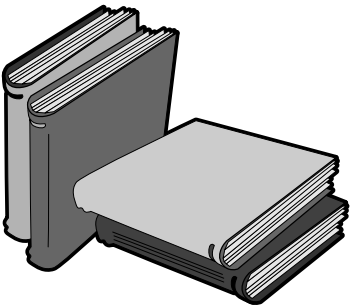
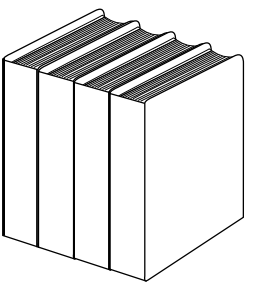


The TM5000 Series User's Reference Guide can be printed in its entirety any time the online document is open on your screen. If you prefer to buy the professionally printed manual from Texas Instruments, call 1-800-TI-TEXAS (in the U.S.) or the Texas Instruments Service Center in your local country.



User's Reference Guide

TravelMate™ 5000 Series Notebook Computer

P/N 9805810-0001

August 1995

TEXAS INSTRUMENTS

TravelMate 5000 Series Notebook
User's Reference Guide
TI Part No. 9805810-0001
Original Issue: August 1995

FCC Notice

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

Notice: Shielded Cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Notice: Peripheral Devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this equipment. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Caution

Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this computer.

Use Conditions

This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice: Canadian Users

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Remarque à l'intention des utilisateurs canadiens

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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Preface

Your TravelMate 5000 Series computer comes with a variety of standard features and options that maximize system performance and ease of operation. This guide 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 Power Saving utilities.

Chapter 5 - Describes Laptop File Manager, a program that helps you manipulate files and directories stored on the hard disk.

Chapter 6 - Describes utilities that allow you to connect an external VGA monitor to your system.

Chapter 7 - Describes miscellaneous utilities for configuration and system enhancement.

Chapter 8 - Describes the Sound utilities provided with your notebook.

Chapter 9 - Describes options you may purchase for your computer.

Appendix A - Provides system specifications for your computer.

Appendix B - Displays character sets used by your computer.

Appendix C - Displays domestic and international keyboard layouts.

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

Appendix E - Describes memory configuration for your computer.

Appendix F - Describes connector pin assignments for the computer.

Appendix G - Describes screen stardards supported by your computer's internal display adapter.

Appendix H - 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 (TI Setup)

Initial Startup Procedure

The first time you boot up your notebook, your system automatically runs Setup. The following steps help you through the software configuration portion of Setup.

1. Boot your system.

You are asked to specify the date and time. A greeting screen appears during the boot process. It describes what system backup procedures will be required and prompts you to press any key to finish setting up MS-Windows for Workgroups.

2. Press any key.

The Windows for Workgroups Setup screen appears and setup begins automatically. After a few seconds, you are prompted for your name, company, and product number.

3. Enter information in each field and select **Continue**.

You are asked to verify the information you just entered.

4. Verify that the information is correct and select **Continue**.

Windows setup continues. You are prompted to select a printer driver from a list of printer drivers.

5. Scroll through the list of printer drivers and click on the one that is used with your printer.

6. Select **Install**.

You are asked to enter the LPT port to which your printer is connected.

7. Scroll through the list and click on the desired LPT port (usually LPT1:)

8. Select **Install**.

Setup configures your printers. Windows for Workgroups files are copied and inflated to their working capacity. You are prompted to insert the System Files Recovery Diskette. This diskette is used in case of a fatal system crash and allows you to restore your computer to working order.

9. Insert the System Files Recovery Diskette that came with your unit into the diskette drive and press any key to continue.

The required system files are copied to the diskette. This takes several seconds. The system prompts you when the copy has completed.

10. Remove the System Files Recovery Diskette and write-protect it.

11. Press any key to continue.

Your system is rebooted. Refer to the "Startup Menu" section when your computer reaches the Startup Menu in the boot process.

Note: Please be sure to fill out and return your Warranty card.

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**
Windows for Workgroups (default)	Loads standard Windows for Workgroups files and excludes PCMCIA.
Windows for Workgroups with PC Card support	Loads standard Windows for Workgroups files and PCMCIA drivers.
MS-DOS prompt	Does not load any extra drivers and does not run Windows.
MS-DOS prompt with PC Card support	Does not load Windows, but will load PCMCIA drivers.
PC-Doctor Diagnostics	Allows you to diagnose and correct problems on TM5000 Series computers.
System Maintenance and Backup	Allows you to create backup system diskettes, to delete image files, or to delete files that allow you to create the backup diskettes. If the files are deleted, you will be unable to create backup diskettes again and must order new backup diskettes from Texas Instruments.
Games Demonstration	Allows you to view or play pre-loaded games on the notebook or delete demo games.

Note: System backups can also be done using the DiskMaker utility in Windows. This utility is located in the Utilities directory in the TravelMate Notebook Center group.

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

It is a good idea to back up the operating system as soon as possible after purchasing your notebook so that you can reinstall the software in case of emergency. Ensure that your diskettes have been checked for viruses to prevent contamination of files on your hard disk.

To create backup system diskettes, use the DiskMaker utility from Windows or complete the following steps:

1. Ensure that you have the required number of high density, 1.4 MB, 3.5" diskettes to back up your system. To verify the number of diskettes, perform steps 2 and 3.

2. Boot your system.

   System startup begins. A DOS Startup Menu appears.

3. Select the *System Maintenance and Backup* option.

   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. Each diskette will automatically be formatted.

If you are using the DiskMaker utility, run Windows and double-click on the DiskMaker icon in the TravelMate Notebook Center group. The number of diskettes required to back up each area is indicated by the number of selections on each tab page. Use these selections to complete the system backup.

Note: If you don't want to use the backup process, you may order operating system diskettes by referring to the Backup Diskette Flier that came in the documentation set.

System Files Recovery Diskette

You are provided a System Files Recovery Diskette with your computer. This is a bootable diskette with backup software and enables you to restore minimum system files. For further information, refer to *Initial Startup Procedure* earlier in this chapter.

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.

To run this program, ensure that you have exited from the Windows environment. 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 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.

Accessing Windows-Based Setup

To access Windows-based Setup, complete the following steps:

1. Double click on the TravelMate Notebook Center group.

2. Double click on TI Setup.

   Several folders appear. You can 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 any given model may not support all of the selections described in the following pages.

Time and Date Parameters

Note: Time and Date parameters are only available in DOS-based and ROM-based Setup.

Time

The Time area displays the current time as stored in the computer's real-time clock. There are either three or four fields in this selection depending on the setting of the Date Display field (either U.S. or European). U.S. is distinguished by a 12-hour (am/pm) format, whereas European time is in a 24-hour format.

To reset seconds to 00, press the space bar when seconds are highlighted.

Date

The Date area displays the current date as stored in the computer's real-time clock. There are three fields that can be changed in this section. The order of the fields depends on the setting of the Date Display field. The day of the week field displays the alpha day of the week and is updated automatically. You may display the date in either U.S. or European format.

Note: Disk Drive parameters are only available in DOS-based and ROM-based Setup.

Diskette Drive(s)

The two Diskette fields allow the user to set the diskette types. If the drive is not present, select "Not Installed." Values can be set as follows:

- 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)

Hard Disk

The Hard Disk Drive (HDD) fields allow you to enter information about your hard disk(s). Your configuration is preset. Do not alter these fields unless you are a qualified technician.

The external IDE drive fields are provided for future options.

The TM5000 Series BIOS uses the total capacity of the hard drive. If a third-party hard drive is purchased, you may need to enable logical block addressing to be able to use all the space on that drive.

Input/Output (I/O) Parameters

The input/output (I/O) parameters define how the computer treats I/O devices. You can use these parameters to enable and define the ports.

Parameter	Definition	Values
9-Pin (Serial) COMM Port	Selects the port number to use for the standard serial port.	COM1 (default) COM2 COM3 COM4 Off
SIR COMM Port (Not available on SE models)	Selects the port number to user for the SIR port.	COM2 Off (default)
COM3/COM4 Port Address	Selects the port address to use for the COM3/COM4 serial ports.	338h/238h 3E8h/2E8h (default) 2E8h/2E0h 220h/228h
Parallel Port	Selects the port for the parallel printer.	LPT1 LPT2 (default) LPT3 Disabled
Enable EPP*	Selects the standard or extended parallel port.	No (default) Yes
EPP Mode*	Selects the Extended port mode.	❑ SPP (default) - Standard AT Compatible ❑ EPP and SPP - Enhanced and standard ❑ ECP - Extended capabilities ❑ ECP and EPP - Extended and enhanced
Sound Port (Not available on SE models)	Enables or disables the sound feature on your computer.	On (default) Off Auto
Internal Mic	Enables or disables the computer's internal microphone.	On (default) Off

* Located in the I/O Ports folder in TI Setup. Selections are made from Extended Mode field.

Keyboard Parameters

The Keyboard group displays parameters you can select so that upon system startup selected values are activated. Values can be set as follows:

Parameter	Definition	Values
Caps Lock	Sets the initial state of the Caps Lock Key. If on, all characters will be typed uppercase.	Off (default) On
NumLock	Sets the initial state of the Num Lock key. If you want the numeric keypad to generate numbers, set this to on.	Off On (default)
Scroll Lock	Sets the initial state of the Scroll Lock key. When on, the arrow keys scroll the screen regardless of the current cursor location.	Off (default) On

Screen Parameters

Screen paramters can be selected so that upon system startup selected values are activated. Values can be set as follows:

Parameter	Definition	Values
Expanded Mode	When using standard text mode of an 80 x 25 character screen, the LCD display does not use all of the available pixels on the panel. Select On to position the screen in the middle of the LCD display. Select Off to position the screen in the center of the panel.	Off On (default)
Display	Selects the boot time display type. CRT - displays on the external CRT only if connected. If not, the Display field defaults to LCD. Selecting both displays LCD and CRT simultaneously.	LCD CRT (default) Both
LCD Palette	Enhances the visibility of the video panel. For TFT (active matrix) panels, select one of the TFT palettes. For DSTN (dualscan passive matrix) panels, select one of the DSTN palettes.	Disabled (default) TFT Palette 1 TFT Palette 2 TFT Palette 3 TFT Palette 4 DSTN Palette 1 DSTN Palette 2 DSTN Palette 3 DSTN Palette 4

Cache Parameters

Data stored in cache memory runs faster than if stored on disk. For this parameter, there are two settings: internal and external. Internal cache means that data is stored in cache memory on the chip while external cache means that data is stored in RAM.

Parameter	Definition	Values
Internal (L1)	Enables or disables internal cache.	Enabled (default) Disabled
External (L2)	When Auto is selected, the external cache is enabled when the notebook is booted on AC power only.	Auto (default) Enabled Disabled

Password Parameters

The Password parameter allows you to enable or disable a system password. To enable this field, complete the following steps:

1. Enter the Setup menu by pressing **Ctrl-Alt-Esc**.

2. Press **Tab** until you reach the Password field.

3. Press the left or right arrow key.

   A Modify Password box appears and prompts you to type in a new password.

4. Enter a new password of up to seven characters and press **Enter**.

   You are asked to verify the password by retyping it.

5. Type the new password and press **Enter**.

6. Press any key to clear the Modify Password Box.

   The password is set to Enabled and you will be prompted for the password every time you reboot the system. You have three tries to enter the correct password on powerup before the system halts and you have to shut down.

7. To save your changes, press **Esc-F4**.

Caution: If you forget the system password, you will not be able to use your computer. To regain access, you must send your computer to the Texas Instruments manufacturing facility in Temple, Texas. This service is not covered by warranty.

Note: The password is not case sensitive. You can enter the password in either upper or lower case characters.

System Configuration Parameters

This set of parameters allows you to customize settings for Quick Boot, alarms, and multimedia options. The following table provides more information on these settings:

Parameter	Definition	Values
Quick Boot	When set to "On", allows the system to bypass certain power-on tests during the boot process.	On (default) Off
Battery Alarm	Enables or disables the low battery alarm when the unit is on battery power.	On (default) Off
Cover Alarm (Not available on SE models)	Enables or disables an alarm that alerts you when the system has not been turned off before the cover was closed. Only functions when the unit is on battery power.	On (default) Off

Power Savings

The power-savings parameters define a variety of ways the computer can modify its activity to affect the drain on the battery. The following Power Savings parameters are available:

Parameter	Definition	Values
Power Savings	Determines when (if ever) the computer implements the defined power savings. Auto enables power savings only if the unit is using the internal battery.	Auto (default) On Off
Runtime Power Level	Sets the Run Time Power Savings level when operating on battery power. The higher the level, the more the system conserves power.	Disabled Level 1 Level 2 (default) Level 3 Level 4 Level 5 Level 6 Level 7
Auto System Timeout	If the designated amount of time elapses, the system performs Auto System Action.	Always On 1 Minute 2 Minutes 3 Minutes (default) 5 Minutes 10 Minutes 15 Minutes
Auto System Action	If the Auto System Timeout period elapses, the system performs this action.	Auto Suspend (default) Auto Standby Off
Cover Closed Action (Not available on SE models)	Type of action taken when cover is closed.	Suspend (default) Standby Off

Parameter	Definition	Values
Hard Drive Motor Off	If this period of time elapses with no activity, the hard disk motor turns off.	Always On 1 Minute 2 Minutes 3 Minutes 5 Minutes (default) 10 Minutes 15 Minutes
Suspend Key Action	Selects the action taken when the Suspend key is pressed.	Suspend (default) Standby Off
Default CPU Speed	Chooses CPU speed during boot process. Choosing Auto automatically selects High speed when running on AC power or Low when running on a low battery.	Low (33 MHz) High (77 MHz) Auto (default)
PCI Expansion Bus	Selects the boot time speed for the PCI expansion bus.	Auto (default) Fast Medium Slow
PCMCIA I/O Addresses	Selects the I/O addresses for the PCMCIA slot.	Minimum Maximum Docked PCMCIA/PCI Docked PCI

Activity Monitor

The following table displays parameters that monitor activity on disk drives and communication ports:

Parameter	Definition	Values
Activity Monitor	Detects activity of disks and communications ports.	N/A
Disks	When "Yes" is selected, detects activity of disks when in a power savings mode.	Yes (default) No
Comm	When "Yes" is selected, detects activity of communications ports.	Yes (default) No

2
Installing and Using Applications

This chapter explains:

- ❑ Guidelines for loading IBM AT-compatible application programs
- ❑ How to restore system files
- ❑ How to restore utilities and drivers.

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.

Processing Speed

Some applications cannot execute at the highest 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 Chapter 1 of this guide)
- ❑ **Ctrl-Alt-**↑ (to increase speed) or **Ctrl-Alt-**↓ (to decrease speed)
- ❑ SPEED utility (see instructions in Chapter 4 of this guide)

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

Memory

Your computer comes with a standard 8 MB of memory that includes 640 KB of system memory, plus extended memory. You may purchase optional memory to upgrade your system with up to 24 MB of extra 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* in the online SmartShelf library 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 Files Recovery diskette.

Default CONFIG.SYS File

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* in the online SmartShelf library for more details on constructing this file and its significance.)

Restoring System Files

These instructions allow you to reinstall your operating system, option, and utility software using backup diskettes. These backup diskettes should have been created after you first received your system. To create the diskettes, refer to instructions in your TM5000 User's Guide. The following sections discuss:

- ❑ Hard Disk Preparation
- ❑ DOS
- ❑ Windows for Workgroups
- ❑ Cirrus VGA Drivers/Utilities
- ❑ PCMCIA Drivers
- ❑ Jazz 16 Sound Drivers (not required for TM5020SE models)
- ❑ Microsoft Video for Windows drivers
- ❑ Microsoft IntelliPoint Mouse Drivers
- ❑ PC-Doctor
- ❑ Win32S
- ❑ TranXit (not required for TM5020SE models)
- ❑ Acrobat Reader
- ❑ BatteryPro Utilities
- ❑ TM5000 Series Manuals
- ❑ System Files Recovery Diskette

Restoring System Files

Important: To rebuild your system, complete all steps in sequence as outlined in these instructions.

Ensure that you have the following diskettes before beginning:

Diskettes Required for System Rebuild	
Name	**Number of Diskettes**
TM5000 System Files Recovery Diskette	1
MS-DOS 6.2x Installation	4
Windows for Workgroups Installation	8 (9 for international)
Cirrus VGA Drivers/Utilities	4
Phoenix PCMPLUS Installation	1
Media Vision Jazz16 Sound Driver/Utilities (not applicable for TM5020SE models)	1
Microsoft Video for Windows Runtime v1.1 Installation	1
Microsoft IntelliPoint Mouse Drivers	1
PC-Doctor Diagnostics	1
Microsoft WIN32S Diskettes	2
TranXit (not applicable for TM5020SE models)	2
Acrobat Reader	1
BatteryPro and Productivity Software	1
TM5000 Manuals	5

When Should You Rebuild?

You should rebuild your system from the system backup diskettes when:

- ❑ you replace a hard drive and want to restore primary system files to the new drive.
- ❑ a fatal system error occurs and you are unable to access system files.

Note: These rebuild procedures overwrite what is currently on your disk and create a new partition. Ensure that you always have a current backup of your data.

Hard Disk Preparation

To load initialization files, complete the following steps:

1. Insert the TravelMate 5000 System Files Recovery Diskette into drive A: and boot the system.

   A Recovery menu appears.

2. Select *Delete Part* and press **Enter**.

   You are prompted to choose an FDISK option.

3. Select Option 3 to delete partition or Logical DOS Drive.

   You are prompted to choose the DOS partition or logical DOS drive to delete.

4. Select Option 1 to delete primary DOS partition.

5. Select Option 1 to confirm deletion of the primary DOS partition.

6. Enter the Volume Label from information on the screen.

   You are asked if you are sure you want to delete the partition.

7. Select **YES**.

8. Press **Esc** to continue.

9. Select Option 3 to Delete Partition or Logical DOS Drive.

10. Select Option 4 to Delete Non-DOS Partition.

11. Select Option 1 to confirm deletion of the Non-DOS Partition.

    You are asked if you wish to continue.

