

*User's Reference Manual*

# **TravelMate Series Notebook Computer**

2581179-0001, REV. B

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This manual provides more detailed information about the hardware and software for your TravelMate™ series notebook computer.

Use the *Read Me First* to get your computer running for the first time.

Use the User's Guide to answer most questions about day-to-day operation of the computer.

Use the MS-DOS® *User's Guide and Reference* for information about the operating system.

If you have a WinSX™, WinDX™, WinDX2™, WinSLC™, or any other Win series model, use the Microsoft® *Windows™ User's Guide* for information about this graphical user interface.

You should also take advantage of the online help files that are available with almost all of the programs shipped with our computer.

# Using the Setup Programs

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## This chapter explains:

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

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# 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

## Accessing Disk-Based Setup

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

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

- Press **Fn-Esc (Setup)**
- Type `SET_UP` and press **Enter**

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

## Accessing 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 the Setup Programs

## Accessing Windows-Based Setup

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

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



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

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# Date and Time Parameters

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

# Disk Drive Parameters

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

# Input/Output (I/O) Parameters

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

- Parallel port
- PS/2 (mouse) port
- Standard serial port
- Optional serial port (usually an Internal Modem)

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

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Baud Rate</b>	<b>Values:</b> 110, 150, 300, 600, 1200, 2400, 4800, 9600 (default)	Page 4	Main Menu ↓ Control Panel ↓ I/O Ports ↓ Standard or Option Comm ↓ Baud Rate
<b>CTS (Clear to Send) (Standard Comm only)</b>	<b>Values:</b> Normal (default) Force On	Page 4	Main Menu ↓ Control Panel ↓ I/O Ports ↓ Standard Comm ↓ CTS



# Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Data Bits</b>	<b>Values:</b> 7, 8 (default)	Page 4	Main Menu ↓ Control Panel ↓ I/O Ports ↓ Standard or Option Comm ↓ Data Bits
<b>DSR (Data Ready Set) (Standard Comm only)</b>	<b>Values:</b> Normal (default) Force on	Page 4	Main Menu ↓ Control Panel ↓ I/O Ports ↓ Standard Comm ↓ DSR
<b>DCD (Data Carrier Detect) (Standard Comm only)</b>	<b>Values:</b> Normal (default) Force On	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ I/O Ports ↓ Standard Comm ↓ DCD



# Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Option Comm</b>	<p>Defines whether port enabled</p> <p><b>Values:</b>            Enable            Disable (default)</p> <p>If Internal Modem installed, enable it in Setup and use MPOWER (DOS) or Modem Power (Windows) utilities to turn modem off when you are not using it.</p>	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ Option Comm Port
<b>Parallel Port</b>	<p>Defines whether parallel port enabled</p> <p><b>Values:</b>            LPT 1 (default)            LPT 2            LPT 3</p>	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ I/O Ports ↓ Parallel
<b>Parity</b>	<p><b>Values:</b>            Odd, Even, None (default)</p>	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ I/O Ports ↓ Standard or Option Comm ↓ Parity



# Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Port</b>	<p>Determines whether port is COM1 or COM2.</p> <p><b>Values:</b> COM1 (default) COM2</p> <p>If you set this port as COM1 the Option Comm Port setting becomes COM2.</p>	Page 4	Cannot change. Use disk- or ROM-based Setup
<b>PS/2 Port</b>	<p>Selects device for PS/2 port</p> <p><b>Values:</b> Off, Mouse, Keyboard Auto (default)=detects whether keyboard or mouse attached</p>	No access. Use Windows-based Setup or the SETKEY command in MS-DOS.	Main Menu ↓ Control Panel ↓ I/O Ports ↓ PS/2 Port
<b>Standard Comm</b>	<p>Defines whether port enabled</p> <p><b>Values:</b> Enable (default) Disable</p>	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ I/O Ports ↓ Standard Comm Port ↓ Port Enabled



# Input/Output (I/O) Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Stop Bits	Values: 1 (default), 2	Page 4	Main Menu ↓ Control Panel ↓ WSETUP ↓ I/O Ports ↓ Standard or Option Comm ↓ Stop Bits

# Keyboard Parameters

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

# Memory Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
Shadow ROM	<p>Set to default for maximum performance of BIOS and Extended RAM unless your application requires the 384 KB (128 KB on SLC models) that Shadow ROM uses.</p> <p><b>Values:</b> Internal (default) All, None</p>	Page 1	Cannot change. Use disk- or ROM-based Setup
Standard	Do <i>not</i> change	Page 1	Cannot change. Use disk- or ROM-based Setup

# Power Management Parameters

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

Setup has two groups of power management parameters:

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

## Power Savings

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

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Advanced OS Power</b>	On (default) Auto Off	Page 2	
<b>Cover Closed Action</b>	What happens when the cover is closed while the computer is on.  <b>Values:</b> Suspend (default)= backlight and hard disk off and CPU suspended Backlight Off= only backlight off	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Cover Closed Action



# Power Management Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Default CPU Speed</b>	<p>CPU speed at startup</p> <p><b>Values:</b> Low, Medium, High Auto (default)—high speed for ac and medium speed for battery</p> <p>CPU speed can be changed by pressing <b>Ctrl-Alt-↑</b>, <b>Ctrl-Alt-↓</b>, or by pressing <b>Fn-F5 (Turbo)</b> on non-DX2 systems. You can also execute the SPEED utility on all systems.</p>	Page 2	<p>Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Processor Speed</p>
<b>Expansion Bus</b>	<p>Determines the rate data is sent across the expansion bus.</p> <p><b>Values:</b> Standard= AT-compatible speed Enhanced= Disables wait state or enhances speed for increased data rate Auto (Default)=standard speed for battery and enhanced speed for ac</p>	Page 2	<p>Main Menu ↓ Control Panel ↓ WSETUP ↓ System Configuration ↓ Expansion Bus</p>
<b>HDD Motor Timeout</b>	<p>Number of minutes without reads or writes before hard disk off</p> <p><b>Values:</b> 1, 2, 5 (default), 10, Always on</p> <p>Hard disk access may be delayed while the hard disk reaches operating speed. If an application has frequent hard disk access, a low setting may actually use more power because of the power required to bring the hard disk up to speed. If the computer is on AC when booted, the default value is Always on.</p>	Page 2	<p>Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ HDD Motor Timeout</p>



# Power Management Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>LCD Power</b>	<p>Defines brightness of backlighting; the lower the setting, the dimmer the backlighting and the lower the power requirements. This parameter does not affect color units.</p> <p><b>Values:</b> Low, Medium, High Auto (default)—high for ac and medium for battery</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ LCD Power
<b>Power Level</b>	<p>Level of savings activated under BatteryPro utility.</p> <p><b>Values:</b> Disabled 1—Low 2—Medium (default) 3—High 4—Maximum</p>	No access. Use SETPOWER command in MS-DOS.	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Power Level
<b>Power Savings</b>	<p>Defines how power-savings parameters as a group are enabled</p> <p><b>Values:</b> Auto (default)—Enabled battery only On (or Enable)—Enabled both battery and ac Off (or Disable)—Disabled</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings
<b>Timeout Action</b>	<p>What happens when defined timeout interval exceeded on monitored devices.</p> <p><b>Values:</b> Auto Suspend (Default)—backlight off on ac and backlight off and CPU low on battery Backlight Off—only backlight off under ac or battery</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ System Timeout



# Power Management Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Timeout Interval</b>	<p>Number of minutes of inactivity on monitored devices before implementing defined timeout action</p> <p><b>Values:</b> 1, 2 (default), 5, 10, 15, Always on</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ System Timeout
<b>Wakeup Action</b>	<p>What happens when wakeup interval expires and auto-suspend enabled; applies to battery operations only</p> <p><b>Values:</b> Backlight On and CPU normal (default) Backlight Remains Off and CPU normal</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Auto Wakeup
<b>Wakeup Interval</b>	<p>Number of minutes in auto-suspend mode before waking up</p> <p><b>Values:</b> 5, 10 (default), 15, 20</p>	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Auto Wakeup

# Activity Monitoring

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

- Comm**—includes the standard serial port and optional internal modem, if installed
- Disks**—includes both the hard disk and floppy drive
- PS/2 mouse or external keyboard** connected to the PS/2 port

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

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Comm</b>	Monitors COM1 and COM2 (if installed)  <b>Values:</b> Yes (or On) No (or Off) (default)	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Activity Monitor ↓ Comm
<b>Disks</b>	Monitors hard disk and floppy drive  <b>Values:</b> Yes (or On) No (or Off) (default)	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Activity Monitor ↓ Disks



# Activity Monitoring

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
PS/2 (Mouse)	Monitors PS/2 port  <b>Values:</b> Yes (or On) (default) No (or Off)  A mouse connected to the serial port is monitored by the Comm monitor	Page 2	Main Menu ↓ Control Panel ↓ WSETUP ↓ Power Savings ↓ Activity Monitor ↓ Mouse

# Screen Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Block Cursor</b>	<p>Specifies whether the cursor is always a block cursor, regardless of the application.</p> <p><b>Values:</b> On (default) Off</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Screen ↓ Block Cursor
<b>Display</b>	<p>Selects the display device.</p> <p><b>Values:</b> LCD= All display output on the LCD CRT= All display output on an external monitor; defaults to LCD if no external monitor (default) Both=Simultaneous display on the LCD and on the external monitor; defaults to LCD if no external monitor</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Screen ↓ Display Device
<b>Expanded Mode</b>	<p>Specifies whether all video modes can use the entire video area.</p> <p><b>Values:</b> On (default) Off</p> <p>In some video modes, <i>Off</i> restricts the viewing area at the top and bottom of the display area.</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Screen ↓ Expanded Mode



# Screen Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>LCD Palette</b>	<p>Specifies the startup palette.</p> <p><b>Values:</b>            Default Palette            Standard Palette 0 (default)            Standard Palette 1            Standard Palette 2            User Palette 1            User Palette 2 (default on some color models)</p> <p>Can be changed with RPAL utility</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Screen ↓ Palette
<b>Monitor Type</b>	<p>Selects the monitor device driver appropriate for your external monitor and application.</p> <p><b>Values:</b>            VGA, 8514 Compatible, Super VGA, Ext. Super VGA (default), Multifrequency, Extended Multifrequency, Super Multifrequency, Ext. Super Multifrequency</p> <p>Must match external monitor</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Monitor Type
<b>Reverse</b>	<p>Specifies startup status of video</p> <p><b>Values:</b>            On= White on black for text and graphics            Off (default)=Black on white for text and graphics            Text Only= Text only            Graphics Only= Graphics only</p> <p>Can change with standard/reverse video switch</p> <p>Not supported on color models</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ Screen ↓ Reverse

# System Configuration Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Battery Alarm</b>	<p>Defines whether the alarm sounds for low-battery condition</p> <p><b>Values:</b> On (default) Off</p> <p>Can be delayed in Windows with Power utility</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ System Configuration ↓ Alarms ↓ Battery Alarm
<b>Cover Alarm</b>	<p>Defines whether the alarm sounds when the cover closed</p> <p><b>Values:</b> On (default) Off</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ System Configuration ↓ Alarms ↓ Cover Alarm
<b>Internal Cache</b>	<p>Defines cache memory</p> <p><b>Values:</b> On (Enable) (default) Off (Disable)</p>	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ System Configuration ↓ Processor Cache



# System Configuration Parameters

Parameter	Definitions and Values	Page No. (Disk/ROM)	Access Path (Windows)
<b>Quick Boot</b>	Defines extent of self-test performed at startup  <b>Values:</b> On (default)=bypasses some tests, including memory tests Off= runs all self tests	Page 3	Main Menu ↓ Control Panel ↓ WSETUP ↓ System Configuration ↓ Quick Boot
<b>Speaker</b>	Defines whether the speaker on or off.  <b>Values:</b> On (default) Off	Page 3	Main Menu ↓ Control Panel ↓ System Configuration ↓ Speaker

# Installing and Using Applications

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## This chapter explains:

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

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# 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 applications 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.

