modes, the palette is predefined and cannot be modified.

Note: Some applications take control of the display and provide their own color setup procedures. See your application documentation for details.

PAL Utility

The PAL utility defines the current palette. The power-on default is defined in Setup as the LCD Palette. You can use the PAL utility to:

- ❑ Change to a predefined palette
- ❑ Change specific colors and gray shades

Changing to a Predefined Palette

To change to one of the system palettes or a user palette defined by the RPAL utility, at the **C:\>** prompt, type PAL Pn and press **ENTER**.

In this form of the command, *n* has the following meaning.

0 — Default palette
1 — Standard palette 0 (text)
2 — Standard palette 1 (text)
3 — Standard palette 2 (graphics)
4 — User palette 1
5 — User palette 2

Note: Palettes P0 through P3 are system palettes that cannot be changed. Palettes P4 and P5 are user palettes that can be modified using the RPAL utility described later in this chapter.

Changing Specific Shades

To change only a few specific shades, at the **C:\>** prompt type PAL Cp:c and press **Enter**.

In this form of the command, *p* is the color number (hex 0 through F), and *c* is the gray scale shade number (hex 0 through F). Refer to "RPAL Utility" later in this chapter for the meaning of the color numbers. If *c* is smaller than *p*, the shade is lighter. If *c* is larger than *p*, the shade is darker.

Note: Palettes created or modified with the PAL command are *not* saved. PAL /S displays the currently selected LCD pallette.

Other Ways to Select a Predefined Palette

After you define a palette using the RPAL utility, you have two additional ways to select the defined palette:

- ❑ Select the palette from the keyboard
- ❑ Include the command in your AUTOEXEC.BAT file

Selecting the Palette From the Keyboard — To change the current palette, press **FN-ALT-ESC**. Each time you press **FN-ALT-ESC**, the display changes to the next palette (P0 through P5). Stop pressing **FN-ALT-ESC** when the palette you prefer is displayed.

Including the Palette in the **AUTOEXEC.BAT file** — If you want the computer to load a particular palette at start up, include the PAL command in your AUTOEXEC.BAT file. For example, to start up with user palette 1 loaded, include the command PAL P4 in your AUTOEXEC.BAT file.

Note: You also can press **FN-ALT-ESC** to toggle through the six available palettes.

Viewing the Current Palette

To view the palette currently in use, type PAL /S at the MS-DOS prompt and press **ENTER**.

The current palette is displayed along with the following statement:

Color Palette set to Grayscale Palette *n*

(n=0 – 5)

RPAL Utility

With the RPAL utility, you can make real-time gray shade changes to the LCD or color changes to a color LCD or an attached color monitor. RPAL displays a small gray-shades or color palette over part of your current screen when you press a hot key (**ALT** plus an alphabet key you can assign).

Note: The RPAL pop-up menu is intended for use only with text applications and has no effect on graphics applications such as Microsoft Windows, Ventura Publisher®, and the graph display within Lotus 1-2-3.

You can create custom palettes for each of your applications and store the specific settings in a data file. If you assign the custom palette file to the application using the Laptop Manager Setup Menu, the computer loads the custom palette when you select the application.

By adding RPAL to your AUTOEXEC.BAT file, you can also define the current palette when you turn on your computer.

Note: Some applications provide their own color setup procedures. Some applications also take control of the keyboard and do not recognize the RPAL hot key.

RPAL does *not* display the palette when you run graphics applications. However, you can adjust your colors or gray shades at an MS-DOS prompt before you load your graphics application program.

Installing RPAL

To see the switches for the RPAL utility, at the MS-DOS **C:\>** prompt type RPAL /? and press **ENTER**.

RPAL displays the following menu and then returns to the MS-DOS prompt:

```
Resident Palette VN.NN
(c) 1990-92 Texas Instruments Incorporated
Usage:  RPAL [ /U /I /Ddatafile /Kc /1user1file /2user2file]
   [ ] - denotes optional parameters
   Parameters:
   /U              attempt to uninstall RPAL
   /I              install RPAL as a TSR
   /Ddatafile      use palette setting in datafile
   /Kchar          use char key with the ALT key as hot key,
                   where char is a letter between A and Z
   /1user1file     set user palette 1 to setting in user1file
   /2user2file     set user palette 2 to setting in user2file
```

RPAL Switches

/I switch — Installing **RPAL as TSR Program —** You can install RPAL as a terminate-and-stay-resident (TSR) program. As a TSR program, RPAL is accessible from MS-DOS and most applications by pressing a hot key (defined by the */Kc* switch described on the next page). To install RPAL as a TSR program, at the **C:\>** prompt type RPAL /I and press **ENTER**.

If you do not include the */Kc* switch, the computer uses **ALT-P** as the default hot key.

/U Switch — Removing **RPAL From RAM —** If RPAL is installed as a TSR program and you want to remove RPAL from RAM, at the **C:\>** prompt type RPAL /U and press **ENTER**.

RPAL is deleted from RAM but not from the hard disk; you can reinstall RPAL at any time at the MS-DOS prompt.

Note: If other TSR programs are currently installed, you must uninstall them in reverse order from which they were installed. Or you can update your work and reboot to remove all TSRs from RAM.

***/Ddatafile* Switch — Loading an RPAL Data File —** To load an RPAL data file, at the **C:\>** prompt type RPAL /Ddatafile and press **ENTER**.

In *datafile* include the full path and filename of the RPAL data file. See "Saving an RPAL Data File" later in this chapter.

For example, if you stored your custom color data file (named COLOR.DAT) in the utilities directory (UTILS), your command to load the file would be:

```
RPAL /D\UTILS\COLOR.DAT
```

/K*c* Switch — Defining a Hot Key — If you install RPAL as a TSR file without defining a hot key, **ALT-P** is the default. To define another alpha key (A through Z) as the hot key, at the **C:\>** prompt type RPAL /Kc and press **ENTER**, where *c* is the alphabet character key (A through Z) you want to be the hot key.

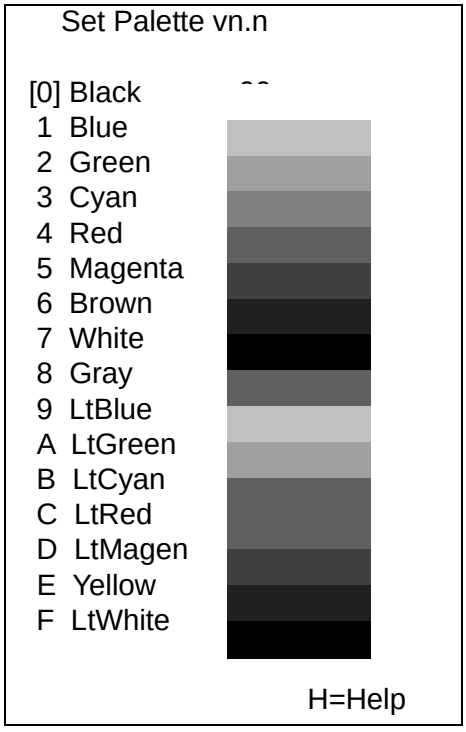
/1 and /2 Switches — Defining User Palettes — To establish an RPAL data file as one of the two user palettes, at the **C:\>** prompt type either RPAL /1user1file or RPAL /2user2file and press **ENTER**.

In these commands, *user1file* and *user2file* must be the full paths and filenames of the RPAL data file you select as user palette 1 (p4) or user palette 2 (p5). You can then access these palettes from the keyboard by pressing **FN-ALT-ESC**.

Refer to the "Saving an RPAL Data File" later in this chapter.

Using RPAL

To use RPAL at any MS-DOS prompt or during most applications, press **ALT-P** (or **ALT** plus the hot key you assigned during installation); RPAL displays the following menu on the left side of your screen:



You can use the following keys at the RPAL menu.

RPAL Menu Function Keys

Key	Function
ì ↓	selects the color to adjust
← →	selects the color hue or gray shade
Ctrl-←	moves the menu to the left or right
Ctrl-→	so you can view the entire screen
R	resets all color hue or gray shades to their factory default values
S	saves the current palette to an RPAL data file (see the following section)
L	load an RPAL data file
1	saves the current palette as user palette 1 (p4)
2	saves the current palette as user palette 2 (p5)
H	displays help information
Esc	exits the menu

RPAL changes gray shades or colors in real time, so you can see the changes as you make them.

Saving an RPAL Data File

To save an RPAL data file, follow these steps.

1. Press **S** from the RPAL Set Up Menu. RPAL displays a filename prompt.

2. Type the full path and filename of the RPAL data file. (RPAL limits your *pathname/filename* to 38 characters.)

3. Either press **ENTER** to save the file or **ESC** to exit without saving the file.

Note: You can save an unlimited number of palettes by assigning them unique filenames.

Adding RPAL to Your AUTOEXEC.BAT File

By including an RPAL command in your AUTOEXEC.BAT file, you can install RPAL each time you turn on the computer. Add the following line to your AUTOEXEC.BAT file:

RPAL /I /D*datafile* /K*c*

where the option *datafile* is the pathname of your custom RPAL data file (if you do not want the factory default palette), and *c* is the alphabet character (A through Z) you want to use with **ALT** as the hot key combination (if you do not want to use the default **ALT-P** combination).

Note: The UTILS directory has several sample color palette files for use with individual applications. These files end with the .PAL extension (for example, the sample palette for Lotus 1-2-3 3.0 is Lotus 3.PAL). When you install your applications, examine the UTILS directory for available palette files and try them.

The PALSET utility allows you to change the gray scale palette definitions for the User1 and User2 palette values. To use PALSET, type PALSET at the MS-DOS C:> prompt. The following keys are available at the PALSET main menu:

Key	Function	Description
F1	Help	Provides additional information on PALSET functionality
F2	Modify User1	Changes the color settings defined for the User1 palette
F3	Modify User2	Changes the color settings defined for the User2 palette
F4	Save	Saves the currently displayed color settings for User1 and User2 to CMOS
ESC	Exit	Exits the PALSET program

Modifying Gray Scale Palettes

To modify gray scale palettes, complete the following steps:

1. From the PALSET main menu, select F2 or F3 (depending on the user palette you wish to update.

The Set Gray Scale User Palettes screen appears. From this screen, the following keys are used to make selections:

Key	Function	Description
F1	Help	Provides additional information on User Palette functionality
F2	Reset	Restores the original color values for the selected user palette
↑↓	Select Palette	Selects the next or previous palette
←→	Change Color	Changes the color definition for the selected palette
ESC	Exit	Returns to the previous menu

2. Use the **UP** and **DOWN** arrow keys to select the color you wish to edit.

3. Use the **LEFT** and **RIGHT** arow keys to changes values for the selected color.

4. Select **ESC** to accept color changes or **RESET** to reset values to the previous settings.

7
Laptop File Manager

This chapter tells you about

- Using the Laptop File Manager (LFM) program to manage and view your files and directories
- LFM commands that simplify directory and file copying, deletion, printing, renaming, and other common file management functions

Contents

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Getting Started with LFM

The Laptop File Manager (LFM) utility supplied with your computer helps you manipulate files and directories stored on the hard disk. Many functions operate on two or more files, called *multiple file operations.* LFM can do the following:

- ❑ Assign or change file attributes to one or multiple files
- ❑ Copy one or multiple files or directories to other directories or floppies
- ❑ Delete one or multiple directories and files from hard disk or floppies
- ❑ Find files using wildcard characters
- ❑ Send one or multiple files to a printer or other device connected to your computer
- ❑ Rename one or multiple files and directories
- ❑ Show files for viewing
- ❑ Change a file's date and time
- ❑ Display hard disk and floppy statistics, such as disk capacity and disk space in use
- ❑ Create files and directories
- ❑ Sort the directory and file listings by name, extension, date, or size
- ❑ Execute MS-DOS commands or shells

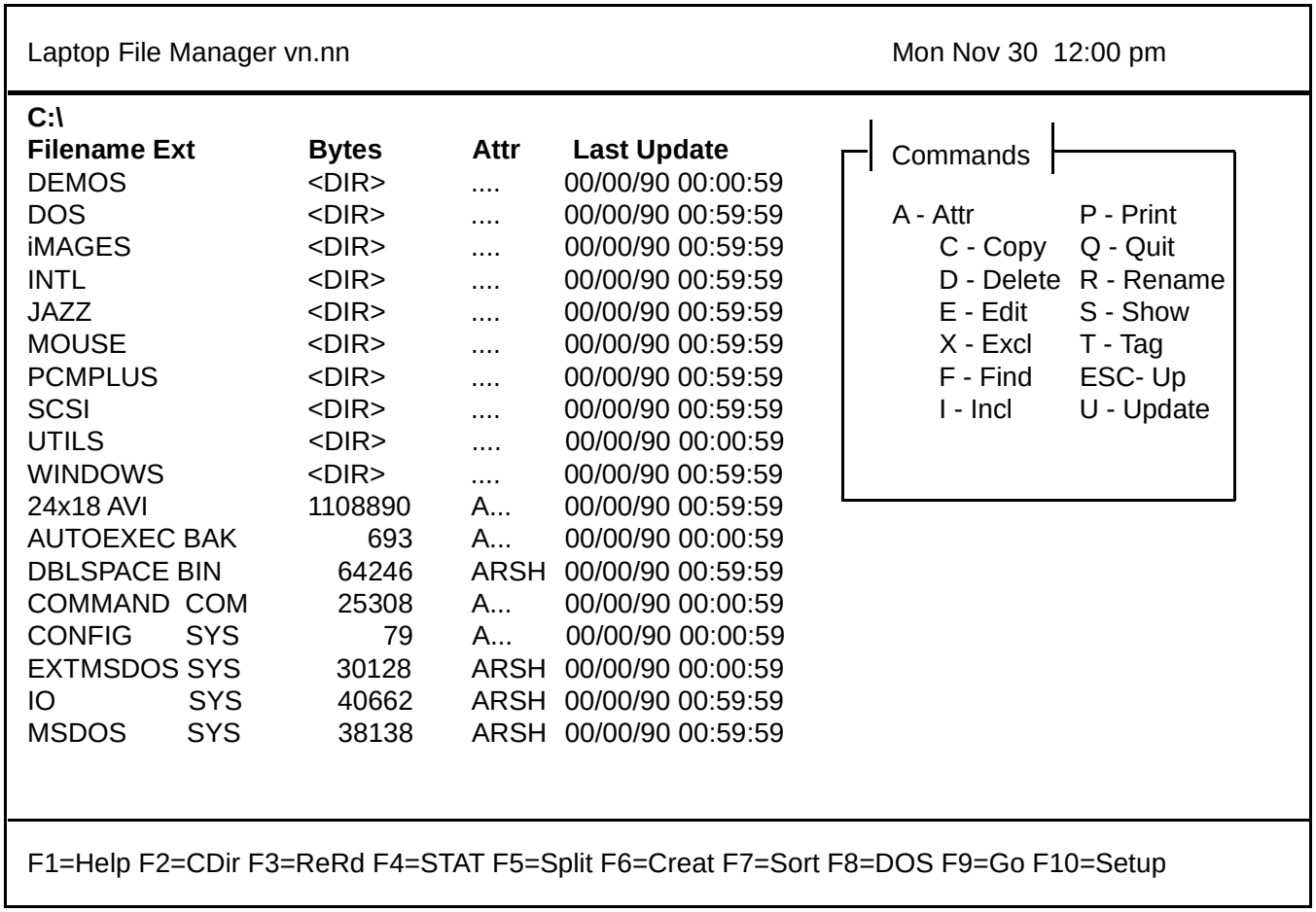
Note: Do not confuse Laptop *File* Manager (LFM) described in this chapter with the Laptop Manager (LM) utility also supplied on your computer.

Loading LFM

The Laptop Manager utility enables you to load LFM from the Laptop Manager main menu by pressing **F2**.

You also can load LFM at the **C:\>** prompt by typing **LFM** and pressing **ENTER**.

Either way, LFM displays a listing of the files and directories in the current directory similar to the following figure. From this listing you can select drives, directories, and files to view and manipulate.



Note: Typing LFM [path] at the MS-DOS prompt will execute LFM using the directory specified in the path.

Use the following keys and commands to move the highlight around the LFM main menu to help you work with your directories and files.

LFM Menu Function Keys

Key	Function
F1	shows Help screen
↑	moves highlight up
↓	moves highlight down
End	highlights last listing
Home	highlights first listing
PgDn	shows next page or Help screen if more than 1 page
PgUp	shows previous page or Help screen
S, **Enter**	if directory name highlighted, shows selected subdirectory; if filename highlighted, shows contents of file
T	tags or untags highlighted directory or file for multiple command action
Esc	if at subdirectory, returns to higher directory; if at root directory, no action; if command active, cancels command
Q	exits LFM or current screen of split screen after the "Are you sure?" prompt: • press **Y** to exit LFM or one screen of split screen • press **N** or **ENTER** to cancel exit command

Function Key Commands

The function keys (**F1** through **F10**) listed along the bottom of the LFM main menu provide the functions described in this section.

F1 Help Key

Pressing **F1** at the LFM main menu—and at some LFM submenus—displays a Help screen with condensed user instructions. Some Help screens have more than one page; look in the upper right corner of the Help screen for the number of pages available. Press **PgUp/PgDn** to move among the pages.

F2 CDir (Change Directory) Key

The change-directory function enables you to view other directories on the current drive, the floppy drive, and any optional drives connected to your computer. Press **F2** at the main menu, and LFM prompts you at the bottom of the screen:

```
Path: [                    ]
```

At this prompt, you can type the pathname of the directory or drive you want LFM to display. If you want to change directories, type **C:\DIRNAME** and press **ENTER**.

LFM then displays the subdirectory and filenames of the directory named DIRNAME.

If you want to change drives, type the drive letter followed by a colon (for example**, A:)**. You also can name a subdirectory on the new drive for display. For example, type **A:\EDITOR** and press **ENTER**.

LFM displays the EDITOR directory and its files.

F3 ReRd (Reread) Key

Pressing **F3** causes LFM to redisplay the listing. This function is useful if you are examining several floppies on the floppy drive. Rather than having to press **F2** (Change Directory) and type the pathname, press **F3** each time you insert a new floppy. You can also "untag" all files you may have previously tagged by pressing **F3**.

F4 STAT (Statistics) or CMDS (Commands) Key

F4 is a toggle that causes LFM to display in the upper right quadrant of the main menu either the current drive statistics or a list of commands you can use at the main menu. If the statistics are displayed, the F4 prompt on the main menu shows *F4=CMDS*. If the commands list is displayed, the F4 prompt shows *F4=STAT*.

The statistics display lists the following information:

- The current drive letter and volume name (if any)
- The number of bytes available on the hard disk or floppy
- The number of bytes in use and available for use (free) on the hard disk or floppy
- The number of files on the current directory and their size in bytes

Note: Subdirectories are listed as files with no size (0 length).

- Number of included (tagged) files, if any, and their size in bytes

F5 Split (Split Screen) Key

The split screen function enables you to view two directory listings on the same screen. At the LFM main menu, press **F5** and LFM prompts you at the bottom of the screen:

Path: [ ]

Type the pathname of the second directory you want to view and press **Enter**. The directory can be on the same drive or a different drive. You can use all function key commands and single-letter commands on directories and files in either listing.

Press **F5** to switch the highlight between the upper and lower directory listing.

Using Split Screen to Copy Files

You can simplify use of the Copy command using the split screen mode. For example, you first select (highlight) the destination directory to which you want to copy the file and press **F5**, then **ENTER**. Then highlight the source file or directory on the other screen and press **C**. LFM then displays the destination directory name in the "Path: […]" prompt described above. The split screen quickly displays the results of the copy process.

Exiting Split Screen

To return to only one screen, press **Q** to exit the highlighted window. LFM prompts you at the bottom of the screen

Are you sure? [N].

To exit the split screen and return to one screen, press **Y**. If you do not want to abandon the split screen mode, press **ENTER** or **N**.

F6 Creat (Create) Key

Pressing **F6** enables you to create a new directory or filename at the LFM prompt at the bottom of the screen

[F]ile or [D]irectory:

If you want to create a new file, press **F**. If you want to create a new directory, press **D**. LFM then prompts:

Path: [ ]

Type the filename or directory name and path and press **ENTER**.

If you do not type a drive letter or directory name, LFM stores the new file or directory under the displayed drive or directory.

You cannot create a new directory and a new file with one command. You must first create the new directory before assigning new or existing files to it.

Example 1: If you want to create a new text file called MYFILE under the existing NEWDIR directory on the floppy drive, type **A:\NEWDIR\MYFILE.TXT** and press **ENTER**.

Example 2: If you want to create a subdirectory called JULY under the existing MEMOS directory on the root directory of hard disk, type **C:\MEMOS\JULY** and press **ENTER**.

F7 Sort Key

The sort function enables you to display listed files in an order determined by one of several file attributes. Pressing **F7** causes LFM to display at the bottom of the screen

Sort file list: [N]ame, [E]xtension, [D]ate/time, [S]ize:

Press the key corresponding to the boxed character in the prompt to begin the sort function. LFM then sorts and displays the files in the current directory listing (and all other directories LFM displays) according to the attribute you select from one of the following.

Name Press **N** and LFM sorts all files in alphabetic order. If any filenames begin with nonalphabetic characters, they are displayed before the alphabetic names.

Extension Press **E** and LFM sorts all files by filename extension in alphabetic order. Filenames with no extension are listed first.

Date/time Press **D** and LFM sorts all files by most recent time and date.

Size Press **S** and LFM sorts all files by number of bytes used, displayingthe largest first.

F8 DOS (Disk Operating System) Key

Pressing **F8** at the LFM main menu causes LFM to prompt at the bottom of the screen

Execute a DOS (S)hell or (C)ommand:

- ❑ If you want to execute an MS-DOS shell, press **S**. LFM displays the **C:\>** prompt where you can type your shell pathname and press **ENTER** to execute.

Note: When you finish using the shell, at the MS-DOS prompt type **EXIT** and press **ENTER**.

- If you want to execute an MS-DOS command, pressing **C** causes LFM to prompt at the bottom of the screen

  DOS Command: [ ]

  where you can type any MS-DOS command and press **Enter** to execute.

F9 Go Key

Pressing **F9** at the LFM main menu causes LFM to load and execute programs based on the file's extension. For example, if you want to execute the MS-DOS EDIT utility on a particular file, move the highlight to the EDIT.COM line under the DOS directory listing and press **F9**. Depending on how you have set up your LFM *Execute Commands* item in the **F10** LFM Setup Commands menu, LFM may prompt you at the bottom of the screen

Press ESC to cancel, any other key to execute:

Press any key except **ESC**. Depending on how you have set up your **F10** LFM Setup Commands menu, LFM then may prompt:

Parameters: [ ]

At this prompt you can type the pathname of the file you want to edit and press **ENTER** (or, if you are executing another type of file that requires no parameters, press **ENTER** to start execution). In the example, the MS-DOS EDIT screen would appear.

When you exit the executable program, LFM reloads and displays its main menu.

LFM uses extended/expanded memory for itself when you use the Go function, reserving all but about 8 KB for the program. If no extended/expanded memory is available, LFM uses about 130 KB of standard base memory.

Note: Do not use the Go function to execute a terminate-and-stay-resident (TSR) program. LFM cannot reload itself when you exit the TSR program, and it displays an error message. The MS-DOS PRINT program is an example. If you intend to use PRINT, install it in your AUTOEXEC.BAT file so the resident portion of PRINT will load when you start the computer.

F10 Setup Key

Pressing **F10** at the LFM main menu causes LFM to display a Setup Commands menu at which you can select one of three submenus described in this section to configure LFM operating features.

Pressing **F1** causes LFM to display a Help screen describing the setup functions.

When you complete your changes to each menu, press **ESC** to return to the Setup Commands menu. Then press **ESC** again and answer the "Save changes?" prompt to return to the LFM main menu.

Pathnames/Options Setup Menu

Pressing **P** at the LFM Setup Commands menu causes LFM to display the Pathnames Setup and Options Setup menu.

```
Pathname Setup
   Editor Pathname      : [ C:\DOS\EDIT.COM                          ]
   Change Parameters    : [ N ]    Parms:    [ %F                    ]

   Showfile Pathname    : [                                          ]
   Change Parameters    : [ N ]    Parms:    [ %F                    ]


Options Setup
   Information Display  : Cmds
   Printer Output       : LPT1
   Restore Original Dir : Yes
   Execute Command      : Prompt
   Sort File List Key   : Extension
   Screen Display Rows  : Normal
   INCLUDE Directories  : No
   Use DOSPRINT if inst : No
```

At this menu you can type the pathnames of your own editing (or word processing) and show-file programs that you have installed in your computer.

The MS-DOS Editor word processing program is furnished on your new computer as the default editor.

If the *Editor Pathname* field is blank, the LFM main menu **E**(dit) command does nothing.

LFM furnishes its own show-file program if you do not type a pathname to another show program.

The executable pathnames you type at the prompts enable you to use the **E**(dit) command and the **S**(how) command at the LFM main menu. The Options Setup portion of the menu enables you to select several LFM operating and display features options.

LFM Colors Menu

Pressing **C** at the LFM Setup Commands menu causes LFM to display the Screen Color Setup menu at which you can change the colors of the LFM menus displayed by a color LCD or an external monitor connected to your computer or change the gray shades of the monochrome LCD.

Execute Commands Menu

Pressing **E** at the LFM Setup Commands menu causes LFM to display the Execute Commands Setup menu at which you can type the filename extension, program pathname, and prompting parameters for executable programs you want to respond when you press **F9** as described in *F9 Go Key*.

The upper right quadrant of the LFM main menu lists the commands you can use to manipulate the directories and files displayed on the main menu. If the Commands box is not displayed, press **F4** and LFM replaces the drive statistics display with the Commands box.

To execute a command press ↑ or ↓ to highlight the directory/filename to which you want to apply the command and then press the first letter of the command name listed in the box to execute the command.

Note: Many of the character key commands are capable of operating on multiple files and directories. See "Multiple File Operations" at the end of this chapter for information.

Attr (Attribute) Command

To set or change file attributes, highlight the filename on the LFM listing and press **A** at the LFM main menu. LFM places an "A" to the left of the highlighted file and prompts you at the bottom of the screen

Attributes: [Y]es, [N]o, [I]gnore: [I] arch [I] rdonly [I] sys [I] hide

Press → or ← to move the cursor to the attribute you want to change. Then press either **Y** to set the attribute for the highlighted file, **N** to delete a previously set attribute, or **I** to leave the attribute unchanged.

When you have changed the attribute(s), press **ENTER** to complete the process. LFM then changes the "Attr" (Attribute) column of the highlighted file to reflect your selections.

arch (Archive) Attribute

Setting a file's Archive attribute affects how MS-DOS and some applications create a back-up file when you make changes to the file.

rdonly (Read Only) Attribute

Setting a file or directory to Read-Only protects the file from any changes or editing. The file cannot be written to or deleted from the storage device (hard disk or floppy).

sys (System) Attribute

The System attribute is used for system files (.SYS) required to start and run your computer. Usually only a user familiar with programming should modify this attribute. System files are hidden in MS-DOS directory (DIR command) listings, but LFM *does* display system files.

hide (Hide File) Attribute

The Hide attribute "hides" the file from the MS-DOS DIR and PRINT commands so that the file is not displayed, read, or printed. However, LFM *does* display, read, and print "hidden" files.

Copy Command

The Copy command enables you to copy the highlighted file, tagged files (see "Multiple File Operations" later in this chapter), or an entire directory to another directory or to the floppy drive.