12. Select **Y** to continue.

13. Press **Esc** to continue.

14. Do not insert the MS-DOS System1 diskette. Instead, ensure that the System Files Recovery diskette is still in drive A and press **Esc** to reboot.

15. Select *Create Part.* to create a new partition.

16. Press any key.

    Two partitions are created. One is reserved for future use. You are asked to insert MS-DOS System 1 diskette.

17. Do not insert the MS-DOS System1 diskette. Instead, ensure that the System Files Recovery Diskette is still installed and press **Enter**.

18. At the next prompt, press **Enter**.

DOS Installation

These procedures are performed directly after the last step of the previous section. To load DOS, complete the following steps:

1. Insert DOS Installation Diskette #1 into the A: drive and press **Ctrl-Alt-Del**.

   The DOS Installation program loads and the Welcome screen appears.

2. To continue Setup, press **Enter**.

   You are prompted to format the drive.

3. Press **Enter**.

   Your hard drive is formatted. A list of system settings appears.

4. Follow instructions for editing the system settings. Press **Enter** when settings are correct.

   You are prompted for the directory into which DOS files will be copied.

5. Keep the default directory that appears on the screen or change it if you want and press **Enter**.

   DOS files are copied into the directory. Follow the prompts as you are asked to insert each DOS diskette. When all files have been copied, you are prompted to remove all floppy disks from the drives.

6. Press **Enter**.

   You are prompted to restart your computer.

7. Press **Enter**.

Your computer reboots. Installation is complete.

Note: A supplemental DOS diskette is provided as a part of the system backup. This contains files from old DOS versions that you may find useful. To install these files, insert the supplemental DOS diskette into the floppy drive. From the A:\ prompt, type: **Setup C:\DOS**. Follow instructions on the screen.

Windows for Workgroups Installation

To install Windows for Workgroups, complete the following steps:

1. Place Windows for Workgroups Installation diskette #1 into the A: drive.

2. From DOS, type one of the following:

SETUP - English, German and Italian versions
INSTALL - French and Swedish versions
INSTALAR - Spanish versions

at the A: prompt.

A Welcome menu appears.

3. Press **Enter** to begin setup procedures.

You are prompted to select Express or Custom Setup.

4. Select *Express Setup* by pressing **Enter.**

Your hardware and software are verified and Setup copies files into the C:\WINDOWS directory. Follow instructions on the screen.

5. When installation is complete, remove the last diskette from the A: drive and select *Return to MS-DOS* in the Exit Windows Setup dialog box.

The C:\WINDOWS prompt appears.

6. Type **Setup** and press **Enter**.

The Windows for Workgroups Setup System Information screen appears.

7. Select **Computer** and press **Enter**.

A list of computer types appears.

8. Use the down arrow key until the option *MS-DOS System with APM* is selected and press **Enter**.

9. The field *to accept this list, press ENTER* should be highlighted. Press **Enter**.

Information about the current driver is given.

10. Press **Esc** to replace the current driver.

You are prompted for Windows for Workgroups diskette #2.

11. Insert the windows for Workgroups diskette #2 into the A; drive and press **Enter**.

The required APM files are copied and you are returned to the DOS prompt.

12. Reboot the computer by pressing **Ctrl-Alt-Del**.

The system restarts and you are returned to the DOS prompt. Installation is complete.

Cirrus VGA Drivers/Utilities Installation

To install VGA Utilities from Windows, complete the following steps:

1. Insert VGA Utilities diskette labelled "Cirrus GD 754X Windows 3.1x Drivers v1.1" into drive A.

2. From the Program Manager, select **File, Run...**

3. Type **A:\Install** and press **Enter**.

   An information screen appears.

4. Select **Continue**.

   The SETUP program begins. You are prompted for the destination directory for the VGA drivers.

5. Press **Enter** to select the default path.

6. Verify the destination path and select **Install** to begin installation.

   Files are copied to the C:\VGAUTILS directory. When installation is complete, you are given the Windows group in which the VGA utility icons are located.

7. Press **Ok** to Continue.

8. Press **Ok** to Continue.

   The WinMode menu appears on the screen. Enter information relative to the external VGA monitor you are using. Ensure that 640 x 480 resolution and 256 colors are selected. If you made monitor changes, complete steps 9 through 10. If not, continue to step 10.

9. If you are not using an external monitor or if your changes have been made, select **Ok.**

You are told to restart Windows for changes to take effect.

10. Select **Yes** to restart Windows.

Modifications are made to your AUTOEXEC.BAT file that reflect monitor configuration changes. Windows is restarted and installation is complete.

PCMCIA Installation

To install PCMCIA drivers from the DOS prompt, complete the following steps:

Note: These drivers must be installed outside of the Windows environment.

1. Turn power off then on to your computer.

2. Insert the diskette labeled "Phoenix v3.xx".

3. At the DOS prompt, type **A:\Install** and press **Enter**.

An information screen appears.

4. Press any key to continue.

A screen appears describing your current system controller board.

5. Press any key to continue.

You are asked to designate C:\PCM320 as the destination directory.

6. Press **Enter**.

PCMCIA drivers are copied into the C:\PCM320 directory. The system prompts you that all files were copied successfully. You are told that system files will now be updated.

Note: If any Warning screens appear, take down the information and press any key to continue.

7. Press any key to continue.

An Installation Mode screen appears.

8. For basic installation, select Quick Mode and press **Enter**.

A Socket Information screen appears.

9. Enter the number of total PCMCIA sockets available with your notebook. If your computer is attached to an expansion station, include the number of sockets attached to the expansion station as well. Press **Enter**.

A Microsoft Windows screen appears.

10. If you plan to use PCMCIA cards under Windows, select **Yes** and press **Enter**.

You are prompted for the pathname where the configuration files will be copied.

11. Press **Enter** to select the default of C:\WINDOWS.

You are prompted to select optional Flash File Support.

12. Select **No** and press **Enter**.

You are asked if you want to use PCMCIA Modem/Fax cards in your system.

13. Select **Yes**.

You are prompted to select the COM port for your modem/fax card.

14. Select COM4 for Communication Port and press **Enter**.

You are asked if ATA type cards are going to be used.

15. Select **No**.

The system automatically configures to the network card installed.

16. Press **Enter**.

Note: If you receive a warning that DOSEMM386 was not detected, press any key to continue. If you receive a warning about battery operations or suspend operations, press any key to continue.

You are prompted that Setup is complete. You can exit without saving changes by selecting No.

17. To save PCMCIA configurations you just entered, select **Yes** and press **Enter**.

Your are returned to the DOS prompt.

Sound Installation

Note: Not available on TM5020SE models.

To install Media Vision Jazz16 sound drivers from MS-DOS, complete the following steps:

1. Insert the Media Vision Jazz16 Installation diskette into drive A:.

2. Type

   A:

   at the DOS prompt and press **Enter**.

   The system prompt is now A:\.

3. Type **INSTALL** and press **Enter** to begin installation.

4. Select *Install Software and Setup Hardware* and press **Enter**.

   You are prompted for the path into which JAZZ drivers will be copied.

5. Press **Enter** to keep the default path of C:\JAZZ.

   You are asked if Windows 3.1 is loaded on your system.

6. Type **Y**.

   You are prompted for the pathname of the Windows directory.

7. To select the default path of C:\WINDOWS, press **Enter**.

   The files are copied to the C:\JAZZ and Windows directories.

8. After the files are copied, select the following values:

- ❑ Jazz I/O Port = 220
- ❑ Jazz IRQ = 5
- ❑ 8-bit DMA = 1
- ❑ 16-bit DMA = 7
- ❑ MPU-401 Enabled = Yes
- ❑ MPU-401 I/O Port = 330
- ❑ MPU-401 IRQ = 2
- ❑ Modify C:\DOS System Files = Yes
- ❑ Modify Win System Files = Yes

9. Press **Enter** to accept the configuration.

10. When installation is complete, press **F3** to end the installation process.

You are returned to the DOS prompt.

11. Remove the Media Vision Jazz 16 diskette and press **Ctrl-Alt-Del** to reboot the system.

MS Video for Windows Installation

To install Video drivers from Windows, complete the following steps:

1. Insert the Video for Windows into drive A:.

2. From the Program Manager, select **File, Run...**

3. Type **A:\Setup** and press **Enter**.

A Welcome screen appears.

4. Select **Continue**.

   Video driver files are copied into the C:\WINDOWS\SYSTEM directory. You are notified that Setup was successful and are asked to restart Windows so that new settings can take effect.

5. Select **Restart NoW**.

   Windows is restarted.

Installing the MS IntelliPoint Mouse Drivers

To install the MS IntelliPoint Mouse Drivers from Windows, complete the following steps:

1. Insert the MS IntelliPoint Mouse Driver diskette into drive A:.

2. From the Program Manager, select **File, Run...**

3. Type one of the following and press **Enter**.

   SETUP - English, German and Italian versions
   INSTALL - French and Swedish versions
   INSTALAR - Spanish versions

   An information screen appears.

4. Select **Continue**.

   You are asked to enter your name or organization to identify your data files.

5. Enter your name and your organization's name and select **Continue.**

   You are asked to verify the name.

6. Verify the information and select **Ok**.

You are prompted to select Express or Custom Select Express installation. You are also prompted to select the default directory to which mouse driver files will be copied.

7. Select CONTINUE to keep the default path of C:\MSINPUT.

The Microsoft IntelliPoint Mouse Setup menu appears. Files are copied to the designated directory. You are prompted that Setup is complete.

8. Select **Exit** to return to Windows.

9. Restart Windows by selecting **Exit** from the Program Manager and typing **Win** at the DOS prompt.

Your mouse configuration is saved and a Mouse Orientation screen appears.

10. Select **Close** to continue.

The Mouse Manager menu appears.

11. Select **Ok** to accept default settings.

Installation of mouse drivers is complete.

PC-Doctor Installation

To install PC-Doctor from MS-DOS, complete the following steps:

1. Insert the PC-Doctor diskette into drive A:.

2. Type

A:

at the DOS prompt and press **Enter**.

The system prompt is now A:\.

3. Type **Install** and press **Enter** to begin installation.

You are asked for the source and destination path of the PC-Doctor files.

4. To accept the defaults, select Install PC-Doctor and press **Enter**.

Files are copied to the C:\PCDR directory. You are prompted that installation is complete.

5. Press the Space Bar to continue.

You are returned to the DOS prompt.

Win 32S Installation

To install the Win 32S Drivers from Windows, complete the following steps:

1. Insert the Win 32S diskette #1 into drive A:.

2. From the Program Manager, select **File, Run...**

3. Type one of the following and press **Enter**.

SETUP - English, German and Italian versions
INSTALL - French and Swedish versions
INSTALAR - Spanish versions

A Welcome screen appears.

4. Select **Continue** to continue the installation.

The path for your Microsoft Windows System is determined.

5. Select **Continue** to continue the installation.

   Files are copied to the Microsoft Windows System directory. Insert the Win32S diskette #2 when prompted. You are prompted when installation is complete.

6. Select **Ok**.

   You are asked if you want to install a Win32 game.

7. Select **Continue** if you want to install the game and follow directions on your screen or select **Exit** to exit the installation program.

   When finished, you are told that all Win32 components have been installed successfully.

8. Select **Continue** to exit to Windows.

TranXit Installation

To install TranXit from Windows, complete the following steps:

Note: Not available on TM5020SE models.

1. Insert the TranXit diskette into drive A:.

2. From the Program Manager, select **File, Run...**

3. Type **A:\Install** and press **Enter**.

   A Welcome screen appears.

4. Select **Continue**.

   The default path for copying the TranXit programs is displayed.

5. Select **Ok** to install all program files.

   Files are copied into the default directory. When finished, you are asked to enter a computer name for identification.

6. Enter a name up to 16 characters in length and select **Continue**.

   You are asked to set up the connection.

7. Select **Infrared** and **Setup Connection**.

8. Select the **Com2** port.

9. Select **Travelmate 5000** as the model.

10. Select **Variable** for the mode.

11. Select **Ok** at this screen and again at the next screen.

    Installation is complete. You are asked to restart Windows to have changes made to the SYSTEM.INI file take effect.

12. Select **Restart Windows**.

Acrobat Installation

To install Acrobat from Windows, complete the following steps:

1. Insert the AcroRead diskette into drive A:.

2. From the Program Manager, select **File, Run...**

3. Type **A:\ACROREAD** and press **Enter**.

   You are prompted that the Acrobat Installer is preparing to install the Acrobat Reader. When complete, a license agreement appears.

4. Select **Accept**.

   You are asked to identify the target directory for Acrobat Reader files.

5. Select **Enter** to keep the default directory of C:\ACROREAD.

   You are prompted to complete the product registration card.

6. Select **Ok**.

   You are prompted for your name and organization.

7. Enter your name and organization. Select **Ok**.

   Acrobat files are copied into the designated directory. When finished, you are prompted that the Acrobat Installer will restart your Windows session to complete the installation.

8. Select **Ok**.

   Windows is restarted.

TM5000 Series Manuals

To install the TravelMate 5000 Series manuals from MS-DOS, complete the following steps:

1. Insert TravelMate 5000 manuals diskette #1 into drive A:.

2. Type

A:

at the DOS prompt and press **Enter**.

The system prompt is now A:\.

3. Type **Install** and press **Enter** to begin installation.

You are prompted to insert the last disk of the backup set.

4. Insert the last diskette of the TravelMate 5000 manuals diskettes and press **Enter**.

You are prompted to insert disk #1 of the backup diskettes.

5. Insert the TravelMate 5000 Manuals diskette #1 of the backup diskettes.

TravelMate 5000 manuals are copied to the C:\ACROREAD directory. Insert each of the following backup diskettes when prompted to do so. When installation is complete, you are prompted to remove the last diskette from drive A:.

6. Remove the last diskette.

Installation is complete.

Battery Pro Utilities Installation

To install Battery Pro Utilities from MS-DOS, complete the following steps:

1. Insert Battery Pro Utilities diskette into drive A:.

2. Type

A:

at the DOS prompt and press **Enter**.

The system prompt is now A:\.

3. Type **Install** and press **Enter** to begin installation.

A menu appears that requires you to select the type of utilities you want to install.

4. Select **Install All Utilities** and press **Enter**.

You are prompted for the pathname of the directory to which utility files are copied.

5. To select the default directory of C:\UTILS, press **Enter**.

You are asked for the pathname of your Windows directory.

6. Update the directory path or select the default if your Windows directory is in C:\WINDOWS. Press **Enter**.

Files are inflated and copied into the C:\UTILS directory. You are notified that installation is complete.

7. Press any key to continue.

You are returned to the DOS prompt.

Restoring System Files

System Files Recovery Diskette

To ensure that your system files are completely restored, complete the following steps:

1. Insert the System Files Recovery diskette into drive A and reboot the system.

   A Recovery menu appears.

2. Select **Restore Init** and press any key.

   The C:\INIT directory and files are restored.

3. Press any key.

4. Select **Restore Cmos** and press any key.

   CMOS factory settings are restored.

5. Press **Esc** to exit and remove the System Files Recovery diskette.

6. Reboot the system.

7. Press **F5** to bypass loading the system files.

8. At the C:\ prompt, type:

   XCOPY C:\INIT C:\ /S /V /Y

   *The original Windows *.ini, *.grp files, AUTOEXEC.BAT file, and CONFIG.SYS files are restored.*

9. Reboot the system and select the appropriate menu item.

   The system is restored and ready to use.

Note: There are four COM ports. Using 2 and 4 in conjunction or 1 and 3 in conjunction could cause conflicts. Ensure that whatever port you select, no other option is using a conflicting COM port. To check COM ports, select TISetup from the Windows Travelmate Notebook Center Group or SET_UP from DOS.

Note: If you backed up the online data files using the System Maintenance and Backup option, you should restore your files at this point.

Setting a Password

You may set a password from the Setup Menu. To set a password, complete the following steps:

1. Enter the Setup menu by pressing **Ctrl-Alt-Esc**.

2. From the Setup Menu, press **Tab** until you reach the Password field.

3. Press the left or right arrow key.

   A Modify Password box appears and prompts you to type in a new password.

4. Enter a new password of up to seven characters and press **Enter**.

   You are asked to verify the password by retyping it.

5. Retype the password and press **Enter**.

6. Press any key to clear the Modify Password Box.

   The password is set to Enabled and you will be prompted for the password every time you reboot the system. You have three tries to enter the correct password on powerup before the system halts and you have to shut down.

7. To save your changes, press **Esc-F4**.

Caution: If you forget the system password, you will not be able to use your computer. To regain access, you must send your computer to the Texas Instruments manufacturing facility in Temple, Texas; this service is not covered by warranty.

Note: The password is not case sensitive. You can enter the password in either upper or lower case characters.

3
Custom Windows Utilities

This chapter tells you about

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

Contents

Overview of Windows Utilities

The TravelMate 5000 Series custom Windows utilities are accessible from Windows by double-clicking individual icons. Most of these utilities are found in the TravelMate Notebook Center 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
- ❑ System

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

Battery Status

Double-click on the Battery Status icon in the TravelMate Notebook Center group to display the battery level icon at the bottom of your screen. To view the Battery Level Settings, single click on the icon to display the menu and select **Settings...** .

This window displays the approximate charge left in your computer based on user-specified settings. At this point, you may modify the following parameters:

- ❑ The position of your Battery Level window 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

BatteryPro APM Help

Double-click on this icon in the TravelMate Notebook Center 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 Tips

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

SmartShelf

Use the Phoenix SmartShelf on-line documentation for information on MS-DOS ® 6.2 and Windows™ for

Workgroups 3.11. The SmartShelf icon is located in the Windows Document group.

Phoenix Card Manager

This icon is located in the Windows Document group and provides information on installing and using PC cards.

TM5000 Series Manuals

Your TM5000 Series computer comes with two product manuals: the *TM5000 Series User's Guide* and *TM5000 Series User's Reference Guide*. These guides are located in the Documents group. Acrobat is the product used in the creation of TI's electronic documentation. Acrobat comes pre-installed on your TM5000 Series computer. For further information on Acrobat, you can select **Run...** from the File menu of Program Manager and type:

C:\ACROREAD\ACROREAD.EXE

in the command line. Select **Ok** to start the application. Select **Help** to read online help for Acrobat.