### Communication Ports

The default serial port is COM1, and the optional Internal Modem, if installed, is COM2. When installing an application requiring communication support, select COM1 or COM2, as appropriate.

# Guidelines for Installing Applications

## Processing Speed

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

- Setup Program (see instructions in this manual)
- Ctrl-Alt-↑**, **Ctrl-Alt-↓**, or **Fn-F5** (Turbo) keys  
(*except on DX2 models*)
- SPEED utility



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**Note:** On DX2 models, memory managers such as EMM386 cannot be loaded when using the SPEED utility.

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- Laptop Manager Change menu



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

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

## Memory

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

# Guidelines for Installing Applications

This memory can be configured either as extended memory on LIM EMS (expanded) memory with appropriate memory messages (See Appendix F for details)

## AUTOEXEC.BAT File

If your applications requires additions or changes to the AUTOEXEC.BAT file, carefully consider the consequences.

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



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**Note:** If you need to restore the default AUTOEXEC.BAT file to your hard disk, it is included on the *BatteryPro & Productivity Applications* floppy furnished with your computer.

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

# Guidelines for Installing Applications

```
@ECHO OFF
SET COMSPEC=C:\DOS\COMMAND.COM
PATH=C:\WINDOWS;C:\UTILS;C:\;C:\DOS;
PROMPT $P$G
SET MFILE=C:\UTILS
SET TEMP=C:\DOS
C:\DOS\SMARTDRV
REM =====
REM = run GETSTAT /QW to insure QuickPort mouse connected
REM =====
GETSTAT /QW
SET MOUSE=C:\UTILS
C:\UTILS\MOUSE.EXE
REM =====
REM = To run MOUSE, remove the REM from the MOUSE line
REM =====
REM MOUSE /Y
REM =====
REM = To run RPAL, remove the REM from the RPAL line
REM =====
REM RPAL /I
GETSTAT /B
IF ERRORLEVEL 1 GOTO BATTERY
GOTO DONE
:BATTERY
VERIFY ON
:DONE
MPOWER OFF >NUL
REM =====
REM = To run LM, remove the REM from the LM line and
REM = place a REM in front of WIN /3.
REM =====
REM LM
WIN /3
```



# Guidelines for Installing Applications

## TravelMate 4000E Factory Default AUTOEXEC.BAT File

<b>Line</b>	<b>Purpose</b>
1	turns off echoing (displaying) of commands on screen
2	tells MS-DOS where to find the command processor
3	defines the directories and order in which to search for files entered on the command line; you can add additional directories to this line as required
4	tells MS-DOS to display the current drive and directory
5	tells MS-DOS where to find the Laptop Manager data file
6	tells MS-DOS where to find the temporary files
7	installs memory manager device driver
8,9,10	comment block describing the GETSTAT /QW command
11	prompts the user to connect BallPoint mouse if not connected at boot
12	tells MS-DOS where to find the mouse driver
13	loads the mouse driver
14,15,16	command block describing the MOUSE program
17	deleting the REM enables the mouse driver to be loaded
18,19,20	command block describing the palette control program
21	deleting the REM enables RPAL, a color palette control program, to load
22,23,24, 25,26,27	determines whether computer is on ac or battery power and turns on the command that verifies files are currently written to disk
28	turns power off to the internal modem
29,30,31,	comment block describing the Laptop Manager (LM)

# Guidelines for Installing Applications

Line	Purpose
32	program
33	deleting the REM enables the Laptop Manager to install
34	loads Windows to run in 386 enhanced mode and displays its Program Manager and Main Menu

## Default CONFIG.SYS Files

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

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

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH
FILES=30
BUFFERS=30
STACKS=9,256
FCBS=1
SHELL=C:\DOS\COMMAND.COM /P /E:256
DEVICE=C:\UTILS\BATTERY.PRO
```

# Guidelines for Installing Applications

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

<b>Line</b>	<b>Purpose</b>
1	tells some applications current DOS version
2	installs extended memory manager device driver
3	loads MS-DOS into extended memory
4	tells MS-DOS how many files can be open at any one time; you can adjust the value as required by your applications
5	tells MS-DOS how many buffers will be used for file input/output; you can adjust the value as required by your applications to maximize processing speed
6	reserves memory for MS-DOS to process hardware interrupts
7	number of file control blocks MS-DOS can concurrently open
8	tells application path to command processor
9	loads the device driver used to save battery power

# Setting Up a Password

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

## Loading the Password Utility

1. Ensure that you have created and are in the correct directory on your C drive. If not, create a PASSWORD directory within the UTILS directory from the MS-DOS `C:\>`, then go to that directory. At the MS-DOS `C:\>` prompt, type

```
CD UTILS\PASSWORD
```

2. Copy PW.EXE from your BatteryPro and Productivity applications diskette to the C drive. At the MS-DOS `C:\>` prompt, type

```
COPY A:\UTILS\PASSWORD\PW.EXE
```

3. At the MS-DOS `C:\>` prompt, type

```
UTILS\PASSWORD\PW
```

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

4. To select a Password command, press the initial character of the prompt, or press  $\uparrow$  or  $\downarrow$  to highlight to the desired command, and then press **Enter**.

## Installing a Password

1. Highlight *Install Password* on the Password Utility menu and press **Enter**. You are prompted for a password.
2. Type a password of up to eight characters, and press **Enter**.



# Setting Up a Password

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



---

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

---

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

Password already exists

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

## Changing a Password

1. Highlight the *Change Password* command on the Password Utility menu and press **Enter**. The Change Password menu appears.
2. Type the current password, and press **Enter**.

If you type the correct password, the message

Password check OK

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

# Setting Up a Password

If you type the wrong password, the message

Incorrect Password

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

3. Type a new password of up to eight characters, and press **Enter**.
4. Press **Enter** again to install the new password, or press the **Esc** key to abort the process and return to the Password Utility menu.

# Removing a Password

1. Highlight the *Remove Password* command on the Password Utility menu, and press **Enter**. The Remove Password menu appears.
2. Type the current password, and press Enter. If you type the correct password, the message

Password check OK

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

If you type the wrong password, the message

Incorrect Password

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

## Entering the Password

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



---

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

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# Restoring MS-DOS System Files

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

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



---

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

---

## If COMMAND.COM is Missing

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

Bad or missing Command Interpreter

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

## If .SYS Files are Missing

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

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

This message is repeated when any key is pressed.

# Restoring MS-DOS System Files

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

1. Turn off the computer, and insert the furnished 3.5-inch *Microsoft MS-DOS, Disk 1* floppy into the floppy drive.
2. Turn on the computer and when the computer displays the "Welcome to Setup" menu, press **Enter**, and follow the directions.

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

3. Press Enter.

*DOS begins installing and prompts you for all three diskettes. A supplemental DOS diskette is provided. This diskette includes optional utilities such as AccessDOS, keyboard utilities, and MS-DOS 5.0 utilities.*

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

```
A:SETUP
```

## Restoring Windows

After you restore the MS-DOS files, you will be instructed to restore the remaining applications (Windows, BatteryPro, BallPoint, and TM4000 display drivers).

1. Place the Windows diskette in Drive A and from the MS-DOS **C:\>** prompt type

```
A:SETUP
```

# Restoring MS-DOS System Files

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

2. Enter C:\Windows as the default.

*You are prompted to load each of the Windows diskettes.*

3. When installation is complete, reboot your computer.

## Restoring BatteryPro Utilities

After you restore the MS-DOS and Windows files, install the BatteryPro utilities:

1. Insert the *BatteryPro and Productivity Applications* floppy into drive A, and at the MS-DOS **A:\>** prompt, type

INSTALL

and press **Enter**.

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

2. Follow the instructions on the screen.

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

# Setting Up a Non MS-DOS Environment

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

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