To copy a file or directory, highlight the file or directory name you want to copy, and press **C**. LFM prompts at the bottom of the screen

Path: [ ]

Type the pathname where you want the directory/file copied to, and press **ENTER**.

- If you do not type a new drive letter or directory name, LFM copies the file or directory to the current drive or directory.

- If you do not type a new filename, LFM uses the existing filename.

You also can copy a file/directory to another name you type at the Path: prompt.

You can create a new directory while copying. At the *Path:* prompt type the new directory name as part of the pathname, and press **ENTER**. LFM prompts at the bottom of the screen

Directory doesn't exist, CREATE? [Y]

Press **Y** if you want LFM to create the new directory.

If you try to copy a file using the same filename under a different directory, LFM prompts at the bottom of the screen

Copy file : [R]eplace, [A]ppend, [S]kip

To this prompt do one of the following:

- Press **R** if you want LFM to delete the existing file and replace it with the highlighted file.

- Press **A** if you want LFM to append (add) the highlighted file to the end of the existing file. Use this option if you want to combine multiple files into one file.

- Press **S** if you want LFM to abort the Copy process.

Delete Command

The Delete command enables you to delete the highlighted file, tagged files (see “Multiple File Operations” later in this chapter), or an entire directory and all files stored in the directory.

To delete a file, highlight the file you want to delete and press **D**. LFM prompts at the bottom of the screen

```
Are you sure? [ N ]
```

If you are certain you want to delete the file, press **Y**. LFM deletes the file and removes the filename from the listing. If you do not want to delete the file, press **N** or **ENTER**, and LFM aborts the Delete operation.

To delete an entire directory of files, highlight the directory name you want to delete and press **D**. LFM prompts you at the bottom of the screen

```
Delete Directory and ALL Subfiles?: [ N ]
```

If you are certain you want to delete the directory and all its files, press **Y**. LFM displays a second prompt to be sure you want to delete a directory and all its files.

```
Are you sure? [ N ]
```

If you still are certain you want to delete the directory and all its files, press **Y**. LFM deletes the directory and its files and removes the directory name from the listing. If you do not want to delete the directory, press **N** or **ENTER**, and LFM aborts the Delete operation.

Edit Command

The Edit command loads the highlighted file and the MS-DOS Editor. You can install and use almost any other word processing or editing program by entering its pathname using the Setup function. You must first install your word processor or editor on the hard disk according to the instructions furnished with your word processing program.

You also can use the Microsoft Windows Write word processing application available under the Windows program furnished with your new computer.

Excl (Exclude) Command

The Exclude command works with the Include command. Both commands are used for multiple file operations where you want to execute one command (such as Copy or Delete) on a number of files in one operation. The Exclude command permits you to exclude selected filenames from tagged files using the Include or Tag commands.

If you have not tagged any files using the Tag or the Include commands, the Exclude command takes no action. If you have tagged files—indicated by the **>>** symbol appearing in the left margin by the filename—you can exclude them from the listing by pressing **X** at the main menu. LFM then prompts you at the bottom of the screen

Exclude: [A]ttribute, [E]arlier Date, [L]ater Date, [S]elect all, [I]gnore:

This prompt permits you to exclude files from the tagged files according to the parameters in the above prompt.

If you want to exclude (untag) *all* included names, press **ENTER** or **S**.

Attribute To exclude (untag) all files with certain attributes, press the **A** key at the Exclude prompt and LFM prompts you at the bottom of the screen

Attributes: [Y]es, [N]o, [I]gnore: [I] arch [I] rdonly [I] sys [I] hide

This prompt enables you to exclude all files with the same attributes. For example, if you want to exclude all read-only files in a directory, move the cursor to the *rdonly* option and press **Y** to select read-only files. Then press **ENTER** twice. If you want to exclude all archived files, press **Y** with the cursor in the *arch* box. You can select any combination of attributes.

Earlier Date The *Earlier Date* prompt enables you to exclude all files dated earlier than the date and time you select. Press **E** at the *Exclude* prompt and LFM prompts

File Date: [12/21/90] Time: [12:34:56]

At this prompt type the date or time which represents the *latest* date and/or time you want; LFM excludes all files dated *earlier* than that date. Then press **ENTER** and LFM prompts at the bottom of the screen

File pattern: [*.*]

At the *File pattern* prompt type the ***.*** wildcard characters if you want to exclude files only by date, or type filename extensions (for example,*.TXT) or filename fragments-plus-wildcards to further delimit the Exclude function. See “Find Command” described previously and your *MS-DOS User’s Guide and Reference* for wildcard use.

Later Date Pressing **L** at the *Exclude* prompt displays the same *File Date* prompt as the *Earlier Date* prompt described above, and works the same except LFM excludes all files *after* the date you specify.

Select All Press **S** (or the **ENTER** key) at the *Exclude* prompt to exclude (and untag) all files in the directory. This option is particularly useful if you first select all files and then use the Exclude command to remove certain files from the included list.

Ignore Press **I** at the *Exclude* prompt if you do not want to use any of its options to select files. LFM then prompts at the bottom of the screen

File pattern: [*.*]

At this prompt you can type file patterns for LFM to use to exclude certain files. For example, the filename pattern *.TXT excludes all files with that extension from the tagged list.

Find Command

The Find command helps you find files on the current (displayed) directory, according to their filename/extension pattern. Pressing **F** at the main menu causes LFM to prompt at the bottom of the screen

Find file: find the [F]irst or [N]ext:

If you select the *[F]irst* option by pressing **F**, LFM looks for the first occurrence of the filename pattern starting at the beginning of the directory.

If you select the *[N]ext* option by pressing **N**, LFM looks for the first occurrence of the filename pattern after the highlighted filename.

After you press **F** or **N**, LFM prompts at the bottom of the screen

File pattern: [*.*]

At this prompt enter the filename pattern for which you are searching. For example, to find the first or next file with a .TXT extension, type ***.TXT** and press **ENTER**. LFM then searches for the first or next filename with the .TXT extension. If you want to find the first or next filename beginning with the characters MI, type MI*.* and LFM looks for the first or next filename beginning with those two characters.

Incl (Include) Command

The Include command enables you to tag (select) a number of files from the current (displayed) directory listing for later multiple execution of commands such as Delete and Copy. You can tag all files in a directory or certain files according to date, file attribute, or file pattern. You can use the Exclude command in conjunction with the Include command for even greater selectivity.

Press **I** at the main menu and LFM prompts at the bottom of the screen

Include: [A]ttribute, [E]arlier Date, [L]ater date, [S]elect all, [I]gnore:

Attribute To include (tag) all files with certain attributes, press **A** at the *Include* prompt, and LFM prompts at the bottom of the screen

Attributes: [Y]es, [N]o, [I]gnore: [I] arch [I] rdonly [I] sys [I] hide

This prompt enables you to include all files with the same attributes. For example, if you want to include all read-only files in a directory, move the cursor to the *rdonly* option and press **Y** to select read-only files Then press **ENTER** twice. If you want to include all archived files, press **Y** with the cursor in the *arch* box. You can select any combination of attributes.

Earlier Date This prompt enables you to include all files dated earlier than the date and time you select. Press **E** at the Include prompt, and LFM prompts you

File Date: [12/21/90] Time: [12:34:56]

Type the date or time which represents the *latest* date or time you want: LFM includes all files dated *earlier* than that date. Then press **Enter**, and LFM prompts at the bottom of the screen

File pattern: [*.*]

At the *File pattern* prompt type the ***.*** wildcard characters if you want to include files only by date, or type filename extensions (for example, * .TXT) or filename fragments-plus-wildcards to further delimit the Include function. See "Find Command" described previously and the *MS-DOS User's Guide and Reference*.

Later Date Pressing **L** at the *Include* prompt displays the same *File Date* prompt as the *Earlier Date* prompt described previously, and works the same except LFM includes all files *after* the date you specify.

Select All Press **S** or **ENTER** at the *Include* prompt to include all files in the directory. This option is particularly useful if you first select all files and then use the Exclude command described previously to remove certain files from the tagged list.

Ignore Press **I** at the *Include* prompt if you do not want to use any of its options to select files. LFM then prompts at the bottom of the screen

File pattern: [*.*]

At this prompt you can type file patterns to use to include files. For example, type the filename pattern ***.TXT** to include all files with that extension in the tagged listing. See the *MS-DOS User's Guide and Reference.*

Print Command

The LFM Print command enables you to send the highlighted file to your system printer or other device connected to your computer via the LPT or COM ports. Using **F10** (**SETUP**), the LFM Setup Commands, and the Pathnames/Options Setup screen described previously, you can select the printer port (LPT parallel or COM serial) and whether or not to use the MS-DOS PRINT command.

The LFM Print command prints your file as recorded, with no pagination or perforation-skip capabilities. You must embed the appropriate printer control characters and escape sequences in your file to control your printer (see your printer's user manual). Since most applications

provide their own printing facility, you may find their print functions more convenient to use.

Quit Command

The Quit command at the main menu erases LFM from RAM and returns control to MS-DOS, Laptop Manager, or Windows depending on how you loaded LFM. If LFM is in split-screen mode, LFM quits the current screen of the two screens.

To quit LFM or one of the split screens, press **Q** at the main menu. LFM prompts at the bottom of the screen

```
Are you sure?  [ N ]
```

Press **Y** if you want to quit LFM. Press **ENTER** or **N** if you want LFM to remain on screen.

Rename Command

The Rename command enables you to rename the highlighted file or directory. You also can use the Rename command to *move* the highlighted file to another directory. However, you cannot move a directory in this manner; you can only rename the current directory.

You can use the Rename command instead of the Copy command when you want to delete the files from their present area while copying the files to another area.

To rename or move highlighted file or directory, at the main menu press **R** and LFM prompts at the bottom of the screen

```
Path:  [ FILENAME.EXT                ]
```

If you only want to change the name of the file or directory and not move it, type the new name, and press **ENTER**.

If you want to move the file, type the entire pathname where you want the file moved, including the new or existing filename, and press **ENTER**.

For example, to move MYFILE.TXT to the MEMOS directory on the root directory and change the name, type **MEMOS\FILE1.TXT**.

LFM deletes MYFILE.TXT entry from the current directory and moves it to the FILE1.TXT file under the MEMOS directory.

Show Command

The Show command has two primary purposes: to display the data in a highlighted file for you to view and to display a subdirectory listing.

Showing a Subdirectory

To view a subdirectory, move the highlight to the directory name and press **S**. LFM displays the selected directory listing. To return to the next higher directory level, press **ESC**. If the root directory is currently displayed, LFM takes no action.

Showing a File

To view a file, move the highlight to the desired filename and press **S**. You cannot edit or modify the file using the Show command (unless you specified a word processor or editor program for the Show command).

You can use **PGUP** and **PGDN** to page through the file, ↑ and ↓ to scroll up and down one line at a time, and ← and → to scroll left and right four columns at a time.

Press **HOME** and **END** to display the beginning and end of the file, respectively. Press **ESC** to return to the LFM directory listing.

Tag Command

The Tag command enables you to tag (include) directories and files, one at a time, for later multiple file operations. To tag a directory or file, highlight the name of the file, and press **T**. LFM displays the **>>** symbol in the left margin opposite the name to denote that the directory or file is tagged; LFM then moves the highlight down to the next name.

If you want to "untag" (exclude) a name, highlight the name, and press **T**. LFM removes the **>>** tag symbol. If you want to untag all tags, use the Exclude command or press **F3** (**REREAD**).

Up (ESC Key) Command

The Up command displays the parent directory of the currently displayed directory. Press **ESC** at any listing, and LFM displays the next higher directory. If the root directory is currently displayed, LFM takes no action.

Update Command

The Update command permits you to change the *Last Update* date and time listing for individual files or multiple tagged files (but **not** subdirectories). At the main menu, press **U** and LFM prompts at the bottom of the screen:

File Date: [01/01/90] Time: [00:00:58]‘

Type the new date or time you want, and press **ENTER**. LFM changes the date on the *Last Update* column listing to your new date.

Multiple File Operations

You can perform the same character key command on two or more directories or files by using the Tag command, Include command, or Exclude command to choose the names and then activating the command. The following LFM commands operate on more than one file:

- ❑ Attribute command
- ❑ Copy command—be careful with your pathname; do not supply a filename when copying multiple files; make use of MS-DOS wildcard characters * and **?** (see the *MS-DOS User's Guide and Reference*). A *Select each* option enables you to choose to copy each file or directory and to *Replace* or *Append* the file.
- ❑ Delete command—be cautious using the Delete command with multiple files; examine the tagged names carefully before answering the final "Are you sure?" prompt
- ❑ Print command—places selected files in the print queue in the order displayed at the main menu from top to bottom
- ❑ Update command
- ❑ Rename command—you can use the Rename command to *move* more than one selected file to another directory: in the pathname, type only a directory name, and use MS-DOS * and **?** wildcard characters

Refer to the individual descriptions of these commands earlier in this chapter and, where the directions refer to one file, assume that the directions affect all tagged files and directories.

Tagging Files for Multifile Operation

To select files for multifile commands, you can use either the Tag command to tag each file in the main menu listing or the Include and Exclude commands to select a large number of related names or extensions. You also can use the *Include All* command to tag all files and then selectively exclude files by pressing **T(AG)**.

If you want to include or exclude directories, follow these steps.

1. Press **F10** to get to the Setup Commands menu.

2. Press **P** to get to the Options Setup Menu.

3. Highlight the Include Directories item and press the right arrow to toggle between *Yes* or *No*, and make your selection.

4. Press **ESC** to exit.

Refer to the individual descriptions of these commands earlier in this chapter for more details.

Split Screen

You can simplify use of the Copy command using the LFM split screen mode. (Press **F5** at the main menu to enter split screen mode). For example, using a split screen you can view and tag the source files and directories on one screen and the destination files and directories on the other screen.

Copying Multiple Files

When you tag multiple files for copying, LFM assumes you want to use the existing filenames under the new destination directory (or drive). Thus you *do not* have to type the MS-DOS wildcard characters in the pathname.

Restoring Laptop File Manager

If LFM has for some reason been deleted from the hard disk, you can install the LFM files from the backup diskettes you made of your system software during SETUP.

After installing the software, you should be able to load LFM from the hard disk, Windows, or from the Laptop Manager main menu.

8
VGA External Monitor Utilities

This chapter tells you about

- ❑ Capabilities and operation of the VGA software when using an external monitor

- ❑ Technical data for users wanting to program the VGA enhanced modes

Contents

Capabilities

Your TravelMate 4000M computer supports several enhanced modes beyond the VGA standard, including the ability to display 132 columns of text and 256-color graphics at resolutions of 640 × 480 and 640 × 400 on any supported monitor. In addition, the TravelMate 4000M supports 800 × 600 resolution, 16- and 256-color graphics on a multifrequency monitor and 1024 × 768 resolution, 16-color graphics on an 8514 or compatible monitor. Some products may also support 1280 x 1024 x 16 and 1024 x 768 x 256 resolution (interlaced).

To take advantage of these enhancements, your computer includes software support for several popular application programs. The following sections describe the procedures necessary to install these programs so they can take full advantage of your computer's enhanced capabilities.

To obtain the external monitor display drivers, you must use the Maintenance and Backup procedures defined in Chapter 1 to make a VGA diskette. You must then install the drivers from the diskette into your /UTILS directory. This is done by typing **A:\INSTALL.**

The TravelMate 4000M drivers described in this chapter assume you are using a color VGA configuration. If you are using a monochrome VGA monitor, use the VGA.EXE utility to switch from monochrome VGA mapping to color mapping before using the drivers. The command VGA VGA will set your computer to color mapping.

Extended 1024 × 768 Graphics Mode

The computer is capable of supporting a 1024 × 768 graphics mode with 16 colors. This high-resolution mode is interlaced and requires the use of an IBM 8514 or equivalent interlaced monitor. Some products may also support 1280 x 1024 x 16 and 1024 x 768 x 256 resolution (interlaced).

Extended 16 and 256-Color 800 × 600 Graphics Mode

Your computer display software can drive a multifrequency display in an extended graphics mode with 800 dots horizontally by 600 dots vertically in 16 or 256 simultaneous colors. This increased resolution effectively provides 56 percent more information than standard VGA modes with software that supports this mode.

Note: The extended resolution 800 × 600 graphics mode of your computer requires a multifrequency monitor. The 1024 × 768 graphics mode requires an IBM 8514 or compatible interlaced monitor.

The computer's 800 × 600 graphics mode is not supported on the IBM PS/2 8503, 8512, 8513 or 8514 or equivalent fixed-frequency displays.

You may need to adjust your multifrequency monitor to display the 800 × 600 graphics mode properly. Use the vertical and horizontal size and position controls on your monitor to display the entire 800 × 600 graphics mode image without distortion.

Extended 256-Color 640 × 400, 640 × 480, and 600 × 800 Graphics Modes

Your computer can display up to 256 simultaneous colors at a resolution of 640 × 480 dots. This mode gives five times the resolution of standard VGA 256-color graphics.

The computer also can display up to 256 simultaneous colors at a resolution of 640 × 400 dots. This mode gives you four times the resolution of standard VGA 256-color graphics.

132-Column Text Modes

Your computer supports two 132-column text modes on either fixed-frequency or multifrequency monitors. One mode displays 25 rows of 132-column-wide text. The second mode displays 60 rows of 132-column-wide text. These modes display large amounts of information at one time.

These extended modes require specific software support to take advantage of their capabilities in software applications.

Most software that is compatible with IBM's Personal System/2, VGA, or EGA will run automatically on your computer. Just turn on your computer and install your application for IBM PS/2 models 50, 60, 70 or 80 video, VGA, or EGA as instructed by the program's documentation.

Configuring Your Application Program

Many applications include an installation or configuration program to prepare them for operation on particular hardware. Most newer programs are able to run in the default VGA configuration of your computer.

However, some programs are written specifically for certain non-VGA or non-EGA video hardware so you may have to configure your computer to behave identically to the video board needed by the particular software. For this purpose, your system includes a utility to configure your computer to behave like each of the IBM standard video devices. This utility, called *VGA.EXE*, is described in the following section.

The following table lists the fully compatible video standards supported by your computer and the video modes and resolutions available under each video standard.

TravelMate 4000M Video Standards Supported

Standard Mode	Resolution	Simultaneous Colors (1)	Mapping (2)
VGA, PS/2 Display Adapter including MCGA and EGA modes *(default)*			
Monochrome Text	80 columns × 25 rows	–	Monochrome
Color Text	80 columns × 25 rows	16	Color
	40 columns × 25 rows	16	Color
	80 columns × 60 rows		
100-Col. Text (4)	100 columns × 50 rows	16	Color
	100 columns × 60 rows	16	Color
	100 columns × 25 rows	16	Color
132-Col. Text (4)	132-columns × 25 rows	16	Color
	132-columns × 60 rows	16	Color
		–	Monochrome
		–	Monochrome
Graphics	320h × 200v (3)	4	Color
	640h × 200v (3)	2	Color
	320h × 200v (3)	16	Color
	640h × 200v (3)	16	Color
	640h × 350v	16	Color
	640h × 350v	–	Monochrome
	320h × 200v (3)	256	Color
	640h × 480v	2	Color
	640h × 480v	16	Color
	1024h × 256v	256	Color
Extended Graphics (4)	1024h × 768v	16	Color
	800h × 600v	16	Color
	800h × 600v	256	Color
	640h × 400v	256	Color
	640h × 480v	256	Color
	1024 x 768 (5)	256	Color
	1280 x 1024 (5)	16	Color
		16	Color

Notes to the table:

(1) "Simultaneous colors" - the number of colors or shades that can be displayed at one time.

(2) This column refers to the old style display the mode was originally designed for. The 800h × 600v graphics modes require a multifrequency monitor, and 1024h × 768v graphics modes require an 8514 or equivalent compatible monitor.

(3) The 200-line vertical resolution modes are double-scanned to display 400 lines on screen.

(4) These modes require use of application-specific drivers that are found on your VGA diskette created at the time of system backup (refer to *Capabilities* earlier in this chapter).

(5) Supported on some notebooks.

Installation Hints

The following software installation tips may help you achieve the best monitor image.

- The best display images usually are achieved by installing your applications for the highest resolution mode available.

- Some applications automatically detect what type of video card and monitor combination are installed and configure themselves to take best advantage of the available hardware.

- Install your software for VGA or IBM PS/2 video if possible. This permits your software to run on your computer in start-up configuration.

- If your software does not specify a VGA or IBM PS/2 option and you are using a color analog monitor, try installing the application for “color” if available. This usually works in the computer’s default color mode on color monitors and the color LCD.

TravelMate 4000M VGA Software

The /UTILS directory contains several programs designed to help you operate your external monitor most efficiently.

Various drivers in the /UTILS directory let popular applications take advantage of your computer's extended graphics and 132-column text modes. For driver installation instructions, run the INSTALL.BAT file by typing INSTALL at the MS-DOS **C:\UTILS>** prompt

```
INSTALL
```

and pressing **ENTER**.

You can copy the drivers for programs such as Lotus 1-2-3.

Note: To switch the display from the computer's built-in LCD to a connected external monitor, use the CRT command at the MS-DOS **C:\>** prompt. If you want to display on the LCD, execute the LCD command at the MS-DOS **C:\>** prompt.

Using VGA.EXE

The VGA.EXE utility enables you to customize several features of your LCD or external monitor.

Note: The VGA utility may not operate correctly under Windows.

At the MS-DOS **C:\>** prompt, type

VGA

and press **ENTER**. VGA displays a simple menu listing some of the options available. Use the ↑ and ↓ keys to select the feature you want, and press **ENTER**.

To quit the VGA program, choose the Exit to Operating System option and press **ENTER** or simply press **ESC**.

You may also load VGA.EXE from the DOS prompt line, thus bypassing the menu. This is useful if you want to incorporate VGA.EXE commands into a batch file.

To view a list of available command line options, at the MS-DOS **C:\>** prompt, type

VGA ?

Note that some commands are for the LCD only, and others are for use with an external monitor. To get more detailed information press **F1**, or at the MS-DOS **C:\>** prompt, type

VGAHELP

VGA Utility

The following commands enable you to use VGA.EXE at the MS-DOS **C:\>** prompt.

VGA Utility Commands

Command	Description
VGA	Displays the VGA.EXE menu
ALT	Switches to or from the external monitor
CRT	Switches to the external monitor
LCD	Switches to the LCD
SIM	Switches to SimulScan mode
REV	Reverses the text foreground or background (not available on color models)
NOR	Switches to the default text foreground or background (not available on color models)
GREV	Reverses graphics only (not available on color models)
BOTH	Reverses both text and graphics (not available on color models)
EXP	Switches the LCD alignment to expanded mode
NOEXP	Disables LCD expanded mode
CON0	Disables contrast adjustment
CON1	Enables the black-and-white contrast adjustment
CON2	Enables the background contrast adjustment
CON3	Enables the foreground contrast adjustment

Command	Description
CON4	Enables the foreground and background contrast adjustments
MON0	Sets the monitor type to VGA
MON1	Sets monitor type to 8514-Compatible
MON2	Sets monitor type to Super VGA
MON3	Sets monitor type to Extended Super VGA
MON4	Sets monitor type to Multi-Frequency
MON5	Sets monitor type to Extended Multi-Frequency
MON6	Sets monitor type to Super Multi-Frequency
MON7	Sets monitor type to Extended Super Multi-Freq.
BLON	Turns backlight on
BLOFF	Turns backlight off
VGA 80 × 25	Switches the computer to 25-line, 80-column text mode. This is the default configuration. A warm boot (**CTRL-ALT-DEL**) restores this mode. (Not available on color models.)
VGA 80 × 50	Switches the computer to enhanced 80-column text mode. This results in 50 lines in VGA mode, or 43 lines in EGA mode. (Not available on color models.)

VGA 132 × 25 Switches the computer to color, 25-line, 132-column text mode. This mode is only for use with specific applications that have been designed to take advantage of this mode's extended text capabilities. Not available on color models.

Command	Description
VGA 132 × 43	Switches the computer to color, 43-line, 132-column text mode. This mode is only for use with specific applications that have been designed to take advantage of this mode's extended text capabilities. Not available on color models.

VGA and Extended VGA Programming

This section describes how to access the enhanced modes of your computer. The information in this section is intended for users familiar with assembly language programming. An understanding of this information is not necessary for normal operation of your computer.

The VGA standard supports a variety of video modes. These video modes can be accessed through standard video BIOS calls from assembly language as well as high-level language routines.

When you start up in MS-DOS, your computer is usually in standard 80-column text or "alphanumeric" mode. On a color system this is mode 3+. VGA 640 × 480 dot 16-color graphics is mode 12H. The following table lists the standard VGA video modes available with your computer.

TravelMate 4000M Standard VGA Video Modes

Mode (hex)	Type	Colors (1)	Columns	Rows	Buffer	Char. Size (2)	Res. (3)
1	text	16/256 KB	40	25	B8000	9 × 16	360 × 400
2	text	16/256 KB	80	25	B8000	9 × 16	720 × 400
3	text	16/256 KB	80	25	B8000	9 × 16	720 × 400
4	graph.	4/256 KB	40	25	B8000	8 × 8	320 × 200
5	graph.	4/256 KB	40	25	B8000	8 × 8	320 × 200
6	graph.	2/256 KB	80	25	B8000	8 × 8	640 × 200
7	text	4 Mono	80	25	B0000	9 × 16	720 × 400
D	graph.	16/256 KB	40	25	A0000	8 × 8	320 × 200
E	graph.	16/256 KB	80	25	A0000	8 × 8	640 × 200
F	graph.	4 Mono	80	25	A0000	8 × 14	640 × 350
10	graph.	16/256 KB	80	25	A0000	8 × 14	640 × 350
11	graph.	2/256 KB	80	30	A0000	8 × 16	640 × 480
12	graph.	16/256 KB	80	30	A0000	8 × 16	640 × 480
13	graph.	256/256 KB	40	25	A0000	8 × 8	320 × 200

Notes to the table:

Default modes are 3 for color monitors and 7+ for monochrome monitors.

(1) Colors: Where two numbers are given, the first is the number of colors available at one time; the second number is the total number of possible colors.

(2) Character Size: The size of the matrix that contains each text character.

(3) Resolution: All 200-line modes are “double-scanned” to display 400 lines on screen.

Your computer display software adds 13 additional modes to the standard VGA modes. These modes are the 1024 × 768 and 800 × 600 extended VGA graphics modes, the 640 × 400, 256-color graphics and the 132-column by 25-row and 43-row text modes. These modes each have been assigned mode identification numbers, summarized in the following table.

Note: Some products support 1024 x 768 x 256 and 1280 x 1024 x 16 resolution.

TravelMate 4000M Extended VGA Video Modes

Mode Number	Resolution column/row	Colors	Character Cell Size (1)	Mode Type	Memory Address	Notes
2D	640 × 400	256	8 × 16	Graphics	A000	
2E	640 × 400	256	8 × 16	Graphics	A000	
30	800 × 600	256	8 × 16	Graphics	A000	CRT only
37	1024 × 768	16	8 × 16	Graphics	A000	CRT only
	1024 x 768 **(2)**	256				
	1280 x 1024 **(2)**	16				
41	100 × 50	16	8 × 8	Text	B800	CRT only
42	100 × 60	16	8 × 8	Text	B800	CRT only
44	100 × 25	16	8 × 16	Text	B800	CRT only
51	132 × 30	16	8 × 13	Text	B800	CRT only
52	132 × 60	16	8 × 8	Text	B800	CRT only
53	80 × 60	16	8 × 8	Text	B800	
54	132 × 25	16	8 × 16	Text	B800	CRT only
64	800 × 600	16	8 × 16	Graphics	A000	CRT only
6A	800 × 600	16	8 × 16	Graphics	A000	CRT only
	1024 x 768	256				

(1) Character Size: The size of the matrix that contains each text character

(2) Available on some notebook products

References

Programming the extended VGA modes is similar to programming the standard VGA video modes of the IBM PS/2 VGA and PS/2 Display Adapter. You may want to refer to the following publications for details on programming VGA in general.