To read online TM5000 Series documentation, double click on the desired icon in the Document group for the document you wish to read. It appears on the screen.

You may print a hardcopy of the online documentation by selecting **Print...** from the File Menu of the open document. If you would like to order a pre-printed manual, call 1-800-TI-TEXAS (in the U.S.) or the sales office nearest you (refer to the TravelMate Passport included in your documentation set).

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

LFM (Laptop File Manager)

Double-click the LFM icon in the Windows TravelMate Notebook Center group 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 in Chapter 5 of 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 Utility

The Power Utility is located in the Windows Control Panel. This utility determines how battery resources are managed by Windows. The options that appear in the dialog box depend on the power-saving capabilities of your computer. If your computer cannot detect the battery level, the Battery Level option does not appear. If your computer does not support power saving options in addition to those provided by Windows, the Options button does not appear.

Power Management

There are three selections in for the Power Management field. These are:

- Advanced - uses the power saving capabilities provided by Windows.
- Standard - uses only the power saving capabilities built into your computer
- Off - turns off all power saving capabilities.

Note: if the power saving features of your computer do not appear to be working, it may be because you are running applications that do not recognize Windows power management. In this case, select the Standard setting.

PCMWin

Provides status on the PCMCIA cards installed in the notebook. PCMWin also allows you to edit the configurations of defined cards and uses the most appropriate configuration for your system. For further information on PCMCIA, refer to the *Phoenix Card Manger User's Guide* in the Windows Document group and online help provided with the PCMWin utility.

Sound Mapper

Note: Not available on TM5020SE models.

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.

DiskMaker

This utility creates installation diskettes for files stored on your hard drive. This allows you to create a full or partial set of installation diskettes to re-install your notebook computer or any of the options.

The DiskMaker Icon is located in the Windows TravelMate Notebook Center group. Double click on the icon to display folders for system and utility software. Clicking on the tab at the top of a folder displays that folder. When a folder is displayed, you are shown how many diskettes it will take to back of that portion of the notebook software.

Creating Installation Diskettes

To create an installation diskette, complete the following steps:

1. Select the tab of the application you wish to back up.

2. If the application requires more than one diskette, select the disk icon for the disk number that you want to back up.

3. Insert a 3.5-inch high density diskette into the floppy drive.

4. Select **Ok**.

   The diskette will be formatted and the files are backed up.

Deleting Images

Selecting this button detetes most of the DiskMaker utility from your system. Once this selection is made, a warning box appears that you are about to remove basic DiskMaker files from the hard drive. If you select Yes to continue, files

are deleted and the only remaining function of the DiskMaker program is to print labels for the installation diskettes you have already created.

PC-Doctor

PC-Doctor is a remote diagnostics program that provides PC diagnostics, system information, and setup. For further information on PC-Doctor, refer to Appendix D of this manual and to the online Help facility.

Win32 Utility

This utility comes pre-installed on your hard drive and adds 32-bit capabilities to your Windows environment. The only time you will see this utility is when you are you are requested to backup Win32 utility files from DiskMaker or the backup procedures discussed in Chapter 1.

WinMode Utility

The WinMode Utility is located in the Windows TravelMate Notebook Center group. This utility allows you to configure your notebook for maximum resolution on your monitor. For more detailed information on this utility, refer to online help.

WinMode Menu

The following table depicts fields to be defined in the WinMode menu:

Field	Description
Monitor Brand	Select your monitor brand from the list provided.
Monitor Model	Select your monitor model from the list provided.
Monitor Refresh Rates	Changing Refresh Rates gives you the option of setting a higher quality display. The higher the refresh rate, the better the quality (and the slower performance) will be. Consult the manual that came with your monitor to determine the proper settings for these fields.
640 x 480	Sets the refresh rates for monitors with 640 x 480 resolution (60 Hz, 72 Hz, or 75 Hz).
800 x 600	Sets the refresh rates for monitors with 800 x 600 resolution (56 Hz, 60 Hz, 72 Hz, 75 Hz, or None).
1024 x 768	Sets the refresh rates for monitors with 1024 x 768 resolution (87 Hz Int., 60 Hz, 70 Hz, 72 Hz, 75 Hz, None).
1280 x 1024 (Not available on SE models)	Sets the refresh rates for monitors with 1280 x 1024 resolution.
Colors	Lets you choose the number of colors that are available to Windows after the installation is complete. Choices are 256, 65536, and 16 million colors.
Resolution	Lets you choose the resolution that WinMode uses to run Windows after the installation is complete. Choices are 640 x 480, 800 x 600, 1024 x 768, or 1280 x 1024.
Font Cache Size	Lets you set the amount of system memory available for font caching. You can choose between 0 KB and 1000 KB.
Operating System	Lets you set the operating system under which Windows will run (DOS-Windows or OS/2 Windows).
Font Size	Lets you select the size of fonts displayed in Windows dialog boxes and menus. You can choose between large and small fonts.

Options Menu

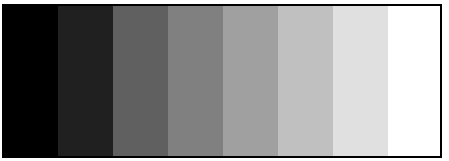
When the Options button is selected, the Options Menu appears. From this menu, you can select the display type and mouse options you desire. More detailed information is provided in online help. The following table depicts fields to be defined in the Options menu:

Button	Description
Current Display	Displays the currently active display. From the Current Display button, you may set Windows to run with any of the following: ☐ CRT - sends output to an external VGA monitor ☐ Panel - sends output to the panel on the notebook ☐ CRT/Panel - sends output to both panel and CRT **NOTE:** If there is no CRT attached, the CRT and CRT/Panel selections will not be available choices.
Options	Lets you change mouse options. From this selection, you may set the mouse as follows: ☐ Mouse Trails - enables mouse trails exactly as if selected from the Mouse section of the Control Panel. ☐ Change Res. - sets Windows to run at the exact resolution of the flat internal LCD panel when in Panel or CRT/Panel modes. When in CRT only mode, Windows runs at the resolution selected in the main screen of WinMode. ☐ Panning/Scrolling - runs Windows at the resolution requested in the WinMode menu on all displays.

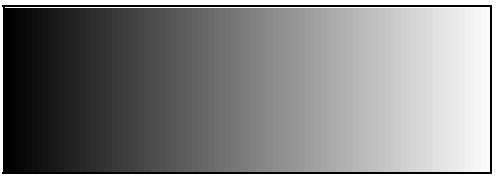
WinDith Utility

Your LCD panel generates 4,096 colors, however some software requires as many as 65,000 colors. When this occurs, you may note that some shades generated by your software are replaced with black areas that produce uneven shading (as in the first figure below). When you turn the WinDith utility on, the shading is smoothed out (as in the second figure below).

The system defaults with the WinDith utility off. To turn the utility on, double-click on the WinDith icon in the TravelMate Notebook Center group. Select **On** and **Ok**.



Shading with WinDith off



Shading with WinDith on

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 in Windows. 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. Refer to online help provided with this utility for further information.

Basic Operations

The following sections cover adding/changing, deleting, copying, and other application-specific functions relating to Drop N' Go. To perform basic operations from the Main menu, you must first complete the following steps:

1. If the Drop N' Go icon does not appear at the bottom of your screen, double click on the Drop N' Go icon in the TravelMate Notebook Center group.

2. When the icon appears, single-click on it to display the Main menu. From this menu, you can:

   - ☐ Perform Setup functions
   - ☐ Move the icon to another position on your desktop
   - ☐ Close all applications that have been set up using the Setup menu
   - ☐ Switch to another application
   - ☐ Save the positions of icons for all applications listed in the setup procedures
   - ☐ Find out more about Drop N' Go
   - ☐ Get help on Drop N' Go functions

Adding/Changing Applications

To add or change applications listed in Drop N' Go, complete the following steps:

1. Click on the Drop N' Go icon on your desktop.

   The Drop N' Go Main menu appears.

2. Click on Setup.

   The Drop N' Go Setup menu appears.

3. If you are adding an application, click on the Add button. If you are changing an application, click on the application you want to change and click on the Change button.

The Icon Application Setup dialog box appears.

4. Enter required information on the application you wish to add or change. This is 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 in the Icon Application Setup dialog box. Selections from the list appear quickly and all information is automatically placed.

5. Select **OK**.

Creating a File Manager Menu Item

You can also add or change applications to be viewed as menu items in File manager. To do this, complete the following steps:

1. Click on the Drop N' Go icon on your desktop.

The Drop N' Go Main menu appears.

2. Click on Setup.

The Drop N' Go Setup menu appears.

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

4. 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).

5. If you are adding an application, continue to step 6. If you are changing an application, click on the application you want to change in Icon Applications.

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

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

8. Select **Ok**.

9. Select **Exit**.

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

10. 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 DropNGo menu.

Deleting Applications

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

1. Click on the Drop N' Go icon on your desktop.

   The Drop N' Go Main menu appears.

2. Click on Setup.

   The Drop N' Go Setup menu appears.

3. 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 File Manager Menu you created in *Creating a File Manager Menu Item* earlier in this chapter. To enable or disable the menu, select the Enable/Disable Menu button and restart File Manager.

Moving Applications

You can change the location of the File Manager menu item by completing the following steps:

1. Click on the Drop N' Go icon on your desktop.

   The Drop N' Go Main menu appears.

2. Click on Setup.

   The Drop N' Go Setup menu appears.

3. Select **Enable Menu**.

The extended menu used to set up File Manager menu items appears.

4. Select the menu application you want to move from the Menu Applications menu.

5. Select **Move**.

A message appears telling you select the new menu position.

6. You can select the new position in one of two ways:

- ☐ Double click on the Menu Applications item above which the selected item will appear.
- ☐ Use the up and down arrow keys to move to the application item above which the selected item will appear. Press **Enter**.

7. Select **Exit**.

You are prompted to restart File Manager for your changes to take effect.

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.

Super Shutdown Utility

Super Shutdown is an automatic shutdown configuration utility available from the TravelMate Notebook Center 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. 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 at the bottom of your screen so that the application 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.

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.

For further information on Super Shutdown, refer to online help provided with the utility.

This menu allows you to:

- ❑ Exit Windows
- ❑ Move the location of the icon on your screen
- ❑ Close the application
- ❑ Switch to another application in the task list
- ❑ Select Shutdown options
- ❑ Find out more about Super Shutdown
- ❑ Go to online Help

Configure Super Shutdown

When the Options selection is made from the Super Shutdown application menu, the Configure Super Shutdown menu appears. From this menu, you can:

- ❑ specify shutdown options
- ❑ specify the icon properties for the Super Shutdown icon
- ❑ specify applications to save and close automatically upon shutdown using Application Setup

To make changes to this menu, click on the boxes next to the desired options so that an X appears, then select **Ok.**

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.

- ❑ Save changed files when possible.

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.

To make changes to the icon, click on the box next to "Stay on top" so that an X appears, then select **Save Position** and **Ok**.

Application Setup

The Application Setup button allows you to save and close applications that use the Dynamic Data Exchange (DDE) to

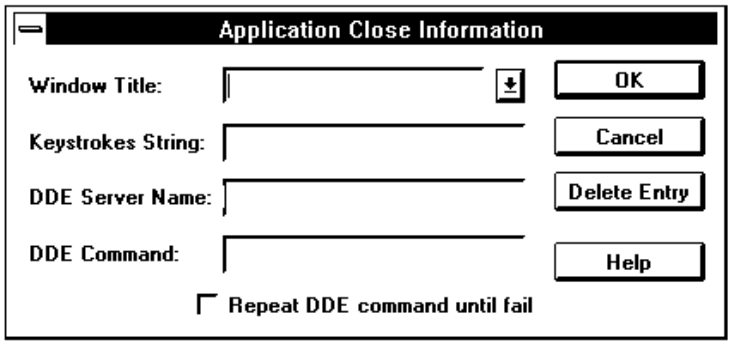
communicate with Windows. This can be done in either of two ways:

- Dynamic Data Exchange (DDE) can be used to communicate with Windows applications that support it. Such applications are called DDE Servers. An example is Microsoft Excel. This requires information from the application vendor about DDE commands that support it.
- A sequence of keystrokes can be sent that simulate keystrokes which normally shut down an application. (For instance, to close an open Word for Windows file, the keystrokes are **Alt-F4**.) This can even be used with MS-DOS applications as long as they can be identified by the window title.

Note: Neither method is foolproof. Use of DDE requires sophisticated knowledge of the application and information that is usually poorly documented, if at all. Keystroke sequences are easier to set up, but can fail due to the application being in an unexpected state. For instance, both methods may have difficulty handling an application with a new document that has not yet been saved to any file.

To make changes to this menu, enter the required information in the fields provided and select **Ok**. To remove an entry from the list of applications first select it from the list, then select **Delete Entry**.

When selected, the Application Close 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 Close Information

Selection	Description
Window Title	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 Word for Windows file, the keystrokes are **Alt-F4**.
DDE Server Name	The name that the application responds to for DDE communication (such as Word for Windows).
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.
Repeat DDE command until fail	If selected, the DDE command specified in the Keystrokes String will be sent repeatedly until an error message is received. For example, if an application has multiple files open, the command is sent until each file is closed. When no more open files exist, the error message is sent.

Note: 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.

4
Power Saving Utilities

This chapter tells you about

- ❑ How to get the most work from a battery charge
- ❑ SETPOWER Utility, a utility that lets you choose from various power saving levels to optimize battery charge
- ❑ 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

Battery LEDs

If two battery packs are installed in the computer, they deplete in parallel. When the battery charge gets low, the **Low Battery** indicator above the keyboard turns red. When the batteries are extremely low, the unit automatically goes into sleep mode for about five minutes. During this time, you can replace the batteries one at a time. To do this, press **Suspend.** After inserting the battery, press any key to resume at the point where the sleep mode was initiated.

There is also a row of four LEDs on the front of each battery pack. These LEDs indicate the following battery states:

- ❑ The percentage of power left in each battery. If all four LEDs light, the battery is at least 76% charged. After reaching this point, the battery LEDs will then turn off. If the battery is removed, the LEDs remain lit for several seconds before turning off (to save the battery charge).

How Many LEDs Lit?	What Color?	Percent Charged?
1	Red	0 to 10%
1	Green	11 to 25%
2	Green	26 to 50%
3	Green	51 to 75%
4	Green	76 to 100%

Note: Ensure that you have pressed the Battery Status button to get the current battery charge reading.

If you wish to check the charge of any Lithium-ION battery after the LEDs have turned off, press the battery status button to the right of the LEDs on the battery pack and they will light once again.

- Low battery state. As the battery discharges, LEDs will turn off one at a time from right to left until the battery is almost depleted. At that time, the last green LED will turn off and a red LED comes on. At the point of near depletion the red LED will begin to flash. As you recharge batteries, the red LED no longer flashes, and will eventually turn green as the charge increases.

Battery Recovery Indicators

There are certain conditions that produce an unrecoverable battery indication (the red light on the front of the battery flashes). The most common causes for unrecoverable battery conditions are:

- the charge current exceeds 2.3 amps
- the discharge current exceeds 4 amps
- the battery charge exceeds 12.75 volts
- the battery discharges below 7 volts

If the LED on the front of the battery flashes red, take the battery out, wait 20 seconds and then press the battery status button. If the light continues to flash red, the battery can no longer be used. Replace with a new battery.

Optimizing Battery Operation

Standby and Suspend

You have two methods for putting your computer to "sleep". The first is by pressing **Fn-F4** (Standby). This puts your computer into a light sleep and saves battery power. The Power LED remains green when this mode is active. To come out of Standby, press any key or move the mouse.

The second method for putting your computer to sleep is to press the **Suspend** button located to the right of the power switch. This puts your computer into a deeper sleep and changes the Power LED to orange. Suspend saves more battery power than Standby, but may take the system a few seconds longer to wake up. To come out of Suspend mode, press any key.

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 recharge your Battery, plug in AC power, or replace one of the batteries.

Auto System Action

Depending on the selection made in Setup for Auto System Action, the system will either be put in Suspend or Standby mode if a designated amount of inactivity time has elapsed. The system suspends all tasks and turns off the LCD.

In Standby mode, the LCD is turned off, but the disk drives remain active. In Suspend mode, the drives are spun down and the LCD is turned off.

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]

where:

/L***n*** specifies the power-savings level (0 through 7) described elsewhere in this chapter. If the /L*n* switch is omitted, the default value of 2 is used.

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.

In general, the higher the power savings level, the greater the power savings. Power level 0 disables the power savings feature.

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

Cover-Closed Action

This mode, which you can invoke by closing the cover, saves the most battery power. In this mode (if enabled in Setup), the computer is placed in suspend or standby mode. If Cover Closed Action is enabled, the system 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 and press any key. 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.

Hard Drive Motor Off

The hard disk turns off automatically after no activity for the time set for the Hard Drive Motor Off 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.

Default CPU Speed

You can set the *Default CPU Speed* item in Setup to low or 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. Set *Default CPU Speed* to the lowest value acceptable to your application to save battery power.

PCI Expansion Bus

Selects the boot time speed for the PCI expansion bus. The slower the speed the better the battery operation. Auto automatically goes to the lowest possible speed for operation.

I/O (Input/Output) Ports

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

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 7) you want to use. You can also include this command line in any batch file (AUTOEXEC.BAT) you create to load an application.

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 7, 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 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 in Chapter 1) or by pressing **Ctrl-Alt-**↑ or **Ctrl-Alt-**↓.

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 or Low]
Auto Speed Select is [On or Off]

Using the SPEED Utility

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

SPEED [/L] [/H]

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

Current CPU speed is set to [Low or High]
Auto Speed Select is [On or Off]

5
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

Loading LFM

You can load LFM at the **C:\>** prompt by typing **LFM** and pressing **Enter** or from Windows by selecting the LFM icon in the TravelMate Notebook Center Group.

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.