```
C:\UTILS\SET_UP.EXE
```

*The Setup Program appears.*

2. Press **FN+PgDn** to go to the page that displays Advanced OS Power: ON.
3. Using the Up and Down arrow keys, select the word ON next to Advanced OS Power.
4. Using the Left and Right arrow keys, select the word OFF.
5. Press ESC.
6. Press F4 to save the change.
7. Continue loading your operating system according to documentation that came with your applications. For additional drivers, call 1-800-TI TEXAS.

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

## Basic Operations

The following sections cover adding/changing, deleting, copying, and other application-specific functions relating to

Overview of Windows Utilities .....	3-2
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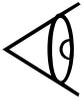
# Drop N' Go Utility

Drop N' Go. To start Drop N' Go, select the **Exit** button from the Drop N' Go Setup menu and follow any instructions that appear on the screen.

## Adding/Changing Applications

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

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



---

**Note:** If Drop N' Go does not appear on your desktop ensure that you have installed utilities from the TravelMate Series *BatteryPro and Productivity Software diskette*.

---

*The Drop N' Go Setup menu appears.*

2. If you are adding an application, place the cursor under Icon Applications and single click. If you are changing an application, single click on the application you want to change.
3. Select the Add or Change button.

*The Icon Application dialog box appears.*

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



---

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

---

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

## Drop N' Go Utility

7. Place the cursor under Menu Title, click, and type the title of the menu you wish to use in File Manager (for instance, Drop N' Go).
8. If you are adding an application, place the cursor under Menu Applications and single click. If you are changing an application, single click on the application you want to change.
9. Select the Add or Change button.
10. Enter required information on the application you wish to add. This very similar to the Run...dialog box used in the Program Manager

11. Select OK.
12. Close the Icon Application Setup dialog box.

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

13. Close and reopen File Manager.

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

## Deleting Applications

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

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

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

3. Select OK.

*The file is deleted from the list.*

# Drop N' Go Utility

## Copying Applications

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

## Enable/Disable Menu

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

## Icon Placement

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

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

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



Shutdown is in the Startup Group, so it loads when Windows loads. If the Shutdown icon is not visible at the lower left corner of the Windows display, click on the small up/down arrows box in the extreme upper right corner of the Program Manager menu. The Shutdown icon appears in the position in which it was last saved.

## **WSetup Icon**

Double-click the WSetup icon in the Control Panel of the Main Windows Group to access the Windows-based Setup program, described elsewhere in this manual.

# Drop N' Go Utility

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

## Basic Operations

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

## Adding/Changing Applications

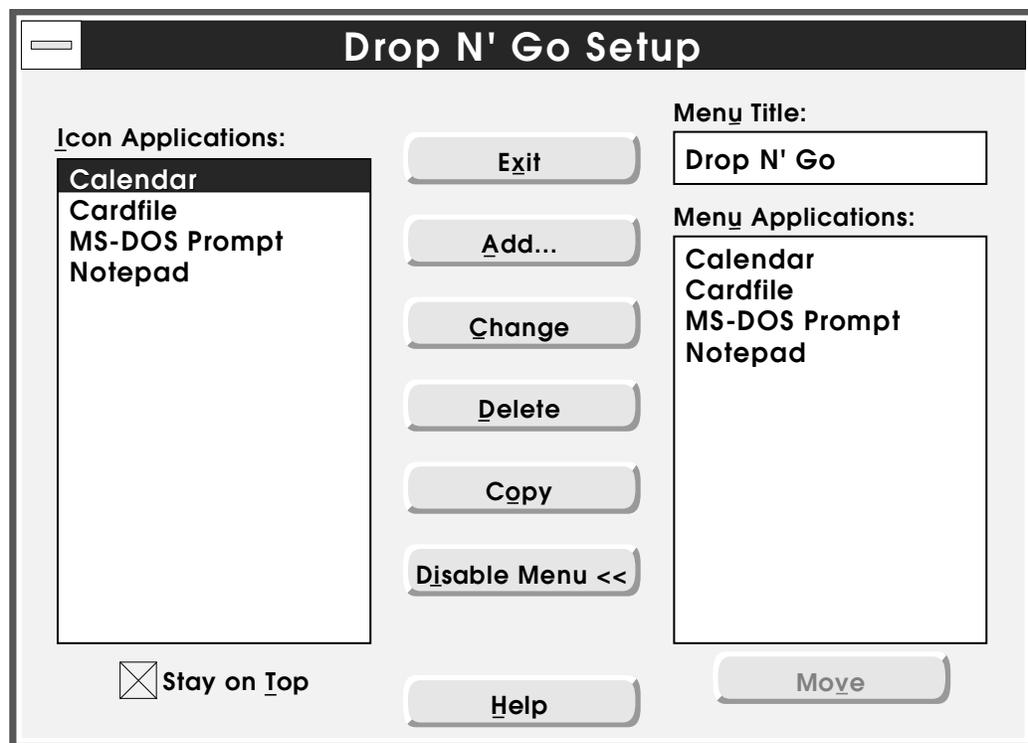
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1. Double click on the Drop N' Go icon on your desktop.



**Note:** If Drop N' Go does not appear on your desktop ensure that you have installed utilities from the TravelMate Series *BatteryPro* and *Productivity Software* diskette.

*The Drop N' Go Setup menu appears.*



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



# Drop N' Go Utility

3. Select the Add or Change button.

*The Icon Application dialog box appears.*

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



---

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

---

5. Select OK.
6. To add the application as a menu item in File Manager, select Enable Menu from the Drop N' Go Setup menu.
7. Place the cursor under Menu Title, click, and type the title of the menu you wish to use in File Manager (for instance, Drop N' Go).
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10. Enter required information on the application you wish to add. This very similar to the Run...dialog box used in the Program Manager

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*The file is deleted from the list.*

# Drop N' Go Utility

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

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

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

# Change Cursor Utility

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

- ❑ **The arrow** is a mouse pointer if your BallPoint device or other mouse-type device is installed
- ❑ The **hourglass** signals that Windows is saving work or loading a program or otherwise performing work that cannot be interrupted
- ❑ The **I-beam**, called a *selection cursor*, denotes the place in text or graphics displays where your typing or drawing will appear; usually can be moved using your BallPoint device or mouse
- ❑ The four double-arrow cursors are used by Windows to denote box sizing. The cursors east-west, north-south, northeast-southwest, and northwest-southeast, are named for the directions to which they point.



---

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

---

## Change Cursor Menu

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

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



# Change Cursor Utility

**Left Button Box** — The two stacked boxes to the right of the detail window, labeled *Left Button* and *Right Button*, let you assign one of four editing functions to the left and right buttons on your BallPoint device or other mouse. Clicking on the circles within the boxes causes the following when you subsequently move the pencil-shaped editing cursor to the detail window.

<b>White</b>	causes the button to change the grid element to white
<b>Black</b>	causes the button to change the grid element to black
<b>Screen</b>	causes the button to change the grid element to the current screen background color: dark gray on the LCD or blue on a color display or an external color monitor. Used to cancel a changed element
<b>Inverse</b>	causes the button to change the grid element to display the inverse of the current screen background color: darker gray on the LCD or green on a color display or monitor



---

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

---

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

## Creating a New Cursor

Creating a cursor involves three primary processes:

Using the File menu to open a new file in which to save your new cursor, or you can load the default cursor or a previously designed cursor to edit

# Change Cursor Utility

- ❑ Drawing new cursor(s) on the detail window or editing existing cursor(s)
- ❑ Using the Configure menu to install (or remove) the new cursor(s) to load automatically when you load Windows

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

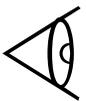
If you wish to erase a change you made to a single grid element -- that is, restore a grid element to its original shade or color -- move the cursor to the Left Button or Right Button box and click on the *Screen* option. Then move your pencil cursor to the grid element you want to erase, and click to the left or right button you just changed to a *Screen*.

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

---

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

---



# Change Cursor Utility

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



---

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

---

## Change Cursor Menu Bar

Select Cursor at the Change Cursor menu bar, and the Cursor menu drops down. The following items are available at this menu.



---

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

---

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

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

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

# Change Cursor Utility

## File Menu

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

- New** erases any cursor currently in the detail window and displays a clean grid.
- pen** displays a menu at which you can type a new filename at the Open File Name box, or double-click the filename of a previously designed cursor.
- Save** saves the cursor shown in the detail window under its existing filename. If you have not yet named the file, the program displays the Save As menu described below.
- Save As** displays a menu where you can type a new filename for your cursor, or you can double-click an existing filename listed in the *Files:* window. If you select an existing filename, the program displays a menu asking you to verify that you want to replace (overwrite) an existing cursor file. Click on the OK button if you still want to replace an existing file.
- Exit** minimizes the Change Cursor program (runs it in background) and returns control to Windows. If you have created or edited a cursor without saving it, the Exit command displays a menu asking if you want to save current changes. If you click on Yes, the program displays the Save As menu described above if the cursor is new or saves the changes if the file already existed.

# Change Cursor Utility

## Configure Menu

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

- Save cursor settings** displays a dialog box listing the filename and path for the seven cursors used with Windows. If the listing is correct, click on the OK button.
- Load cursor settings** restores cursor settings after you save them and automatically loads them for use in Windows. This function is automatically done if you use the *Install for automatic setup* option described next.
- Install for automatic setup** modifies Windows so that it always boots (if CHCURSOR also is loaded) with the cursor(s) you select, either the default cursors or your own design. Clicking on this option presents a display asking you to OK or cancel the action.
- Uninstall Change Cursor** removes the CHCURSORutility from Windows, which then uses the default cursors.
- Scheduling** relates to power-savings features. Do not change the value unless advised by your authorized TI representative.

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

- ❑ **The arrow** is a mouse pointer if your BallPoint device or other mouse-type device is installed
- ❑ The **hourglass** signals that Windows is saving work or loading a program or otherwise performing work that cannot be interrupted
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- ❑ The four double-arrow cursors are used by Windows to denote box sizing. The cursors east-west, north-south, northeast-southwest, and northwest-southeast, are named for the directions to which they point.



---

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

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---

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# Change Cursor Utility

- ❑ Drawing new cursor(s) on the detail window or editing existing cursor(s)
- ❑ Using the Configure menu to install (or remove) the new cursor(s) to load automatically when you load Windows

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

If you wish to erase a change you made to a single grid element -- that is, restore a grid element to its original shade or color -- move the cursor to the Left Button or Right Button box and click on the *Screen* option. Then move your pencil cursor to the grid element you want to erase, and click to the left or right button you just changed to a *Screen*.

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

---

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

---



# Change Cursor Utility

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



---

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

---

## Change Cursor Menu Bar

Select Cursor at the Change Cursor menu bar, and the Cursor menu drops down. The following items are available at this menu.



---

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

---

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

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

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

# Change Cursor Utility

## File Menu

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

- New** erases any cursor currently in the detail window and displays a clean grid.
- pen** displays a menu at which you can type a new filename at the Open File Name box, or double-click the filename of a previously designed cursor.
- Save** saves the cursor shown in the detail window under its existing filename. If you have not yet named the file, the program displays the Save As menu described below.
- Save As** displays a menu where you can type a new filename for your cursor, or you can double-click an existing filename listed in the *Files:* window. If you select an existing filename, the program displays a menu asking you to verify that you want to replace (overwrite) an existing cursor file. Click on the OK button if you still want to replace an existing file.
- Exit** minimizes the Change Cursor program (runs it in background) and returns control to Windows. If you have created or edited a cursor without saving it, the Exit command displays a menu asking if you want to save current changes. If you click on Yes, the program displays the Save As menu described above if the cursor is new or saves the changes if the file already existed.

# Change Cursor Utility

## Configure Menu

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

- |                                    |                                                                                                                                                                                                                                       |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Save cursor settings</b>        | displays a dialog box listing the filename and path for the seven cursors used with Windows. If the listing is correct, click on the OK button.                                                                                       |
| <b>Load cursor settings</b>        | restores cursor settings after you save them and automatically loads them for use in Windows. This function is automatically done if you use the <i>Install for automatic setup</i> option described next.                            |
| <b>Install for automatic setup</b> | modifies Windows so that it always boots (if CHCURSOR also is loaded) with the cursor(s) you select, either the default cursors or your own design. Clicking on this option presents a display asking you to OK or cancel the action. |
| <b>Uninstall Change Cursor</b>     | removes the CHCURSORutility from Windows, which then uses the default cursors.                                                                                                                                                        |
| <b>Scheduling</b>                  | relates to power-savings features. Do not change the value unless advised by your authorized TI representative.                                                                                                                       |

## This chapter tells you about

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

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# Laptop Manager Features

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

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

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

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



---

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

---

LM is installed on the hard disk at the factory and is also stored on the *BatteryPro & Productivity Software* floppy. LM displays its main menu when you load it from the Windows Notebook group menu or from the MS-DOS prompt.

## Loading LM

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

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

LM

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

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

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

## Exiting LM

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

## Quick Commands Box

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

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

- F1 — Help screens

# LM Main Menu

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

## Single-Character Quick Commands

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

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

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

# Adding Applications to the Menu

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

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

## Quick Commands Program Setup Menu

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

Laptop Manager-Change Menu vn.nnTue Oct 15 12:15 pm

---

Applications List

Texas Instruments Incorporated  
TravelMate Series

Microsoft Windows n.n

Change Menu Commands

F1	- Help
F2	- Insert Appl
F3	- Delete Appl
F4	- Modify Appl
F5	- Cut Appl
F6	- Paste Appl
F7	- Modify Fkey
F8	- Cut Fkey
F9	- Paste Fkey
F10	- Exit Password
F11	- Screen Colors
F12	- Save

---

C:\ESC = Exit

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



# Adding Applications to the Menu

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

LM then displays the Quick Command Program Setup menu.

Laptop Manager - Change Menu Vn.nn Tue Oct 15 12:15 pm

---

Quick Command Program Setup - Fn

Display string:	[	]
Program pathname:	[	]
Parameter string:	[	]
Working directory:	[	]
Password required? [ N ]	Password:	[ ]
Use color palette? [ N ]	Filename:	[ ]
Power savings level to use?.....		[Current]
Screen background during execution?		[Current]
CPU speed during program execution?		[Low ]
Keep Laptop Manager resident?.....		[ Y ]
Prompt after program execution?....		[ N ]

---

C:\ F1=Help

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

## Display String

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

Communication

# Adding Applications to the Menu

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

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

If you have the Numeric Keypad option, you can enter the graphical characters directly by pressing and holding **Alt**.

## Program Pathname

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

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