IBM Personal System/2 Display Adapter Technical Reference, April 1987, IBM part number 68X2251 S68X-2251-0

IBM Personal System/2 and Personal Computer BIOS Interface Technical Reference, April 1987, IBM part number 68X2260 S68X-2260-00

Programmer's Guide to PC and PS/2 Video Systems, by Richard Wilton, Microsoft Press, 1987 (ISBN 1-55615-103-9)

External Monitor Troubleshooting

The following are typical symptoms of installation problems and their solutions.

Symptom	Solution
No display	**(1)** Computer not configured appropriately for VGA; configure the application as instructed in the application's documentation. **(2)** Monitor signal and/or power cable not properly plugged in. **(3)** Monitor not turned on. **(4)** Brightness and/or contrast controls on monitor not adjusted properly. **(5)** LCD still active; use the CRT command to switch to external monitor.
CRT or setup error on startup	Setup Program not run. See Chapter 1 of this Manual.
Screen displays distorted images or screen goes blank when software is executed	Check that your monitor was turned on before starting your computer.

External Monitor Troubleshooting

Symptom	Solution
Screen displays distorted image on IBM PS/2 monitor	Your computer is configured for an invalid monitor via the Setup Program; the CRT Type item must be set to match the PS/2 display or equivalent fixed frequency monitor.
Unable to display 800 × 600	You must have a multifrequency extended graphics monitor to use the extended 800 × 600 graphics mode of the computer. If you are using a multifrequency monitor, try adjusting the vertical hold and vertical position adjustments.
Unable to display 1024 × 768 extended graphics	This high-resolution mode is interlaced and requires the use of an IBM 8514 or equivalent interlaced monitor.
Large blank bands at top and bottom of some images on multifrequency monitor; screen image does not fill up entire screen in some modes.	Some multifrequency monitors do not automatically adjust vertical screen size as IBM PS/2 monitors do. Adjust your display for best results.

9
Other Utilities

Other utilities available from Texas Instruments are automatically installed in the /UTILS directory on the hard disk. Available utilities are as follows:

- ALARM utility that controls the low-battery and cover-closed alarm beepers
- GETSTAT utility that tests for the presence of external devices and the computer power source
- RAMDRIVE.SYS device driver that uses part of computer memory as a hard disk
- SETCMOS utility that restores your Setup Program settings in case of a power loss
- SETKEY utility that sets the PS/2 port settings as well as the keyboard typematic speed and delay
- DATES utility provides important system information

Contents

ALARM Utility

The ALARM utility enables you to turn on or turn off the low-battery beeper and the cover-closed beeper at the MS-DOS **C:\>** prompt. To view the command and its options, at the MS-DOS **C:\>** prompt type

ALARM

and press **ENTER**. The current status of the ALARM utility is displayed.

The Cover Alarm is turned On.
The Low Battery Alarm is turned On.

To view a brief help display, type

Alarm /?

and press **ENTER**. The utility displays the following screen listing the command options and the current alarm status.

Usage: - Alarm (/switch)

Alarm - Shows status of Cover and Low Battery Alarms
Alarm /On - Turns the Cover and Low Battery Alarms On.
Alarm /Off - Turns the Cover and Low Battery Alarms Off.

The ALARM utility turns on or turns off the low-battery and the cover-closed alarm beepers.

You also can add either of the commands to your AUTOEXEC.BAT file to control the alarms when you boot the computer. For example, add the line

ALARM ON

to your AUTOEXEC.BAT file to turn on both alarms when you boot the computer. You can also control one or both alarms using the computer's Setup Program. (See Chapter 1 of this manual.)

The GETSTAT program can be used in a batch file to test for the following:

- ❑ Connection of an external monitor (/M)
- ❑ Presence of an optional external expansion unit (/E)
- ❑ Power source in use, external AC Adapter or internal battery pack (/B)
- ❑ Type of monitor in use, external or built-in LCD (/V)

GETSTAT returns an error code to the batch file for it to test.

GETSTAT Commands

To test for the presence of an optional external expansion unit, use the command:

```
GETSTAT /M
```

If the monitor is connected, GETSTAT exits with an ERRORLEVEL = 1; if the external monitor is not connected, GETSTAT exits with an ERRORLEVEL = 0.

To determine the current power source in use, use the command:

```
GETSTAT /B
```

If the computer is currently powered by the Battery Pack, GETSTAT exits with an ERRORLEVEL = 1; if the computer is currently powered by the AC Adapter, GETSTAT exits with an ERRORLEVEL = 0.

To test which video device is in current use, use the command:

GETSTAT /V

If the computer is displaying data on both the external monitor and the built-in LCD, GETSTAT exits with an ERRORLEVEL=2.

If the computer is displaying data on an external monitor, GETSTAT exits with an ERRORLEVEL = 1; if the computer is using its built-in LCD, GETSTAT exits with an ERRORLEVEL = 0.

Sample GETSTAT File

The following sample shows a typical GETSTAT file you could create as a batch file named SAMPLE.BAT. This file is stored in the /UTILS directory.

```
@echo off
rem version 1.0
25rem ========================
rem check the battery status
rem ========================
getstat /b
if ERRORLEVEL 1 goto yes_batt
echo The unit is currently powered by external power source
goto chk_video
:yes_batt
echo the unit is currently powered by the battery
:chk_video
rem ============================
rem check the video display status
rem ============================
getstat /v
if ERRORLEVEL 2 goto yes_sim
if ERRORLEVEL 1 goto yes_mon
echo the video is currently on the LCD
goto chk crt
:yes_mon
echo the video is currently on the external monitor
goto chk crt
:yes_sim
echo the video is currently on SimulSCAN
:chk_crt
rem ============================
rem check the presence of monitor
rem ============================
getstat /m
if ERRORLEVEL 1 goto yes_crt
echo An external monitor is not conected to the system
goto exit_all
:yes_crt
echo An external monitor is connected to the system
:exit_all
```

RAMDRIVE.SYS Device Driver

Note: When you turn off or warm start your computer, all data stored in RAM disks is lost (for DOS versions earlier than 6.0).

The RAMDRIVE.SYS device driver enables your computer to use some of its memory as if it were a hard disk drive. Called a *RAM disk* (and sometimes a *virtual disk*), it is much faster than a hard disk because its data is always loaded into RAM. RAMDRIVE.SYS puts the RAM disks into the memory area above 1 MB.

Note: Using the RAMDRIVE.SYS device driver increases the size of MS-DOS resident in memory.

Install and use this device driver as described in the *Microsoft MS-DOS User's Guide and Reference*.

The SETCMOS utility enables you to save and restore the computer configuration data saved in a battery-powered CMOS RAM by the computer's Setup Program. This utility is useful for:

- Restoring configuration data if the CMOS battery is ever removed, disconnected, or fails.

Note: The CMOS battery is a small internal battery that powers the CMOS RAM; it is completely separate from the internal battery pack.

- Creating custom configuration data files for each of your applications. For example, if one program works best with extended memory and one works best with expanded memory, you can use SETCMOS to change configurations without having to use the Setup Program each time you load the application.

The SETCMOS utility saves the current configuration data to a file you name. The factory default file, FACTORY.CMS stored under the UTILS directory, is the file used when you press **F4** (**RESET CONFIG**) at the Laptop Manager main menu.

When you change configuration data (for example, when you add options or change configuration for an application), be sure you save the data by pressing **F3** (**SAVE CONFIG**) on the Laptop Manager main menu, or you can run the SETCMOS utility as described in this section.

SETCMOS Command

To view the SETCMOS command and options, at the MS-DOS **C:\>** prompt type

SETCMOS /?

and press **ENTER**.

The utility displays the following screen and returns to the MS-DOS prompt.

```
Usage: setcmos ( (/r) file /s file /n /d /v /h /? )
/r file     Restore from file and reboot
/s file     Save to file
/n          No reboot on restore
/d          Don't detect hard disk type
/v          Display version
/h or /?    This help message

Saves/restores CMOS RAM to/from a file.
```

Note: The /R switch is the default switch for the SETCMOS command.

Restoring Factory Default CMOS Data

To restore the factory default CMOS configuration data file, at the MS-DOS **C:\>** prompt type

SETCMOS /R C:\UTILS\FACTORY.CMS

and press **ENTER**.

The factory default configuration values are restored in the CMOS RAM, and the computer reboots itself. The factory default file (FACTORY.CMS) is stored on the hard disk under the /UTILS directory.

Note: You also can restore the factory default CMOS configuration by press **F4** at the Laptop Manager main menu.

Saving Your CMOS Data

Once you have used the computer's Setup Program to configure your new computer for your operating environment and options, you should save the data stored in the CMOS RAM to your own custom file.

To save the current CMOS RAM data, at the MS-DOS **C:\>** prompt type

SETCMOS /S MYFILE.CMS

and press **ENTER**.

You can type any filename you want instead of the MYFILE.CMS filename shown in the example. If you ever need to restore the computer to *your* configuration settings, type your filename to the SETCMOS /R command described previously.

SETKEY Utility

The SETKEY utility enables you to set the keyboard typematic rate and the key repeat delay rate. This utility also sets or displays the current settings for the PS/2 port (Windows-based units only).

The utility displays the following screen and returns to the MS-DOS prompt.

```
Usage:  SETKEY [/rx /dx /nx /px /S]
  /rx  char repeat rate, x is:
      v    - 30 cps
      f    - 20 cps
      n    - 10 cps (default)
      s    - 5 cps
      c    - 2 cps

  /dx  char repeat delay, x is:
      1    - 1 second
      2    - .75s
      3    - .5s (default)
      4    - .25s
```

Character Repeat Rate

The character repeat rate, set using the *rx* code, enables you to adjust the number of characters per second (cps) the keyboard generates when you hold down an alphanumeric key. You can set the rate from 2 cps to 30 cps as shown on the CURSOR command listing. The default repeat rate is 10 cps.

Character Repeat Delay

The character repeat delay, set using the *dx* code, lets you adjust the time you must hold down a key before the typematic feature starts. You can set the delay from 0.25 to 1 second as shown on the CURSOR command listing. The default delay value is 0.5 second.

Dates

The Dates utility provides the following:

- ❑ System Information
- ❑ System BIOS Information
- ❑ VGA BIOS Information
- ❑ BatteryPro Power Management Information

To view data provided by the Dates utility, enter

DATES

at the MS-DOS prompt.

10
Sound

Sound has been pre-installed on your TravelMate 4000M system. This section is an overview of the Sound utilities for Windows.

Contents

Features

The sound card included in your TravelMate 4000M includes the following features:

- ❑ High quality sound
- ❑ Full Sound Blaster and Sound Blaster Pro compatibility
- ❑ 20-voice FM music synthesizer
- ❑ 44.1 kHz digitized audio playback
- ❑ Built-in 2:1, 3:1, and 4:1 compression/decompression for 8-bit PCM files in both mono and stereo samples
- ❑ µ-Law, A-Law, and IMA ADPCM compression/decompression in real time for 16-bit files
- ❑ MPU-401 UART mode compatible MIDI
- ❑ Supports the largest library of third-party software
- ❑ Joystick/MIDI port
- ❑ Built-in power amplifier

Pocket Recorder is a Windows application for recording waveform data in 8 or 16-bit format. Pocket Recorder can splice and blend files together for interesting audio effects.

With Pocket Recorder's compression and decompression feature, you can record and play back 16-bit sound files at higher audio frequencies using a fraction of the memory space.

To start Pocket Recorder, double click on the Pocket Recorder icon in the JAZZ group. To exit from Pocket Recorder, select Exit from the File menu.

Changing the Effects on the Waveform

In both the Higher and Lower commands, the total duration of the sound wave is held constant. The pitch alteration is achieved by removing every other wave sample to raise the pitch or by doubling each wave sample to lower the pitch. In both cases, this process changes the waveform's duration. The technique used in the Faster and Slower commands is applied here to restore the waveform to its original duration with its new modified pitch.

By using the Higher and Lower command in conjunction with the Faster and Slower command, the pitch and duration may be changed together. This is a more common feature found in other waveform applications. To get these effects with Pocket Recorder, the best results are obtained by applying the combinations in the following sequences:

- For increased rate and pitch, use first Higher followed by Faster.

- For decreased rate and pitch, use first Slower followed by Lower

Editing a Waveform

To edit a waveform, select the portion of the waveform file you want to cut, copy, or paste. You can either:

- Click on the mouse button while the insertion point is in the waveform view area and drag the mouse until a portion of the waveform is highlighted.

- Hold down the SHIFT key and click the mouse button at a point in the view area. This method selects a region between the current insertion point (if no position has been selected, the selection begins at the beginning of the view area) and the position where the mouse is clicked.

Zooming into a Larger View

You can zoom into a portion of the waveform by double clicking inside the view area. Once you have this zoom view, it is possible to see a wider range of frequencies. You can then select the portion of the waveform you want to edit by clicking and dragging over the waveform section. Edit by pressing the SHIFT key and clicking the left mouse button simultaneously. This highlights the region between the two selection points.

Note: You can't scroll the view area while you select a portion of the waveform. You can't click and drag outside of the waveform view area to scroll. You can only select one zoom mode at a time.

Playing Several Waveform Files

You can select a number of waveform files and drop the selection into Pocket Recorder to play. To do this, minimize the Pocket Recorder dialog box, select one or more waveform files (using a File Management tool), and drop the selection into Pocket Recorder. Pocket Recorder plays all selections in order unless you maximize the Pocket Recorder application.

Playing a Single Waveform File

To play a single waveform file, select OPEN from the File menu. Select the file you wish to play from the resulting dialog box and select PLAY.

Recording a Waveform File

To record a waveform file, ensure that your microphone or audio device is plugged into the microphone or line-in plug on the TravelMate 4000M. Select NEW from the File menu and customize your sample rate, channels, and sample mode. Click on the Record button and begin recording.

To stop recording, select STOP. Save the file.

Note: Pocket Recorder does not allow you to produce a recording larger in size than the temporary recording file. Pocket Recorder uses an Auto-Stop feature when your temporary recording file becomes to large to be saved.

Recording/Playback Considerations

When recording, it is recommended that all audio sources not used as input for recording have their volume levels reduced to zero, even though no audio may be present.

Compressing Sound Files

You can select file compression in a 4:1 or 2:1 ratio or with no compression. To do this, select Save As... from the File menu and choose the desired compression rate from the resulting dialog box. Selecting OK saves the compressed file.

Using OLE with Pocket Recorder

Object linking and embedding (OLE) is a Windows 3.1 system that allows applications to transfer and share data by establishing a common link between them. The application requesting data is called a client while the application providing data is called the server.

OLE clients include Cardfile and Write. OLE servers include Pocket Recorder, TM4000M, Excel, and Sound Recorder.

A useful application for OLE would be sending a personal message through E-mail and having the recipient click on the embedded icon to hear your voice message.

Pocket Mixer is a Windows 3.1 based application that allows you to:

- control master volume
- control volume levels and balance of individual input sources
- select a record source

Starting Pocket Mixer

To start Pocket Mixer, double click on the Pocket Mixer icon in the JAZZ group.

Audio Mixer Configuration

The driver found in your Control Panel window allows you to select the way DOS and Windows mixers interact with each other.

Setting an Audio Source to Play or Record

The Pocket Mixer can be used to mix five audio sources for playback. For recording, you can select one of the three audio sources:

- CD-Player
- Line-in
- Microphone

Recording Without a Microphone

When not using the microphone to record or playback sound tracks, reduce the volume level to zero to reduce extraneous noise.

With Pocket Mixer, you can also:

- ❑ Edit waveform files
- ❑ Playback from other sources
- ❑ Record new tracks

A common use of the Pocket Mixer is in recording voice annotation and placing them within other documents. You cannot use the Pocket Mixer to record a voice annotation over CD audio, for example. The Pocket Mixer allows you to select the recording source. You can adjust the recording level by using the slider in the Master volume knob.

Using VU Meters

To monitor recording levels, click on the VU meter button. For optimum recording of a strong signal, the VU meters should "Bounce" toward the top of the meter and periodically enter the red zone. To turn the VU meter function off, click on the VU meter button once again.

Note: The VU meter function can only be activated when the card is in a record mode.

Pocket CD lets you play audio compact discs in your TravelMate 4000M CD-ROM drive. Pocket CD has controls similar to those used by the CD audio player you may have in your home entertainment center. Pocket CD can play back music CDs as either an icon or as a maximized window.

If you minimize or close Pocket CD, the CD-ROM reader continues playing until you eject the disk. Pocket CD lets you select the order of songs you want to play with the default of sequential play.

Creating and Saving Playlists

Once you insert a CD into your CD drive, Pocket CD scans your CD for playlist information. If you did not create a playlist for your CD, Pocket CD displays a listing of the total number of tracks on that CD. Once you create a playlist, Pocket CD assigns a specific number to that CD. You may add, select, and modify playlists from the Edit menu.

Playing a CD

You can play a CD by inserting the disc into the CD-ROM drive, double clicking the Pocket CD icon and pressing the Play button. You can play as follows:

- by randomly rearranging the title selections in your playlist (using the Shuffle button)

- by playing specific tracks (by selecting a track title from the current CD Title box or selecting the Start of Track/Previous Track and Next Track buttons.

Assigning a Title to a CD

You can assign a title to a CD by selecting Modify from the Edit menu, typing the title in the title box, and clicking OK.

Entering CD Track Titles

You can title a track for a specific CD by selecting Modify from the Edit menu, selecting the song you want to name, and Saving from the File menu. A Playlist dialog box appears into which you type a Playlist filename. Select OK.

Deleting Songs

Select Delete Songs from the Edit menu. This command allows you to delete songs from your playlist. You cannot issue this command while a CD is playing.

Adjusting Volume

If your CD-ROM drive has audio output, you can control volume with the drive's volume control or you can click the Pocket Mixer icon to call up Pocket Mixer. Click and drag the mouse inside the meter for CD audio (the meter with the CD disk icon above it) to adjust the volume.

Cueing Pocket CD for Recording

Use the Cue feature to pause Pocket CD. You can use this feature with Pocket Recorder to record audio from a CD that Pocket CD is cued to play.

Quitting Pocket CD

To end playing your CD sound track and eject the disk, exit out of the Pocket CD. Click on the eject button to eject the CD from the drive and select Close from the File menu.

11
TravelMate Options

This chapter explains:

- ❑ Options available for your computer
- ❑ How to install and use some of these options
- ❑ How to use external monitors with the computer

Contents

List of Options

The following options are available with your TM4000M computer:

Portable CD-ROM Docking System	Provides portable CD-ROM capabilities to the TM4000M notebook user. This is a 350 ms double speed CD-ROM drive with built in stereo speakers, Microsoft headphone, microphone, and CD-ROM sampler. The unit is battery and AC powered. Further information on the Portable CD-ROM Docking System is provided in Chapter 12.
External Battery Charger	Provides a fast way of charging a battery pack without inserting it into the computer.
Spare Battery Pack	Extends the time you may operate the computer before recharging.
PCMCIA Options	Provides modem and Ethernet connections.
Memory Upgrade	Memory may be upgraded to 8 MB (using a 4-MB upgrade kit) or to 20 MB (using a 16-MB upgrade kit).
Spare AC Adapter	You may purchase a spare AC adapter for your notebook. The kit includes an extra power cord.
External Numeric Keypad	Allows you to connect an external numeric keypad to the PS/2 port.
Carrying Case	Three versions available. Helps protect the computer and accessories during transport.
Headphone/ Microphone Kit	Provides external headphone and microphone.

Printers

You may connect almost any parallel printer to the parallel port or a serial printer to the serial port. Texas Instruments makes a variety of laser and impact printers you may use with your computer. (Printer interface cables sold separately.)

MIDI Connection

Allows you to connect external game and audio devices to your computer.

SCSI Cables

High Density to High Density
(TI Part No. 9794074-0001)

High Density to 50-Pin Centronix
(TI Part No. 9694074-0002)

Battery Options

Your computer has the following options to enhance battery-powered operations:

- ❑ Battery Charger
- ❑ Extra Battery Pack

Battery Charger

The Battery Charger (TI Part No. 9793360-0001) enhances the battery power. The Battery Charger allows you to charge the battery that came with your Portable CD-ROM Docking System.

Note: It is recommended that you purchase an extra battery pack so that you always have a fully charged battery. This extra battery pack may also be charged using the battery charger.

To maximize battery life, completely charge and discharge a new battery two to three times.

Refer to the guide that comes with the Battery Charger for usage instructions.

Extra Battery Pack

Keeping an extra, fully-charged Battery Pack (TI Part No. 9793371-0001) on hand can extend the time you can operate your computer. Install and remove the extra Battery Pack as described in the *Battery Release* section of this chapter. When not in use, always keep the Battery Pack in its protective case to prevent accidental shorting or other damage.

PCMCIA Options

Your PCMCIA options include the following:

- ❑ 14.4 KB data/send/receive fax modem
- ❑ Ethernet 10BaseT
- ❑ Ethernet 10Base2
- ❑ Ethernet 10Base5

Refer to the *Phoenix PCMCIA User's Manual* to configure your system with these options. Refer to installation instructions that come with these options for proper seating and cabling (if any) of the adapters.

RAM Expansion

Your computer is equipped with 4 MB of random access memory (RAM). You can increase memory by installing one of the RAM options:

- ❑ 4-MB RAM Expansion Board (TI Part No. 9793357-0001). This expands RAM from 4 MB to 8 MB.

- ❑ 16-MB RAM Expansion Board (TI Part No. 9793358-0001). This expands RAM from 4 MB to 20 MB

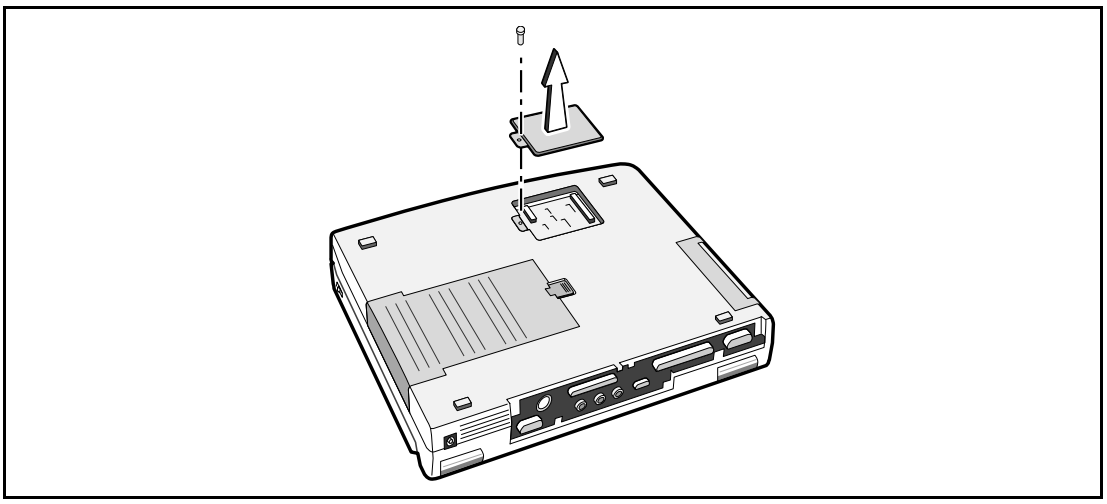
Installing A RAM Expansion Board

To install the RAM Expansion Board, complete the following steps.

Caution: Prevent component damage caused by electrostatic discharge (ESD). Use a high-impedance, grounded-conductive floor mat or wrist strap to prevent ESD. Before touching the integrated circuit devices, discharge static electricity from your hands, tools, and containers by touching them to a grounded surface.

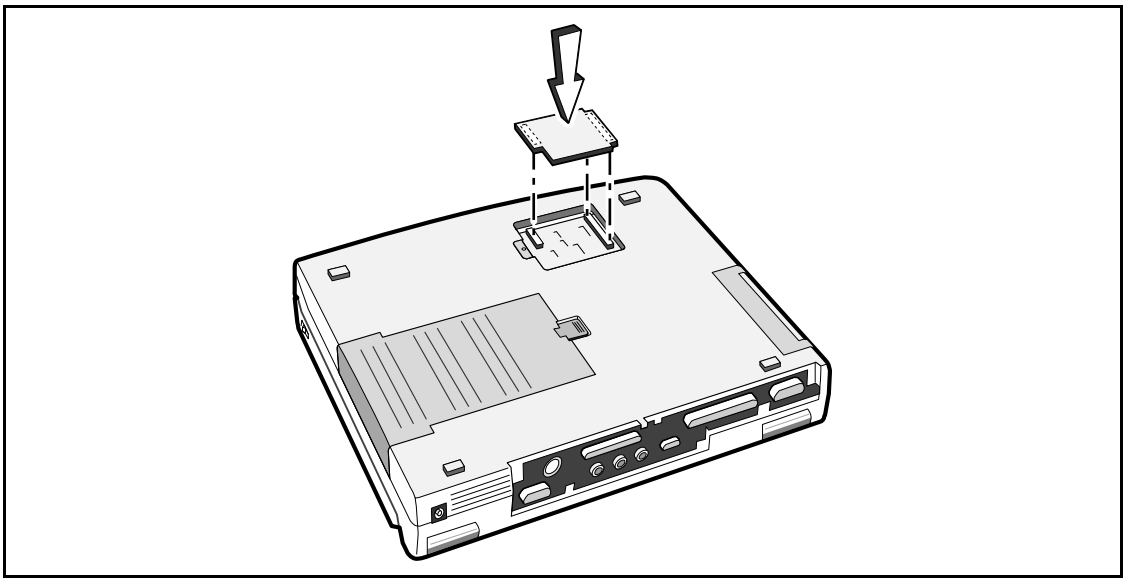
1. Turn the notebook upside down on a padded surface.

2. Remove the screw from the RAM expansion compartment.



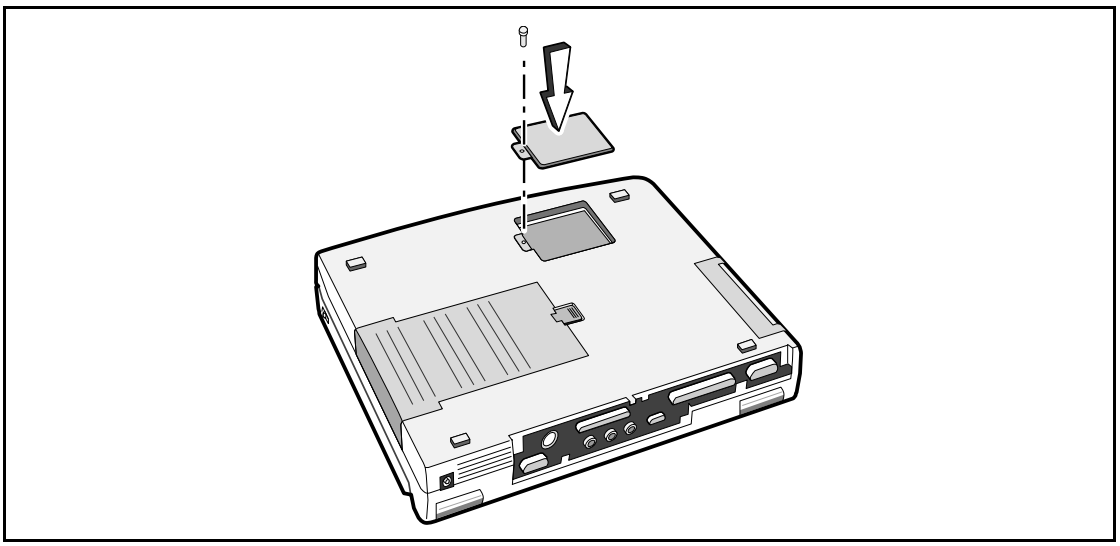
Removing the screw from RAM expansion compartment

2. Carefully attach the expansion card so that connectors match.



Connecting RAM expansion card

3. Replace the plastic cover and tighten the screw.



Replacing the plastic cover

After installing memory, check that all system memory is recognized by turning off QuickBoot in the System Setup. Memory is automatically checked at powerup.