Laptop File Manager vn.nn Mon Nov 30 12:00 pm

C:

Filename	Ext.	Bytes	Attr	Last Update
DEMOS		<DIR>	....	00/00/90 00:00:59
DOS		<DIR>	....	00/00/90 00:59:59
IMAGES		<DIR>	....	00/00/90 00:59:59
INTL		<DIR>	....	00/00/90 00:59:59
JAZZ		<DIR>	....	00/00/90 00:59:59
MOUSE		<DIR>	....	00/00/90 00:59:59
PCMPLUS		<DIR>	....	00/00/90 00:59:59
SCSI		<DIR>	....	00/00/90 00:59:59
UTILS		<DIR>	....	00/00/90 00:00:59
WINDOWS		<DIR>	....	00/00/90 00:59:59
24X18 AVI		1108890	A...	00/00/90 00:59:59
AUTOEXEC	BAK	693	A...	00/00/90 00:00:59
DBLSPACE	BIN	64246	ARSH	00/00/90 00:59:59
COMMAND	COM	25308	A...	00/00/90 00:00:59
CONFIG	SYS	79	A...	00/00/90 00:00:59
EXTMSDOS	SYS	30128	ARSH	00/00/90 00:00:59
IO	SYS	40662	ARSH	00/00/90 00:59:59
MSDOS	SYS	38138	ARSH	00/00/90 00:59:59

Commands

A - Attr	P - Print
C - Copy	Q - Quit
D - Delete	R - Rename
E - Edit	S - Show
X - Excl	T - Tag
F - Find	Esc - Up
I - Incl	U - Update
M - Run Commands	

F1=Help F2=Cdir F3=ReRd F4=STAT F5=Split F6=Creat F7=Sort F8=DOS F9=Go F10=Setup

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, displaying the 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 four 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:                 )

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 or Windows.

6
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 5000 computer supports several enhanced modes beyond the VGA standard with the ability to displya 132 columns of text.

Note: 1280 x 1024 mode is not available on TM5020SE models.

The following configurations are available on the TM5000:

- ❑ 800 × 600 resolution with up to 65K colors (non-interlaced on CRT)
- ❑ 1024 × 768 resolution with up to 256 colors (non-interlaced on CRT only)
- ❑ 1280 x 1024 with up to 256 colors (interlaced on CRT only)

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 VGA diskettes. You must then install the drivers from the VGA diskette labelled "Cirrus GD 754X Windows 3.1x Drivers v1.1" into your /VGAUTILS directory. This is done by typing:

```
A:\INSTALL
```

The TravelMate 5000 Series 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 will set your computer to color mapping.

Extended 256 Color 1280 × 1024 Graphics Mode

Note: Not available on TM5020SE models.

The computer is capable of supporting a 1280 x 1024 graphics mode with 256 colors on external monitors. This high-resolution mode is interlaced and requires the use of an IBM 8514 or equivalent interlaced monitor.

Extended 256 Color 1024 × 768 Graphics Mode

The computer is capable of supporting a 1024 × 768 graphics mode with 256 colors on external monitors. This high-resolution mode is non-interlaced and requires the use of an IBM 8514 or equivalent non-interlaced monitor.

Extended 65K 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 up to 65,000 colors.

Note: The extended resolution 800 × 600 graphics mode of your computer requires a multifrequency monitor.

The computer's 800 x 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 x 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.

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 43 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 5000 Series Video Standards Supported (Standard IBM VGA CRT-Only Modes)

Display Mode	Number of Colors	Resolution
Text	16/256K	360 x 400
Text	16/256K	720 x 400
Graphics	4/256K	320 x 200
Graphics	2/256K	640 x 200
Text	Monochrome	720 x 400
Graphics	16/256K	320 x 200
Graphics	16/256K	640 x 200
Graphics	Monochrome	640 x 350
Graphics	16/256K	640 x 350
Graphics	2/256K	640 x 480
Graphics	16/256K	640 x 480
Graphics	256/256K	320 x 200

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 5000 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.

To load drivers, refer to your MS-DOS online documentation.

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**. The following commands are available from the VGA.EXE menu:

VGA.EXE Menu Commands	
Command	**Description**
CRT/LCD	Switch to/from external monitor
Expand	Enable/disable expanded mode
Contrast	Select contrast enhancement
80 x 25	Set 25 line, 80 column text mode
80 x 50	Set 50 line, 80 column text mode
132 x 25	Set 25 line, 132 column text mode
132 x 43	Set 43 line, 132 column text mode

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

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
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
CON4	Enables the foreground and background contrast adjustments
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.)

COMMAND	DESCRIPTION
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.
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 3h. VGA 640 × 480 dot 16-color graphics is mode 12H. The following table lists the standard VGA video modes available with your computer.

TravelMate 5000 Series Standard VGA Video Modes

Hex Mode	Display Mode	Number of Colors	Number of Gray Shades	Resolution
0,1	Text	16/256K	16/16	320 x 400
2,3	Text	16/256K	16/16	720 x 400
4,5	Graphics	4/256K	4/64	320 x 200
6	Graphics	2/256K	2/16	640 x 200
7	Text	Monochrome	2/16	720 x 400
D	Graphics	16/256K	16/64	320 x 200
E	Graphics	16/256K	16/16	640 x 200
F	Graphics	Monochrome	2/16	640 x 350
10	Graphics	16/256K	16/16	640 x 350
11	Graphics	2/256K	2/16	640 x 480
12	Graphics	16/256K	16/16	640 x 480
13	Graphics	256/256K	64/256	320 x 200

Your computer display software adds additional modes to the standard VGA modes. These modes each have been assigned mode identification numbers, summarized in the following table.

TravelMate 5000 Series Extended VGA Video Modes

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
11[a]	Graphics	2/256	640 x 480	72
11[a]	Graphics	2/256	640 x 480	75
12[a]	Graphics	16/256	640 x 480	72
12[a]	Graphics	16/256	640 x 480	75
14	Text	16/256	1056 x 400	70
54[b]	Text	16/256K	1056 x 350	70
55	Text	16/256K	1056 x 350	70
58, 6A[c]	Graphics	16/256K	800 x 600	56
58, 6A	Graphics	16/256K	800 x 600	60
58, 6A	Graphics	16/256K	800 x 600	72
58, 6A	Graphics	16/256K	800 x 600	75
5C	Graphics	256/256K	800 x 600	56
5C	Graphics	256/256K	800 x 600	60
5C	Graphics	256/256K	800 x 600	72
5C	Graphics	256/256K	800 x 600	75

TravelMate 5000 Series Extended VGA Video Modes (cont.)

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
5D[d]	Graphics	16/256K	1024 x 768	43
5D	Graphics	16/256K	1024 x 768	60
5D	Graphics	16/256K	1024 x 768	70
5D	Graphics	16/256K	1024 x 768	72
5D	Graphics	16/256K	1024 x 768	75
5E	Graphics	256/256K	640 x 400	70
5F	Graphics	256/256K	640 x 480	60
5F	Graphics	256/256K	640 x 480	72
5F	Graphics	256/256K	640 x 480	75
60[d]	Graphics	256/256K	1024 x 768	43
60	Graphics	256/256K	1024 x 768	60
60	Graphics	256/256K	1024 x 768	70
60	Graphics	256/256K	1024 x 768	72
60	Graphics	256/256K	1024 x 768	75
64	Graphics	64K	640 x 480	60
64	Graphics	64K	640 x 480	72
64	Graphics	64K	640 x 480	75
65	Graphics	64K	800 x 600	56
65	Graphics	64K	800 x 600	60

TravelMate 5000 Series Extended VGA Video Modes (cont.)*

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
66[e]	Graphics	32K	640 x 480	60
66[e]	Graphics	32K	640 x 480	72
66[e]	Graphics	32K	640 x 480	75
67[e]	Graphics	32K	800 x 600	60
6C[d]	Graphics	16/256K	1280 x 1024	43
6D[d]	Graphics	256/256K	1280 x 1024	43[f]
74[d]	Graphics	64K	1024 x 768	43[f]

a IBM standard VGA mode enhanced for higher vertical frequency
b Mode 54 uses 1056 x 344 addressable pixels (text mode), however it uses 1056 x 350 timing
c Application programs should use mode 6A rather than mode 58 to retain compatibility with other VGA BIOS products
d Interlaced mode
e True-color packed-pixel mode
f Not available on TM5020SE models

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.

7
Other Utilities

This chapter tells you about

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

Contents

GETSTAT Utility

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)
- ❑ The system this utility is running on (/S)

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

- ❑ The number of batteries in the system (/N)

GETSTAT Commands

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

GETSTAT /M

Usage: returns 1 if an external monitor is attached to the system.

GETSTAT /E

Usage: returns 3 if connected to the DockMate docking system. Returns a 4 if connected to the DockMate Plus docking system.

GETSTAT /B

Usage: returns 1 if the system is currently powered by the battery

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.

GETSTAT /S

Usage: returns the system type

/1 TM4000
/2 TM4000E
/3 TM4000M
/4 TM5000

GETSTAT /N

Usage: returns 1 if one battery is installed in the system and 2 if two batteries are installed in the system.

Note: It takes the system about 15-20 seconds to detect the number of batteries installed.

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 2.02
rem ================================================
rem check to see which TI system program is running on
rem ================================================
getstat /s
if ERRORLEVEL 255 goto unknown
if ERRORLEVEL 4 goto yes_tm5
if ERRORLEVEL 3 goto yes_tm4m
if ERRORLEVEL 2 goto yes_tm4e
if ERRORLEVEL 1 goto yes_tm4
:unknown
echo The system type is unknown.
goto exit_all
:yes_tm5
echo The system is a Texas Instruments TravelMate 5000.
rem ================================================
rem check the number of batteries on TM5000
rem ================================================
getstat /n
if ERRORLEVEL FF goto batunk
if ERRORLEVEL 2 goto tm5_2bat
if ERRORLEVEL 1 goto tm5_1bat
if ERRORLEVEL 0 goto tm5_0bat
:batunk
echo Unable to detect the number of batteries.
goto tm5_dock
:tm5_2bat
echo The system contains 2 batteries.
goto tm5_dock
:tm5_1bat
echo The system contains 1 battery.
goto tm5_dock
:tm5_0 bat
echo The system contains no batteries.
rem ================================================
rem check to see if an expansion station is attached to the TM5000
rem ================================================
:tm5_dock
getstat /e
if ERRORLEVEL 4 goto yes_ez+
if ERRORLEVEL 3 goto yes_ez
echo No expansion station attached
goto chk_batt
:yes_ez+
echo The DockMate Plus docking station is attached
```

```
goto chk_batt
:yes_ez
echo The DockMate docking station is attached
goto chk_batt
rem ========================
rem non-TM5000's
rem ========================
:yes_tm4m
echo The system is a Texas Instruments TravelMate 4000M.

:yes_tm4e
echo The system is a Texas Instruments 4000E.
:yes_tm4
echo The system is a Texas Instruments TravelMate 4000.
goto chk_tm4ds
rem ========================
rem check to see if an expansion station is attached to TM4000's.
rem ========================
:chk_tm4ds
getstat /e
if ERRORLEVEL 4 goto tm4mds
if ERRORLEVEL 3 goto yes_mds
if ERRORLEVEL 2 goto yes_ds
if ERRORLEVEL 1 goto yes_exp
echo No expansion station attached
goto chk_batt
:tm4mds
echo The expansion station check is not available on the TM4000M Series
goto chk_batt
:yes_exp
echo The expansion station is attached.
:chk_batt
rem ========================
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 connected to the system
goto exit_all
:yes_crt
echo An external monitor is connected to the system
:exit_all
```

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* located online in the SmartShelf library.

SETCMOS Utility

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.

When you change configuration data (for example, when you add options or change configuration for an application), be sure you save the data by running 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.

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.

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.

The SETKEY utility enables you to set the keyboard typematic rate and the key repeat delay rate.

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

```
Usage:  SETKEY [/rx /dx]
  /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.

8
Sound

Sound has been pre-installed on your TravelMate 5000 system. This section is an overview of the Sound utilities for DOS and Windows.

Note: Not available on TM5020SE models.

Contents

Features

The sound card included in your TravelMate 5000 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
- ❑ Built-in power amplifier

DOS Mixer

The DOS Mixer allows you to adjust the volume controls and balance for individual mixer channels and selected record source. To start DOS Mixer, go to the JAZZ directory and at the DOS prompt (C:\JAZZ) type:

JAZZMIX

or

JAZZTSR

and press **Enter**.

Note: JAZZTSR lets you load the TSR which allows you to automatically call up DOS Mixer by pressing the left and right Shift keys simultaneously.

The DOS Mixer control panel appears. This panel allows you to perform the following functions:

- Master Volume - controls the sound intensity heard through headphones or speakers
- Synth Volume - controls the sound intensity for FM sounds
- CD Volume - controls sound intensity from a CD-ROM drive
- Line In Volume - controls sound from line-level devices
- Wave Volume - controls the volume of the *.WAV files
- Mic Volume - controls the volume from the microphone

- Record Source - displays the source that is currintly used as the input device

Adjusting the Left and Right Channels

The Mixer and Volume Control slide knobs initially appear as solid bars and extend across both the left and right channels. When the name of the slide control is highlighted, you can adjust that control when you press either the PgUP or the Right Arrow key.

Channel	Keys
Left	Home to lower the volume PgUP to raise the volume
Right	End to lower the volume PgDn to raise the volume
Both Simultaneously	Right arrow to lower the volume Left arrow to raise the volume

Adjusting the Master Volume Control

The Master Volume Control controls the volume you hear through headphones or speakers. This includes all sound sources set for either recording or not recording input. The control is located on the right side of the Main Control Panel.

Selecting Record Source

Position the cursor on the Record Source. Use the Left and Right arrow keys to select between three sources (microphone, CD-Audio, and Line-In).

Playfile

Playfile is a DOS-based utility used to play back *.VOC and *.WAV sound files.

From the JAZZ directory, type:

PLAYFILE

and use the following parameters:

Parameter	Definition
filename.xxx	Name of the sound file you want to play (*.WAV or *.VOC).
Rxxxxx	Optional parameter for .WAV and .VOC files. This is a sampling rate in the file header and can vary between 6000 and 44100.The following variables may be used: 16 - Play 16 bit PCM S - Playback in stereo Dx - Sets the DMA channel number for 8-bit files (1, 3, 5, or 7). Ixx - Sets the IRQ channel number (2, 3, 5, 7, 10, or 15). Hx - Sets the DMA channel number for 16-bit files (1, 3, 5, or 7). M - Turns on maximum memory usage.
Sxxx	Changes the playback speed (xxx represents a percentage from 0 to 200).

Example: PLAYFILE TESTFILE.WAV s120
plays the sound file TESTFILE.WAV at 120% of the speed it was recorded

Recfile

Recfile is a DOS-based utility used to record *.VOC and *.WAV sound files.

From the JAZZ directory, type:

RECFILE

and use the following parameters:

Parameter	Description
filename.xxx	Name of the sound file. If the extension is .VOC, data is saved in Sound Blaster format. If the extension is .WAV, data is saved in MS WAVE format.
M{+}	Activates maximum memory usage.
Rxxxxx	Optional parameter for .WAV and .VOC files. This is a sampling rate in the file header and can vary between 6000 and 44100
Vxxx	Records only voice activated levels
V+xxx	Record all when Voice activated at threshold
S	Enables stereo recording

Parameter	Description
Dx	Sets the DMA channel number for 8-bit files (1, 3, 5, or 7).
Ixx	Ixx - Sets the IRQ channel number (2, 3, 5, 7, 10, or 15).

Example: RECFILE LEFT.WAV r11025 S
creates a stereo digitized audio *.WAV file with sampling at 11 kHz (recording 22 kHz samples per second at 8-bit)

Note: Press **ESC** to end recording.

Pocket Recorder

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

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 5000. 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 too 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, TM5000, 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

Pocket Mixer is a Windows 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.

Editing, Playing, and Recording

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 you are in a record mode.

Pocket CD

Pocket CD lets you play audio compact discs from a CD-ROM drive. Pocket CD has controls similar to those used by the CD audio player you may have in your home entairtainment 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.

9
TravelMate Options

This chapter tells you about:

- ❑ Options available for your computer
- ❑ How to install and use some of these options

Contents

Contents

List of Options

The following options are available with your TM5000 Series 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 from 8 MB to up to 32 MB.
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 Cases	Three versions available. Helps protect the computer and accessories during transport.
Microphone/ Headphone 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.)
External Monitors	TM5000 Series computers support several third-party multifrequency and VGA monitors.

Battery Options

Your computer comes with two Lithium-ION battery packs. Keeping an extra, fully-charged battery pack on hand can extend the time you can operate your computer. TM5000 Series computers allows you to exchange batteries with the computer still in operational mode (hot pluggable).

Checking Battery Charge

When you receive new batteries, ensure they are fully charged. To check the charge of any Lithium-ION battery, press the battery status button on the front of the battery pack. The LEDs indicate the current charge. For more information, refer to *Battery LEDs* and *Recharging the Battery* later in this chapter.

Standby and Suspend

You have two methods for putting your computer to "sleep". The first is by pressing **Fn-F4** (Standby). This puts your computer into a light sleep and saves battery power. To come out of Standby, press any key.

The second method for putting your computer to sleep is to press the **Suspend** button located to the right of the power switch. This puts your computer into a deeper sleep. This saves more battery power, but takes the computer a few more seconds to wake up. You may come out of Suspend by pressing any key.

Battery LEDs

If both battery packs are installed in the computer, they deplete in parallel. When the battery charge gets low, the **Low Battery** indicator above the keyboard flashes red. When the batteries are extremely low, the unit automatically goes into sleep mode for about five minutes. During this time, you can replace the batteries one at a time. To do this, press **Suspend.** After inserting a charged battery, press any key to resume at the point where the sleep mode was initiated.

There is also a row of four LEDs on the front of each battery pack. These LEDs indicate the following battery states:

- The percentage of power left in each battery. The following legend shows how the LEDs reflect current charge levels:

How Many LEDs Lit?	What Color?	Percent Charged
1	Red	0 to 10%
1	Green	11 to 25%
2	Green	26 to 50%
3	Green	51 to 75%
4	Green	76 to 100%

  If you wish to check the charge of any Lithium-ION battery after the LEDs have turned off, press the battery status button to the right of the LEDs on the battery pack and they will light once again.