```
C:\UTILS\COMPROG
```

and press **Enter**.

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

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

# Adding Applications to the Menu

## Parameter String

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

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

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

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

When you press the selected function key, the prompt

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

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

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

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

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

# Adding Applications to the Menu

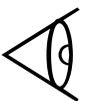
You can use up to four optional parameter string buffers (%A, %B, %C, and %D); however, the %D buffer is assigned for use by the LM single-character command D (DOS). You can use all four, but the information in the %D buffer will change every time you enter a string for either the application or the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

## Working Directory

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

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

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



---

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

---

## Password Required?

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

# Adding Applications to the Menu

## Password

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

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



---

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

---

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

## Use Color Palette?

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

# Adding Applications to the Menu

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



---

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

---

## Power-Savings Level to Use?



---

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

---

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

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

## Screen Background During Execution

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

# Adding Applications to the Menu

## CPU Speed During Program Execution?

In response to the *CPU speed during program execution?* prompt, select the system speed you want to use during program execution by pressing the Space Bar to toggle among *High*, *Low*, and *Auto*. Select *Low* for optimum battery-charge conservation. *Auto* uses high speed if the computer is on ac power or medium speed if the computer is on battery power. Your application may specify a processing speed; check your application documentation. If you are running this application on a DX2 model, ensure that EMM386 or other memory managers are not loaded.

## Keep Laptop Manager Resident?

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

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

## Prompt After Program Execution?

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

Press any key to return to Laptop Manager

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

# Adding Applications to the Menu

## Exiting the Quick Command Program Setup Menu

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

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

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

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

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

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

## Testing Your Menu

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

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

# Adding Items to the Application Menu

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

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

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



---

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

---

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

## Changing LM Menu Colors

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

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

# LM\_Setup

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

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

## This chapter tells you about

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

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# Color Display Utilities

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

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

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

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



---

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

---

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

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

## Changing to a Predefined Palette

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

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

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



---

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

---

## Changing Specific Shades

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

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

# PAL Utility



---

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

---

## Other Ways to Select a Predefined Palette

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

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

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

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



---

**Note:** You also can press **Fn-Alt-Esc** to toggle through the six available palettes.

---

## Viewing the Current Palette

To view the palette currently in use, type **PA** at the MS-DOS prompt and press **Enter**.

The current palette is displayed along with the following statement:

Color Palette set to Grayscale Palette  $n$

**( $n=0 - 5$ )**

## **RPAL Utility**

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



---

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

---

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

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



---

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

---

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



# PAL Utility

## Installing RPAL

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

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

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

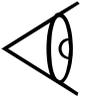
## RPAL Switches

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

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

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

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



---

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

---

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

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

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

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

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

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

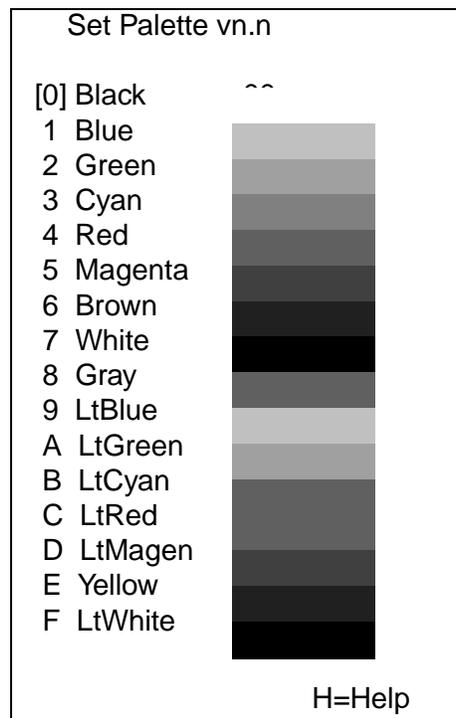
In these commands, *user1file* and *user2file* must be the full paths and filenames of the RPAL data file you select as user palette 1 (p4) or user palette 2 (p5). You can then access these palettes from the keyboard by pressing **Fn-Alt-Esc**.

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

# PAL Utility

## Using RPAL

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



You can use the following keys at the RPAL menu.

## RPAL Menu Function Keys

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

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

## Saving an RPAL Data File

To save an RPAL data file, follow these steps.

1. Press **S** from the RPAL Set Up Menu. RPAL displays a filename prompt.
2. Type the full path and filename of the RPAL data file. (RPAL limits your *pathname/filename* to 38 characters.)
3. Either press **Enter** to save the file or **Esc** to exit without saving the file.



---

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

---

## Adding RPAL to Your AUTOEXEC.BAT File

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

```
RPAL /I /Ddatafile /Kc
```

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



---

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

---

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

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

## Modifying Gray Scale Palettes

To modify gray scale palettes, complete the following steps:

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

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



# PALSET Utility

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

2. Use the **up** and **down** arrow keys to select the color you wish to edit.
3. Use the **left** and **right** arrow keys to change values for the selected color.
4. Select **ESC** to accept color changes or **RESET** to reset values to the previous settings.

## 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

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# Getting Started with LFM

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

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



---

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

---

# Getting Started with LFM

## Loading LFM

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

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

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

Laptop File Manager vn.nn				Mon Nov 30 12:00 pm	
C:\				Commands	
<b>Filename Ext</b>	<b>Bytes</b>	<b>Attr</b>	<b>Last Update</b>	A - Attr	P - Print
DOS	<DIR>	....	00/00/90 00:59:59	C - Copy	Q - Quit
UTILS	<DIR>	....	00/00/90 00:00:59	D - Delete	R - Rename
AUTOEXEC BAK	183	A...	00/00/90 00:00:59	E - Edit	S - Show
CONFIG BAK	75	A...	00/00/90 00:00:59	X - Excl	T - Tag
AUTOEXEC BAT	184	A...	00/00/90 00:00:59	F - Find	ESC- Up
CONFIG SAV	55	A...	00/00/90 00:00:59	I - Incl	U - Update
COMMAND COM	25308	A...	00/00/90 00:00:59		
MSETUP EXE	143680	A...	00/00/90 00:00:59		
CONFIG SYS	79	A...	00/00/90 00:00:59		
MSDOS SYS	30128	ARSH	00/00/90 00:00:59		
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.

# Using the Main Menu

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
<b>F1</b>	shows Help screen
↑	moves highlight up
↓	moves highlight down
<b>End</b>	highlights last listing
<b>Home</b>	highlights first listing
<b>PgDn</b>	shows next page or Help screen if more than 1 page
<b>PgUp</b>	shows previous page or Help screen
<b>S, Enter</b>	if directory name highlighted, shows selected subdirectory; if filename highlighted, shows contents of file
<b>T</b>	tags or untags highlighted directory or file for multiple command action
<b>Esc</b>	if at subdirectory, returns to higher directory; if at root directory, no action; if command active, cancels command
<b>Q</b>	exits LFM or current screen of split screen after the “Are you sure?” prompt: <ul style="list-style-type: none"><li>• press <b>Y</b> to exit LFM or one screen of split screen</li><li>• press <b>N</b> or <b>Enter</b> to cancel exit command</li></ul>



# Function Key Commands

## 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





# Function Key Commands

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**.

---



# Function Key Commands



---

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

---

## F10 Setup Key

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

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

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

# Function Key Commands

## Pathnames/Options Setup Menu

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

<b>Pathname Setup</b>	
Editor Pathname :	[ C:\DOS\EDIT.COM ]
Change Parameters:	[ N ] Parms: [ %F ]
Showfile Pathname:	[ ]
Change Parameters:	[ N ] Parms: [ %F ]
<b>Options Setup</b>	
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.

# Function Key Commands

## 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 previously.

# Character Key Commands

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  $\uparrow$  or  $\downarrow$  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] ronly [I] sys [I] hide

Press  $\rightarrow$  or  $\leftarrow$  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.



# Character Key Commands

- 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.

# Character Key Commands

## 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.

# Character Key Commands

## 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**.

# Character Key Commands

**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] ronly [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 *ronly* 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.

# Character Key Commands

- 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.

# Character Key Commands

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

# Character Key Commands

Attributes: [Y]es, [N]o, [I]gnore: [I] arch [I] ronly [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 *ronly* 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*.

# Character Key Commands

- 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

# Character Key Commands

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

## Quit Command

The **Q**uit 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**.

# Character Key Commands

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.

# Character Key Commands

## 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.

# Multiple File Operations

## 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 3.5-inch *BatteryPro & Productivity Software* floppy furnished with your computer.

Insert the *BatteryPro* floppy and at the **A:\>** prompt, type **INSTALL** and press **Enter**. Then respond to the prompts to install the appropriate software for your computer and its options.

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

# 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

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# Capabilities

Your TravelMate 4000 E computer supports several enhanced modes beyond the VGA standard, including the ability to display 132 columns of text and 256-color graphics at resolutions of  $640 \times 480$  and  $640 \times 400$  on any supported monitor. In addition, the TravelMate 4000 E supports  $800 \times 600$  resolution, 16- and 256-color graphics on a multifrequency monitor and  $1024 \times 768$  resolution, 16-color graphics on an 8514 or compatible monitor. Some products may also support  $1280 \times 104 \times 16$  and  $1024 \times 768 \times 256$  resolution (interlaced).

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

The computer external monitor display drivers are furnished on a 3.5-inch floppy named *VGA Driver Installation*.

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

## **Extended $1024 \times 768$ Graphics Mode**

The computer is capable of supporting a  $1024 \times 768$  graphics mode with 16 colors. This high-resolution mode is interlaced and requires the use of an IBM 8514 or equivalent interlaced monitor. Some products may also support  $1280 \times 104 \times 16$  and  $1024 \times 768 \times 256$  resolution (interlaced).

## Extended 16 and 256-Color 800 × 600 Graphics Mode

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



---

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

---

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

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

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

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

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

# Capabilities

## 132-Column Text Modes

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

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

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

## Configuring Your Application Program

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

However, some programs are written specifically for certain non-VGA or non-EGA video hardware so you may have to configure your computer to behave identically to the video board needed by the particular software. For this purpose, your *BatteryPro & Productivity* floppy 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.

# VGA Utility

## TravelMate 4000E Video Standards Supported

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

### Notes to the table:

- (1) “Simultaneous colors” refers to the number of colors or shades that can be displayed at one time.
- (2) This column refers to the old style display the mode was originally designed for. The 800h × 600v graphics modes require a multifrequency monitor, and 1024h × 768v graphics modes require an 8514 or equivalent compatible monitor.
- (3) The 200-line vertical resolution modes are double-scanned to display 400 lines on screen.

- (4) These modes require use of application-specific drivers included on your *VGA Drivers* floppy or special drivers furnished with your application.
- (5) Supported on some notebooks.

## Installation Hints

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

- The best display images usually are achieved by installing your applications for the highest resolution mode available.
- Some applications automatically detect what type of video card and monitor combination are installed and configure themselves to take best advantage of the available hardware.
- Install your software for VGA or IBM PS/2 video if possible. This permits your software to run on your computer in start-up configuration.
- If your software does not specify a VGA or IBM PS/2 option and you are using a color analog monitor, try installing the application for “color” if available. This usually works in the computer’s default color mode on color monitors and the color LCD.



# VGA Utility

## TravelMate 4000E VGA Software

The *VGA Driver Installation* floppy furnished with your computer contains several programs designed to help you operate your external monitor most efficiently.

Various drivers that let popular applications take advantage of your computer's extended graphics and 132-column text modes are supplied on the furnished *VGA Driver Installation* floppy. For driver installation instructions, run the INSTALL.BAT file included on the floppy by typing at the MS-DOS **A:\>** prompt

INSTALL

and pressing **Enter**.

You can copy the drivers for programs such as Lotus 1-2-3. You should make back-up copies of your *VGA Driver Installation* floppy.



---

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

---

## Using VGA.EXE

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



---

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

---

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