Using the AC Adapter

The AC Adapter - Charges the internal Battery Pack and operates the computer on AC power whether or not a Battery Pack is installed

Caution: Use only the AC Adapter supplied with your computer. Another adapter can damage your computer.

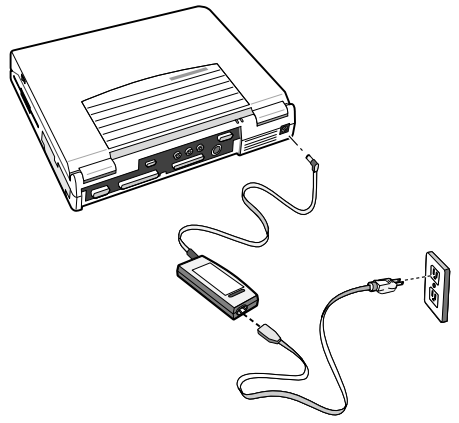
To connect the AC Adapter, complete the following steps:

1. Set the power switch to the off (⏻) position, or press **STANDBY** to put the computer into standby mode.

2. Connect the female connector of the AC cord to the inlet on the AC Adapter.

3. Hold the round connector from the AC Adapter and press it into the matching jack on the rear panel of the computer.

4. Plug the male end of the AC cord into a grounded wall receptacle of the correct voltage.

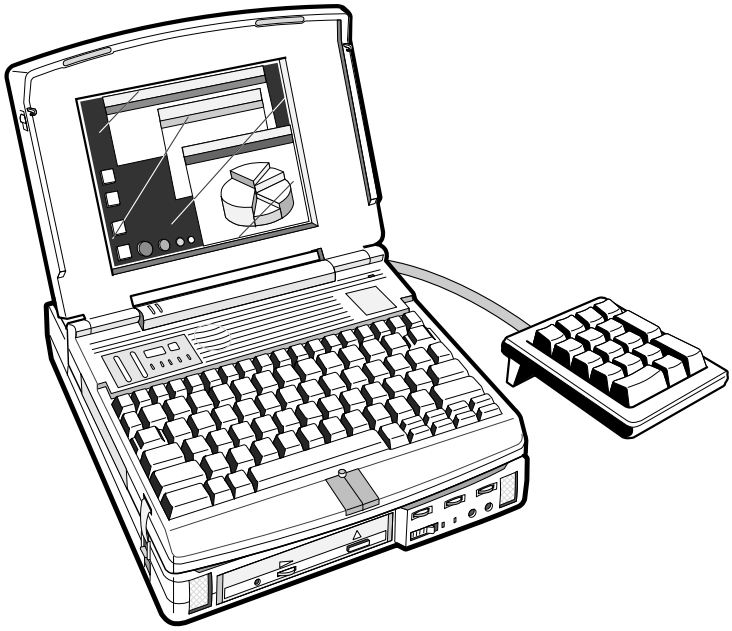


AC Adapter - Notebook

5. If you plan to use other external devices with your unit, connect the device to the computer before setting the computer power switch to the on (|) position.

External Numeric Keypad

The optional Numeric Keypad (TI Part No. 2581381-0002) enables you to type numeric data while still permitting data entry on the keyboard. You also have the convenience of direct access to some functions (such as the **PGUP**, **PGDN**, and **HOME** keys) without the need to also press the **Fn** key. Installing the Numeric Keypad disables the embedded numeric keypad.



Extended Numeric Keypad

To attach the numeric keypad:

1. Turn off the computer.

2. Attach the keyboard connector to the PS/2 port on the back of your computer.

3. Ensure that the keyboard/numeric keypad/mouse switch is in the UP position.

4. Turn the computer on.

For usage instructions, refer to the Numeric Keypad documentation.

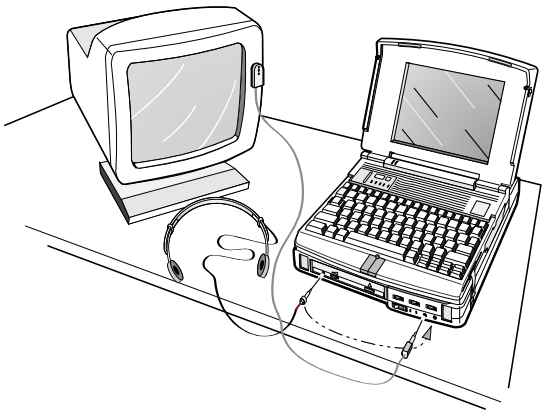
Carrying Cases

There are three types of carrying cases for the TM4000M notebook:

- Portfolio - a low-cost carrying case for your notebook computer (holds the notebook only)
- Carrying Case - a high-quality case for use with your notebook computer (holds the notebook with power supply, cables, etc.)
- Brief Case - Enough room to carry the notebook and portable CD-ROM docking system

Microphone/Headphone Kit

The TravelMate 4000M has an optional microphone and headphone kit (TI Part No. 9793399-0001). The kit also comes with installation instructions. To plug in your microphone, insert the plug into the Mic connector on the back of the notebook.



Microphone/headphone connections

Printers

Texas Instruments makes a variety of laser, ink jet, and impact printers. Your computer has ports for both parallel and serial printers.

To use a printer, connect the printer to the appropriate port on the left panel of the computer. Then run Setup as described in this manual.

Refer to your printer documentation for more installation and usage instructions.

Cables

The following cables are available with the TM4000M and Portable CD-ROM Docking System:

Cables		
Type	**Used With**	**Part Number**
High Density to High Density	TM4000M	9794074-0001
High Density to 50-Pin Centronix	TM4000M and Portable CD-ROM Docking System	9794074-0002

External Monitor

Supported Monitors

The computer supports the following multifrequency external and VGA monitors.

- ❑ 31kHz/70 Hz (400/200 line mode)
- ❑ 60 Hz (480 line mode)
- ❑ IBM PS/2 monitors
- ❑ Multiscanning monitors covering 15.75 to 31.5 kHz, 50 to 70 Hz

Installing an External Monitor

Caution: Always turn off the computer before connecting an external monitor.

1. Turn off power to both the external monitor and the computer.
2. Connect the 15-pin external VGA monitor cable to the 15-pin connector on the back panel of the computer.
3. Turn on power to the computer first; then turn on the external monitor.
4. Switch the display between the LCD and the external monitor by double clicking the Windows Notebook Group menu CRT or Panel icon. Alternatively, you may type:

   LCD, PANEL, SIMUL VGA UTILS

   at the MS-DOS **C:** prompt and press **ENTER**.

5. In modes that support simultaneous display on the LCD and the CRT, switch to simultaneous display by double-clicking the SimulScan icon in the Windows Notebook Group menu or by typing

SIM

at the MS-DOS C:\ prompt and pressing **ENTER**.

For usage information, refer to the external monitor documentation.

12
Portable CD-ROM Docking System

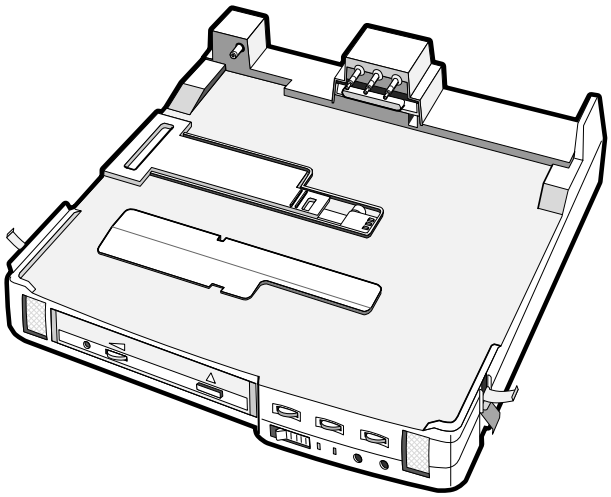
This chapter explains:

- ❑ Features of the Portable CD-ROM Docking System
- ❑ Options available for the Portable CD-ROM Docking System
- ❑ How to dock your notebook
- ❑ How to use features and options of your Portable CD-ROM Docking System

Contents

Features

The Portable CD-ROM Docking System may be attached to the TM4000M to provide multi-media capabilities for your notebook.



Portable CD-ROM Docking System

Features

The Portable CD-ROM Docking System has the following standard features:

- ❑ Portable CD-ROM Docking System - supports both information and music CDs
- ❑ AC Adapter - provided with power cord
- ❑ Battery power - NiMH battery provides clean and efficient battery power. Battery charger is built in
- ❑ 50-Pin Centronix connector - can connect to up to six external SCSI devices
- ❑ Microphone/headphone kit - comes complete with microphone, headset, and instructions

- ❑ CD Home Sampler - comes complete with samples of Microsoft games for use in the Portable CD-ROM Docking System.

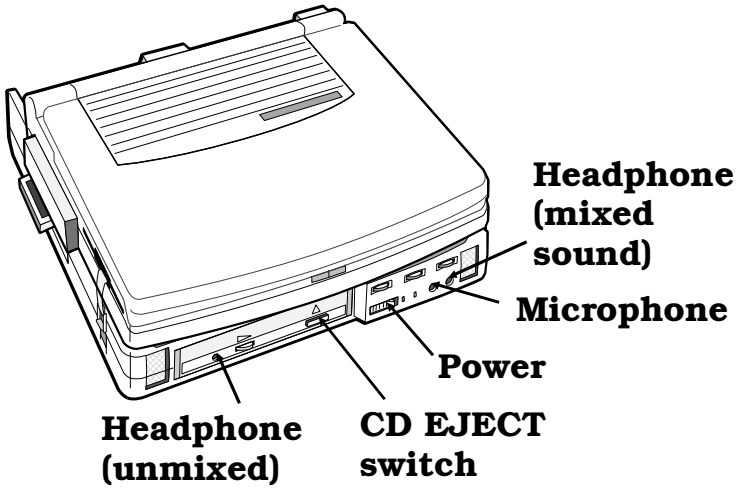
- ❑ Built in speakers - sound wings can be opened to provide enhanced sound

- ❑ CD Eject - slides the CD out of the drive

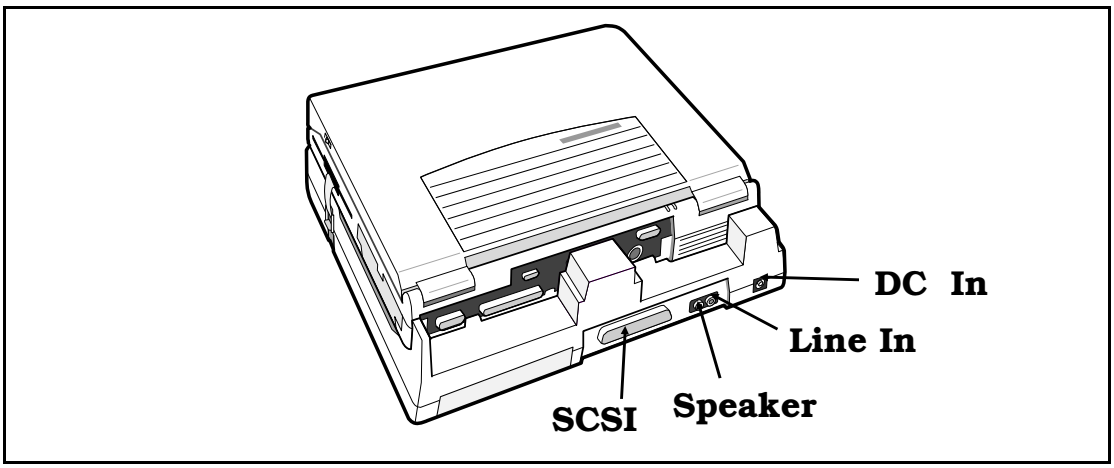
- ❑ Power - turns power to the Portable CD-ROM Docking System on and off

- ❑ Mic, headphone, and speaker ports - allows you to connect external microphones, headphones, and speakers

- ❑ Mix, balance, and volume controls - adjusts bass, treble, volume level, and sound distribution. These levels can also be adjusted using the sound software. For more information, refer to Chapter 10, *Sound*.



Portable CD-ROM Docking System - FRONT VIEW



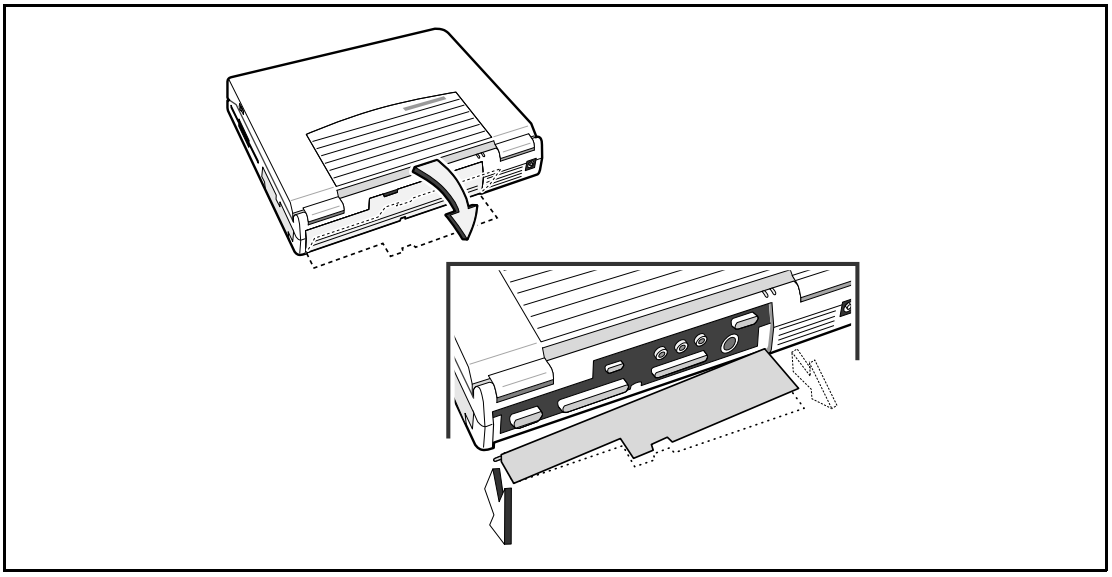
Portable CD-ROM Docking System - REAR VIEW

Docking Your Notebook

To dock your notebook to the Portable CD-ROM Docking System, complete the following steps:

1. Ensure that power is turned off at the notebook and that the AC adapter has been unplugged.

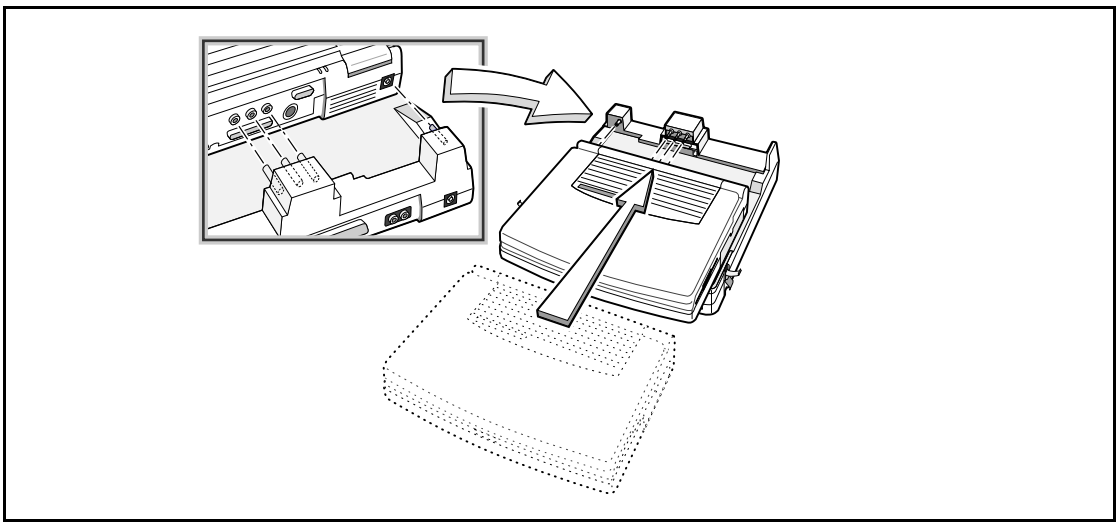
2. Remove the back plate from the notebook.



Removing the back plate

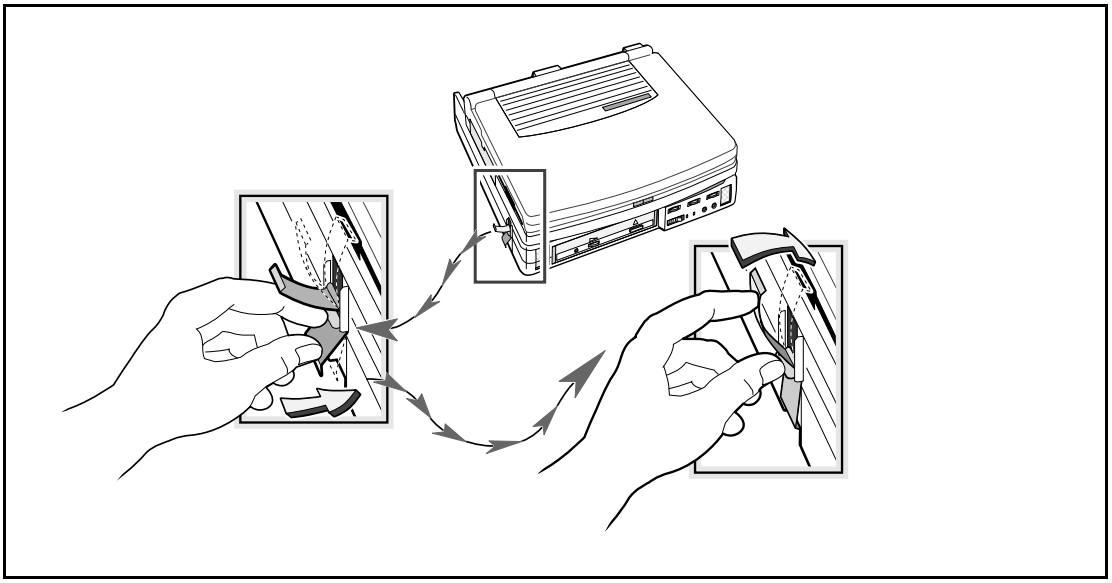
Note: The Back plate may be stored in the backplate compartment on top of the Portable CD-ROM Docking System.

3. Gently insert the notebook into the three male connectors (Audio In/Out/MIC) on the Portable CD-ROM Docking System.



Inserting the Portable CD-ROM Docking System

4. When in place, push the clamps on the side of the Portable CD-ROM Docking System in and then up to latch over the notebook.



Clamping the notebook

5. When secure, plug in the DC connector.

6. Switch on the Portable CD-ROM Docking System.

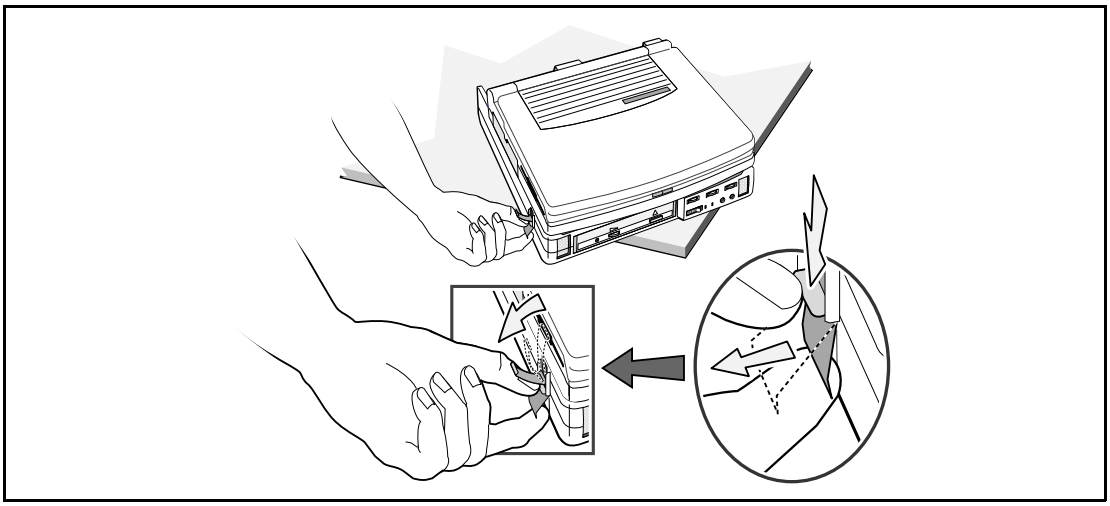
Undocking the Notebook

To undock the notebook from the Portable CD-ROM Docking System, complete the following steps:

1. Turn off power to both the Portable CD-ROM Docking System and the notebook.

2. Remove all batteries and remove the power cord.

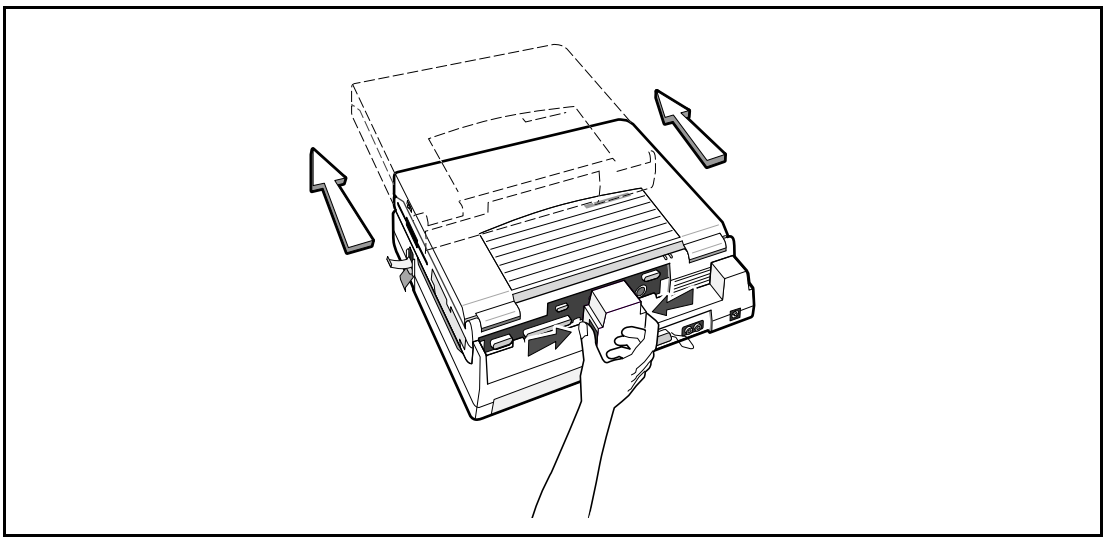
3. Unclamp the notebook. To do this, first push in on the tab with the thumb and lift the clamp up from the bottom so that the latch drops. Do this on each side of the notebook.



Unclamping the notebook

4. Release the notebook by pressing in on the tabs at the back of the Portable CD-ROM System.

Undocking the Notebook



Releasing the notebook

Using the Portable CD-ROM Docking System

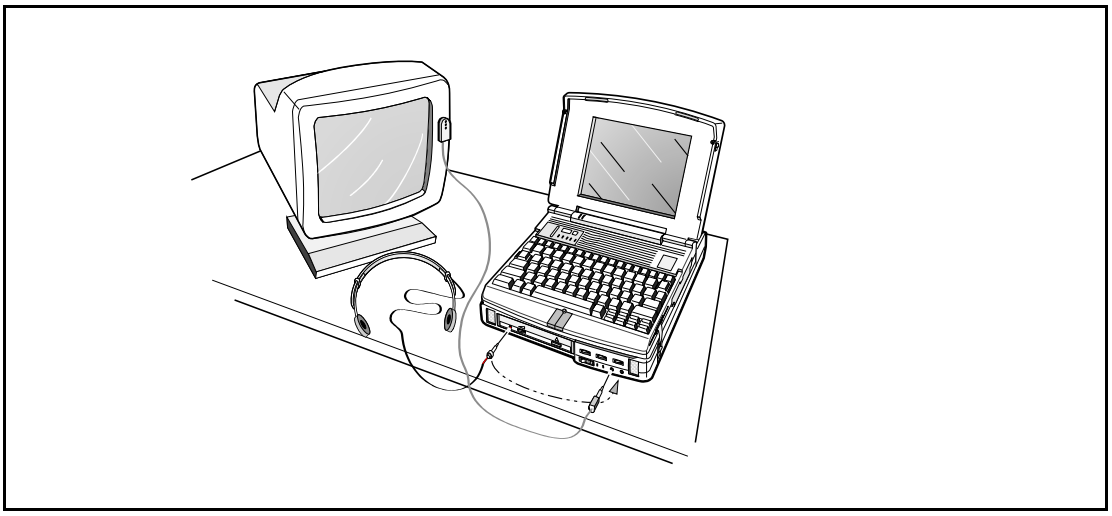
This section describes the functionality of your Portable CD-ROM Docking System. With the Portable CD-ROM Docking System, you may:

- ❑ CD Eject
- ❑ Power
- ❑ Plug in microphones
- ❑ Plug in headphones
- ❑ Plug in external audio sources
- ❑ Adjust audio

Microphones and Headphones

The TravelMate 4000M Portable CD-ROM Docking System features a microphone and headphone set. The following diagrams display where the microphone and headset plug into the Portable CD-ROM Docking System.