- Low battery state. At the point of near depletion the red LED will begin to flash. As you recharge batteries, the Low Battery indicator no longer flashes red, and eventually turns green as the charge increases.

Battery Recovery Indicators

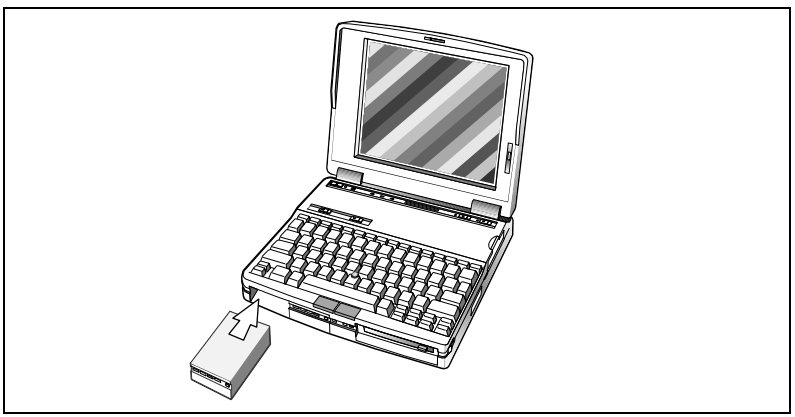
There are certain conditions that produce an unrecoverable battery indication (the red light on the front of the battery flashes). The most common causes for unrecoverable battery conditions are:

- the charge current exceeds 2.3 amps
- the discharge current exceeds 4 amps

- ❑ the battery charge exceeds 12.75 volts
- ❑ the battery discharges below 7 volts
- ❑ if the LED on the front of the battery flashes red, take the battery out, wait 20 seconds and then press the battery status button. If the light continues to flash red, the battery can no longer be used. Replace with a new battery.

Inserting the Battery Pack

To install the battery pack into TM5000 Series computers, insert the battery until it clicks and locks into place.

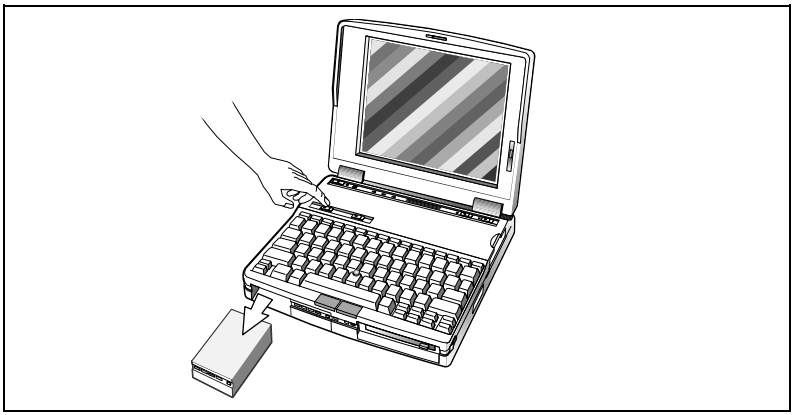


Insert battery

Removing the Battery Pack

To remove a battery pack, complete the following steps:

1. Press the left eject button on the top of the notebook to the left to release the left battery. Press the right eject button to the left to release the right battery.



Remove battery pack

2. Slide the battery out.

Recharging the Battery

Caution: Never recharge the battery differently from the procedure described in this document.

To recharge your battery, complete the following steps:

1. Install the battery pack in your computer (if not already installed).

2. Connect the AC Adapter.

3. To maintain a full charge, leave the computer connected to the AC Adapter when not in transport.

Note: The batteries will charge much faster (by several hours) if charging with the notebook powered off.

Battery Options

Caring for Your Battery

The following operating tips for your notebook can help you prolong the life of a battery charge:

- ❑ Keep the LCD at the lowest comfortable brightness level. Reducing brightness even a small amount can significantly reduce power consumption and increase operating time.

- ❑ Press **Fn-F4** or **Suspend** whenever you are not actively using the computer. Press any key to resume normal operation.

- ❑ Press **Suspend** after writing to the hard disk to stop the disk rotation. Then return to operation by pressing any key.

- ❑ Use the *Power Savings* items in Setup to turn off the LCD when not in use and to ensure that the hard disk is not powered for longer periods than necessary.

- ❑ You can choose between two CPU speeds: high and low. The computer uses less power at lower CPU speeds. When using an application that is not CPU-intensive (for example, many word processing programs), press **Ctrl-Alt-**↓ to reduce the CPU speed. To increase the speed again, press **Ctrl-Alt-**↑. This speed control feature is not available in the Windows environment or on most models that use a memory manager. When high speed is selected, the Turbo LED is lit.

- ❑ You can minimize the number of times the computer needs to access the hard disk by using disk caches or RAM disks.

- ❑ Disconnect or turn off external options that you are not using.

- ❑ Use one of the Setup programs to disable ports you are not using.
- ❑ Use only Texas Instruments options, which are designed to operate with the least possible energy consumption. Third-party options, such as RAM, and mouse devices, can drain the battery more quickly.
- ❑ Run the computer with the AC Adapter connected when using external devices, such as an external keyboard.
- ❑ Increase the BatteryPro™ power savings to level 7 using the SETPOWER utility or the Power Level utility in Windows TISetup.
- ❑ Lithium-ION rechargeable batteries must be disposed of properly.
- ❑ Don't damage or short circuit the terminals on the battery pack.

Battery Status Utility

Double click on the Battery Status icon in your Windows TravelMate Notebook Center group to display the percentage of charge left in your batteries. If one battery is installed, the utility indicates the charge remaining in that battery. If two batteries are installed, the utility displays the average charge remaining in both batteries.

Important Battery Information

The following information is important for safe and effective use of your battery:

Caution: Replace the Battery with the same type recommended by the manufacturer (Texas Instruments Part Number 9786247-0001).

Battery Options

Caution: The Battery pack is suitable for use only with Texas Instruments TM5000 Series computers.

Caution: Disassembling the Battery may cause a burn or fire hazard. Do not disassemble the Battery. Handle damaged or leaking Lithium-ION Batteries with extreme care. If the Battery is damaged, electrolyte may leak from the cells and cause personal injury.

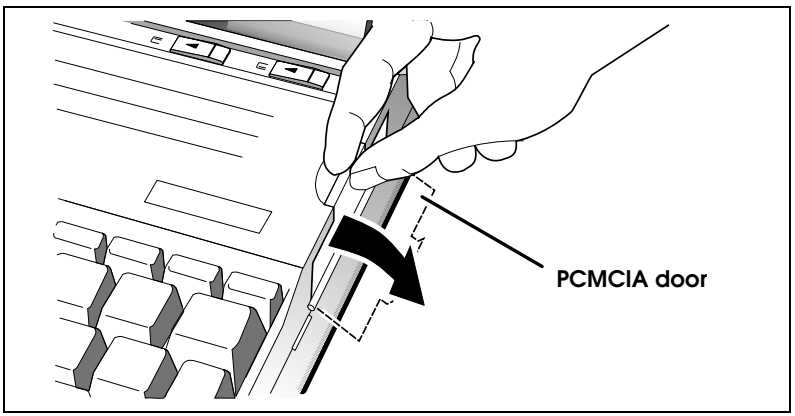
Caution: There may be local restrictions on the disposal or recycling of Batteries. Consult your local regulations or waste disposal provider.

Caution: Do not expose the Battery to high temperatures (140^{o}F).

These instructions provide information on the installation of PCMCIA Option Cards. There are two types of PCMCIA cards: those used for fax/modem (the XJACK®) and those used for network connections. These instructions can be used for both modem types.

Opening the PCMCIA Door

To install a PCMCIA card, you must first open the PCMCIA door located on the right side of your computer.

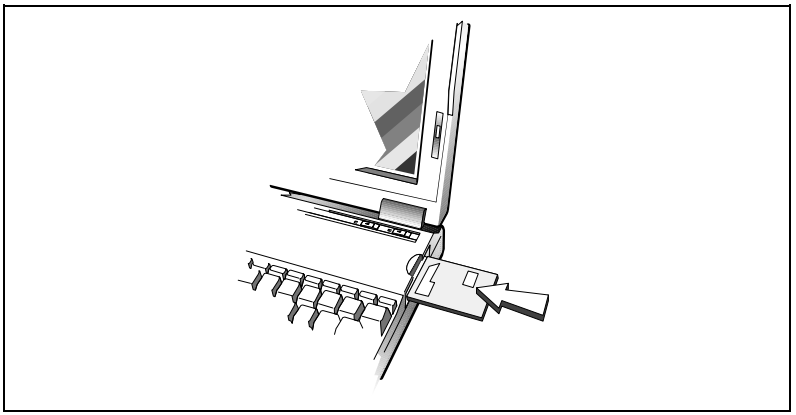


Opening the PCMCIA door

Installing an XJACK PCMCIA Option Card

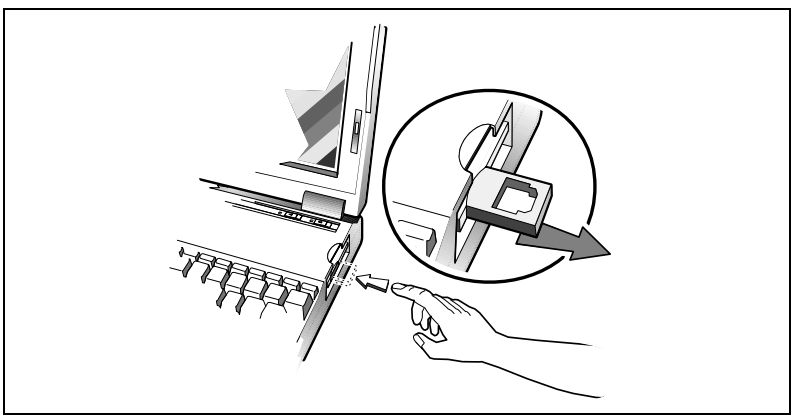
To install an XJACK PCMCIA Option Card, complete the following steps:

1. Insert the PCMCIA modem into the PCMCIA slot on the computer. Ensure the modem is facing up.



Insert the card

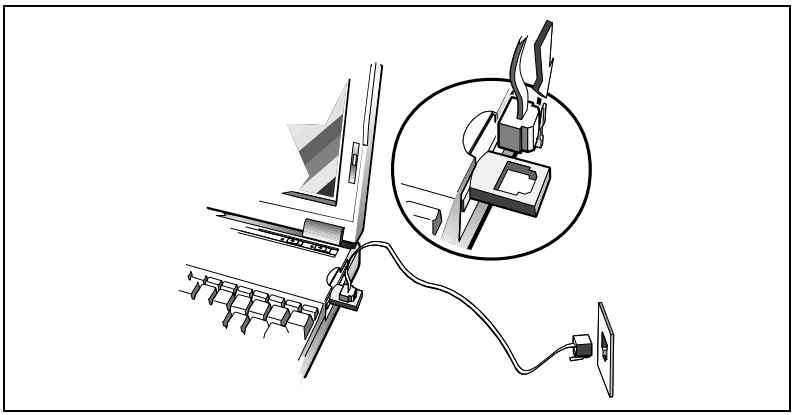
2. Press the XJACK extension so the telephone connector springs out. It works like a ballpoint pen - push in to extend and push in again to withdraw.



Press the XJACK connector

3. Plug one end of the telephone cable into the extended XJACK phone connector on the modem.

4. Plug the other end of the telephone cable into the phone jack.



Plugging into the phone jack

5. Refer to your *Phoenix PCMCIA User's Guide* and the *README First* file provided on the diskette that came with your option to complete software installation required to run your PCMCIA option.

Installing Other PCMCIA Cards

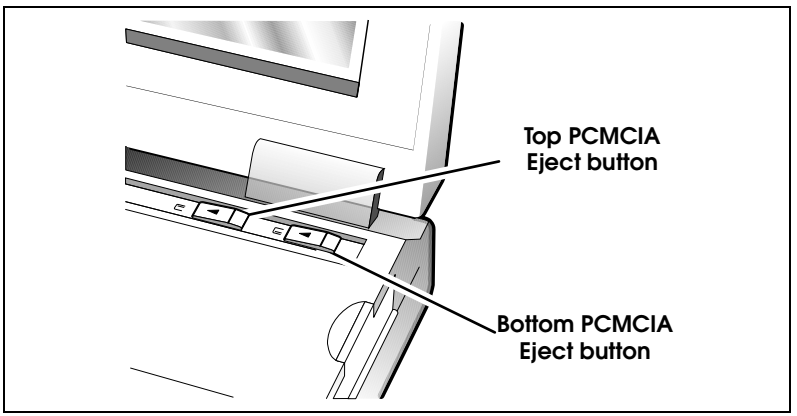
To install other PCMCIA Option Cards, complete the following steps:

1. Insert the PCMCIA option into the PCMCIA slot on the computer. Ensure the card is facing up.

2. Refer to your *Phoenix PCMCIA User's Guide* and the *README First* file provided on the diskette that came with your option to complete software installation required to run your PCMCIA option.

Removing a PCMCIA Option Card

To remove the upper PCMCIA card from the notebook computer, press the left PCMCIA eject button. To remove the lower PCMCIA card from the notebook computer, press the right PCMCIA eject button.



PCMCIA eject buttons

Card Types

The following PCMCIA cards are available from TI at the time of this printing. For more current information on the availability of PCMCIA cards, call 1-800-TI-TEXAS.

- ❑ PCMCIA 14.4 Data/Send/Receive Fax Modem Card with Voice
- ❑ PCMCIA Token Ring Card
- ❑ PCMCIA Ethernet 10Base_T Twisted Pair Card
- ❑ PCMCIA Ethernet 10Base 2 Thin Coax Card

Refer to the *Phoenix PCMCIA User's Manual* (located online in the SmartShelf library) 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 8 MB of random access memory (RAM). You can increase memory by installing one of the RAM options:

- ❑ 8-MB RAM Expansion Board (TI Part No. 9798816-0001). This expands RAM from 8 MB to 16 MB.

- ❑ 16-MB RAM Expansion Board (TI Part No. 9798816-0002). This expands RAM from 8 MB to 24 MB.

Additional Memory Expansion

- ❑ 8-MB Add-On Memory Expansion (TI Part No. 9798816-0003) - allows further memory expansion by adding an additional memory card onto one of the existing memory expansion boards.

  The following table illustrates possible memory configurations with your TM5000 Series computer:

Memory Configurations for TM5000 Series Computers			
Memory Expansion Without Add-On		**Memory Expansion With Add-On**	
	Total		Total
Base Memory	8 MB	Base Memory	8 MB
Base Memory + 8 MB Expansion	16 MB	Base Memory + 8 MB Expansion + 8 MB Add-On	24 MB
Base Memory + 16 MB Expansion	24 MB	Base Memory + 16 MB Expansion + 8 MB Add-On	32 MB

Caution: Texas Instruments does not warranty the use of non-TI memory. TI will not be held responsible for problems or degradation of performance incurred by the use of any memory other than the TI memory described in these instructions.

Preparing a Unit for Installation

To prepare a unit for installation, 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 off Quick Boot in the System Setup (refer to the *TM5000 Series User's Reference Guide* for information on Quick Boot).

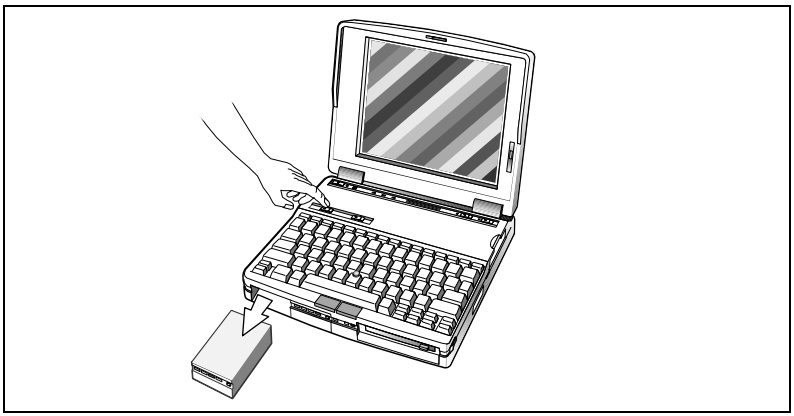
2. Turn off the notebook, unplug the AC Adapter, and remove the battery pack.

3. With the cover closed, turn the notebook upside down on a padded surface.

4. Remove the two Phillips screws underneath the memory expansion compartment located below the floppy drive to remove the bezel.

Removing an Existing Memory Expansion Board

To remove an existing memory expansion board, pull the board out of the slot by inserting a screwdriver in the hole on the board and popping the board out of the unit.



Remove battery pack

Installing 8-MB or 16-MB Boards

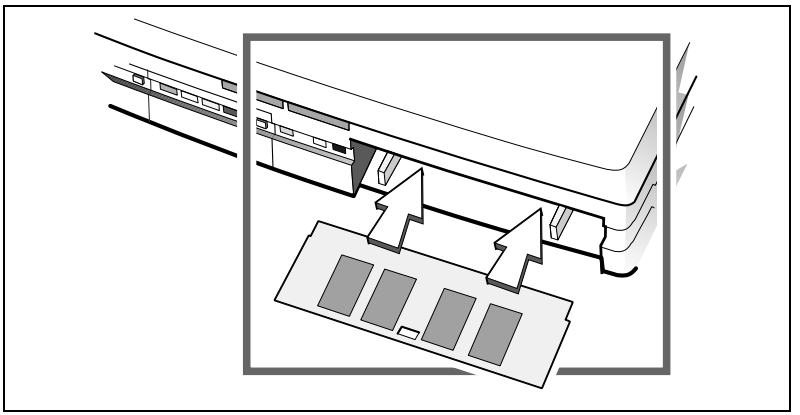
To install 8-MB Add-On Memory, refer to *Attaching 8-MB Add-On Memory* later in this document. To install the 8-MB or 16-MB optional memory expansion boards, complete the following steps:

1. Complete steps in *Preparing a Unit for Installation* earlier in this document. If an expansion board already resides in the unit, see *Removing an Existing Memory Expansion Board* earlier in this document.