```
VGA
```

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

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

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

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

```
VGA ?
```

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

```
VGAHELP
```

# VGA Utility

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

## VGA Utility Commands

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

## VGA Utility Commands (continued)

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



# VGA Utility

**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.

---

## Installing the Video Device Drivers

The *VGA Driver Installation* floppy furnished with your computer provides a special installation program to help you install various video device drivers supported by enhanced VGA display modes. To run the installation program, insert your *VGA Driver Installation* floppy into the floppy drive. At the MS-DOS **A:\>** prompt type

INSTALL

and press **Enter**. When the installation menu appears, move the highlight to the name of the video driver you want to install. The menu then shows installation instructions for that program or automatically installs the driver after pressing **Enter**.

# Advanced Monitor Operations

## VGA and Extended VGA Programming

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

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

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

# Advanced Monitor Operations

## TravelMate 4000 E Standard VGA Video Modes

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

### Notes to the table:

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

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

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

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

# Advanced Monitor Operations

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

---

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

---

## TravelMate 4000 E Extended VGA Video Modes

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

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

**(2)** Available on some notebook products

# Advanced Monitor Operations

## 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.

<b>Symptom</b>	<b>Solution</b>
No display	<p><b>(1)</b> Computer not configured appropriately for VGA; configure the application as instructed in the application's documentation.</p> <p><b>(2)</b> Monitor signal and/or power cable not properly plugged in.</p> <p><b>(3)</b> Monitor not turned on.</p> <p><b>(4)</b> Brightness and/or contrast controls on monitor not adjusted properly.</p> <p><b>(5)</b> LCD still active; use the CRT command to switch to external monitor.</p>
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 <i>CRT Type</i> 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.

Other utilities available from Texas Instruments are automatically installed in the /UTILS directory on the hard disk. Backup copies of this software are available on the BatteryPro/Productivity Software diskette. Available utilities are as follows:

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

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# ALARM Utility

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

ALARM

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

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

To view a brief help display, type

Alarm /?

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

Usage:     - Alarm (/switch)

Alarm       - Shows status of Cover and Low Battery Alarms

Alarm /On   - Turns the Cover and Low Battery Alarms On.

Alarm /Off   - Turns the Cover and Low Battery Alarms Off.

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

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

ALARM ON

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

# Cursor Control

The CURSOR utility gives you control over the size and visibility of the cursor on your LCD. This utility also enables you to control the typematic character repeat rate and character repeat delay times.



---

**Note:** Many applications take control of the cursor and typematic features and provide their own cursor setup procedures. See your application documentation.

---

Adjust the cursor and typematic characteristics as follows.

1. At the **C:\>** prompt, type

```
CURSOR /?
```

and press **Enter**. The CURSOR utility displays the following menu and then returns to the MS-DOS prompt:

```
/sx cursor size, s is:  
  f - full cursor  
  h - half  
  u - underline (def)
```

2. To change the cursor, type

```
CURSOR /SY
```

where *Y* is the one-letter code to change the cursor.

For example, the code to change cursor size to a full-size cursor is *F*. Therefore, to change the cursor to full-size, you would type

```
CURSOR /SF
```

and press **Enter**.



---

**Note:** Be sure you include the / (slash) character before each two-letter code. Spaces between codes are optional.

---

## Cursor Size

The cursor size adjustment, set using the *SX* code, lets you set the cursor size to a half, full, or underline cursor. The underline is the default size.

# 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)
- Presence of mouse or QuickPort (/Q)

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

## GETSTAT Commands

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

```
GETSTAT /M
```

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

```
GETSTAT /E
```

If the expansion unit is connected, GETSTAT exits with an `ERRORLEVEL = 1`; if the expansion unit is not connected, GETSTAT exits with an `ERRORLEVEL = 0`.

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

```
GETSTAT /B
```

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

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

```
GETSTAT /V
```

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

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

To verify that a mouse is attached to the QuickPort, type

```
GETSTAT /Q
```

If a mouse is attached to the QuickPort, GETSTAT exits with an ERRORLEVEL=1. If a mouse is not attached to the QuickPort, GETSTAT exits with an ERRORLEVEL=0.

If GETSTAT /QW is used, GETSTAT prompts you to attach a mouse to the QuickPort before continuing.

## 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 on the *BatteryPro & Productivity Software* floppy.



# GETSTAT Utility

```
@echo off
rem version 1.0
rem =====
rem check to see if an expansion station is attached
rem =====
getstat /e
if ERRORLEVEL 1 goto yes_exp
echo No expansion station attached
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 conected to the system

getstat /q (HELP!)
:exit_all
```

# RAMDRIVE.SYS Device Driver



---

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

---

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



---

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

---

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

# 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. The factory default file, FACTORY.CMS stored under the UTILS directory, is the file used when you press **F4 (Reset Config)** at the Laptop Manager main menu.

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

## SETCMOS Command

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

```
SETCMOS /?
```

and press **Enter**.

# SETCMOS Utility

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 and on the *BatteryPro & Productivity Software* floppy.



---

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

---

# SETCMOS Utility

## Saving Your CMOS Data

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

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