Using the Portable CD-ROM Docking System



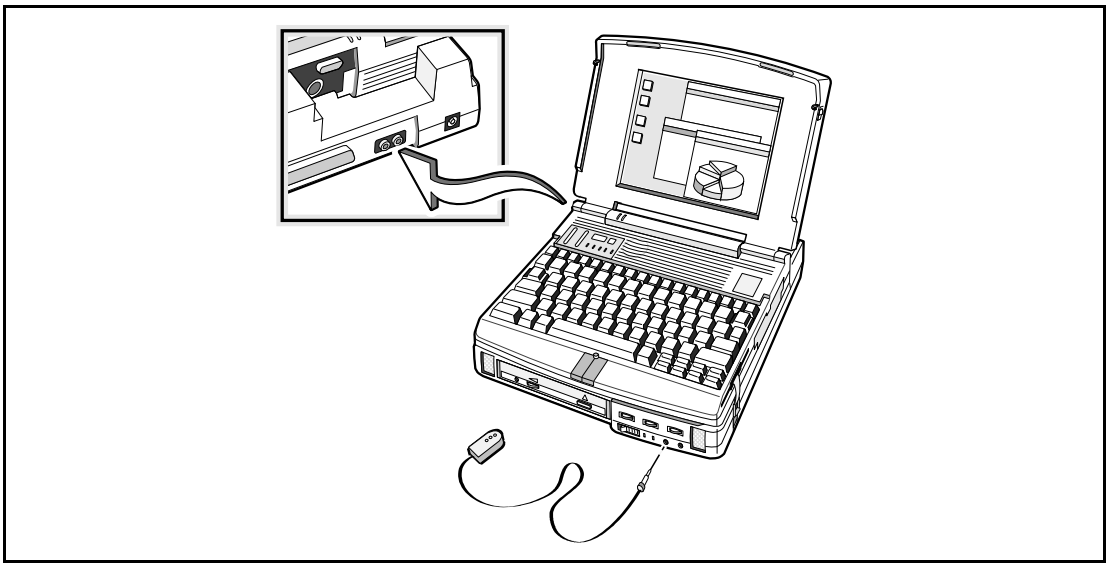
Microphone and headphone connections

Software has been pre-loaded on your hard drive that configures your notebook for the microphone and headphone. To plug in your microphone, insert the plug into the Mic connector on the front of the Portable CD-ROM Docking System. The headphones may be plugged in either at the CD-ROM player (un-mixed sound) or at the portable docking system (mixed sound)s.

Audio Input

You can plug in external audio sources through ports on the Portable CD-ROM Docking System. External sources may include:

- ❑ Musical instruments - Line in port
- ❑ Tape players - Line in port
- ❑ Mixers - Line in port
- ❑ Microphones - Microphone port



Audio input ports

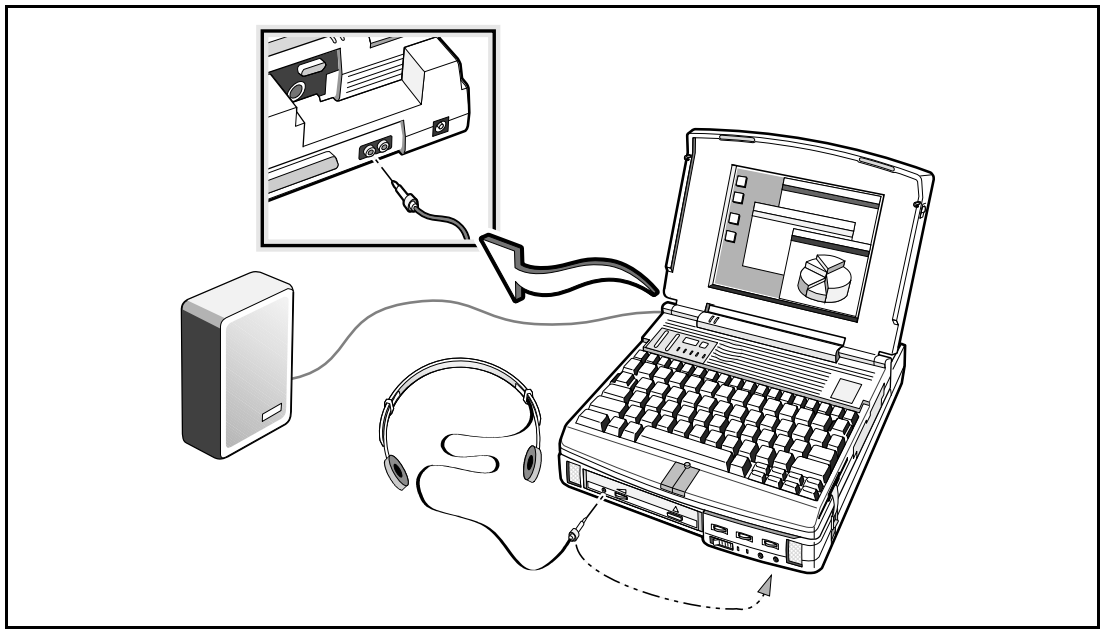
Audio Output

You may output audio through the following ports on the Portable CD-ROM Docking System:

- Headphones - Phones port. There are two ports for the headphones. The port at the Portable CD-ROM Docking System allows you to listen to CDs as you would a normal CD player. The port on the right front of the Portable CD-ROM Docking System allows you to listen to music that has been mixed or edited through your notebook.

- Speakers - Speaker Out port

Using the Portable CD-ROM Docking System



Speaker port

Controls

The following controls are provided with the Portable CD-ROM Docking System:

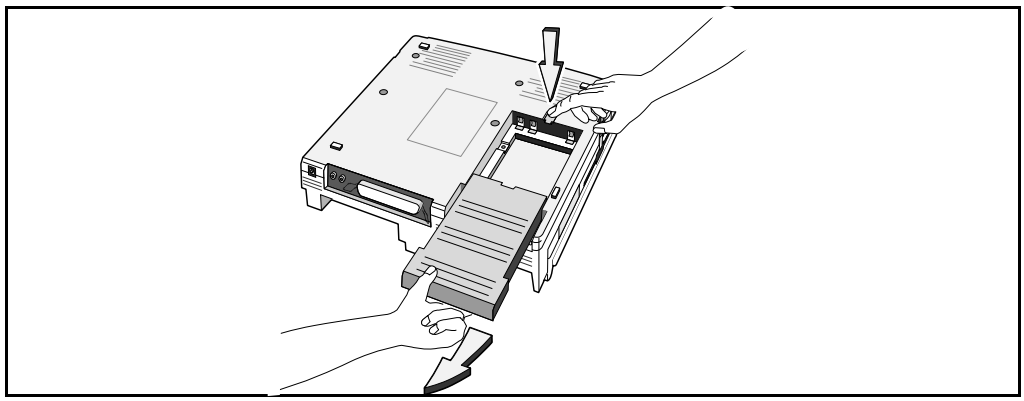
- ❑ CD Eject - when pressed, releases the CD from the Portable CD-ROM Docking System
- ❑ Power - Turns power to the Portable CD-ROM Docking System on and off
- ❑ Volume - Adjusts the level of volume
- ❑ Balance - Distributes sound to left and right speakers
- ❑ Mix - Adjusts bass and treble

Battery LED

The battery LED lights amber when the internal battery of the Portable CD-ROM Docking System is charging. The LED turns green when the battery is at least 90% charged. The Battery LED on the notebook lights red when the battery is low in the upper or lower compartments.

Battery Release

The Battery Release removes the battery from the notebook while the notebook is docked to the portable CD-ROM docking system. To release the battery, pull the battery release tab out.



Battery release

Using the Portable CD-ROM Docking System

Note: The Portable CD-ROM Docking System cannot run on battery power if a third-party SCSI hard drive is installed. You must use AC power.

The battery for the Portable CD-ROM Docking System can power both the Portable CD-ROM Docking System and the notebook. If the battery in the CD-ROM Docking System is too low to power the notebook, the notebook enters into Standby mode. You can place a charged battery in the notebook without first having to turn the system off. After inserting a new battery, press Standby to return to normal operations.

The following optional features can be purchased for the CD-ROM portable docking system:

- ❑ SCSI 2.5" Hard Drive Enabler kit - TI Part No. 9793373-0001
- ❑ Spare AC Adapter - TI Part No. 9793362-0001
- ❑ Battery Kit - TI Part No. 9793371-0001
- ❑ Brief Case - will hold the portable docking system docked to a TM4000M notebook
- ❑ Battery Charger - TI Part No. 9793360-0001
- ❑ 50-Pin Centronix to 50-Pin Centronix Cable - TI Part No. 9694704-0003

  SCSI-II to 50-Pin Centronix Cable - TI Part No. 9694704-0002

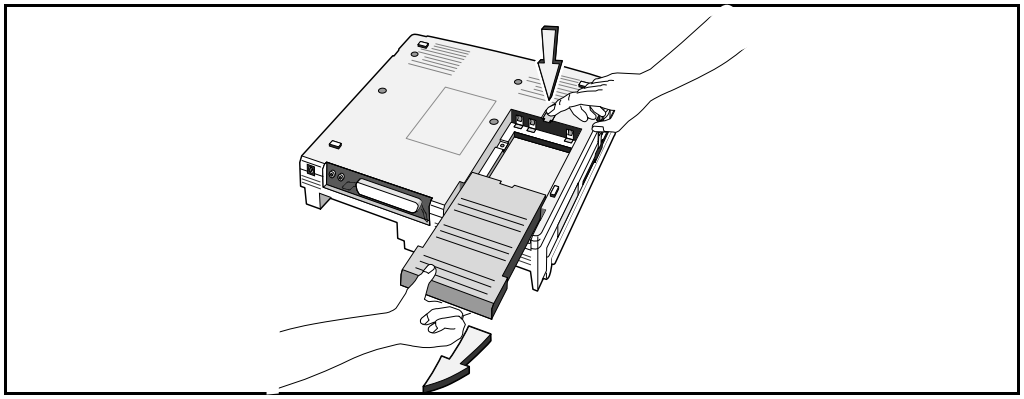
SCSI Hard Drive Enabler Kit

The Portable CD-ROM Docking System includes an external SCSI II connector. Using a special adapter with this connector allows you to connect up to six external SCSI devices.

The SCSI hard drive enabler kit (TI Part No. 9793373-0001) can be used to place a SCSI drive in place of the battery on the underside of the Portable CD-ROM Docking System. To install the SCSI drive, complete the following steps:

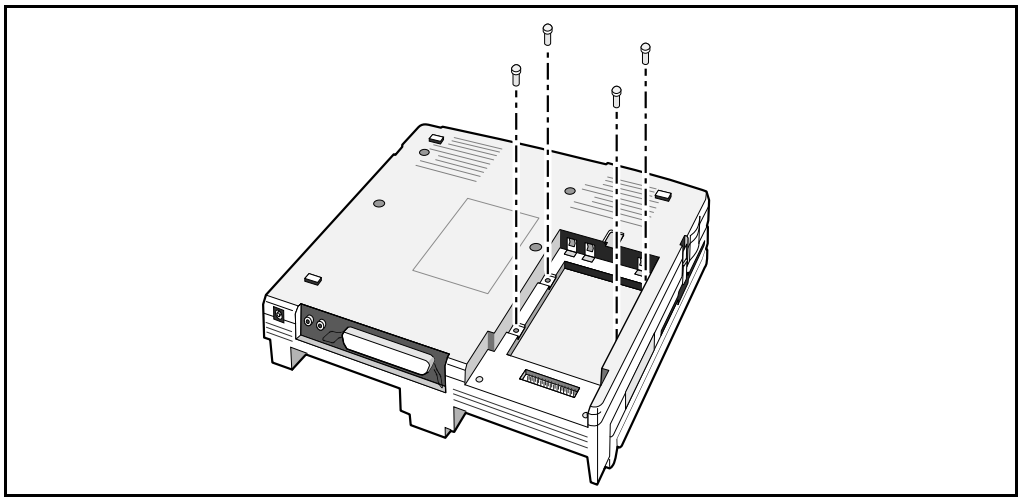
1. Turn power off to both the notebook and Portable CD-ROM Docking System and disconnect the power cord.
2. Turn the system upside down on a padded surface. The Portable CD-ROM Docking System may still be clamped to the TravelMate TM4000M notebook.

3. Remove the battery by pressing the release button and sliding the battery out.



Battery release

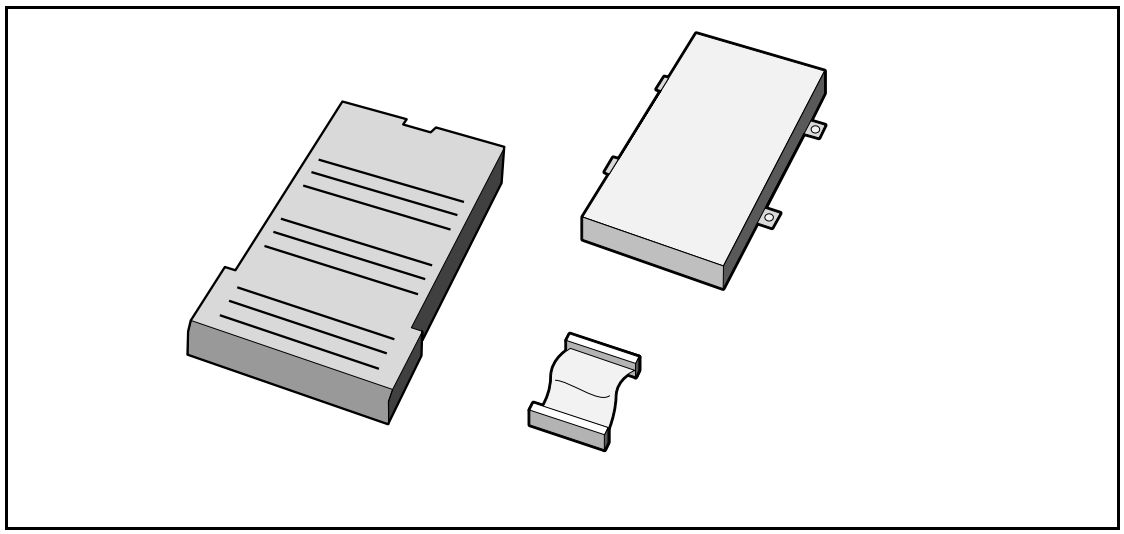
4. Remove the four screws beside the recessed area in the battery compartment of the Portable CD-ROM Docking System.



Remove screws

5. Open the SCSI drive kit. This should include a SCSI connector, metal bracket, plastic cover, screws, and installation instructions.

Note: You must purchase a third party 2.5" SCSI hard drive from your computer supply store or reseller. Seagate and Toshiba models are known to be compatible.

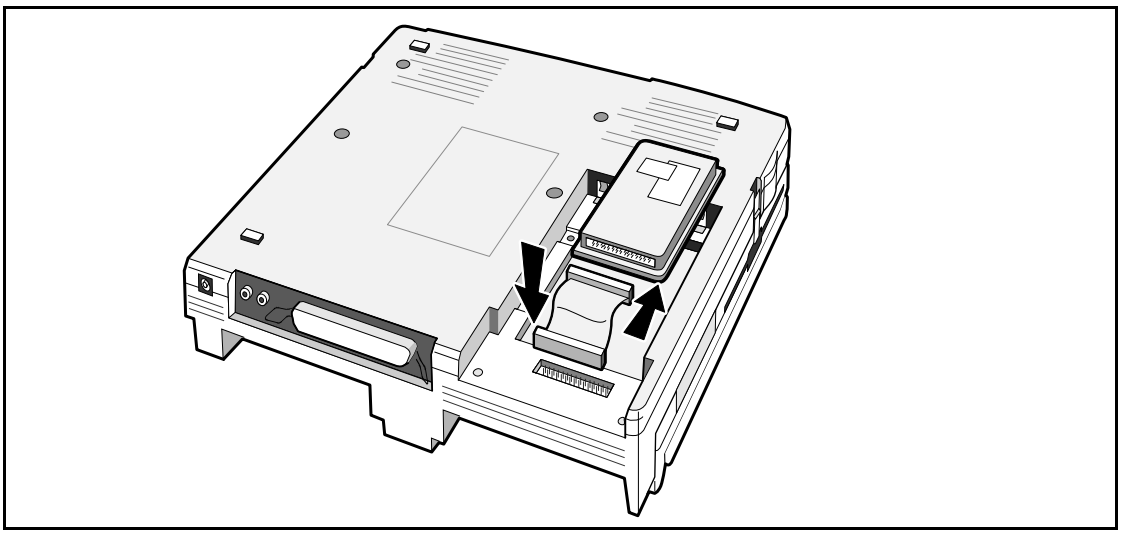


SCSI Hard Drive Enabler Kit

6. Attach one end of the SCSI connector to the SCSI drive and the other to the connector on the bottom of the Portable CD-ROM Docking System.

Note: There will be left-over pins on the right side of the connector.

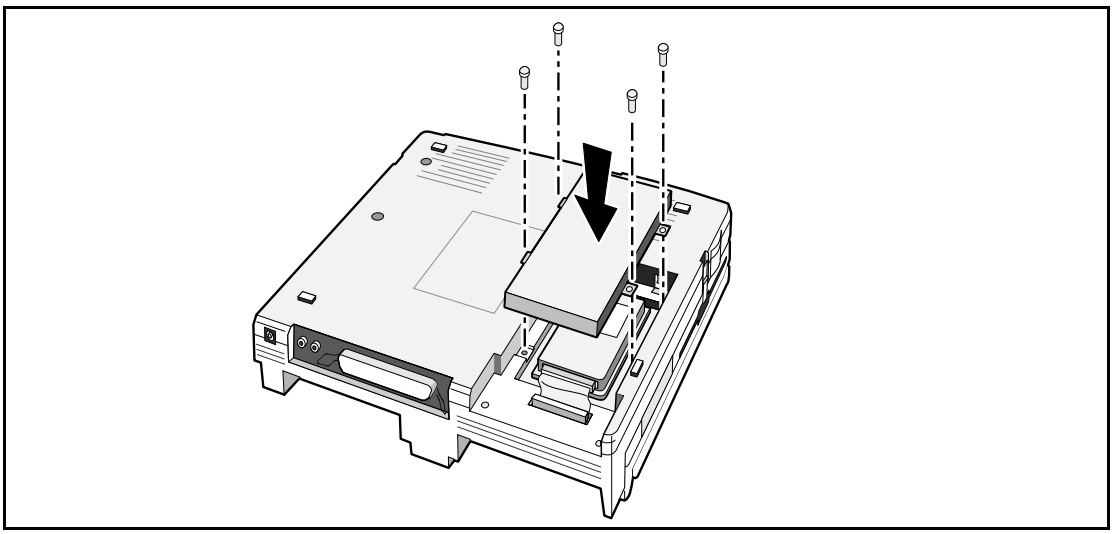
7. Place the drive in the Portable CD-ROM Docking System.



Attaching SCSI connectors

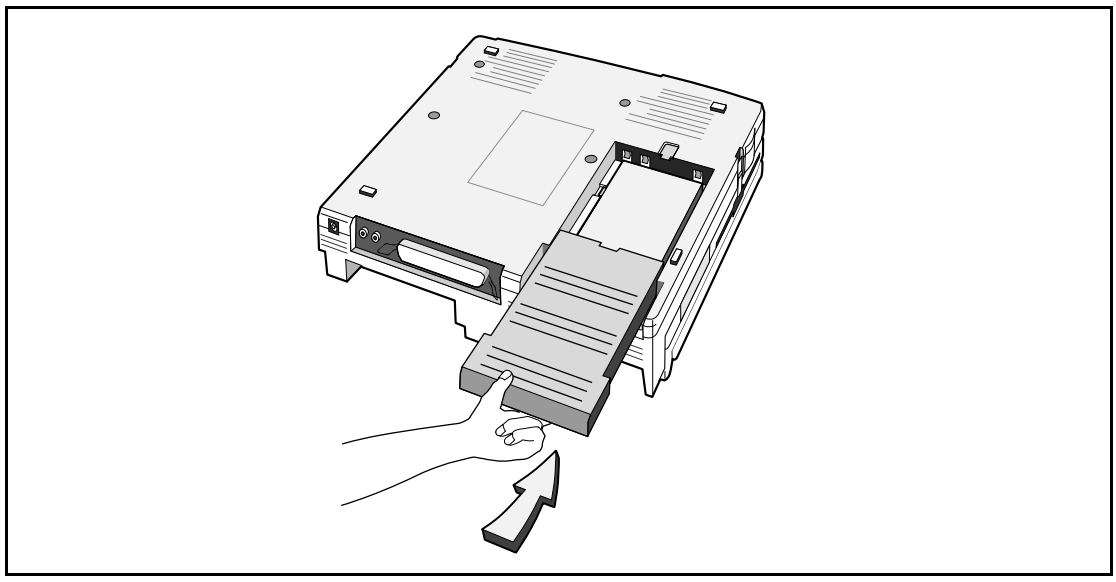
8. Place the metal bracket over the drive so that the holes in the feet on the plate are aligned directly over the holes left by removing the screws.

9. Screw the bracket down.



Screw the metal plate over the drive

10. Slide the plastic cover over the drive until the plastic release tab clicks into place.



Insert plastic cover

11. Turn the unit over, attach notebook, and plug in AC power.

12. Change the lastdrive in the CONFIG.SYS file from **D** to **E**.

13. Add **ASPIDISK.SYS/D** to the CONFIG.SYS file.

14. Reboot

To partition and format the SCSI hard drive, perform the following steps:

1. Go to the SCSI directory and type **AFDISK**.

2. Verify the correct hard disk make and type.

3. Press **ENTER**.

4. Verify logical drive information.

5. Press **INSERT** to create the partition.

6. Follow instructions on the screen.

7. When complete, reboot and type **FORMAT D:**.

Note: The SCSI hard disk should be set at ID0.

AC Adapter

An AC Adapter is provided with your Portable CD-ROM Docking System. If you want to order a spare AC Adapter, refer to TI Part No. 9793362-0001. For further information refer to Chapter 11, *TravelMate Options*.

Battery Options

The following battery options may be purchased for your Portable CD-ROM Docking System:

- ❑ Battery Charger
- ❑ Extra Battery Pack

For further information on these options, refer to Chapter 11, *TravelMate Options*, the *TravelMate 4000M User's Guide* and the instructions that accompany the options.

Note: You cannot operate the Portable CD-ROM Docking System on battery power when a third-party SCSI drive has been installed using the SCSI Hard Drive Enabler Kit. You must use AC power.

A
Specifications

Memory

Memory for the TM4000M Series includes 4 MB of standard RAM with the following upgrades available:

- ❑ 4-MB Upgrade Kit TI Part No. 9793357-0001
- ❑ 16-MB Upgrade Kit TI Part No. 9693358-0001

Display

The following display types are available:

DX4/75	SX2/25
8.5 inches - Active Matrix Color	9.5 inches - Monochrome
	8.5 inches - Active Matrix Color

Video RAM

1-MB

External Monitors

The TM4000M Series notebooks may use the following external monitor types:

- ❑ 640 x 480 x 256
- ❑ 800 x 600 x 256
- ❑ 1024 x 768 x 256
- ❑ 1280 x 1024 x 16

Appendix A

Floppy Disk Drive

All TM4000M Series notebooks use 1.44-MB, 3.5" floppy disks.

Hard Disk Drives

The following is a listing of hard drives types for the TM4000M Series notebooks:

DX4/75	SX2/25
340-MB Hard Drive	120-MB Hard Drive
	200-MB Hard Drive

CD-ROM Drive

CD-ROM specifications are as follows:

- ❑ Single-sided
- ❑ 250 ms access time
- ❑ 300 KB per second sustained transfer rate
- ❑ Supports SCSI synchronous transfer (up to 4.2 MB per second)
- ❑ Supports photo-CD multi sessions disc compatibility and multi-media PC specification compatibility
- ❑ Output level - .9V (rms Typ)
- ❑ Output type - unbalanced
- ❑ Load impedence - 10 kΩ min

- ❑ Frequency response - 20 Hz to 20 kHz +/- 3dB
- ❑ Distortion - 0.02% Max. (at 1 kHz w/20 kHz LPF)
- ❑ Signal to Noise Ratio - 84 dB Typ (IEC 179 A-weighted)

PCMCIA Slots

The TM4000M Series notebooks come standard with a PCMCIA slot that accommodates 1 Type III or 2 Type II PCMCIA option cards.

Printer Ports

The TM4000M Series notebooks come standard with the following:

- ❑ 16550 UART Serial Port
- ❑ EPP/ECP Parallel Port

SCSI Connections

The TM4000M Series notebooks can be connected to up to seven external SCSI devices (six if docked to the Portable CD-ROM Docking System).

PS/2 Port

The PS/2 port accommodates either an external keyboard, numeric keypad, or mouse. Since an internal pointing device already exists on the TM4000M Series notebooks, you must complete the following steps to use an external mouse:

1. Turn off the computer.

Note: If you connect the PS/2 mouse to the computer while power is on, press **CTRL-ALT-DEL** (warm start), or cycle power so the computer can detect the presence of the mouse.

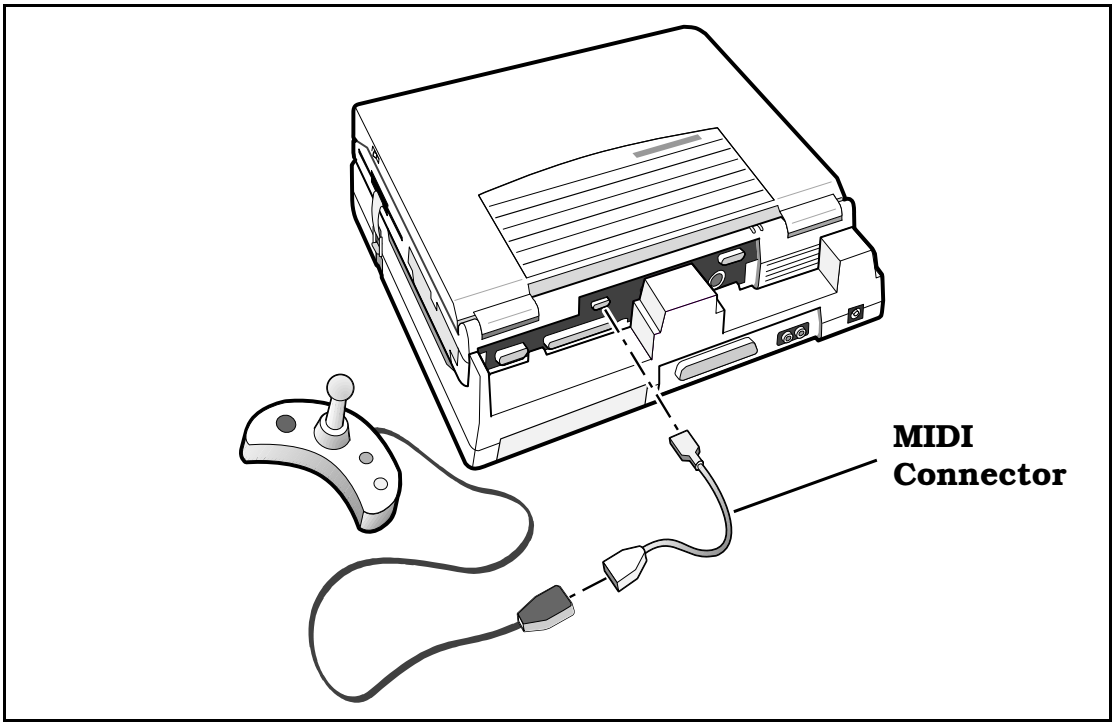
2. Attach the six-pin Mini-Din connector to the mouse and insert the other end of the connector into the external keyboard port on the TravelMate 4000M.

3. Set the keyboard switch located between the serial and parallel port on the rear of the notebook to the down position. This deactivates the internal pointing device.

4. Reconnect the AC Adapter, and turn on the computer.

MIDI Connection

You can purchase a MIDI connector cable that will connect digital musical devices or game devices to the MIDI/Joystick port on the back of your notebook.



MIDI Connector

Sound

TM4000M Series notebooks come with 16-bit sound and MIDI connections as standard features.

Environment

This section provides information on the optimum operating environment for your TravelMate 4000M notebook computer:

Temperature
Operating: 50° to 95° F (10° C to 35° C)
Storage: -4° to 140° F
(-20° C to +60° C)

Relative Humidity (Noncondensing)
Operating: 20% to 80%
Storage: 10% to 90%

Shock

Maximum 60g pulse in X and Y orientation and a 35g pulse in the Z axis.