2. Remove the RAM expansion board from the plastic bag.

3. Turn the unit right side up on a padded surface.

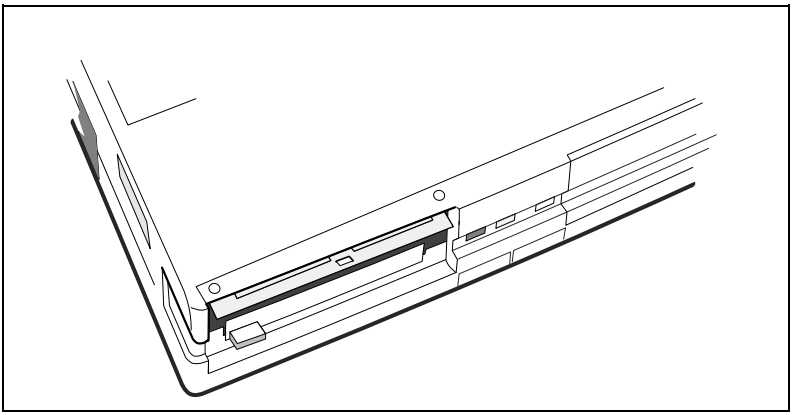
4. Carefully insert the expansion board so that it follows the rails until the board fits snugly and the connectors match.



Insert the expansion board

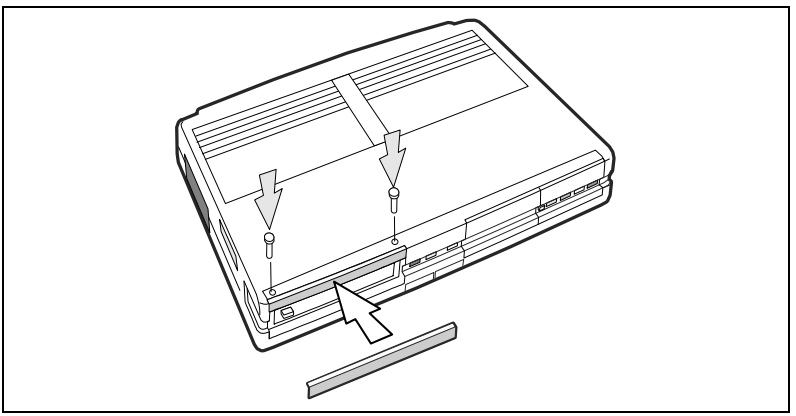
5. Turn the unit upside down on a padded surface.

Note: The curve of the plastics on the underside of the computer causes the board to show beyond the lip of the plastic. The board is properly seated in this position.



View of underside plastics

6. Replace the bezel and tighten the screws.



Replace the bezel and tighten screws

7. After installing the memory expansion board and with Quick Boot still turned off, reboot. Memory is automatically checked at powerup.

Note: If all of the memory is not recognized at powerup, try re-installing the memory board.

Attaching 8-MB Add-On Memory

These procedures are used if you are operating a TM5000 Series computer and have purchased the 8-MB Add-On Memory option. The 8-MB Add-On Memory board can only be installed if you have already purchased an 8-MB or 16-MB RAM expansion board. To attach the 8-MB Add-On Memory board, complete the following steps:

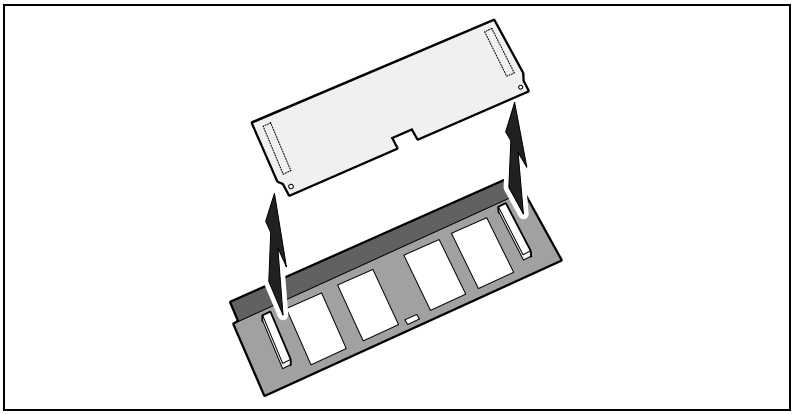
1. Complete steps in *Preparing a Unit for Installation* earlier in this document. If an expansion board already resides in the unit, see *Removing an Existing Memory Expansion Board* earlier in this document.

2. If your first optional memory board has not been installed, remove it from its packaging.

3. Remove the 8-MB Add-On Memory board from its packaging.

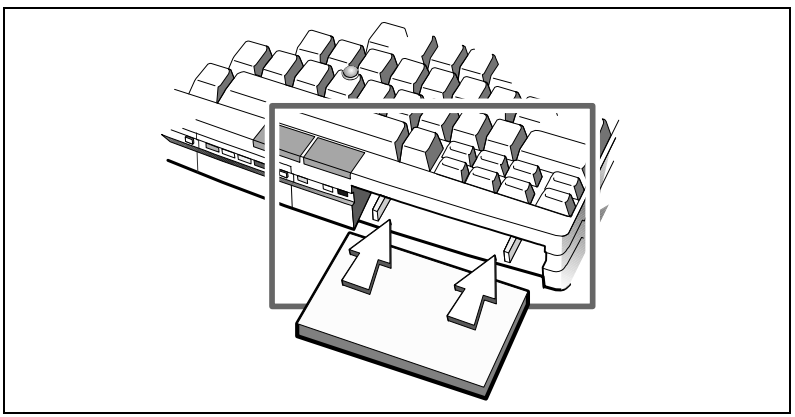
4. Turn the unit right side up on a padded surface.

5. Connect the two boards so that they fit together snugly.



Connecting Add-On Memory

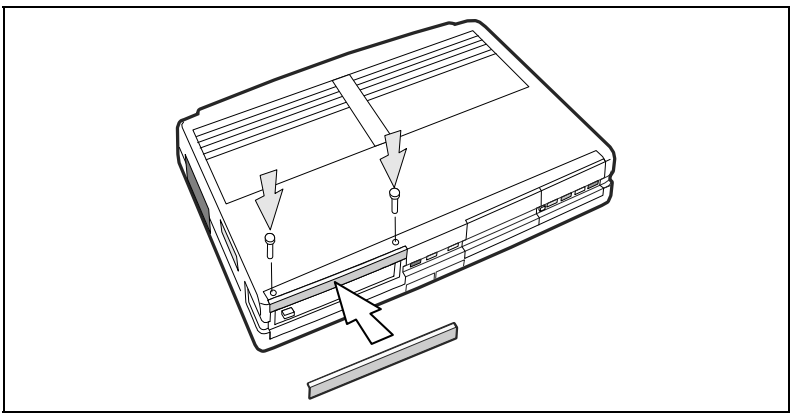
6. Carefully insert the expansion boards so that the first optional memory board follows the rails and fits snugly into matching internal connectors.



Insert memory expansion boards

Note: The Add-On Memory board does not directly connect to the computer. The curve of the plastics on the underside of the computer causes the board to show beyond the lip of the plastic. The board is properly seated in this position.

7. Turn the unit upside down on a padded surface.



Replace the bezel and tighten screws

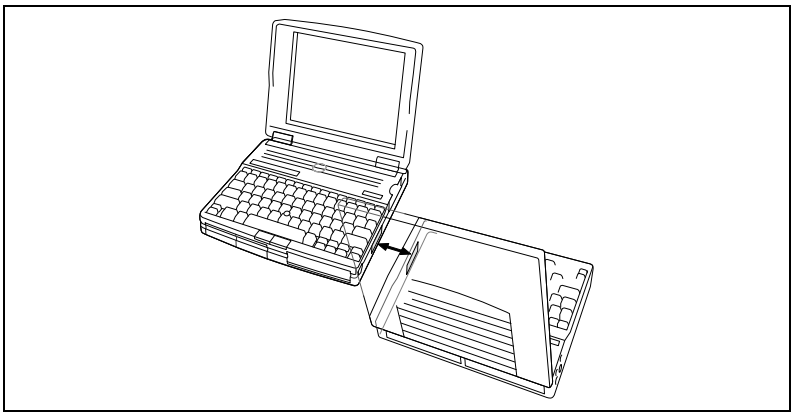
7. Replace the bezel and tighten the screws.

SIR Port

The Serial Infrared (SIR) port offers wireless communication with other TM5000 Series notebooks or with a variety of IRDA-compliant devices made by other manufacturers.

Note: This feature is not available on TM5020SE models.

To use the SIR port to transfer data between two TM5000 Series computers, align the SIR ports of the two devices making sure that the distance separating them is between six inches and one meter.



SIR communication

After the devices are aligned, you must use the TranXit software (located in the Windows TravelMate Notebook Center Group) to complete the SIR communication process. For further information, refer to the *TranXit Quick Reference Guide* or the *TM5000 Series User's Guide* that came with your computer.

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.

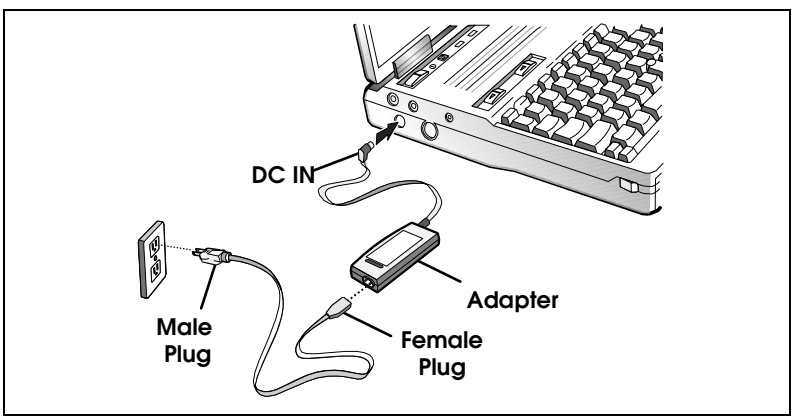
To connect the AC Adapter, complete the following steps:

1. Set the power switch to the off (⏻) position, or press **Fn-F4** or **Suspend** to put the computer into a sleep mode.

2. Connect the female connector of the AC cord to the inlet on the AC Adapter.

3. Hold the DC In connector from the AC Adapter and press it into the matching jack on the side of the computer.

4. Plug the male end of the AC cord into a grounded wall receptacle of the correct voltage.



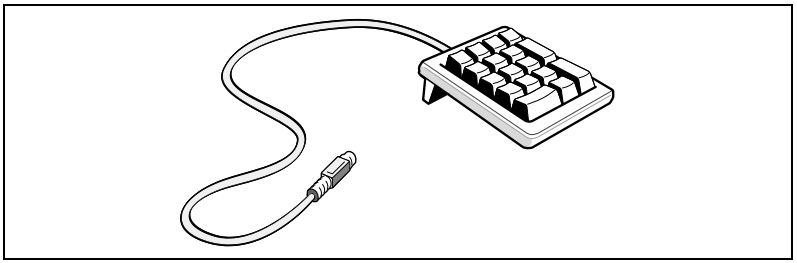
AC Adapter

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.

Note: The computer must be completely powered off when connecting other external devices. You cannot use **Fn-F4** or **Suspend**.

External Numeric Keypad

The optional Numeric Keypad (TI Part No. 2581381-0001) enables you to type numeric data while still permitting data entry on the keyboard. 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 left side of your computer.
3. Turn the computer on.

For usage instructions, refer to the Numeric Keypad documentation that comes with the keypad (TI Part No. 2581382-0001, Rev. A).

Carrying Cases

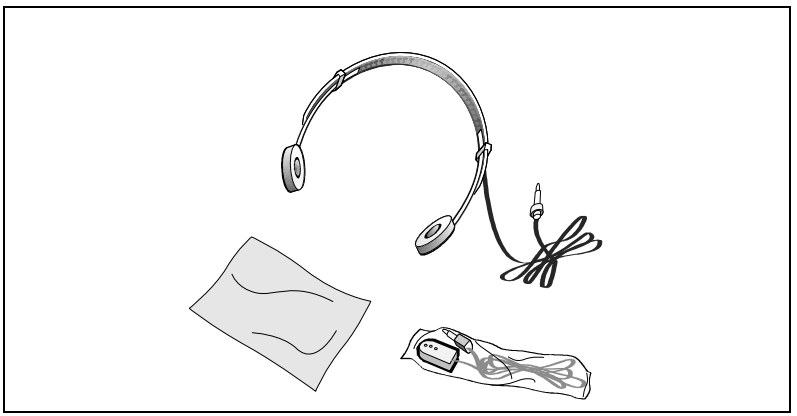
The following carrying cases are available for TM5000 Series computers:

- ❑ Leather Portfolio (TI Part No. 2567028-0001) - carries only the notebook computer.
- ❑ Deluxe Carrying Case (TI Part No. 2568069-0001) - carries the notebook computer and several smaller accessories (such as the AC adapter, floppy disks, etc.).
- ❑ Executive Brief Case (TI Part No. 9793372-0001) - a larger carrying case that carries the notebook and various smaller accessories.

Microphone/Headphone Kit

Note: Not for use with TM5000SE models.

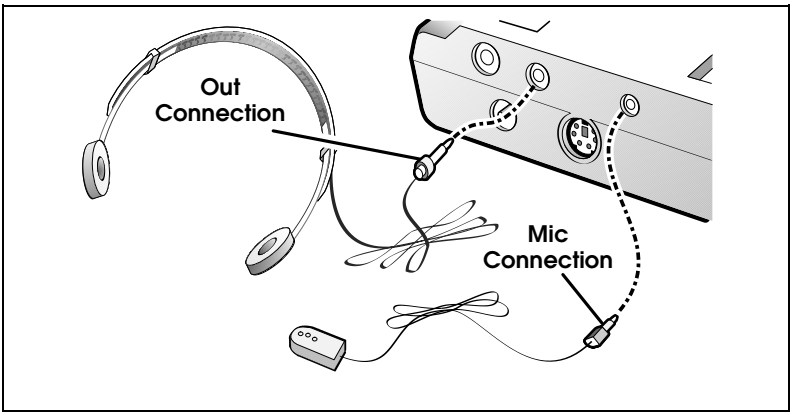
This section describes the optional microphone and headphone kit. Software required to configure your notebook for the microphone and headphone is preinstalled on your computer. Refer to the User's Guide or the installation instructions that come with the kit (TI Part No. 9793377-0001, Rev. A) for further information.



Microphone/Headphone Kit

To plug in your microphone, insert the plug into the Mic port on the left side of your computer. Insert the headphone into the Audio Out port on the left side of your computer.

Microphone/Headphone Kit



Installing the microphone and headphone

Caution: High volume levels may cause hearing damage.

Printers

Texas Instruments makes a variety of laser, inkjet, 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 rear panel of the computer. Then run Setup as described in this manual.

Refer to your printer documentation for more installation and usage instructions.

External Monitor

Supported Monitors

The computer supports the following multifrequency external and VGA monitors.

Note: TM5020SE models do not support 1280 x 1024 mode.

- ❑ 800 x 600 with 65 thousand colors on CRT
- ❑ 1024 x 768 with up to 256 colors on CRT
- ❑ 1280 x 1024 with 256 colors on CRT (interlaced)

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 external monitor first; then turn on the computer.
4. Switch the display between the Panel, CRT, and LCD using the WinMode Utility in the Windows TravelMate Notebook Center Group or the DOS VGA utility. For more information on the WinMode Utility, refer to WinMode Utility in Chapter 3 of this guide. For more information on the VGA Utility, refer to Chapter 6 of this guide.

A
Specifications

PCI Bus

A PCI bus gives users the memory bandwidth to fully utilize the Pentium processor, I/O bandwidth to receive and transfer information faster, eliminating bottlenecks, and providing true multitasking. The PCI bus takes full advantage of 64-bit Pentium power on both the local bus and the I/O bus. While this technology is available on many desktops, Texas Instruments is the first to offer PCI architecture at the notebook level. The following are some other features of your PCI bus:

- ❑ Bus speeds up to 33 MHz and high transfer rates. This allows for faster running applications.
- ❑ Video runs off the internal PCI bus allowing for superior graphics performance.
- ❑ High end processing speeds offer growth protection for your system.
- ❑ Your system processor operates quickly and independently of the PCI Bus.
- ❑ External access to connect the latest peripherals.

Memory

Memory for the TM5000 Series includes 8 MB of standard RAM with the following upgrades available:

- ❑ 8-MB Upgrade Kit TI Part No. 9798816-0001
- ❑ 16-MB Upgrade Kit TI Part No. 9798816-0002
- ❑ 8 MB Add On TI Part No. 9798816-0003

Appendix A

Display

The following display types are available:

- TM5000 models
  - 10.4 inch TFT on TM5000 Models
  - 10.5 inch Dual Scan Passive Matrix
- TM5020SE models
  - 9.5 inch TFT on TM5020SE models

Video RAM

- 2-MB on TM5000 models
- 1-MB on TM5020SE models

External Monitors

The TM5000 notebooks may use the following external monitor types:

Note: TM5020SE models do not support 1280 x 1024 mode.

- 800 x 600 with 65 thousand colors on CRT
- 1024 x 768 with up to 256 colors on CRT
- 1280 x 1024 with 256 colors on CRT (interlaced)

Floppy Disk Drive

All TM5000 Series notebooks use either 720 Kbyte or 1.44-MB, 3.5" floppy disks.

Hard Disk Drives

The TM5000 computer has a user-replaceable 2.5 inch hard disk drive with capacities of 524 million bytes (500 MB) to 810 million bytes (772 MB) depending on the notebook model.

PCMCIA Slots

The TM5000 Series notebooks come standard with a PCMCIA slot that accommodates 1 Type III or 2 Type I or II PCMCIA option cards.

Printer Ports

The TM5000 Series notebooks come standard with the following:

- ❑ 16550 UART Serial Port
- ❑ EPP/ECP Parallel Port.