```
SETCMOS /S MYFILE.CMS
```

and press **Enter**.

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

# SETKEY Utility

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

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

Usage: SETKEY [/rx /dx /nx /px /S]

/rx char repeat rate, x is:

- v - 30 cps
- f - 20 cps
- n - 10 cps (default)
- s - 5 cps
- c - 2 cps

/dx char repeat delay, x is:

- 1 - 1 second
- 2 - .75s
- 3 - .5s (default)
- 4 - .25s

/mx mouse location, x is:

- q QuickPort active after powerup
- p PS2 port active after powerup
- n Serial mouse or no mouse

/kx keyboard location, x is:

- i internal or expansion port
- a automatic (PS2, internal or expansion port)
- p assume device at PS2 port is a keyboard (disables for mouse)
- n numeric PS2 keypad on PS2 port

/S Show the current PS/2 port setting

/cx swap caps lock key with left Ctrl key, x is:

- n caps lock and left Ctrl keys function normally
- s caps lock and left Ctrl keys are swapped

# SETKEY Utility

/ax right Alt/Ctrl key switch, x is:

- n Right Alt key functions normally
- s Right Alt key functions as the Control key

## 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.

## This chapter explains:

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

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# Battery Options

Your computer has the following options to enhance battery-powered operations:

- Battery Charger
- Battery Discharger
- Extra Battery Pack

## Battery Charger and Discharger

The Battery Charger and Discharger (TI Part No. 2581240-0004) enhances the battery power. The Battery Charger allows you to charge an extra Battery Pack independently of the computer to ensure that you always have a fully-charged battery. Refer to the guide that comes with the Battery Charger for usage instructions.

The Battery Discharger helps condition a battery by putting it through its deep discharge cycle without disrupting computer operations. Refer to the guide that comes with the Battery Discharger for usage instructions.

## Extra Battery Pack

Keeping an extra, fully-charged Battery Pack (TI Part No. 2566962-0001) on hand can extend the time you can operate your computer. Install and remove the extra Battery Pack as described in the *User's Guide*. When not in use, always keep the Battery Pack in its protective case to prevent accidental shorting or other damage.

# Communications Options

Your computer has the following options for communications:

- Ethernet Adapter
- Small Computer System Interface (SCSI)

The Internal Modem option is described under "Internal Modem" in this chapter.

## Ethernet Adapter

The Ethernet Adapter (TI Part No. 2567036-0001) enables you to connect the computer to a local area network and supports both the thick Ethernet (IEEE802.3, 10Base5) and twisted-pair Ethernet (IEEE802.3, 10BaseT) standards.

The Ethernet Adapter is compatible with industry-standard LAN software, including NetWare, LAN Manager, and NetBIOS environments. The Ethernet Adapter also has a connector for external PS/2-compatible 101-key keyboards. See the Ethernet Adapter documentation for installation and usage information.

## Small Computer System Interface (SCSI)

The SCSI Adapter (TI Part No. 2567029-0001) enables you to use the computer with up to seven external SCSI devices such as CD-ROM drives, tape backup drives, and external hard drives. The SCSI Adapter has a transfer rate of 500 KB/sec and a throughput rate of 120-160 KB/sec.



# Communications Options

The SCSI Adapter supports MS-DOS, OS/2, and UNIX operating systems and Novell NetWare®. Additional drivers are available from Columbia Data Products. Further information on the additional drivers is provided in the Columbia Data Products User's Manual that came with your notebook documentation set. The adapter also provides a connector for external PS/2-compatible 101-key keyboards. Windows files are included. Refer to the SCSI Adapter documentation for more information.

## Supported Monitors

The computer supports the following multifrequency external and VGA monitors.

- 31kHz/70 Hz (400/200 line mode)
- 60 Hz (480 line mode)
- IBM PS/2 monitors
- Multiscanning monitors covering 15.75 to 31.5 kHz, 50 to 70 Hz

## Installing an External Monitor



---

**Caution: Always turn off the computer before connecting an external monitor.**

---

1. Turn off power to both the external monitor and the computer.
2. Connect the 15-pin external VGA monitor cable to the 15-pin connector on the left side panel of the computer.
3. Turn on power to the computer first; then turn on the external monitor.
4. Switch the display between the LCD and the external monitor by double clicking the Windows Notebook Group menu Altvid icon. Or at the MS-DOS **C:\** prompt type

ALTVID

and press **Enter**.



# External Monitor

5. In modes that support simultaneous display on the LCD and the CRT, switch to simultaneous display by typing

VGA /SIMUL

and pressing **Enter**.

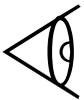
For usage information, refer to the external monitor documentation.

# Internal Modem

With an internal modem installed, you can connect your computer to the telephone network and communicate with a remote modem. You also can make facsimile (Fax) transmissions to remote Fax machines.

The optional 2400-bps (bits-per-second) Internal Modem supports Send-Fax and MNP Class 5 error-correcting capabilities.

Also available is the 14,400/9600-bps Internal Modem with Fax send/receive capabilities for 9600-bps Group3 Fax. This modem transfers data four times faster than the 2400-bps modem option.



---

**Note:** The Internal Modem options may not be available in some countries. For availability of this option, contact your dealer.

---

To install the internal modem, complete the following steps:

1. Ensure the modem is seated in the COM port.
2. From the Windows Main Group Control Panel, select ports.
3. Select COM2.
4. Click on settings.

For a 9600-bps modem, the settings should be 9600, 8, 1, none, Xon/Xoff.

5. Click on Advanced.

The Base I/O address should be 08F2, on (IRQ)3.

6. Go to the WSetup and click on I/O ports.



# Internal Modem

7. Select Option COMM Insure.

This enables the port and selects the correct baud rate.

8. Exit Windows.

9. Press **Ctrl+Alt+ESC** to go to Setup.

10. Go to page 4 and ensure the optional Comm is enabled as COM 2 at 9600, 8, 1, None.

11. Press **ESC+F4** to reboot.

12. Run Windows and ensure that the modem power is on in the notebook group.

Bitcom and Bitfax are already configured for the modem. All other communication applications must include /J0/Q3 in the initialization string (Send/Receive fax modem).

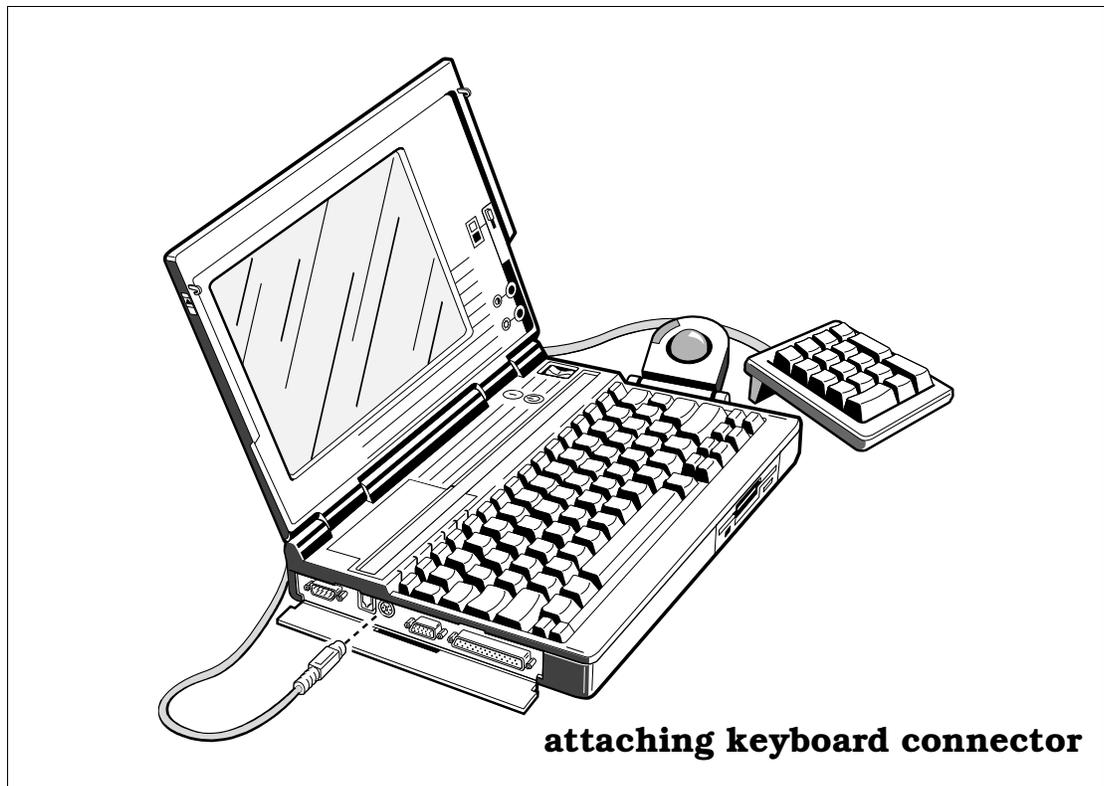
For more information on installing and using the Internal Modem option, see the documentation furnished with the Internal Modem Option Kits.

# Numeric Keypad

The optional Numeric Keypad (TI Part No. 2581381-0002) enables you to type numeric data while still permitting data entry on the keyboard. You also have the convenience of direct access to some functions (such as the **PgUp**, **PgDn**, and **Home** keys) without the need to also press the **Fn** key. Installing the Numeric Keypad disables the embedded numeric keypad.