Operating: Maximum 6g pulse in X, Y, and Z orientations

Storage: Maximum 60g pulse in X, Y, and Z orientations

Vibration

Operating: Sinusoidal 5 to 20 Hz limited to 0.0244 inch peak-to-peak maximum displacement

0.5g, 20 to 400 Hz

Storage:	Sinusoidal 5 to 20 Hz limited to 0.244 inch peak-to-peak maximum displacement
	5.0g, 20 to 400Hz

Options

Refer to the individual publications furnished with each option for specifications.

B
Character Sets

The TravelMate Computer character sets are identical to the IBM Code Pages for MS-DOS. This appendix shows the character sets for Code Page 437 (United States), 850 (Multilingual), 863 (Canadian-French), and 865 (Nordic), with the decimal and hexadecimal codes for each character.

The four-character sets contain differences in the international, symbol, and graphics characters above decimal code 128 (extended ASCII characters).

Note: The extended ASCII characters that are not on the keyboard (128 to 255 decimal) can be displayed at the MS-DOS prompt and in many applications. Press **ALT**, and type the ASCII decimal code for the character using the keys with numbers on their front face and also using **FN** or **NUM LK** on. Release the **ALT** key and the character is displayed on the screen. Your printer may or may not print the extended characters. Refer to the character code tables in your printer documentation.

Code Page 437, United States

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	⣿	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	⣿	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	-6	♠	—	&	6	F	V	f	v	ȧ	û	ª	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	■	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▬	∩	

Code Page 850, Multilingual

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	-
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	Đ	ß	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	=
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	Ë	Ò	¾
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	È	õ	¶
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	-6	♠	—	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	╠	╩	┌	Û	•
11	-B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	■	Ù	¹
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	ý	³
13	-D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	×	«	¥	╬	ì	-	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▬	´	

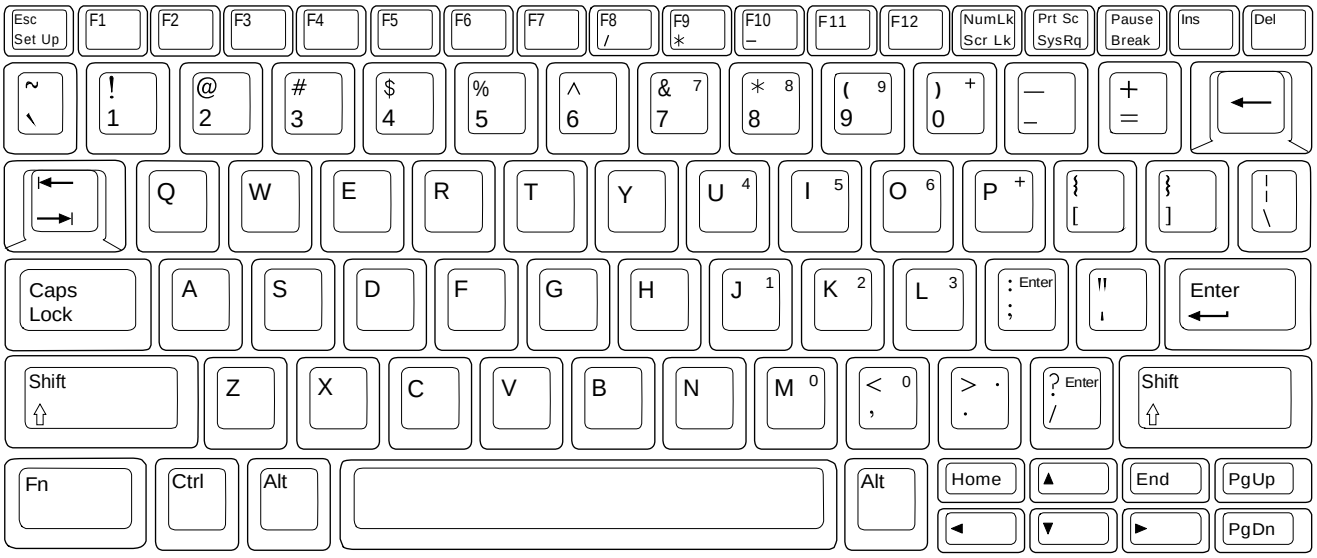
Code Page 863, Canadian-French

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	¦	⣿	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	È	´	▒	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Ê	ó	⣷	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	⎸	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	Â	Ë	¨	┤	—	╘	Σ	⌠
5	-5	♣	§	%	5	E	U	e	u	à	Ï	˘	╡	┼	╒	σ	⌡
6	-6	♠	—	&	6	F	V	f	v	¶	û	³	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	¯	╖	╟	╫	τ	~
8	-8	◘	↑	(	8	H	X	h	x	ê	¤	Î	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ô	⌐	╣	╔	┘	Θ	•
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	■	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	∞	n
13	-D	♪	↔	-	=	M	]	m	)	=	Ù	¾	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	À	Û	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	§	ƒ	»	┐	╧	▬	∩	

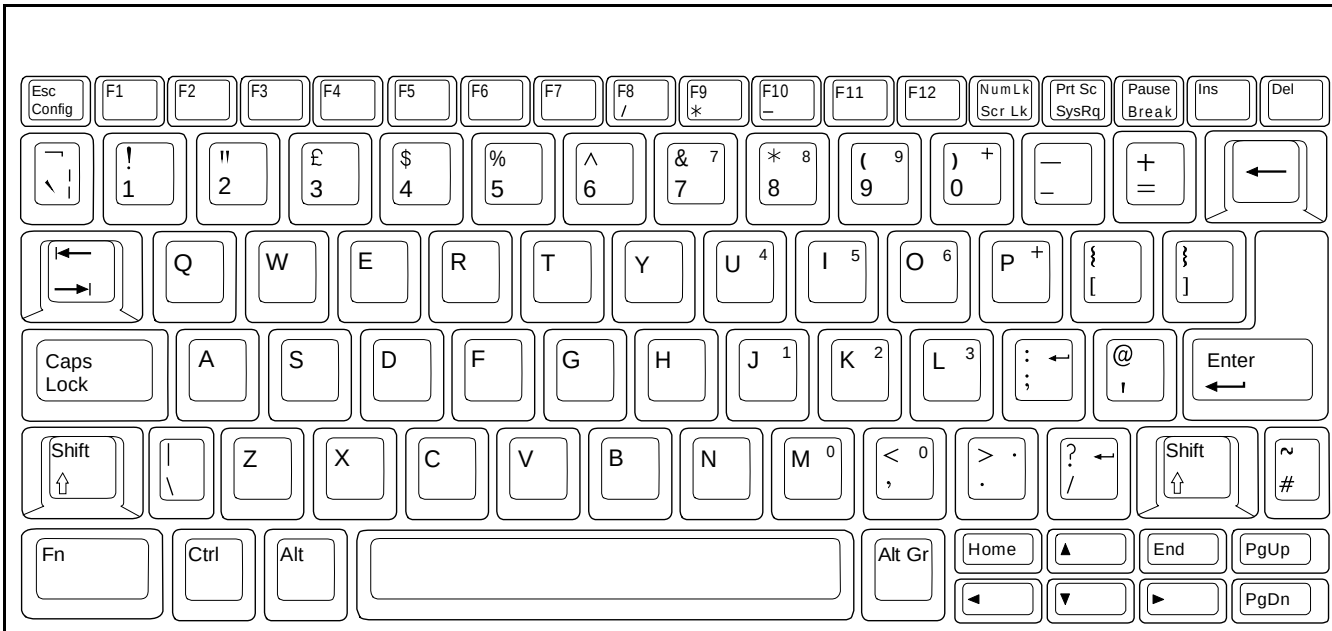
Code Page 865, Nordic

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	⣿	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	⣿	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	∫
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌠
6	-6	♠	—	&	6	F	V	f	v	ȧ	û	ª	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	~
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
10	-A	■	→	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	■	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	¤	┐	╧	▬	∩	