PS/2 Port

The PS/2 port accommodates an external keyboard, numeric keypad, or mouse. These devices are hot-pluggable.

Appendix A

SIR Port

Range:	6 inches to 1 meter
Angle of communication	+/- 15 degrees
Wavelength	875 nm
Backlight environment	typical indoor environment
Line of sight/point to point link communication parameters	Bidirectional, half duplex Baud rates supported 1200 to 115 Kbaud, 8 data bits, (odd, even, or No) parity, stop bit.
Modes supported:	Infra Red Data Assn. (IrDA)™ Hewlett-Packard (HPSIR)™

Note: Not available on TM5020SE models.

Environment

This section provides information on the optimum operating environment for your TravelMate 5000 notebook computer:

Temperature

Operating:	50^{o} to 95^{o} F (10^{o} C to 35^{o} C)
Storage:	-4^{o} to 140^{o} F (-20^{o} C to $+60^{o}$ 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

Note: Option specifications are provided with each option.

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	ª	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	≡
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3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
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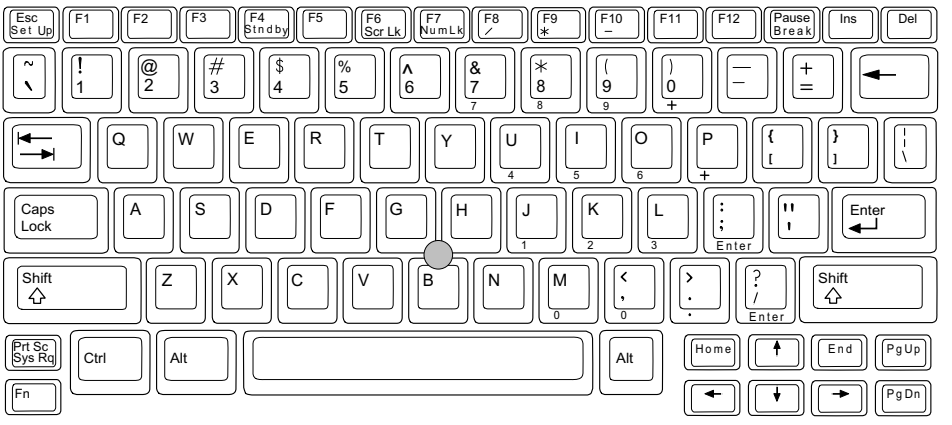
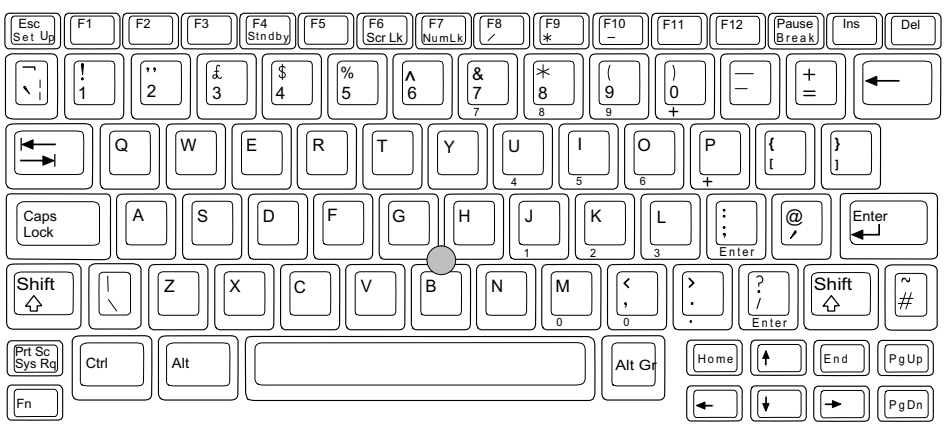
6	-6	♠	—	&	6	F	V	f	v	ª	û	ª	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	▄	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	¤	┐	╧	▀	∩	

C
Keyboard Layouts

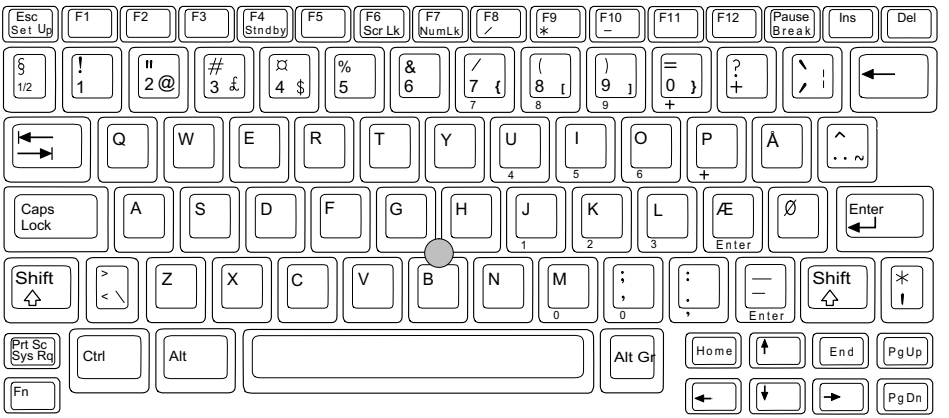


U.S. English Keyboard

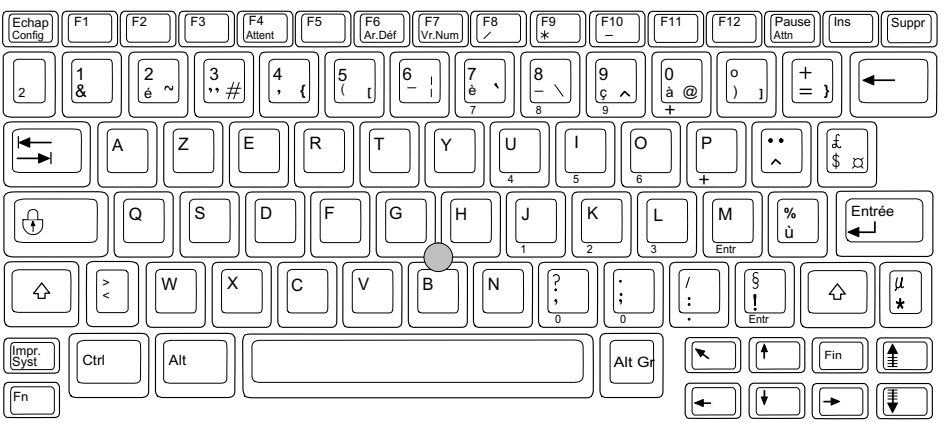


U.K. English Keyboard

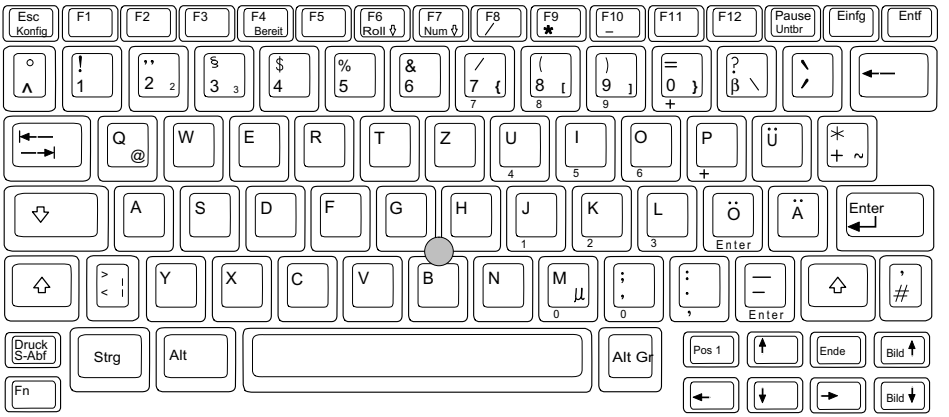
Keyboard Layouts



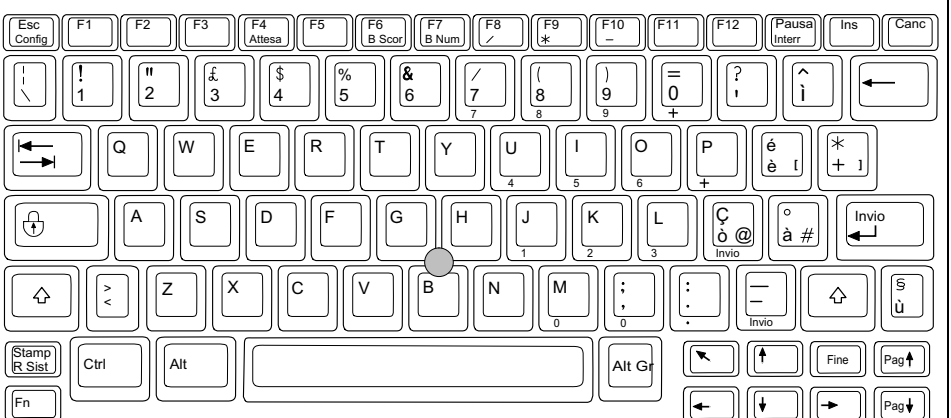
Danish Keyboard



French Keyboard

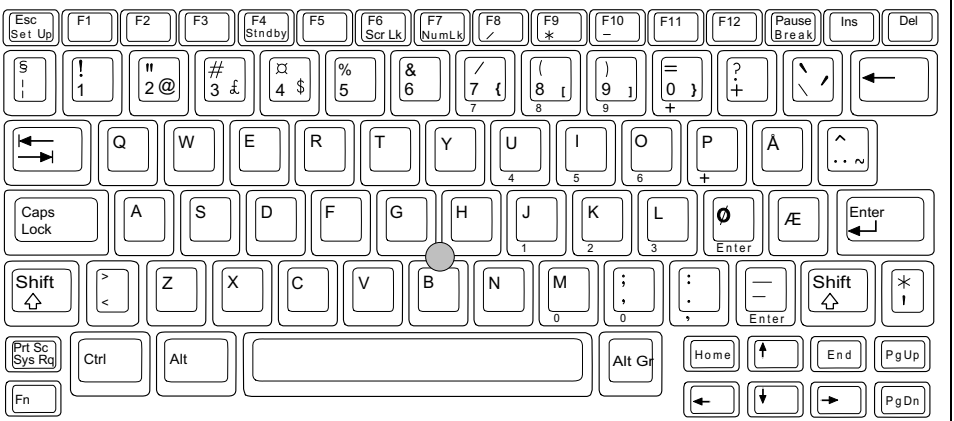


German Keyboard

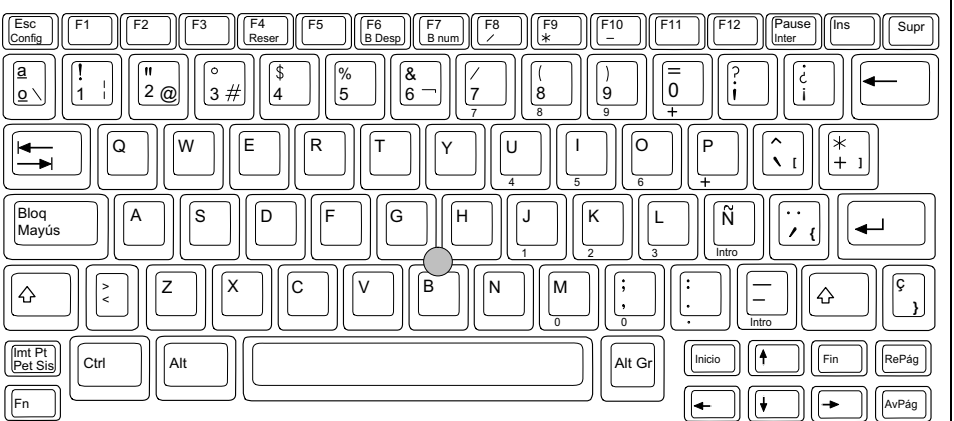


Italian Keyboard

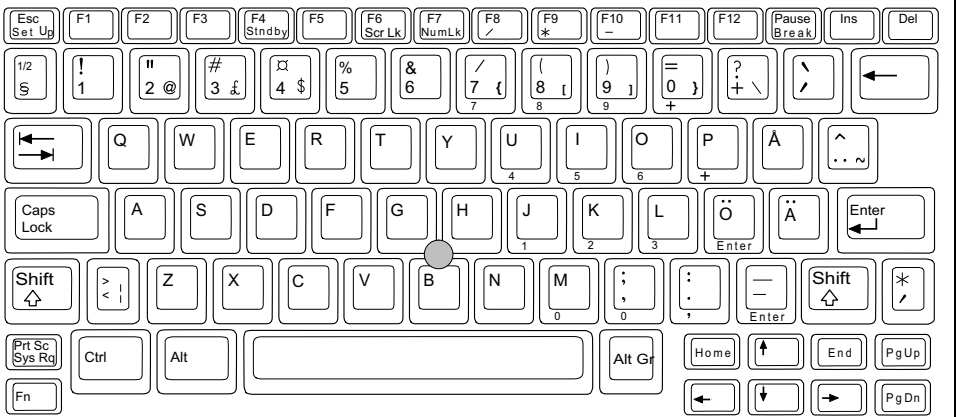
Keyboard Layouts



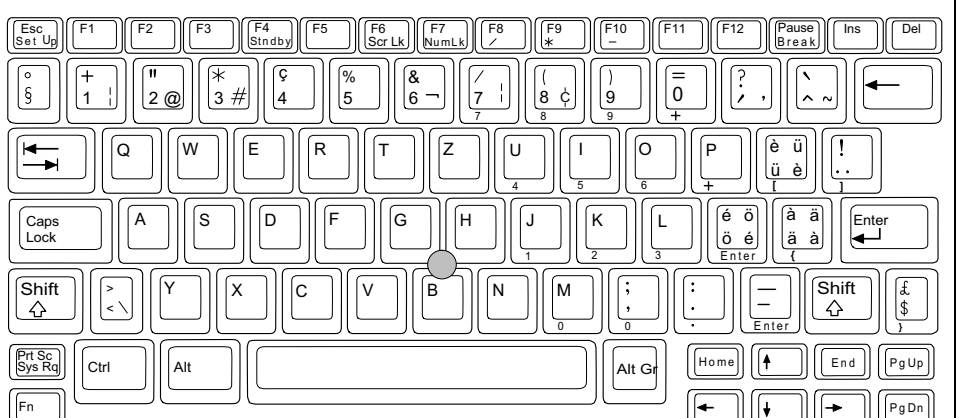
Norwegian Keyboard



Spanish Keyboard

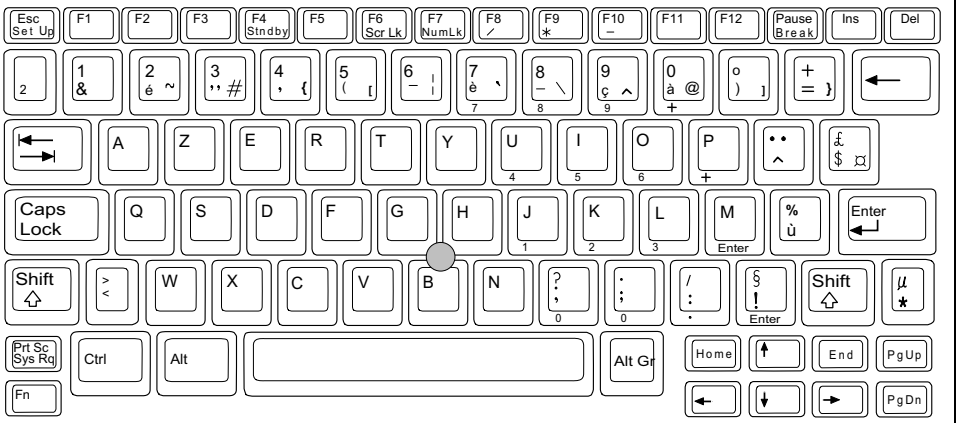


Swedish/Finnish Keyboard

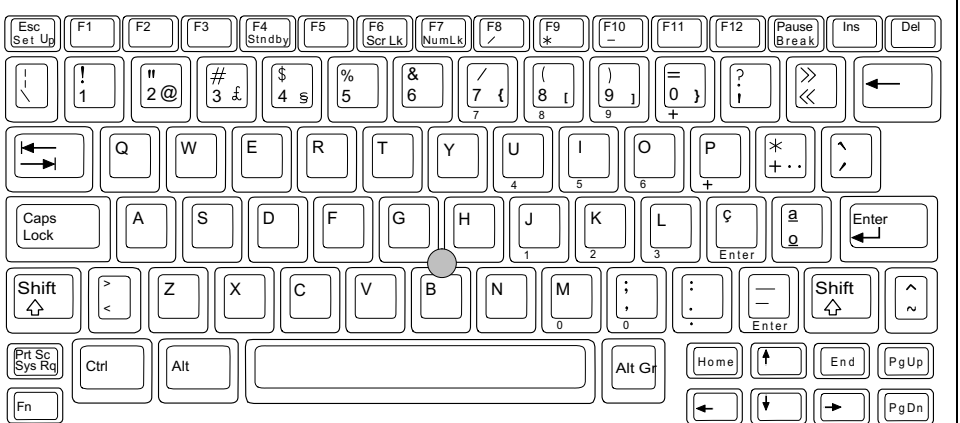


Swiss Keyboard

Keyboard Layouts



Belgium Keyboard



Portuguese Keyboard

D
PC-Doctor Diagnostics

PC-Doctor is a remote diagnostics program based on a text-mode user interface with pull-down menus. The program provides PC diagnostics, system information, and setup. In addition, PC-Doctor checks your keyboard and printer for problems and possible fixes. Detailed information is found in your online Help facility. This booklet contains information on basic PC-Doctor operations.

Starting PC-Doctor

PC-Doctor comes pre-installed on your TravelMate 5000 computer. To run the utility, reboot your computer. When the Startup Menu appears, you have ten seconds to select PC-Doctor Diagnostics (Startup Menu selection #5). See Chapter 1, *Using the Setup Programs* for further information on this menu.