To attach the numeric keypad:

1. Turn off the computer.
2. Attach the keyboard connector to the port on the left side of your computer.



For usage instructions, refer to the Numeric Keypad documentation.

# RAM Expansion

Your computer is equipped with 4 or 8 MB of random access memory (RAM). You can increase memory by installing one of the RAM options:

- ❑ 4 MB RAM Expansion Board (TI Part No. 2581266-0001). This expands RAM from 4 MB to 8 MB.
- ❑ 16 MB RAM Expansion Board (TI Part No. 2581271-0001). This expands RAM from 4 MB to 20 MB

## Removing the Keyboard to Install a RAM Option

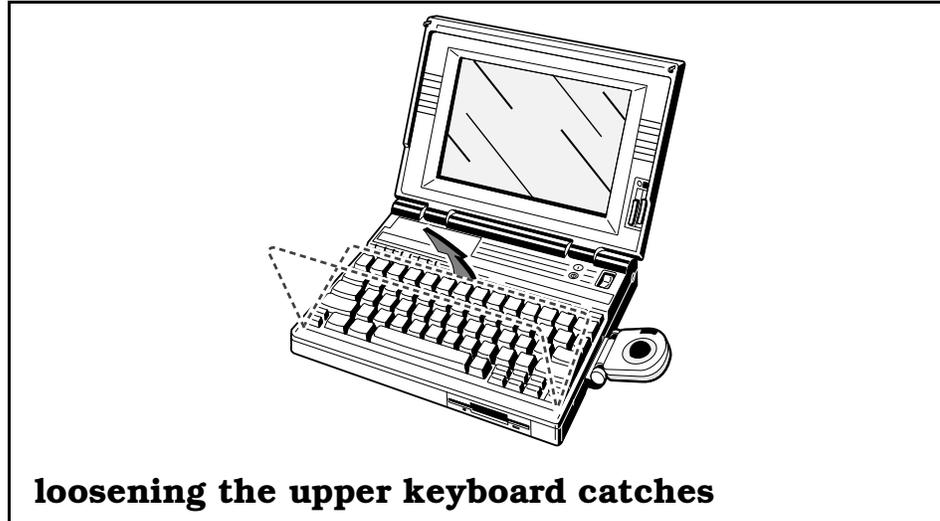
To install a RAM option, you need a small, flat-blade screwdriver. Installation involves removing the keyboard, installing the RAM option, and replacing the keyboard. Read this procedure thoroughly before starting; if you are uncomfortable performing the steps, contact your Texas Instruments dealer.

1. Turn the computer off, disconnect the AC Adapter, and disconnect any external devices and cables connected to the computer.
2. Remove the Battery Pack according to the instructions in the *User's Guide*.



# RAM Expansion

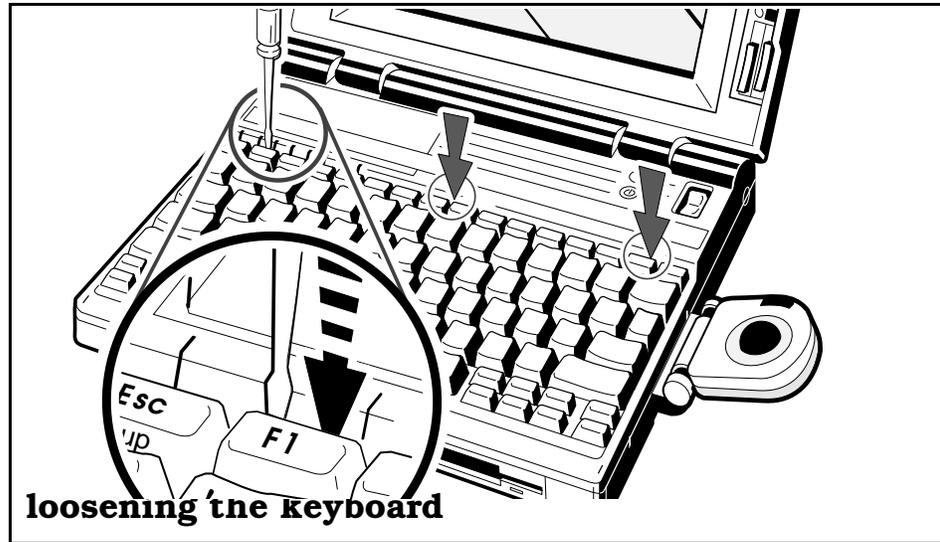
3. Carefully insert the blade of a small, flat-blade screwdriver about  $\frac{1}{4}$  inch into the leftmost of three slots, behind the **F1** key and between the keyboard and the computer case.



4. Rotate the screwdriver toward the rear of the computer about 30 degrees until the top left corner of the keyboard loosens and raises about  $\frac{1}{4}$  inch (6 mm) above the computer case.
5. Holding the top left corner of the keyboard above the case with one hand, insert the screwdriver blade into the center slot (behind the **F8** key), and rotate the screwdriver 30 degrees toward the rear to release the middle catch.
6. Continue holding the top left corner of the keyboard while inserting the screwdriver blade into the rightmost slot (behind the **Ins** key). Then rotate the screwdriver 30 degrees toward the rear; the keyboard should now be fully released from the rear catches.



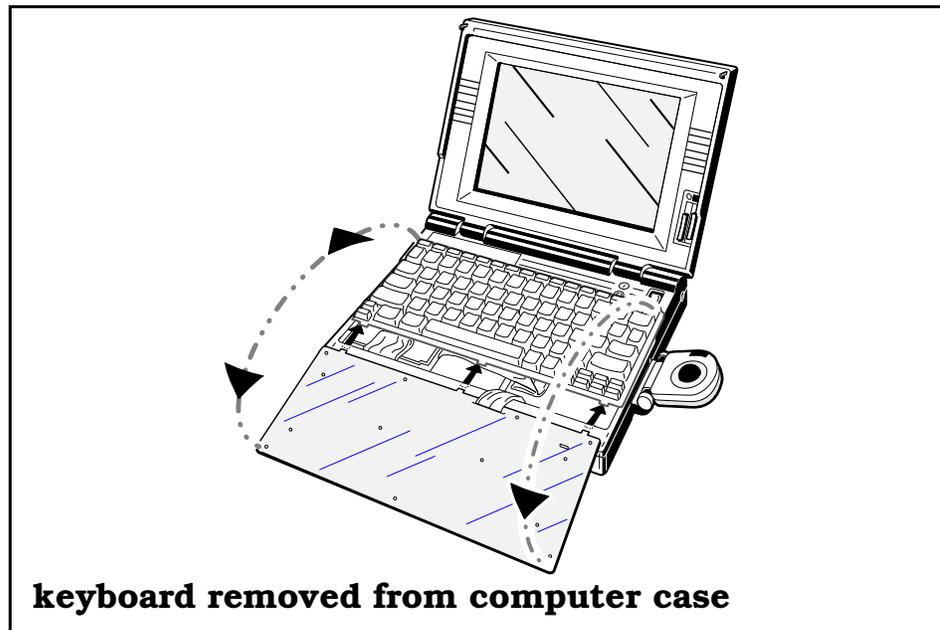
# RAM Expansion



7. Raise the rear of the keyboard several inches, rotate the rear of the keyboard 180 degrees toward you, and place the keyboard in front of you with the keys facing down.



**Note:** Do not disconnect the cable connecting the keyboard to the computer case.



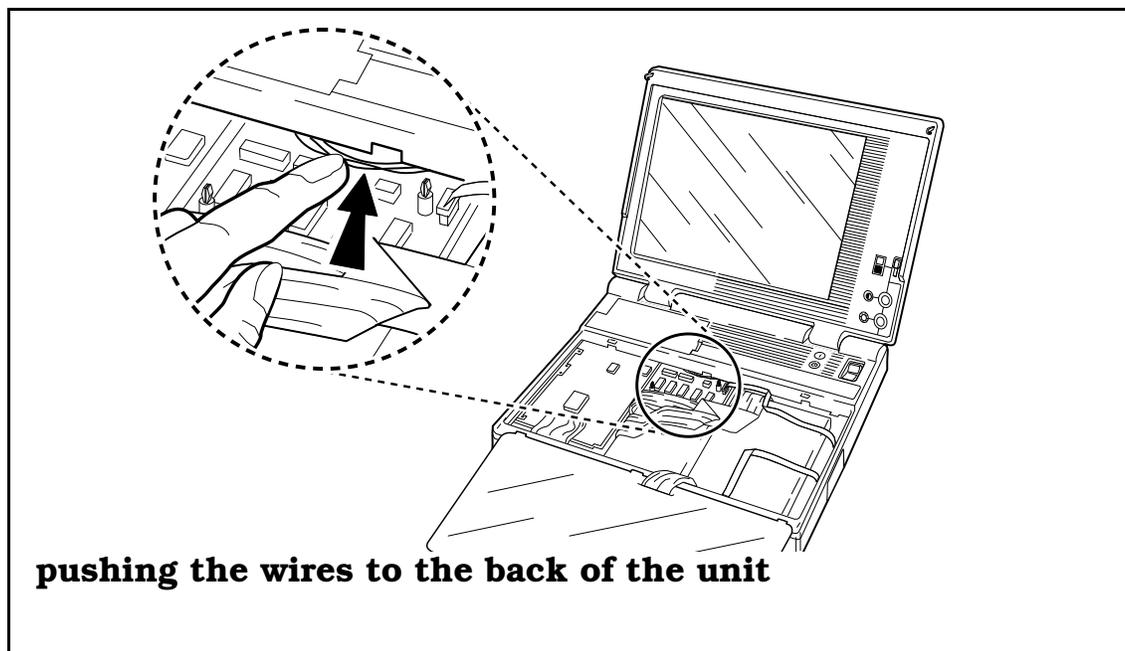
## Installing A RAM Expansion Board

After removing the keyboard, install the RAM Expansion Board as follows. You do not need any tools.

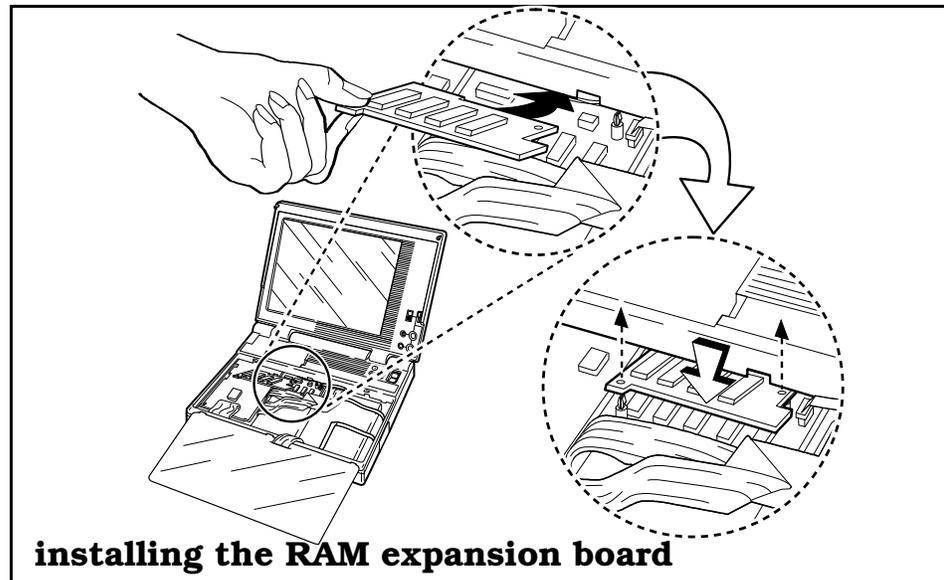


**Caution: Prevent component damage caused by electrostatic discharge (ESD). Use a high-impedance, grounded-conductive floor mat or wrist strap to prevent ESD. Before touching the integrated circuit devices, discharge static electricity from your hands, tools, and containers by touching them to a grounded surface.**

1. Remove the RAM Expansion Board from its shipping container.
2. Carefully push the wires towards the back of the computer to allow access to the area to install the RAM Expansion Board.
3. Slide the RAM Expansion Board into the unit.
4. Carefully snap the RAM Expansion Board into place.



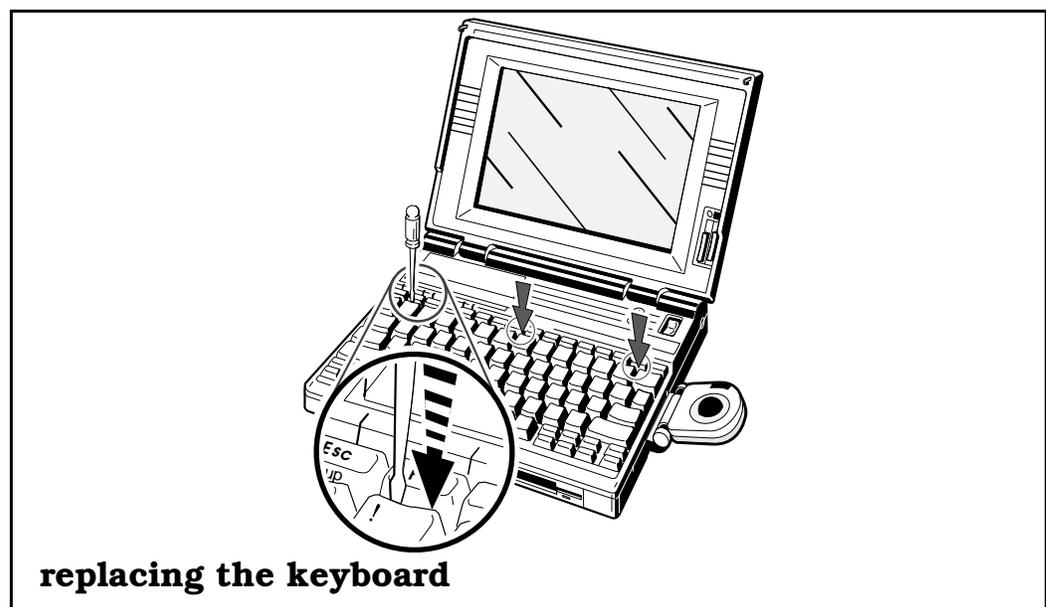
# RAM Expansion



5. Go to "Replacing the Keyboard" in this section.

## Replacing the Keyboard

1. Rotate the keyboard right side up, and insert the three tabs on the front side of the keyboard panel into the three matching slots on the computer case.
2. Hold the front of the keyboard in place while you lower the rear of the keyboard onto the computer case.



# RAM Expansion

3. Insert the screwdriver blade between the **F1** key and the **1** key, and gently press down on the keyboard until the leftmost catch snaps locked.
4. Insert the screwdriver blade between the **F8** key and the **7** key, and gently press down on the keyboard until the center catch snaps locked.
5. Insert the small screwdriver blade between the **Ins** key and the **Backspace** key, and gently press down on the keyboard until the rightmost catch snaps locked.
6. Test installation by closing the computer display. If display closes securely with no resistance, the keyboard is correctly installed.

After installing memory, check that all system memory is recognized by turning off QuickBoot in the System Setup. Memory is automatically checked at powerup.

# Other Options

Among the options your computer supports to enhance performance and usability are:

- Docking System
- MicroDock System
- I/O Port Adapter
- Mouse Devices
- Printers

## Docking System

The Docking system is an expandable, desktop hardware/software system that automates installing and removing your notebook computer to and from your desktop environment. Software supplied with the system provides for automated intelligent docking, "plug and play" configuration support, Windows for Workgroups Version 3.11 upgrade for both desktop and portable operation, and enhanced power saving features for portable and desktop use. Docking system hardware and software features combine to simplify the installation process.

The Docking System has the following features:

- Automated (switch and software controlled) Docking and Undocking
- Keylock (and software password protection) security features - prevents unauthorized removal of notebook
- Front Panel Notebook **battery** charge condition indicator
- Front Panel System **On/Standby** indicator

## Other Options

- ❑ Intelligent power monitoring/charging system provides up to 230 watts of power for charging your notebook computer batteries and operating the Notebook/Desktop Docking System and all installed options
- ❑ Six Internal ISA/AT Expansion Card slots (three are Half-Size card slots) - Configuration support provided by Intel's Plug-N-Play Program supplied with the system
- ❑ Four internal bays and onboard power/signal connectors and adapters to support up to four internal mass storage devices.
- ❑ Onboard Floppy Controller - Drives up to two internal floppy type devices
- ❑ Onboard SCSI-II Compatible Host Adapter (Controller)- Drives up to seven internal/external SCSI devices. Adaptec's EZ-SCSI software, supplied with the system, provides configuration support.
- ❑ External SCSI Connector Option - Permits attaching external SCSI devices to the system.
- ❑ Onboard PCMCIA Option Card Adapter - Drives up to two Type I, II, or III PCMCIA option cards (3-V or 5V). Phoenix Card Manager, supplied with the system, provides configuration support and device drivers for all common options.
- ❑ Onboard Printer Controller - Supports standard 25-pin Centronics devices and EPP/ECP bi-directional devices
- ❑ Onboard Game Port Controller- Supports standard 15-pin game devices (e.g. joystick).

## Other Options

- ❑ Onboard External 101-Key Keyboard Controller- supports external 101-compatible keyboard.
- ❑ Two Serial Port (16550 UART) Controllers - drive 9-pin and 25-pin serial devices.
- ❑ Pass Through Ports for:
  - External Monitor
  - RJ-11 (or RJ-45 on some international models) pass-through-port from the optional internal modem card in your notebook