C
Keyboard Layouts

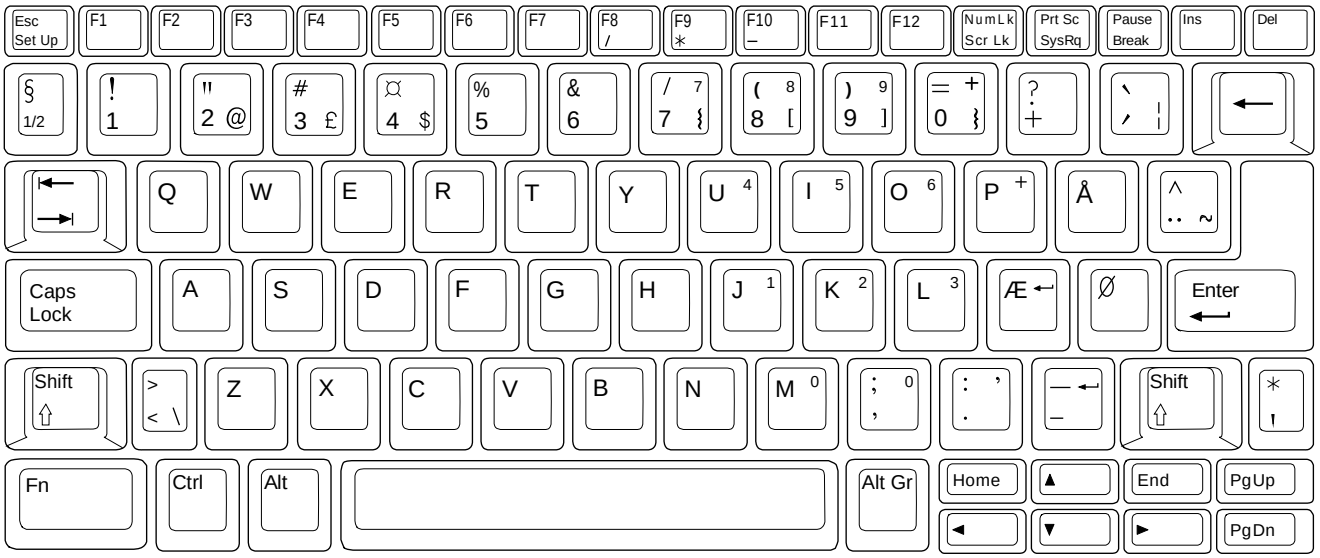


U.S. English Keyboard

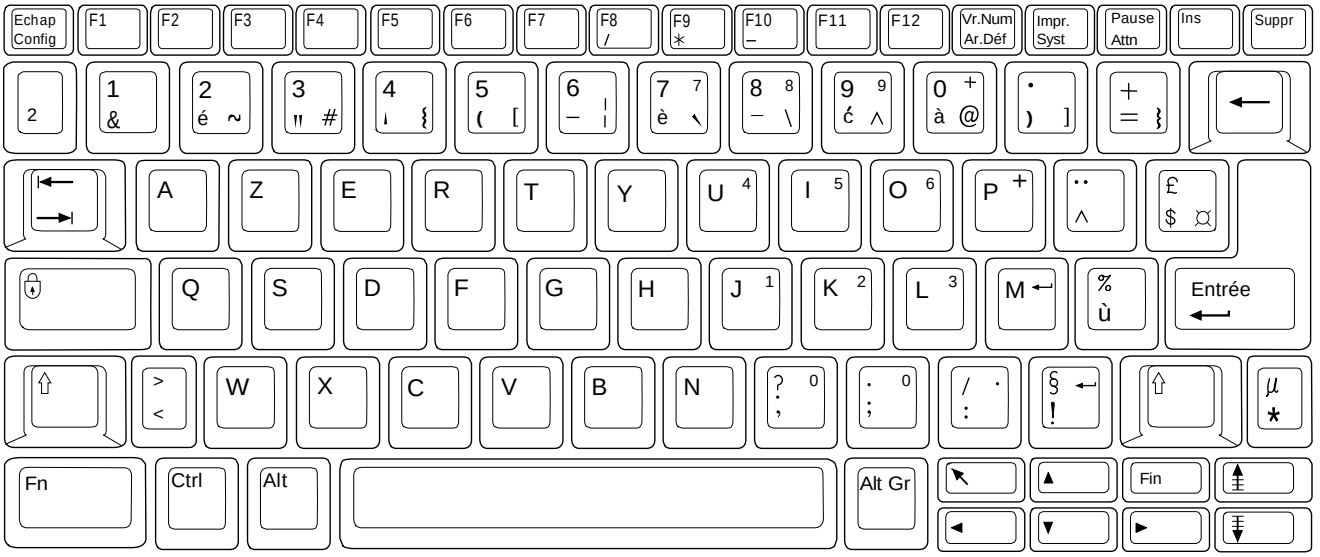


U.K. English Keyboard

Keyboard Layouts

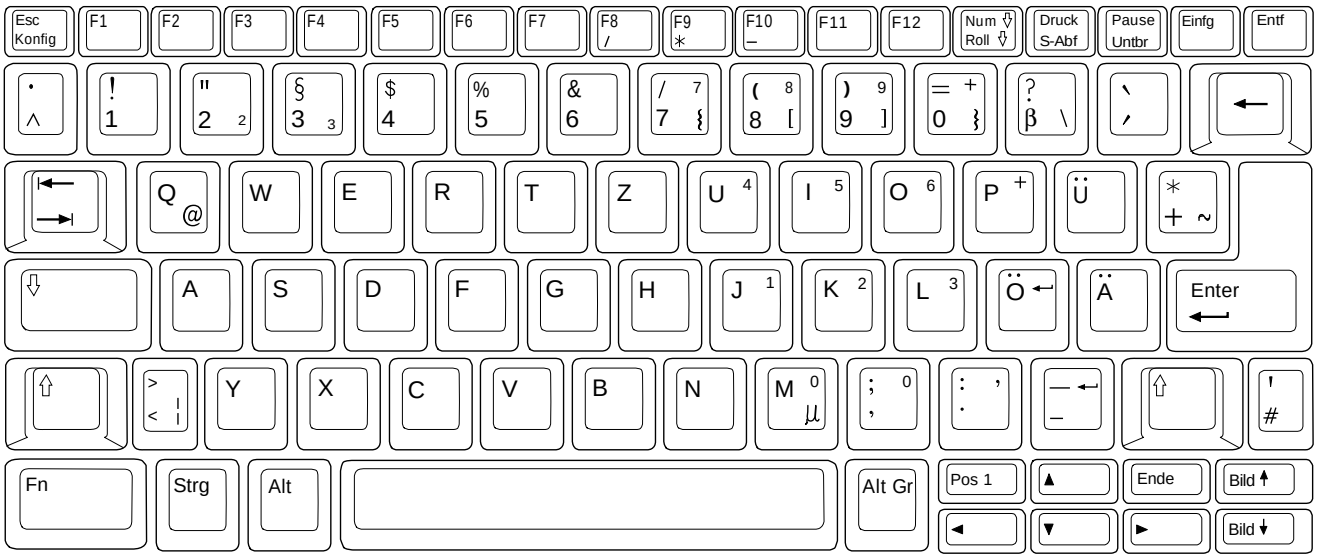


Danish Keyboard

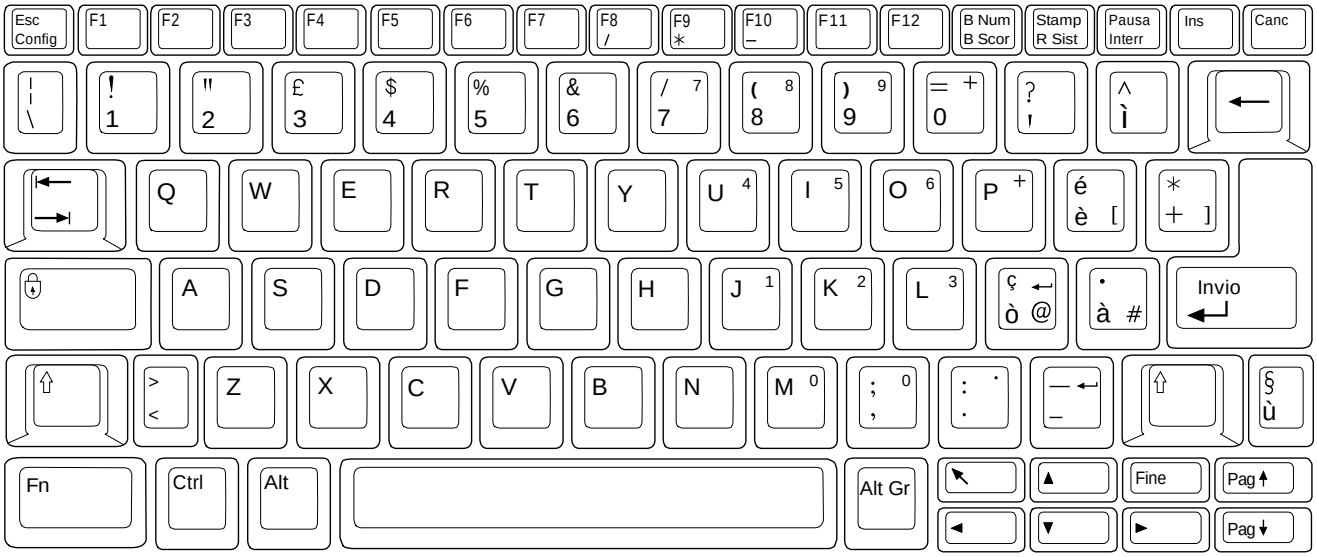


French Keyboard

Keyboard Layouts

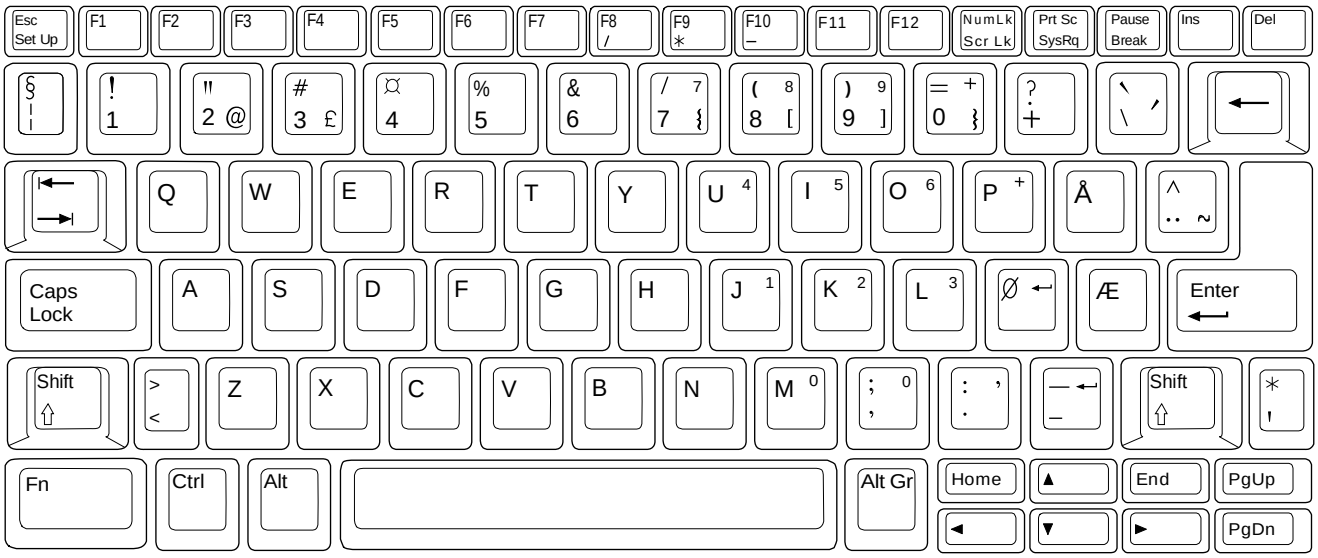


German Keyboard

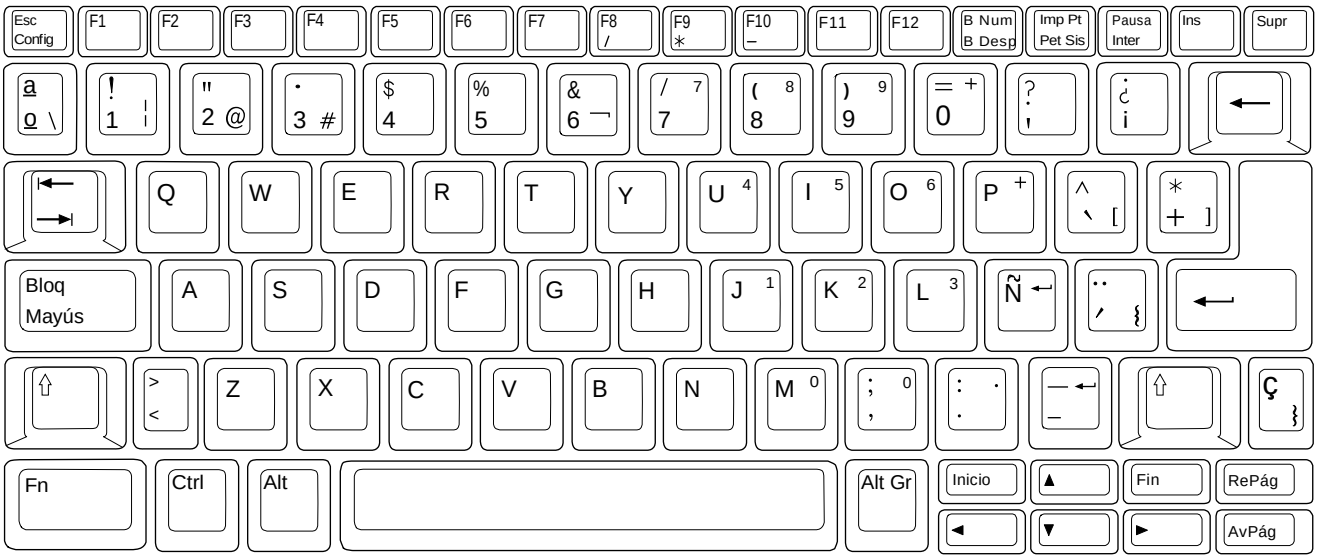


Italian Keyboard

Keyboard Layouts

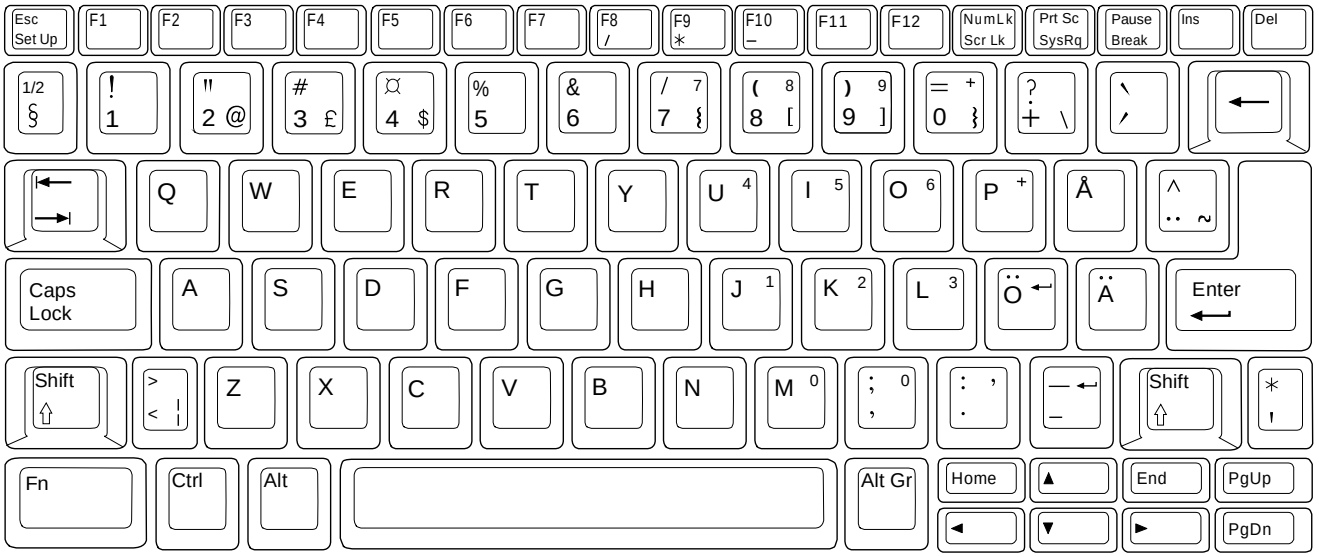


Norwegian Keyboard

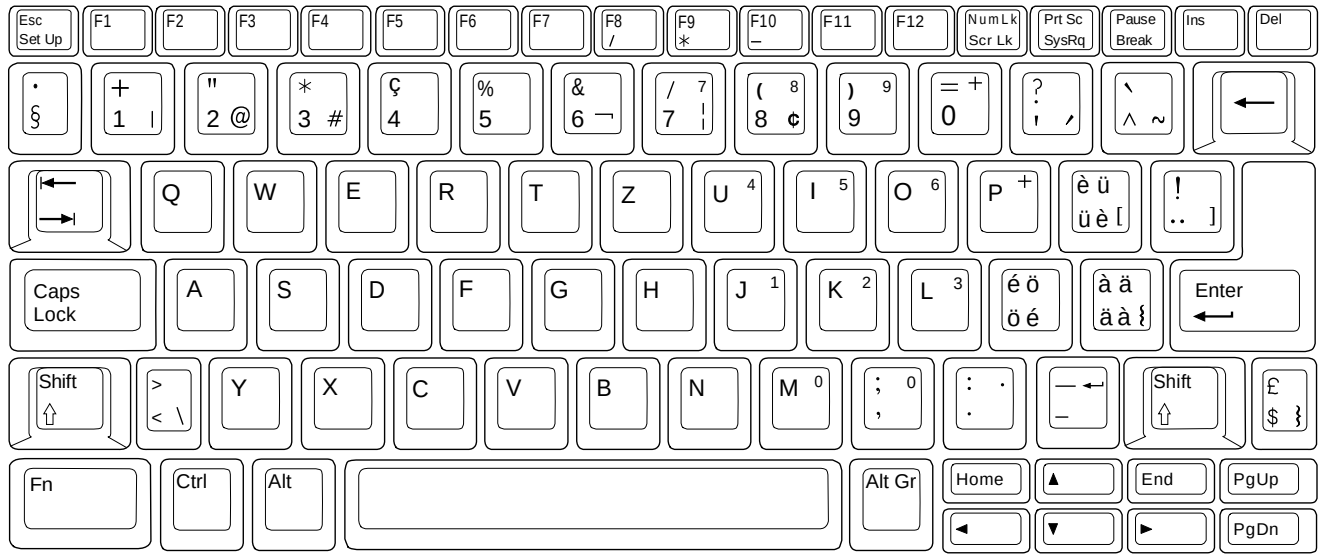


Spanish Keyboard

Keyboard Layouts

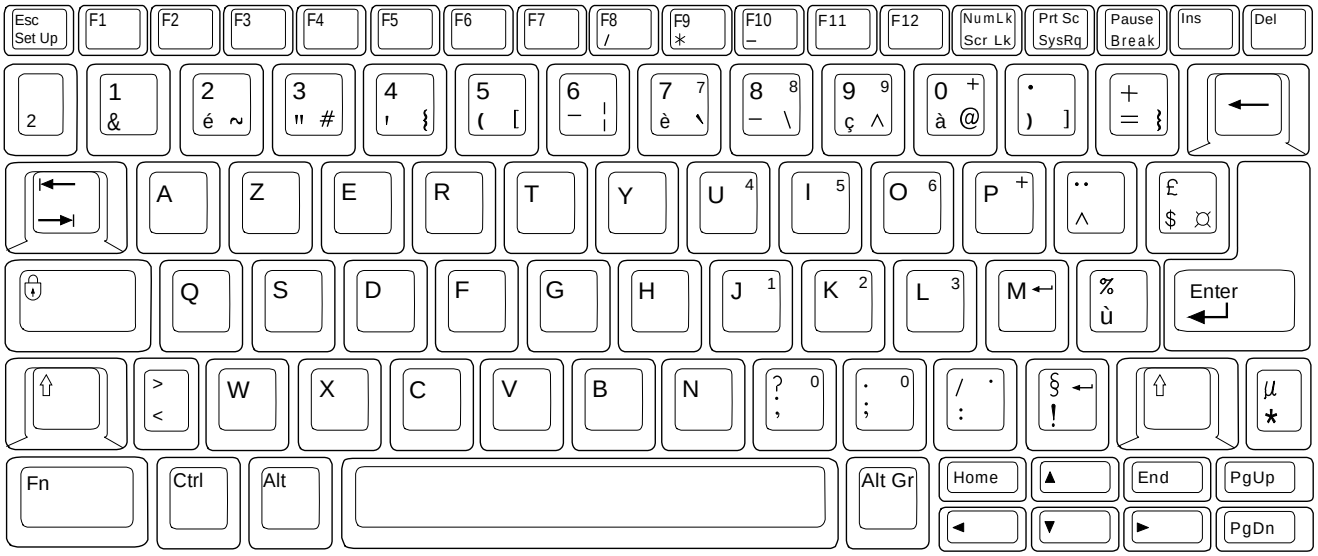


Swedish/Finnish Keyboard

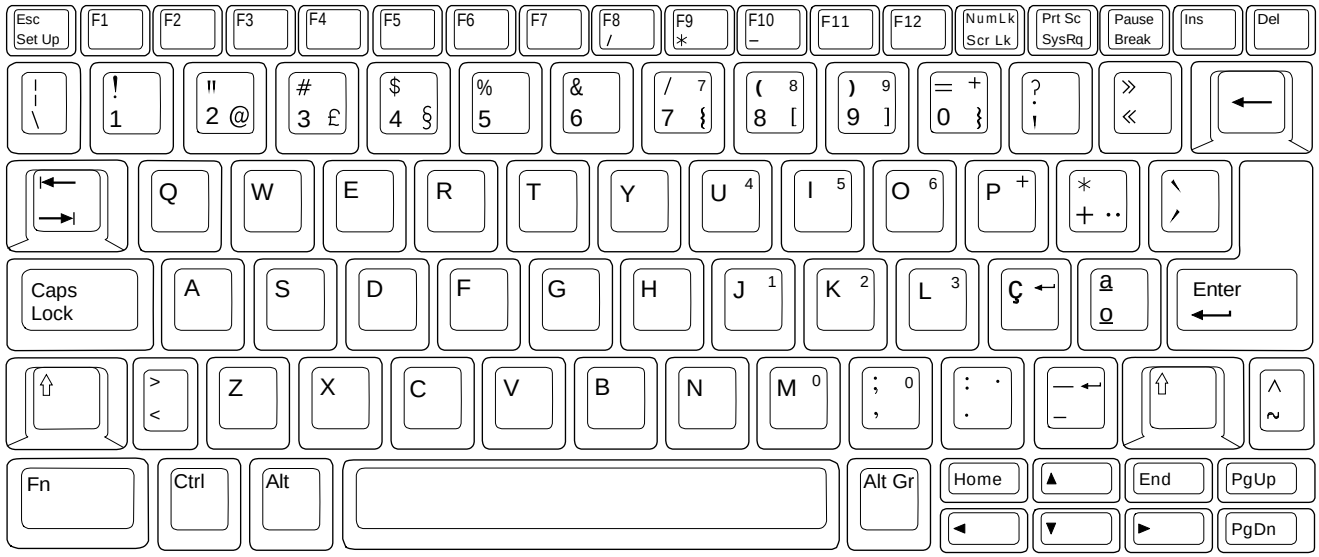


Swiss Keyboard

Keyboard Layouts



Belgium Keyboard



Portuguese Keyboard

D
Diagnostics

Your computer provides two diagnostics routines to ensure that it and its peripherals are functioning properly. One routine is executed every time you turn on the computer. The other is accessed from a separate Diagnostics Program.

Power-On Diagnostics

When you turn on the computer, a self-test executes, checks internal memory, and displays the number of kilobytes available for use.

Note: If Quick Boot is enabled, the memory is not displayed.

After a few seconds, MS-DOS starts to load. If MS-DOS fails to load from the hard disk or a floppy, an error message appears.

Turn off the computer, wait 5 seconds, and turn the computer on again. If the error message displays repeatedly, call your Texas Instruments dealer, or call TI Service at 1-800-TI-TEXAS.

Diagnostics Program

Diagnostics loads and displays its main menu. Use the cursor keys to highlight the test you want, and press **ENTER** to start the test.

Note: For diagnostics on SCSI devices, refer to the *Adaptec EZ-SCSI User's Manual*. For diagnostics on PCMCIA, refer to the *Phoenix PCMCIA User's Manual*.

Park Fixed Disks

The Park Fixed Disk function prepares the fixed disks for relocation. The fixed disk heads are placed over the diagnostics cylinder so that vibrations do not cause errors on the usable media. The heads are also automatically parked for safe travel when you turn off the computer or the computer enters standby mode.

Diagnostics

If you select the Diagnostics Program, a warning and menu display. Press **N** to abort Diagnostics. Press **Y** to continue, and the Diagnostics menu displays.

Each test listed indicates the hardware item and its configuration to be tested. Some items are listed only present (**P**) or not present (**N**), while others specify a hardware type. For example, **KEYBOARD** can be an 84-key keyboard, a 101-key keyboard, or not present (**N**). The floppy types are defined as they are in the Setup Program menu.

The Diagnostics menu reflects the hardware configuration that the Diagnostics Program detects in your computer. The selection process overrides this automatic selection process or excludes specific tests from a complete suite of tests to be performed.

Press the cursor keys to highlight an item you want to test or change, and press **F5** and **F6** to select new items in each field.

You can test a single item by moving the highlight to a particular test and pressing **F10**. You must select something other than not present (**N**) or **NONE**.

Pressing **F9** tests all currently selected devices. If you do not want to perform specific tests, set these test selections to not present (**N**); this tells the Diagnostics Program not to test these items.

When a single test or suite of tests is initiated, the Test Control Options and Test Results menu displays. On the left side of this menu is information relating to the test currently being performed. The right side of the menu contains the results of previously completed tests.

Test Control Options

The fields at the top of the menu represent options that control how tests are performed. These options must be set before a single test or suite of tests is initiated.

Continuous Test — This field causes the tests to be performed continuously until you specifically stop them by pressing **ESC**. When you press **ESC**, you can continue again by pressing the Space Bar, or abort the suite of tests by again pressing **ESC**. If you select a single test using **F10**, the single test is repeated if the continuous test field is set to **YES**. If you select a suite of tests using **F9**, the entire suite is repeated.

Stop On Error — If an error is detected during a suite of tests, the Diagnostics Program stops after the error is reported, depending on the status of this field. If set to **YES** (the default), the program reports the error and then stops testing until you press the Space Bar to continue or **ESC** to end testing.

Echo to LPT1 — This field permits you to send the test results to a parallel printer attached to LPT1. The information written to the right side of the menu is echoed to LPT1 if this option is set to **YES**. This is useful if you set the Continuous Test field to **YES**, the Stop on Error field to **NO**, and want to run a test or tests unattended.

Choosing Specific Suites of Tests

Many of the tests have submenus that permit you to select which parts of the test you want. When you select any of these tests, either individually (using **F10**) or as part of suite of tests (using **F9**), the submenus ask for additional information. If the tests are run multiple times, the submenus are displayed only before the first pass.

Each of the test submenus displays whether or not the test is interactive and whether or not it is destructive to data. Interactive tests require some user intervention to operate. For example, if you select the interactive keyboard test, you must press keys on the keyboard to verify that it is operating properly. In general, if you are performing continuous tests, you should not select any interactive tests, permitting the suite of tests to run unattended.

The following component tests and their respective options can be selected.

Keyboard Test
- Keyboard test (interactive)
- Controller test (non-interactive)

Floppy Disk Test
- Seek tracks
- Verify tracks
- Disk change (interactive)
- Read/Write (destructive)
- Format (destructive)

Fixed Disk Drive Test
- Controller test
- Head select test
- Seek test

Monochrome Adapter Test
- Attribute test
- Character test
- Text test
- Memory test

Color Graphics Adapter Test
- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

EGA Adapter Test
- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

VGA Adapter Test
- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

Parallel Port Test
- Internal loopback
- Printed pattern (requires connected printer)
- External loopback (requires loopback connector)

Additional Diagnostics

The Diagnostics Program hard disk tests are all nondestructive except on the diagnostics cylinder. The tests perform seek tests, head tests, and controller tests, but do not perform read/write tests on the entire media. Additional tests for the hard disk are contained in the hard disk format system, which is described later in this appendix.

Sound Diagnostics

To check Sound, select sound from the Windows Control Panel. Select Test to see if sound is on.

Diagnostics Error Codes

When an error is detected by the Diagnostics Program, a two-byte hexadecimal code is displayed. The first byte is the class of the error and the second byte is the subclass. The error code class generally corresponds to a specific hardware system or group of hardware systems. For example, class one (01) is used for the system planar board. The last byte of the code (subclass) describes the actual test that failed on the specified peripheral. For example, error 0108 indicates that the 8253 counter test failed during the system planar board test.

The following table lists the classes of error codes. The numbers are in hexadecimal.

Diagnostics Error Code Classes	
Code	**DESCription**
01xx	System planar board tests
07xx	Keyboard tests
10xx	Math coprocessor tests
17xx	Video tests
20xx	Asynchronous ports tests
27xx	LPT ports tests
30xx	Memory tests
37xx	Diskette/FDisk tests

The following table lists the error codes, by class and subclass, that could be displayed by the Diagnostics Program.

Diagnostics Program Error Codes

Code	Class	Failure Description
0101	System board	DMA registers
0102	System board	DMA memory move
0103	System board	Interrupt mask
0104	System board	Hot interrupt line
0105	System board	Stuck NMI
0106	System board	Processor registers
0107	System board	System timer

Diagnostics Program Error Codes (continued)

Code	Class	Failure DESCription
0108	System Board	8253 counters
0109	System Board	System timer interrupts (1)
010A	System Board	System timer interrupts (2)
010B	System Board	Processor flags
0110	System Board	CMOS memory
0111	System Board	Real time clock
0120	System Board	BIOS checksum
0701	Keyboard	Controller
0702	Keyboard	Keyboard map
1001	Coprocessor	Registers
1002	Coprocessor	Calculations
1701	Video	Text attributes
1702	Video	Background colors
1703	Video	Character set
1704	Video	Text page registration
1705	Video	Text pages
1706	Video	Graphics display
1707	Video	EGA/VGA palette
1708	Video	Memory
1709	Video	VGA sequencer
170A	Video	VGA controller registers
170B	Video	VGA attribute controller
170C	Video	VGA DAC

Diagnostics Program Error Codes (continued)

Code	Class	Failure DESCription
1730	Video	Cannot initialize video
2001	Serial	Baud rate clock
2002	Serial	Internal loopback data
2003	Serial	Internal loopback control
2004	Serial	External loopback data
2701	LPT	Registers read/write
2702	LPT	Control loopback
2703	LPT	Printed pattern
2704	LPT	Printer not ready
2705	LPT	Unknown error
2706	LPT	No paper/paper jam
2707	LPT	Printer timeout
2708	LPT	Printer busy
3001	Memory	Address lines
3002	Memory	Data patterns
3003	Memory	Walking bits
3701	Disk	Invalid parameter
3702	Disk	Address mark not found
3703	Disk	Write protect error
3704	Disk	Sector not found
3705	Disk	Reset failed
3706	Disk	Change line active
3707	Disk	Drive parameter error

Diagnostics Program Error Codes (concluded)

Code	Class	Failure DESCription
3708	Disk	DMA overrun
3709	Disk	Attempt to DMA across 64 KB
370A	Disk	Bad sector flag found
370B	Disk	Bad cylinder detected
370C	Disk	Media type not found
370D	Disk	Invalid format sectors count
370E	Disk	Control data mark detected
3710	Disk	CRC or ECC error detected
3711	Disk	EGC corrected error
3720	Disk	General controller failure
3740	Disk	Seek operation
3750	Disk	Change line test
3780	Disk	Drive not ready
37BB	Disk	Undefined error occurred
37CC	Disk	Write fault on selected drive
37E0	Disk	Status error
37FF	Disk	Sense operation failed

Loopback Connections

The serial and parallel communications tests in the Diagnostics Program offer optional loopback tests that require placing loopback connectors on the output ports of the computer. The loopback connector pin assignments are listed in the following tables.

Loopback Connector Pin Assignments

Serial Loopback Connections

DB9 Pin	Signal
1-7-8	CD-RTS-CTS
2-3	TX-RX
4-6	DTR-DSR

Parallel Loopback Connections

DB25 Pin	Signal
15-2	D0-ERR
13-1	STRB-SLCT
16-10	INIT-ACK
17-11	SLCTIN-BUSY
14-12	AUTOFEED-PE

Hard Disk Format

When you select the Hard Disk Format, the program displays the Format Fixed Disk menu.

Use the cursor keys to highlight the hard disk you want formatted or analyzed, and press **ENTER**. After you have selected a hard disk, the program displays a warning that the formatting operation will erase any data currently stored on the hard disk.

If you do not intend to format or analyze your hard disk, press **N**; otherwise, press **Y** to continue, and the program displays a menu listing the drives, heads, and cylinders under test.

Bad Track Table

The center portion of the Format Fixed Disk menu displays the list of currently recorded bad tracks. This list is central to the processing of most of the format functions.

Bad tracks are areas of the hard disk that cannot store data properly. A list of the bad tracks detected by the drive manufacturer is usually provided with the hard disk drive when it is purchased. Some of these areas may work intermittently, but are not dependable for storing data. The program formats these tracks with a special attribute so that other programs or commands (such as the MS-DOS FORMAT command) will not attempt to use bad areas on the disk.

The bad track list is modified automatically by the SCAN BAD TRACKS command, the ANALYZE SURFACE command, and the FORMAT PREFORMATTED DRIVE command. Each of these functions adds to the list bad tracks they detect during their processing.

To manually add a bad track to the table, press **INS**. Use the cursor keys or **ENTER** to select between cylinder and head fields. After the cylinder and head are entered, press **F10** or **ENTER**, and the new entry will be added to the table. If an invalid head or cylinder value is entered, the program displays a menu permitting you to delete a bad track.

To delete a bad track, use the cursor keys to highlight the bad track, and press **Del**. You are not prompted to verify the deletion, so use this function with care.

To clear the bad track table, press **F2**; the program displays a warning message to be sure you want to continue. Press **Y** to clear all entries from the bad track table, or press **N** to abort. To print the bad track table, press **F3** (be sure your printer is connected).

You can search the disk for all existing bad tracks if the drive has already been formatted by selecting **F5** (scan for bad tracks). This causes the program to quickly test each track on the hard disk to determine if it has already been formatted as bad. Each track found to be bad is added to the list if not already there.

Setting Interleave

Press **F4** to set the interleave, which is the value used by the format operation to interleave the hard disk tracks. When setting interleave manually, always use a value of 1, the default. The interleave setting is the value used to format, not necessarily the current value for your hard disk.

Analyzing the Hard Disk Surface

If you do not need to reformat the entire hard disk but want to perform a thorough test of the media to detect any bad or marginal areas, select **F6** to analyze the surface.

Caution: This performs a destructive analysis of the hard disk media (all data on the hard disk will be erased).

Any bad tracks found during the analysis are automatically added to the bad track table. As bad tracks are found, they are reformatted as bad so that a subsequent MS-DOS operation does not attempt to use these areas on the disk.

Formatting a New Hard Disk

After installing a new hard disk, you should enter the bad track information provided by the manufacturer into the bad track table (see above). Then press **F7**. This option, specifically for formatting a hard disk that was previously unformatted—performs the following operations:

- Each track of the hard disk is reformatted using the current interleave value.
- Each track in the bad track table is reformatted as bad so that it cannot be used.

When the format operation is complete, run a surface analysis to verify that no additional bad tracks are found.

Reformatting a Hard Disk

If your hard disk was previously formatted, press **F8** to automatically reformat. This causes the following operations:

- The program scans the drive for tracks that have already been marked as bad and adds them to the bad track table.
- Each track is reformatted using the current interleave value.
- Each track in the bad track table is reformatted as bad so that it cannot be used.
- The program performs a surface analysis on the media, reformats any additional bad tracks as bad, and adds them to the list.

Using this option is equivalent to performing a SCAN FOR BAD TRACKS command (**F5**), followed by a FORMAT UNFORMATTED DRIVE command (**F7**), followed by an ANALYZE HARD DISK operation (**F6**). The only differences are that all three operations are done automatically, and the surface analysis performed is not as thorough or as time-consuming as that performed when you select **F6**.

If the bad track table from the manufacturer is available when the reformat of the drive is done, enter that map before this operation is performed. This ensures that all tracks in that list are reformatted as bad regardless of whether or not they are found by the SCAN FOR BAD TRACKS operation.

After Formatting is Complete

The HARD DISK FORMAT commands perform low-level formatting operations on hard disks. After these operations are complete, insert the *MS-DOS Disk 1* floppy into the floppy drive, and reboot the computer. Follow the instructions displayed to install MS-DOS and utilities. If you are using another operating system, see its documentation for formatting and installation instructions.

E
Power Consumption Values

The following table summarizes approximate power consumption using various computer power-saving features, manual and automatic.

Power Consumption by Operating Mode

Operating Mode	Typical Power Consumption
Manual Standby* with DOS background tasks	4.0 – 6.0 watts
Manual Standby* with no background tasks	2.0 – 4.0 watts
Auto Suspend† with DOS background tasks	3.5 – 6.0 watts
Auto Suspend† with Windows background tasks	2.5 – 5.0 watts
Auto Suspend† without background tasks	2.0 – 3.5 watts
Cover Closed Suspend mode	2.0 – 3.2 watts
Operation with hard disk access‡	7.5 – 12.5 watts
Operation with no hard disk access‡	7.0 – 9.0 watts
Operation with LCD off	3.5 – 6.5 watts
Setup Program *LCD Power* set to Low	0.5 watts
LCD brightness, minimum to maximum	1.5 – 3.5 watts
Typical full-charge battery capacity	32.4 watts
Maximum power consumption, all options	20.5 watts

*Press **STANDBY** to enter Standby mode.
†Select *Auto Suspend* in the Setup Program's Power Savings category.
‡Add 3 to 3.5 watts if BatteryPro is *not* activated (level 0).

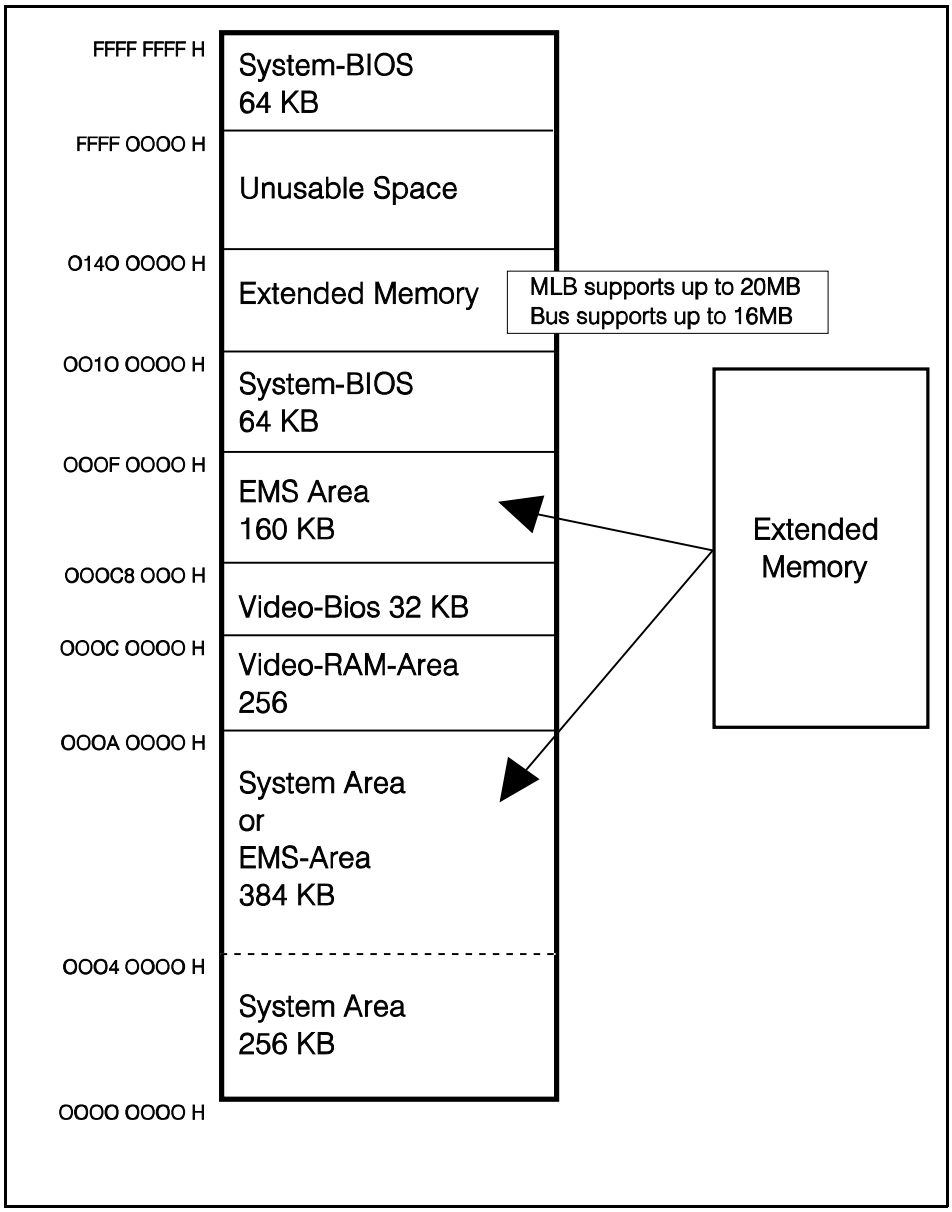
F
Configuring Memory

This appendix describes the various areas of RAM and how you can make it more efficient by configuring it with the memory management device drivers supplied with your computer.

Memory Areas

MS-DOS directly accesses up to 640 KB of RAM for the execution of programs and commands and for storing temporary data. MS-DOS cannot directly access memory beyond this 640-KB limit. The amount of standard default RAM (640 KB) in the computer is displayed on the Setup Program menu as *Standard* (Memory), and it can be changed in 64-KB increments if required by your application.

The following memory map shows the available memory and how MS-DOS uses it.



Extended Memory

Extended memory is internal system RAM above 1024 KB. MS-DOS or your applications (that support extended memory) can access Extended memory if your system is configured with an extended memory driver (XMS). Extended memory drivers manage the extended memory ensuring that two programs do not use the same part of memory. The enhanced mode of MS Windows uses extended memory to multitask applications.

MS-DOS includes the HIMEM.SYS extended memory driver. HIMEM.SYS is defined in your CONFIG.SYS file where it is automatically loaded each time you boot the system. HIMEM.SYS also enables MS-DOS programs to use an extra 64-KB region located just above the 1-MB mark for storage of code and data. This area is known as high memory area (HMA).

Note: MS-DOS can also be loaded in HMA to free up conventional memory. Refer to your *MS-DOS User's Manual* for instructions.

Note: Some application programs that run in 386 enhanced mode (such as Windows) require special extended memory managers. Use the extended memory manager provided with your application, if available. Otherwise, use HIMEM.SYS, the MS-DOS version furnished with your computer.

You can define part of extended memory as one or more RAM disks using the RAMDRIVE.SYS device driver. Details are provided in the next section.

Expanded Memory

Expanded memory conforms to the Expanded Memory Specification (EMS) developed by Lotus/Intel/Microsoft (LIM) known as LIM-EMS. Your computer supports EMS version 4.0.

Expanded memory is accessed by allocating an area (usually 64 KB) of system memory between 640 KB and 1 MB (and between 256 KB and 640 KB when the /O option is used) as a "window." Pages or segments of data are passed to and from Expanded memory through this window, which is called the *page frame*. The page frame is divided into at least four physical pages of 16 KB each.

The total amount of internal memory above 640 KB can be assigned to either Extended memory (XMS) or Expanded memory (EMS), depending on your requirements and which driver is installed.

Note: MS Windows can use both XMS and EMS in 386 Enhanced mode when properly configured. Refer to your *Windows User's Guide* for details and instructions.

The Expanded Memory Manager included with MS-DOS (EMM386.EXE) manages the interface between the program and Expanded memory, bringing data in and out through the page frame as required.

Before you can use Expanded memory, you must install the EMM386.EXE device driver as described in the next section, "Memory Device Drivers." You need not install the Expanded memory driver if your application does not support Expanded memory.

The following device drivers included in the **C:** directory are provided to manage memory:

- **HIMEM.SYS** — An extended memory manager that supervises the computer's Extended memory so that no two applications use the same memory at the same time
- **EMM386.EXE** — Supports LIM-EMS Expanded memory
- **RAMDRIVE.SYS** — Supports RAM disks in standard, Extended, and Expanded memory
- **SMARTDRV.EXE** — For use with a hard disk and Extended or Expanded memory that supports disk-caching to speed up reading from the hard disk.

Installing Device Drivers

To install a driver, add a DEVICE command line to your CONFIG.SYS file similar to the following, using the MS-DOS EDIT utility or a word processor that saves text files in ASCII format:

```
DEVICE=C:\DOS\XXXXXXXX.XXX [options]
```

Where XXXXXXXX.XXX is the name of the device driver, for example, HIMEM.SYS. You must then restart the computer to load the new CONFIG.SYS settings and activate the driver(s).

EMM386.EXE

The EMS memory manager provided with your computer, EMM386.EXE, conforms to version 4.00 of the Lotus/Intel/Microsoft Expanded Memory Specification (EMS). EMM386.EXE enables areas of system memory to be used as Expanded memory.

The EMM386.EXE device driver must be installed before you can use Expanded memory. To install EMM386.EXE in its simplest form, include the following command line in your CONFIG.SYS file *before* any other DEVICE commands that use Expanded memory (for example, RAMDRIVE.SYS) but *after* the HIMEM.SYS command line. This allows other device drivers to use the memory manager.

```
DEVICE=C:\DOS\EMM386.EXE [options]
```

Parameters (also called *switches* or *options*) for the EMM386.EXE driver are described in the *Microsoft Windows User's Guide* furnished with your new computer. After it loads, the memory manager determines the amount of Expanded memory in the system and performs any required initialization.

Note: The 386 enhanced mode of Microsoft Windows allows you to simulate part of extended memory as expanded memory using the EMM386.EXE device driver. However, this is not recommended as it degrades system performance. MS-DOS also uses EMM386.EXE to enable Upper Memory Area (UMA). This allows you to load TSR programs and device drivers in this area to free up conventional memory. Again, this may degrade performance. Refer to your *Microsoft Windows User's Guide* or your *MS-DOS User's Guide* for details.