The system continues the boot process and automatically displays the PC-Doctor Diagnostics main menu.

Keyboard Navigation

The following keys can be used to navigate through the PC-Doctor menus:

Key	Description
Cursor Keys	Moves the highlighted pointer.
ENTER	Selects the highlighted option.
ESC	Cancels current function and goes back one step.
F1	Activates context-sensitive help.
F1 (twice)	Activates the online documentation.
PageUp/PageDn	Moves the screen one page at a time
F2	Prints the log.
F3	Saves the log to a file.

In addition, when you select All Tests from the Diagnostics menu, the Test Selection Menu that appears uses the following keys:

Key	Description
Space Bar	Enables/Disables the selected test.
ENTER	Enables/Disables the selected test.
F2	Activates Test Options Menu
F5	Runs the selected tests.
F10	Disables all tests.

Mouse Navigation

You can also use a mouse with the user interface. PC-Doctor requires that you load a mouse driver into memory. See your Mouse User's Guide for more details. Use the left mouse button to choose objects (menu entries and action codes in square brackets). Use the right mouse button as you would the ESC key to take you back to your previous step. Click on the **?** in the upper left corner of the screen for context-sensitive help.

PC-Doctor Menus

There are several selections available from the menu bar of the PC-Doctor Diagnostics main menu. These include:

- ?
- Diagnostics
- Interactive Tests
- Hardware Info
- Utility
- Quit

Online Help (?)

To obtain context sensitive help from any menu, press **F1**. Pressing **F1** twice (or clicking on the question mark in the upper left-hand corner of the menu if you are using a mouse) provides you with complete online documentation.

Diagnostics

The Diagnostics menu allows you to run non-destructive tests with little or no operator interaction. Options available from the PC-Doctor Diagnostics Menu include:

- System Test - tests all major aspects of the system except those found in Memory, Hard Disk, Floppy Disk, and the Miscellaneous Test categories.
- Memory Test - tests all types of main memory in the system including base, extended, expanded, and upper memory block (UMB) memory.
- Hard Disk Test - tests all hard disk drives in the system that are either IDE or provide a BIOS command interface.
- Floppy Disk Test - tests all floppy disk drives in the system.

- All Tests - allows you to select which tests to run. You can also specify special testing options. By pressing **F2**, the following options are available:
  - Halt On Errors - interrupts testing if an error is detected.

Note: External serial and parallel port testing requires loopback plugs (not provided with this software).

  - External Loopback - tests external loopback of COM and LPT ports. You can select the type of loopback adapter you want to use.
  - Pass Count - selects how many times tests are repeated. The highest limit is 9999 times.
  - Test Logging - opens the Log Options menu that lets you define how test results are printed or stored to a file during testing. By default, PC-Doctor produces a test result file at the end of testing if an error was detected.
  - Switch LCD - lets you change your video output to either the internal LCD, external monitor, or simulscan mode. If your system does not support simulscan, both the external monitor and the built-in LCD screen go blank.
  - Cache Control - allows you to leave the level 1 and level 2 cache enabled during memory testing. This assists in tracking down cache timing issues.

Interactive Tests Menu

Interactive tests are diagnostics that need user interaction to complete. Interactive tests include:

- Keyboard - tests the keyboard keys, LEDs, and repeat rate

- ❑ Video - tests the character sets, colors, monitor, and VGA
- ❑ Speaker - tests the volume response at different frequencies
- ❑ Mouse - tests the mouse driver, buttons, and functionality
- ❑ Joystick - calibrates the joystick and tests the buttons. During the test, the joystick(s) should first be calibrated. To calibrate the joystick, move the stick to the extremes in each direction. PC-Doctor registers the coordinate data and adjusts the screen display accordingly.
- ❑ Diskette Drive - checks diskette drive functionality
- ❑ Maximum System Load - burn-in tests a system. This function simulates the operating conditions that are produced by operating systems such as OS/2 and Windows NT. Some systems are not compatible with the Maximum system Load test.
- ❑ Printer Test - tests for the correct acceptance and execution of common printer control commands. Printer test information is stored in printer test files with an extension of *.PDP*.
- ❑ SCSI Test - PC-Doctor contains SCSI device testing features that work if you have an ASPI or CAM device driver loaded. You can select which SCSI host adapter to work with if you have more than one SCSI adapter present.
- ❑ CD-ROM Test - tests CD-ROM drives using the Microsoft CD-ROM Extensions (MSCDEX) and the standard CD-ROM device drivers.
- ❑ Stereo Speaker Test - tests the external speakers.

Hardware Info Menu

This menu contains functions that determine and report on the setup of the computer. None of these functions perform

diagnostic tests; however any errors are included in the reports. The following functions are available from the Hardware Info menu:

- System Configuration - lists main system configuration data.
- Memory Contents - shows allocation and use of system memory
- IRQ and DMA use - identifies interrupts for all standard IRQ and DMA devices
- Device Drivers - shows all essential data on DOS resident and installable device drivers
- COM and LPT ports - displays information about the installed serial and parallel ports. Only ports that are identified by BIOS are listed
- Physical Disk Drives - shows the basic characteristics for each installed fixed disk drive including the contents of partition tables
- Logical Disk Drives - displays information about each DOS drive that is available and has a disk in it. If Stacker or DoubleSpace disk compression software has been installed, details about each "stacked" or "doubled" drive is shown
- VGA Information - identifies the type of installed VGA chip
- Software Interrupts - displays software interrupt vectors and the area of memory they point to
- SCSI Devices - lists information about SCSI devices and interface cards if a CAM or ASPI compliant SCSI device driver is present
- I/O Use - displays how your I/O memory is being used by different devices.
- IDE Drive Information - displays information about IDE drives attached to the primary controller.

- Network Information - shows information about the current network connection or the network adapter.
- PCMCIA Information - uses card services to obtain information about the status of card and socket services as well as installed PCMCIA cards.
- PCI Information - displays information about your PCI bus and attached devices.

Utility Menu

PC-Doctor has a dedicated menu for utility functions. These functions include:

- Run External Tests - runs other programs from PC-Doctor
- Edit CMOS RAM - gives access to CMOS RAM data
- File Editor - allows editing of configuration files
- Surface Scan Hard Disk - checks for defects on the hard disk
- Benchmark System - measures system performance
- DOS Shell - opens a DOS prompt from within PC-Doctor
- Terminal - gives access to devices connected to a serial port (such as a modem)
- Memory Debugger - displays memory contents in either hexadecimal, decimal, or ASCII form
- Remote Operation - enables remote control if available
- Tech Support Form - allows you to collect information about the current system
- Battery Rundown - quickly deep-discharges the internal battery or batteries.

Quit

You can quit PC-Doctor in the following ways:

- **Exit to DOS** (**Alt-F4**) - takes you back to the DOS prompt
- **Reboot** - performs a cold boot. PC-Doctor flushes all files and attempts to flush write-caches
- **Park HD** - prepares a computer for transport

Remote Operation

This entry opens the Remote Operation menu if you are not yet online, or closes the remote connection if the system is already remotely controlled.

When PC-Doctor is operated remotely, it is possible to perform a remote reboot. Remote rebooting is a complicated procedure that reloads the operating system and makes changes to CMOS RAM and configuration files. For further information on remote operations, refer to online documentation or help.

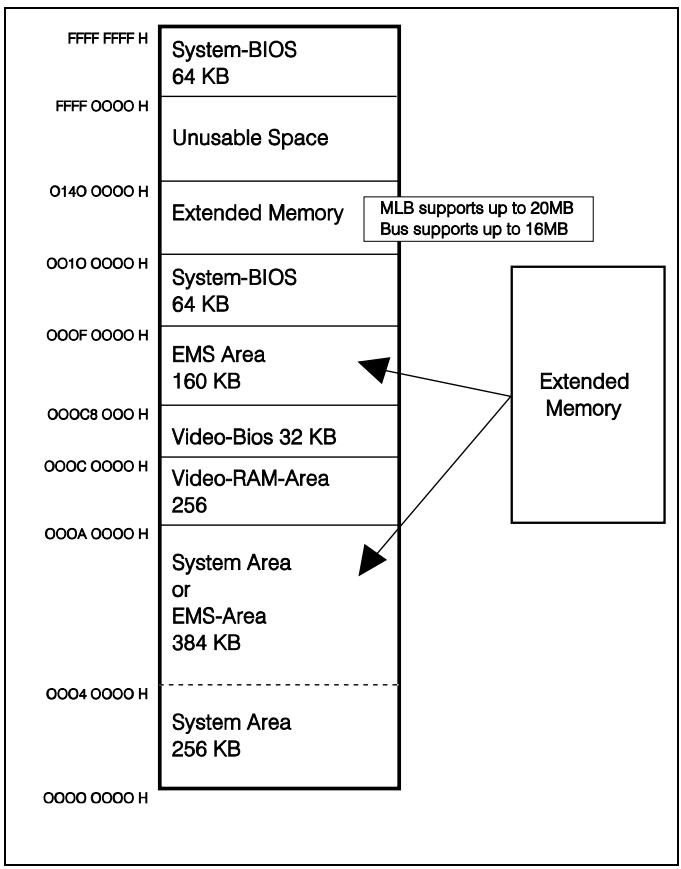
E
Configuring Memory

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.

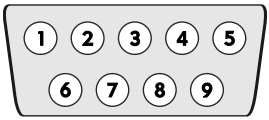
DEVICE=C:\DOS\EMM386.EXE [options]

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.

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

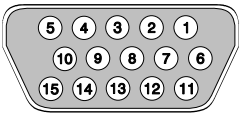
25-Pin Parallel Printer Connector

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

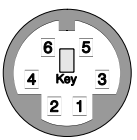
15-Pin VGA External Monitor Connector



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	
2	Not used	
3	Ground	
4	+5 volts	
5	Clock	
6	Not used	

G
Screen Standards

This appendix summarizes the screen standards supported by your computer's internal display adapter.

The following tables display screen standard and extended modes for external monitors, the LCD, and additional SimulScan modes.

Standard VGA Modes

External Monitors
Standard VGA Modes

Hex Mode	Display Mode	Number of Colors	Char. Per Row	Char. Cell (pixels)	Screen Resolution	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
0, 1	Text	16/256K	40 x 25	9 x 16	360 x 400	28	31.5	70
2,3	Text	16/256K	80 x 25	9 x 16	720 x 400	28	31.5	70
4,5	Graphics	4/256K	40 x 25	8 x 8	320 x 200	25	31.5	70
6	Graphics	2/256K	80 x 25	8 x 8	640 x 200	25	31.5	70
7	Text	Mono	80 x 25	9 x 16	720 x 400	28	31.5	70
D	Graphics	16/256K	40 x 25	8 x 8	320 x 200	25	31.5	70
E	Graphics	16/256K	80 x 25	8 x 8	640 x 200	25	31.5	70
F[a]	Graphics	Mono	80 x 25	8 x 14	640 x 350	25	31.5	70
10[a]	Graphics	16/256K	80 x 25	8 x 14	640 x 350	25	31.5	70
11	Graphics	2/256K	80 x 30	8 x 16	640 x 480	25	31.5	60
12	Graphics	16/256K	80 x 30	8 x 16	640 x 480	25	31.5	60
13	Graphics	256/256K	40 x 25	8 x 8	320 x 200	25	31.5	70

a 8 x 14 font provided with use of TSRFont utility.

External Monitors
Extended VGA Modes

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
11[a]	Graphics	2/256	640 x 480	72
11[a]	Graphics	2/256	640 x 480	75
12[a]	Graphics	16/256	640 x 480	72
12[a]	Graphics	16/256	640 x 480	75
14	Text	16/256	1056 x 400	70
54	Text	16/256K	1056 x 350	70
55	Text	16/256K	1056 x 350	70
58, 6A[c]	Graphics	16/256K	800 x 600	56
58, 6A	Graphics	16/256K	800 x 600	60
58, 6A	Graphics	16/256K	800 x 600	72
58, 6A	Graphics	16/256K	800 x 600	75
5C	Graphics	256/256K	800 x 600	56
5C	Graphics	256/256K	800 x 600	60
5C[a]	Graphics	256/256K	800 x 600	72
5C[a]	Graphics	256/256K	800 x 600	75
5D	Graphics	16/256K	1024 x 768	43
5D	Graphics	16/256K	1024 x 768	60

Extended VGA Modes

External Monitors
Extended VGA Modes (cont.)

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
5D	Graphics	16/256K	1024 x 768	70
5D	Graphics	16/256K	1024 x 768	72
5D	Graphics	16/256K	1024 x 768	75
5E	Graphics	256/256K	640 x 400	70
5F	Graphics	256/256K	640 x 480	60
5F	Graphics	256/256K	640 x 480	72
5F	Graphics	256/256K	640 x 480	75
60[d]	Graphics	256/256K	1024 x 768	43
60	Graphics	256/256K	1024 x 768	60
60	Graphics	256/256K	1024 x 768	70
60	Graphics	256/256K	1024 x 768	72
60	Graphics	256/256K	1024 x 768	75
64	Graphics	64K	640 x 480	60
64	Graphics	64K	640 x 480	72
64	Graphics	64K	640 x 480	75
65	Graphics	64K	800 x 600	56
65	Graphics	64K	800 x 600	60

External Monitors
Extended VGA Modes (cont.)

Hex Mode	Display Mode	Number of Colors	Resolution	Refresh Rate
66[e]	Graphics	32K	640 x 480	60
66[e]	Graphics	32Kd	640 x 480	72
66[e]	Graphics	32Ke	640 x 480	75
67[e]	Graphics	32K	800 x 600	60
6C[d]	Graphics	16/256K	1280 x 1024	43
6D[d]	Graphics	256/256K	1280 x 1024	43[f]
74[d]	Graphics	64K	1024 x 768	43[f]

a IBM standard VGA mode enhanced for higher vertical frequency
b Mode 54 uses 1056 x 344 addressable pixels (text mode), however it uses 1056 x 350 timing.
c Application programs should use mode 6A rather than mode 58 to retain compatibility with other VGA BIOS products
d Interlaced mode
e True-color packed-pixel mode
f Not available on TM5020SE models

Standard LCD Modes

Standard VGA LCD-Only Video Modes*

Hex Mode	Display Mode	# of Gray Shades (Mono)	Number of Colors	Char. Per Row	Char. Cell (pixels)	Screen Resolution
0, 1	Text	16/16	16/256K	40 x 25	8 x 16	360 x 400
2,3	Text	16/16	16/256K	80 x 25	8 x 16	720 x 400
4,5	Graphics	4/64	4/256K	40 x 25	8 x 8	320 x 200
6	Graphics	2/16	2/256K	80 x 25	8 x 8	640 x 200
7	Text	2/16	Mono.	80 x 25	8 x 16	720 x 400
D	Graphics	16/64	16/256K	40 x 25	8 x 8	320 x 200
E	Graphics	16/16	16/256K	80 x 25	8 x 8	640 x 200
F	Graphics	2/16	Mono.	80 x 25	8 x 14	640 x 350
10	Graphics	16/16	16/256K	80 x 25	8 x 14	640 x 350
11	Graphics	2/16	2/256K	80 x 30	8 x 16	640 x 480
12	Graphics	16/16	16/256K	80 x 30	8 x 16	640 x 480
13	Graphics	64/256	256/256K	40 x 25	8 x 8	320 x 200

* Maximum resolution for TM5020SE models is 1024 x 768 with 16 colors.

Extended LCD-Only Video Modes*

Hex Mode	Number of Colors	Char. Per Row	Char. Cell (pixels)	Screen Resolution	Video Clock (MHz)
5E	256/256K	80 x 25	8 x 16	640 x 400	25
5F	256/256K	80 x 30	8 x 16	640 x 480	31.5
64	64K	---	---	640 x 480	25
66[C]	32K[C]	---	---	640 x 480	25

* Maximum resolution for TM5020SE models is 1024 x 768 with 16 colors.

Standard SimulSCAN Modes

Standard SimulSCAN Video Modes

Hex Mode	Display Mode	# of Gray Shades (Mono)	Number of Colors	Char. Per Row	Char. Cell (pixels)	Screen Resolution
0, 1	Text	16/16	16/256K	40 x 25	8 x 16	360 x 400
2, 3	Text	16/16	16/256K	80 x 25	8 x 16	720 x 400
4, 5	Graphics	4/64	4/256K	40 x 25	8 x 8	320 x 200
6	Graphics	2/16	2/256K	80 x 25	8 x 8	640 x 200
7	Text	2/16	Mono.	80 x 25	8 x 16	720 x 400
D	Graphics	16/64	16/256K	40 x 25	8 x 8	320 x 200
E	Graphics	16/16	16/256K	80 x 25	8 x 8	640 x 200
F	Graphics	2/16	Mono.	80 x 25	8 x 14	640 x 350
10	Graphics	16/16	16/256K	80 x 25	8 x 14	640 x 350
11	Graphics	2/16	2/256K	80 x 30	8 x 16	640 x 480
12	Graphics	16/16	16/256K	80 x 30	8 x 16	640 x 480
13	Graphics	64/256	256/256K	40 x 25	8 x 8	320 x 200

Extended SimulScan Modes

Extended SimulSCAN Video Modes

Hex Mode	Number of Colors	Char. Per Row	Char. Cell (pixels)	Screen Resolution
5E	256/256K	80 x 25	8 x 16	640 x 400
5F	256/256K	80 x 30	8 x 16	640 x 480
64	64K	---	---	640 x 480
66[a]	32K[a]	---	---	640 x 480

a True-color packed-pixel mode

H
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.

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.

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.

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.

Glossary

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.

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*.

CPU — See *central processing unit*.

CRT — Abbreviation for cathode ray tube, a common term for a television-like computer monitor.

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.

Glossary

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."

extended memory — The internal RAM above the 1,024 KB of conventional memory.

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 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 casing 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.

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*.

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.

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.

PCI Bus — a 33 MHz bus that increases I/O bandwidth. This allows for faster information transfer, eliminates bottlenecks, and provides true multitasking.

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.

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*.

Glossary

SIR port — Serial Infrared port. Lets you connect external devices without cabling using infrared technology.

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 disk that prevents recording of data over existing data.

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