Some applications may require "backfill" memory, which is the unused area of standard memory that can be used by EMM386.EXE as Expanded memory. For example, an application may require only 256 KB or 512 KB of standard memory, leaving 384 KB and 128 KB of backfill memory space, respectively, for use as Expanded memory.

The Shadow ROM memory that you define with the Setup Program enables mapping the internal system BIOS, Video BIOS, and option BIOS into high-speed memory for faster operation. When not selected, the shadow memory is available for use as Extended memory. The shadow memory area is limited to 384 KB.

Your computer provides 4 MB of RAM (main memory) standard. The first MB (1024 KB) of the *standard* 4 MB is the system base memory (640 KB) and shadow memory (384 KB) and cannot be increased beyond 1024 KB. You can optionally add 4 MB or 16 MB of memory to use as Extended and/or Expanded memory. This added memory when combined with the remaining standard 3 MB (4 MB - 1024 KB) of system memory (not used for base or shadow memory) provides either 7 MB or 19 MB, respectively, of Extended or Expanded memory.

See the *Microsoft MS-DOS User's Guide and Reference* for detailed instructions on installing and configuring expanded memory.

HIMEM.SYS

HIMEM.SYS is an eXtended Memory Manager (XMM) conforming to eXtended Memory Specifications (XMS), version 3.04. HIMEM.SYS uses 64 KB of the high-memory area (HMA) at the beginning of Extended memory to store a single TSR program or device driver, or it uses this area for data storage. This effectively increases the size of standard memory for use by your main application.

To install HIMEM.SYS in its simplest form, include the following command line in your CONFIG.SYS file before any other device commands that use Extended memory:

```
DEVICE=C:\WINDOWS\HIMEM.SYS
```

In this form, HIMEM.SYS uses default values. Access to HMA is on a "first-come-first-served" basis.

RAMDRIVE.SYS

A RAM disk is a portion of your computer's memory configured to simulate a disk drive. A RAM disk, also called a *virtual disk*, can be accessed much faster than a normal drive.

You lose the data stored on a RAM disk when you turn the computer power off. Therefore, to save the contents of a RAM disk, copy the contents of the RAM disk to a floppy or to the hard drive before turning off power. You can copy files using the included Laptop File Manager utility or the MS-DOS COPY command, or you can set up a batch file to do it automatically. Unlike a normal disk, a RAM disk does not require formatting before use.

To set up a RAM disk, include the following line in your CONFIG.SYS file:

```
DEVICE=C:\DOS\RAMDRIVE.SYS [size]
```

Specify the size in kilobytes. The minimum size is 16 KB, and the default value is 64 KB.

Several other options are available for setting up a RAM disk. Refer to your *BatteryPro & Productivity Software User's Manual* for details.

The RAM disk is given the drive letter that follows the last drive letter being used by your system. For example:

- If your hard drive is configured as drive C, the RAM disk is drive D.

- If your hard drive is drive C and your hard drive is drive D, the RAM disk is drive E.

SMARTDRV

SMARTDRV is a disk-caching program that reduces the time it takes your computer to read data from the hard disk.

When SMARTDRV is installed, information from the hard disk is temporarily stored in a cache in Extended or Expanded memory. When needed, the data can be accessed by the processor directly from the cache memory. The data on the hard disk is updated automatically to reflect the changes in the data stored in the cache.

Installing SMARTDRV .SYS

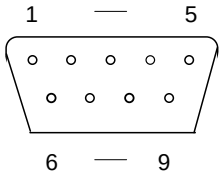
To install SMARTDRV.SYS in its simplest form, include the following command line in your AUTOEXEC.BAT file:

```
C:\WINDOWS\SMARTDRV.EXE
```

In this form, a 256-KB cache will be set up in Extended memory.

If you need to specify a particular size for the cache, or if you want the cache to be in Expanded memory, refer to your MS-DOS and Windows manuals.

G
Connector Pin Assignments

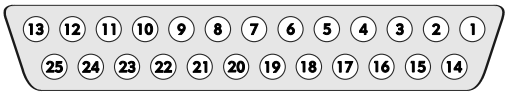


RS-232C Connector

Nine-Pin RS-232C Serial Connector (Female IBM-AT)

Pin No.	Signal Name	Abbreviation	Direction
1	Carrier detect	CD	Input
2	Receive data	RD	Input
3	Transmit data	TD	Output
4	Data terminal ready	DTR	Output
5	Signal ground	SG	
6	Data set ready	DSR	Input
7	Request to send	RTS	Output
8	Clear to send	CTS	Input
9	Ring indicator	RI	Input

Parallel Connector



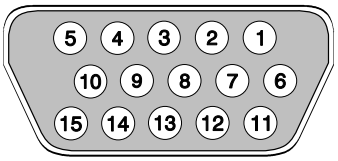
25-Pin Parallel Printer Connector

Pin No.	Signal Name	Abbreviation	Direction
1	Strobe	STROBE–	Output
2	Data 0	DATA0	Output
3	Data 1	DATA1	Output
4	Data 2	DATA2	Output
5	Data 3	DATA3	Output
6	Data 4	DATA4	Output
7	Data 5	DATA5	Output
8	Data 6	DATA6	Output
9	Data 7	DATA7	Output
10	Acknowledge*	ACK–	Input
11	Busy	BUSY	Input
12	Paper Out	PE	Input
13	Select	SLCT	Input
14	Auto Linefeed*	AUTO FEED–	Output
15	Error*	PERROR–	Input
16	Initialize printer*	INIT–	Output
17	Select input*	SLCT IN–	Output
18-25	Ground	GND	

*Note: Active Low

Connector Pin Assignments

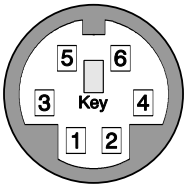
15-Pin VGA External Monitor Connector



Pin No.	Signal Name	Direction
1	Red video	Output
2	Green video	Output
3	Blue video	Output
4	Not used	
5	Ground	
6	Red return	Input
7	Green return	Input
8	Blue return	Input
9	Not used	
10	Ground	
11	Not used	
12	Not used	
13	Horizontal sync	Output
14	Vertical sync	Output
15	Not used	

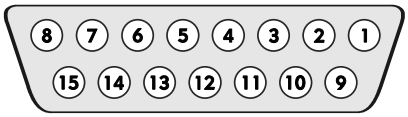
Note: Monochrome monitors use green video for all video input and ignore red and blue video.

Six-Pin Mini-Din PS/2 Mouse or PS/2 Keyboard Connector



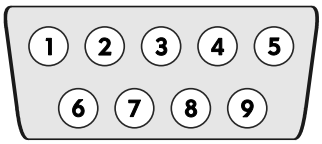
Pin No.	Signal Name	Abbreviation
1	Data	DATA
2	Not used	
3	Ground	GND
4	+5 volts	VCC
5	clock	CLK
6	Not used	

15-Pin Micro MIDI/Joy Connector



Pin Number	Signal Name
1, 8, 9, 15	VCC
2	DC4
3	TMRD
4, 5, 12	GND
6	TMRC
7	D5
10	D6
11	TMRB
13	TMRA
14	D7

9-Pin Serial Port Connector



Pin	Signal Name	Abbreviation
1	Carrier Detect	DCD
2	Receive Data	RXD
3	Transmit Data	TXD
4	Data Terminal Ready	DTR
5	Ground	GND
6	Data Set Ready	DSR
7	Request to Send	RTS
8	Clear to Send	CTS
9	Ring Indicator	RI

H
Screen Standards

This appendix summarizes the screen standards supported by your computer's internal display adapter.

VGA (Video Graphics Array)

The VGA standard supports 640-by-480 pixel monochrome or 16 of 64 color graphics and 320-by-200 pixel 256-color graphics. The VGA standard uses an 8-by-16 pixel character box for text display.

Your computer's LCD supports VGA by displaying text in an 80-column by 25-line text display with 16 shades of gray (selectable from 64 shades) in an 8-by-16 pixel character box in a 640-by-400 pixel area centered on the display.

Your computer also supports color graphics by displaying colors as 64 shades of gray in two modes:

Resolution: 320-by-200 pixels with 256 shades of gray mapped into 64 shades

One pixel is converted to a 2 × 2 cell
Display area: 640 × 400

Resolution: 640-by-480 with 64 shades of gray

One pixel is displayed as a 1 × 1 cell
Display area: 640 × 480

Screen Standards

External Monitor Support

Your computer supports all IBM standard VGA video in addition to 640 x 480, 800-by-600, 1024 x 768, and 1280 x 1024 extended graphics modes on an external monitor. Many extended text modes are also supported.

Note: Operating the LCD in high-resolution modes (800 x 600, 1024 x 768, or 1280 x 1024) or operating the computer in SimulScan mode requires the computer to use more power than the Battery Pack can supply; use the AC Adapter to supply the additional power required.

Caution: Do *not* operate the LCD in SimulScan mode with a low battery. Damage to the LCD may occur.

Extended Modes Supported

The following table lists the supported extended modes.

Extended Modes

Mode (hex)	Colors	Graphics Resolution	Text Resolution (Char x Row)	DotClk MHz	Horizontal Frequency	Vertical Frequency	Notes
2e	256/256K	640x480		25	31.5	60	1,4,5
30	256/256K	800x600		40	37.8	60	2,5
37	16/256K	1024x768		44.9	35.5	87	2,3,5,7
52	16/256K		132x60	40	31.5	60	1,5
54	16/256K		132x25	40	31.5	60	1,5
64,6a	16/256K	800x600		40	37.8	53	2,6
6Ci	16/256K	1280x 1024	160x64	65	48	87	

Notes:

1. All PS/2 compatible monitors supporting horizontal sync frequency of 31.5 KHz
2. All Multisync type monitors supporting variable horizontal sync frequencies ranging from 25.9 KHz to 37.8 KHz
3. Interlaced mode
4. This mode is supported on the LCD, showing 64 gray shades. Simultaneous LCD and CRT display is supported with the LCD showing 16 gray shades.
5. The extended modes require special software drivers to function correctly. Your computer comes with an extensive selection of software drivers. Execute INSTALL on the extended VGA drivers diskette to see information on loading these drivers.
   Some applications come with extended mode support. If so, select the computer or Cirrus Logic driver provided by the application.
6. This is Super VGA compatible mode (SVGA). If SVGA is supported by the application, this is the mode it will use. Super VGA modes, or other modes identified as needing a multisync type monitor, do not work with fixed-frequency monitors. Examples of fixed-frequency monitors are IBM PS/2, 8503, 8512, 8613, and 8514.
7. Supported only with systems containing 1 MB of video memory

I
Creating Help Displays

You can custom design your own Help displays to show information for your own programs or off-the-shelf applications. You also can add subjects and related descriptions to the HELP.DAT file created at the factory.

Use an ASCII word processor or editor (such as the MS-DOS Edit utility) to create and edit the HELP.DAT files or an editor that creates or "exports" files in ASCII format.

Rules for Creating Help Files

Use the following rules to create your own help files.

- **: : HELP** — must always be the first line in the file, with the first colon in column 0
- **: T** — precedes the main title for the help display
- **: C X BF** — precedes the colors used for the help menus, where **X** selects one of the following menus to assign a color:

  1 = main menu
  2 = subject name box
  3 = subject description box
  4 = error message menu
  5 = help menu
  6 = print menu

and **BF** selects the menu color, using **B** for background color and **F** for foreground color in hexadecimal. Colors are defined as follows:

0 = black
1 = blue
2 = green
3 = cyan
4 = red
5 = magenta
6 = brown
7 = light gray (white)
8 = dark gray
9 = light blue
a = light green
b = light cyan
c = light red
d = light magenta
e = yellow
f = bright white

For example, the string **: C 1 97** sets the main menu (1) background to light blue (9h) and the foreground to light gray (7h). You must start each menu color selection on a new line.

- **: P** — precedes the subject name that appears in the left subject name box. You can use up to 12 characters. Data you enter on the lines below the **: P** line make up the description that appears in the right subject description box. You can enter any number of data lines for the description box. The description box terminates with a **:** (colon) in column 0 to start another command or an EOF character.

- **;** — (semicolon) in column 0 precedes a comment line, which is ignored by the program. You can insert any number of comment lines for your own information; comment lines are not displayed in the Help screens. You also can use the **;** (semicolon) character anywhere on a menu color line after the **:C X Y** characters when preceded by a space character; for example,

  : C 1 0f ; this is a sample color comment line.

Column length of the subject name box is 13 characters maximum; the description box is 52 characters maximum.

Sample Help File

The following figure shows a sample help subject entry, with comment lines explaining the command lines.

Creating Help Displays

```
::HELP
;_____________________________________________
; the line above must be the first line in the file
;_____________________________________________
; the following line is the Help menu main title
;_____________________________________________-
:T My Help Display, Version 1.0
;_____________________________________________-
; the following three lines set the colors for the main menu
; and the subject and description boxes
;_____________________________________________-
:C 1 0f ; sets main menu to bright white on black
:C 2 f0 ; sets subject box to black on bright white
:C 3 87 ; sets description box to dk gray on lt gray
;_____________________________________________-
; you can insert a character counter like the following to
; help you keep lines for the description box to the 52-
; character maximum
_____________________________________________
;        10        20        30        40        50
;12345678901234567890123456789012345678901234567890123456789012
;_____________________________________________
; the following lines list the subject box entry ; and the
; description box entry; the subject name is limited to 13
; characters and the description box is 52 characters
; maximum
;_____________________________________________-
:PSubject Name
   The words “Subject Name” will appear in the
left-hand subject name box on the displayed Help
menu and this explanation, whose first line is
indented three characters, will appear in the
right-hand subject description box.
   If more than one page is required to complete
the description, the program will automatically
adjust for additional pages.
;_____________________________________________-
; the following lines are additional entries in the Help file
;_____________________________________________-
:PEntry No. 2
   Entry number 2 will display next on the Help
display.
:PEntry No. 3
   Entry number 3 will display next on the Help
display.
:PEtc.
   Etc.
;_____________________________________________-
; the end-of-file command depends on your word
; processor or editor; no particular command is
; necessary
;_____________________________________________
```

Naming Your Help File

You can give your help display data file any name and extension you want—*except* HELP.DAT which is already in use in the UTILS directory. For example, you could name your Help display data file MYFILE.HLP. Then when you want to load your Help display, at the MS-DOS **C:\>** prompt type

```
HELP MYFILE.HLP
```

and press **ENTER**.

If you type only HELP, without specifying a data file, the program searches first for the default data file HELP.DAT in the current directory; then it searches through all directories specified in the PATH environment variable defined in your AUTOEXEC.BAT file. The program uses the same search technique if you type only a filename. If you type a filename preceded by a \ (backslash), which creates a pathname, the program searches only for the file specified by the pathname.

Adding Subjects to Existing Help Displays

You can add subjects and descriptions to the existing HELP.DAT file, stored under the UTILS directory on the hard disk (drive C). Use your word processor or file editor to insert new subjects and descriptions anywhere in the file, following the rules outlined previously in this appendix.

Note: Be sure to save the file back to disk in ASCII format, not your word processor's particular format.

Glossary

This glossary explains many of the terms found in this manual as well as other computer-related terms.

access — The ability to obtain data from or place data into internal memory, a floppy, or the hard drive.

access shutter — A metal cover on a floppy that slides open to allow the computer to read or write data.

adapter — A device that connects an option to the computer.

application program — A program that instructs the operating system to perform specific tasks by using either off-the-shelf routines, such as word-processing, or programming languages such as BASIC that allow you to design your own programs.

archiving — The process of storing back-up copies of data files in a specific location.

ASCII — An acronym for the American Standard Code for Information Interchange; an agreed-upon standard for the assignment of numeric values to letters, digits, punctuation marks, and control codes. The computer processes only numbers even though characters, letters, and graphic symbols appear on the screen. The ASCII list is a set of numeric values for the most frequently used characters. The computer converts these numeric values to their binary equivalents.

asynchronous communications software — The software used to communicate with a subscription information service, send or receive electronic mail, or process data using a remote computer.

Glossary

backlight — A feature that allows you to control background brightness for better readability.

backing up — Duplicating a program or file onto a separate storage medium so that a copy will be preserved against possible loss or damage to the original.

backup — A duplicate copy of information or programs; usually stored on a diskette and kept in a separate location in case the original is lost or damaged.

BASIC — An acronym for Beginner's All-purpose Symbolic Instruction Code; a programming language widely used because many of its commands resemble everyday language.

battery, battery pack — An electrical power storage device that can be installed in, or affixed to, your computer to provide electrical power.

baud — A signal element change per second. If a signal element change has only one bit, baud equals bits per second.

binary — A system of numbering that uses patterns of only zero's and one's. Each item of information, whether a letter, graphic symbol, or an instruction, is converted to a binary number before it is processed by your computer.

BIOS — An acronym for Basic Input-Output System; instructions stored in read-only memory (ROM) at the factory that check hardware components and load the computer operating system (MS-DOS, for example) into the computer when you boot it.

bit — A binary digit (0 or 1); the smallest unit of information used by your computer.

bits per second — The speed at which your computer receives or sends data to a device such as a modem or serial printer.

boot — To start your computer; also called *start-up* and *power-up*.

bps — See *bits per second*.

brightness control — A control that allows you to adjust the brightness of the display.

buffer — A portion of the computer's memory that temporarily holds information used by a program; for example, the portion of a document you are working on while using a word processor.

bug — An error in the hardware or software of your computer that causes an operation to perform incorrectly.

byte — A grouping of eight binary digits (bits) that your computer treats as one unit; usually represents one character.

cache — A software device that accumulates copies of recently used disk sectors in RAM. The application program can then read these copies without accessing the disk, thereby increasing performance.

central processing unit (CPU) — The electronic circuits in your computer where most processing of information takes place.

Glossary

character — One of a set of symbols, such as letters, numerals, or punctuation marks, that can express information when collectively arranged. Although these symbols are intelligible to humans, they are not understood by your computer. For this reason, standardized character codes consisting of groups of binary digits have been developed to allow characters to be processed by computers. In most cases, a character is represented by 8 bits or 1 byte.

character set — A system of codes, such as ASCII, that assigns a special standardized group of binary digits to each character.

clock — A timing device that coordinates all internal events in your computer.

CMOS — An acronym for Complementary Metal Oxide Semiconductor; a large-scale integration technology that requires low-power consumption and is, therefore, used for battery-assisted memory systems.

command — The portion of a computer instruction that specifies what operation is to be performed.

communications — The electronic transfer of information between computers or between a terminal and a computer. An example is sending a data file to another computer by using telephone lines and a modem.

compiler — A program that translates a language, such as BASIC, into a language your computer can understand. A compiler translates the entire program just once.

computer — A combination of a central processing unit (CPU) and memory designed to process information. Although a combination of the central processing unit and memory is defined as a computer, an input device (such as a keyboard) and an output device (such as a display unit) are required to make the computer useful.

configure — To adapt software so that it sends the correct control codes to external devices such as printers. Also called *customize* and *set up*.

connector — A coupling device that allows your computer to communicate with an external hardware device such as a printer or another computer.

contrast control — A control that allows you to adjust how data shows up against the background of the display screen.

control code — A code that initiates some kind of physical control action that is not printed (such as line feed and tab), turns off an external device, or, in combination with other characters, defines unique commands (for example, pressing the **Ctrl** and **C** keys might tell the computer to abort a program); a numeric value that instructs the computer or an external device to perform a specific instruction.

controller — The electronic circuitry that allows communication between the computer unit and an external device.

conventional memory — Internal RAM up to 640 KB, accessed by MS-DOS directly; also called *main memory* and *RAM*.

coprocessor — An auxiliary processing unit designed to speed up the processing of certain types of information.

Glossary

CPU — See *central processing unit*.

CRT — Abbreviation for cathode ray tube, a common term for a television-like computer monitor.

CRT adapter — A hardware option that allows you to use a CRT with your computer.

cursor — A special graphic character on the screen (usually a block or underline shape, sometimes blinking) that indicates the next position at which a character will be entered or deleted from the keyboard.

customize — See *configure*.

data — Information entered into your computer and then processed by mathematical and logical operations so that, ultimately, it can be output in a sensible form. It usually consists of numerals, letters, or symbols that describe an object, idea, condition, relationship, or other information.

data base — A collection of related information; usually a large number of data files stored in one or more storage media.

data file — A grouping of information with common descriptive attributes. For example, a customer data file might consist of basic customer information. Each file might represent one customer.

data processing — The input, storage, manipulation, and dissemination of information using sequences of mathematical and logical operations.

default value — A value that your computer assumes as a response to a prompt, unless instructed otherwise.

device driver — The small programs used to control external devices or to run other programs. A device driver directs production, manipulation, and presentation of appropriate signals by the computer so that the external device will perform as required.

diagnostics programs — The programs that test the components of your computer to verify proper operation or to diagnose problems.

directory — The list of all files, which itself is a file, on your computer storage medium for easy reference.

disk controller — A device that controls how information is transferred between the system unit and the hard disk or floppies.

disk drive — A device that rotates magnetic media and accesses data by means of a read/write head.

diskette — See *floppy*.

DOS — The disk operating system, programs that act as translator between you and your computer; also see *operating system*.

expanded memory — The memory that utilizes an area of the computer memory as a window, through which pages of data are "passed."

expansion bus connector — A coupling device that connects an external device to your computer.

extended memory — The internal RAM above the 1,024 KB of conventional memory.

Glossary

external commands — The utility programs of an operating system (for example, MS-DOS) that enable you to perform occasional operations such as copying an entire floppy or partitioning a hard drive.

external devices — The devices, usually for input and output, connected to your computer to increase its capability and usefulness. Examples include printers and modems.

file — A group of organized data assembled for one particular purpose, considered as one unit, and stored in permanent offline storage, such as a drive or tape.

filename — A name that distinguishes one file from another; may consist of alphabetical characters, numeric characters, or a combination of both.

firmware — The software that is built into the hardware of a computer and controls the functions of the hardware.

fixed drive — See *hard drive*.

floppy — A flexible, flat, circular medium that magnetically records and provides access to stored data. It is divided into concentric circular tracks and wedge-shaped sectors. The diskette is sealed in a protective square envelope that is lined with a soft material that cleans as the diskette rotates. The cover has several openings and notches to accommodate the drive.

formatting — The preparation of various types of magnetic media to accept data. For example, before you can use floppies, track and sector information must be set for the controller. After the floppy is formatted, it can be used for normal input-output and retrieval operations.

function keys — The keys that perform editing functions in MS-DOS and have application-defined functions at other times.

graphics — Visual patterns displayed on the screen or produced on a printer; usually formed by patterns of dots.

hard drive — A combination of a drive mechanism and permanently sealed storage medium; capable of storing large amounts of information.

hardware — The physical components of a computer: central processing unit, internal memory, drives, printer, display unit, option boards, external devices, etc. Contrast with *software*.

hardware options — Any of several devices that can make your computer more efficient and powerful.

head — A small electromagnetic device that reads, records, and erases data on a magnetic storage medium, such as a drive or tape. Also called a read-write head.

hexadecimal — A numbering system that consists of 16 symbols, 0 to 9 and A to F; used by programmers as a convenient method of expressing binary values.

input — Information that enters the computer.

input/output — An operation that transfers information from the central processing unit to a device or from a device to the central processing unit. An example is storing and retrieving information with a floppy.

integrated circuit — A microscopic grouping of electronic components and their connections mounted on a small chip of material, usually silicon.

Glossary

internal commands — The core program of the operating system (for example, MS-DOS) that consists of commands necessary for day-to-day operations, such as copying files.

internal memory — A temporary storage area for information (programs and data) in binary form.

KB — An abbreviation for 1,024 bytes; used to designate the memory capacity of a computer or the storage capacity of a storage device.

keyboard — A device, similar to a typewriter keyboard, that allows you to communicate with your computer.

kilobyte — 1,024 bytes, abbreviated KB.

LCD — See *liquid crystal display*.

liquid crystal display (LCD)— A display made of material, that reflects or transmits changes when an electric field is applied.

load — To copy information from a storage device, such as a floppy or a hard drive, into internal memory of the computer. Also called *download*.

loop — A series of instructions or one instruction in a program that is repeated a prescribed number of times, followed by a branch instruction that exits the program from the loop.

main directory — The primary directory of a diskette or a hard drive. Also called a *root directory*.

MB — An abbreviation for *megabyte*; used to designate the memory capacity of a computer or the storage capacity of a storage device.

megabyte — 1,024 kilobytes.

microprocessor — A central processing unit assembled on a single silicon integrated-circuit chip.

modem — A device, separate from or installed in your computer, that allows it to use telephone lines to communicate with other devices such as computers.

monitor — A view screen to which a computer sends graphics or text data you can see.

mouse — A device, manipulated by hand, that moves a cursor or pointer in the same direction as the movement created when the mouse is moved.

multi media — The combination of sound, graphics, animation, and/or text.

multitasking — The concurrent execution of two or more programs.

multiuser system — A system in which the computer and other external devices are shared in any one of several arrangements by several people.

operating system — A set of programs that control the operation of the computer. Typically, the operating system regulates space allocation, keeps track of files, saves and retrieves files, and manages other control functions associated with data storage. Also see *DOS*.

partitioning — Dividing a hard disk into work areas, usually approximately 20 MB in size, to accommodate the working capacity of the operating system.

path, **pathname** — A sequence of directory names, usually ending in a filename, all separated by backslashes (\), to tell your computer where to find particular subdirectories and files.

port — An input/output connection between external devices and the computer. The port has both male and female connectors that contain a specific number of pins.

processing — The calculating, sorting, storing, and retrieving of information.

program — A list of instructions that tells your computer how to perform a specific task.

program file — A program stored on a storage medium such as a floppy or hard disk.

programming language — A set of words, abbreviations, or symbols that are converted into the binary numbers and that represent instructions to the computer. Programming languages enable programmers to write instructions using words or symbols and avoid the time-consuming task of entering the long string of 0s and 1s that represent the numeric language of the computer. A programmer can use any one of several different programming languages designed for a particular computer. Some programming languages have more than one version (for example, MS-BASIC and GW-BASIC).

RAM — See *random access memory*.

random-access memory (RAM) — A type of internal memory used for the temporary storage of information. The contents of RAM can be altered, allowing information stored there to be processed. Unlike read-only memory, information in RAM is usually lost when power is turned off. For this reason, information in RAM must be saved on a storage device before the computer is turned off. Also called *main memory* and *system memory*.

read — To access information from a storage device.

read-only memory (ROM) — A type of internal memory that contains permanent instructions for your computer. The contents of ROM cannot be altered. For this reason, essential instructions are permanently stored in ROM. These instructions, such as those that execute the self-test, are not lost when the computer is turned off.

resolution — The contrast between the display and the background on a screen.

ROM — See *read-only memory*.

self-test — An automatic check the computer performs every time it is turned on.

set up — See *configure*.

software — Computer programs, usually supplied on floppies or on ROM. Contrast with *hardware*.

system board — An internal circuit board that holds the integrated circuits for the microprocessor, memory, and clock in your computer.

working copy — A copy of a floppy that is used in day-to-day operations while the original is kept in storage. This term also can mean a floppy that has both an operating system and an application on it.

working directory — The default directory used by an application when it first is loaded onto the hard drive.

write — To record information on a storage device.

write-protect tab — A switch on a floppy drive that prevents recording of data over existing data.

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