  - PS/2 Mouse Port (pass-through from notebook)
- ❑ 115/230 VAC Power Supply with speed control fan - supplies low voltage DC power and cooling for all Docking System components and notebook. All high voltages are enclosed in the power supply box for safe access to internal areas of Docking System 1
- ❑ Monitor Stand capability for up to 17" monitor (Desktop horizontal mounting position)
- ❑ Optional Tower Stand Kit for off-desk installation
- ❑ Onboard System Configuration jumpers available if conflicts exist with I/O Addressing/Interrupt assignments of installed options and the onboard adapters (controllers)

## MicroDock System

The MicroDock system is an expandable, desktop hardware/software system that simplifies the process of installing and removing your notebook computer to and from the desktop environment. Hardware features include:

The MicroDock System includes the following features:

- External SCSI Port (drives up to seven external SCSI devices)
- Two PCMCIA Type 3 card slots
- One 9-pin 16550 UART serial port
- One EPP/ECP parallel port
- PS/2 keyboard port
- Game port
- EZ-SCSI Software Configuration Kit and external cable
- Windows for Workgroups Upgrade

# Other Options

## I/O Port Adapter

The IO Port Expander Adapter is a user-installable module that connects to the Expansion Bus Connector on the rear of a notebook product to simplify the process of removing/re-installing the notebook product when going to and from the desktop environment. The IO Port Expander also adds a new game port that permits attaching a joystick or other game port compatible devices to the notebook computer. Serial, parallel and PS/2 keyboard ports implemented on the IO Port Expander are direct replacements for the connectors that support these functions on the side of the notebook. This gives you the convenience of disconnecting only one device when removing the notebook from the desk.

An 8-position Dual In-line Position (DIP) switch permits serial port address selection, selecting the operational mode of the parallel port (PC/AT or PS/2) and selecting the operational mode of the PS/2 External Keyboard port.

## Mouse Devices

The Microsoft BallPoint is supplied with your unit; however, you also may be able to use other mouse devices. Be sure to add a mouse device driver line to your CONFIG.SYS file, or include a TSR (terminate and stay resident) mouse program (such as MOUSE.COM) in your AUTOEXEC.BAT file. Also set the PS2 mouse port item in Setup to ON. See TSR and AUTOEXEC.BAT information in this manual and see the documentation furnished with the mouse device.

## Printers

Texas Instruments makes a variety of laser, ink jet, and impact printers. Your computer has ports for both parallel and serial printers.

To use a printer, connect the printer to the appropriate port on the left panel of the computer. Then run Setup as described in this manual.

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

## Central Processing Unit (CPU)

Type: 32-bit 80486 (low-power WinSX or WinDX2)

<b>Maximum Speed</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
----------------------	------------	---------------	-------------

25 MHz	8	12.5	25
--------	---	------	----

40 MHz	8	25	40
--------	---	----	----

50 MHz	8	25	50
--------	---	----	----

---

Bus Speed: 8 MHz (standard)

## Memory

RAM: 4 MB standard TravelMate 4000E  
32-bit bus width or 3-1-2 wait state (TravelMate 4000)  
Expandable, with RAM Kit options

### RAM Kit Options Upgrades

<b>TravelMate Model</b>		<b>Maximum RAM</b>
TravelMate 4000E	25 MHz	20 MB
TravelMate 4000E	40 MHz	20 MB
TravelMate 4000E	50 MHz	20 MB

---

ROM: 96 KB, 8-bit bus; contains IPL, self-test, Setup, AT/BIOS, and VGA/BIOS. Shadow to 3-1-2-wait state 32-bit fast system RAM.

# Specifications

## Display

<b>Technology</b>	<b>Size</b>	<b>Type</b>	<b>Video Memory</b>	<b>Models</b>
Illuminated, triple supertwist liquid crystal display (LCD)	10"	Monochrome	1 MB	WinDX2/50 WinSX/25
Advanced Passive	8.2"	Color	512 KB	WinSX/25
Passive	9.4"	Color	512 KB	WinSX/25 WinDX2/40
Dual Scan	9.4"	Color	1 MB	WinDX2/50
Active Color	9.4"	Color	1 MB	WinDX2/50

### **All Models:**

Characters/Line:	80
Lines/Screen:	25
Resolution:	640 x 480
Gray Scale:	64 (in some graphics modes)
Emulation:	VGA
Video Bus:	32 Bits

# Specifications

## Physical Dimensions

Width:	11 inches (279 mm)
Depth:	8.5 inches (216 mm)
Height:	1.8 inches (46 mm) monochrome display 2.1 inches ( ) mm) color display
Weight:	Less than 5.6 lbs (2.5 kg) monochrome display Less than 6.3 lbs (2.8 kg) color display. Depending on model, including battery, without options

## Power Source

NiCad battery:	5.7 Amps at 4.8 Volts
AC Adapter Input:	100 to 250 Vac, 0.7 to 0.4 A, 50 to 60 Hz
Output:	+5 Vdc, 4.0 A max +7 Vdc, 1.5 A max +8.5 Vdc, 1.5 A max Total output not to exceed 4.5 A

## Temperature

Operating:	50° to 95° F (10° to 35° C ) 50° to 90° F (10° to 3 ° C ) DX2 monochrome display
Storage/Transit:	-4° to 140° F (-20° to 60° C )

## Humidity

Operating:	20% to 80%, non-condensing
Storage/Transit:	10% to 90%, non-condensing

## Vibration

Operating:	0.5 G, 5 to 250 Hz
Storage/Transit:	5.0 G, 5 to 250 Hz

# Specifications

## Shock

Operating:	10 G applied in six orientations (positive and negative X, Y, and Z axes)
Storage/Transit:	40 G applied in six orientations (positive and negative X, Y, and Z axes)

## Standard Ports

Parallel Port:	Centronics-type, 25-pin
Serial Port:	RS-232C, 9-pin male DB-9 connector for full duplex asynchronous transmission at up to 9600 baud
Quick Port: (depends on model)	5-pin special
VGA Monitor:	15-pin DB-15 analog
PS/2:	Mini-DIN (PS/2 compatible) for either mouse or PS/2 Keyboard

## Drives

Hard drive:	120 MB and 200 MB
Floppy Drive:	Reads/writes 3.5-inch, 720 KB and 1.44 MB floppies

## Keyboard

Keys:	79 (80 outside of U.S.A.) including 12 function keys and <b>Fn</b> key; supports all functions of IBM AT enhanced keyboard
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## Agency Approvals

Main Unit: (including AC Adapter)	FCC, Part 15, Class B (U.S.A.) FCC Part 68 (U.S.A.) UL safety
-----------------------------------------	---------------------------------------------------------------------

## Options

Refer to the individual publications furnished with each option for specifications.

# B

## Character Sets

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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.

---



# Character Sets

## 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	f
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊕	+	⊖	σ	∫
6	-6	♠	—	&	6	F	V	f	v	à	û	°	⊕	⊖	⊖	μ	÷
7	-7	●	↑	'	7	G	W	g	w	ç	ù	°	⊖	⊕	⊖	τ	~
8	-8	■	↑	(	8	H	X	h	x	ê	ÿ	¿	⊖	⊖	⊖	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌒	⊕	⊖	⊖	⊖	•
10	-A	■	→	*	:	J	Z	j	z	è	Ü	⌒	⊕	⊖	⊖	Ω	•
11	-B	♂	←	+	;	K	[	k	{	ï	Ç	½	⊕	⊖	■	δ	✓
12	-C	♀	⌒	,	<	L	\	l		î	£	¼	⊕	⊖	■	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	¥	ì	⊕	=	■	φ	²
14	-E	🎵	▲	.	>	N	^	n	˘	Ä	Pt	<	⊕	⊖	■	ε	▪
15	-F	☀	▼	/	?	O	_	o	◊	À	f	>	⊕	⊖	■	∩	

# Character Sets

## 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	⋮	⌒	ø	Ó	-	
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	⋮	⊥	Ð	β	±
2	-2	☺	↑	"	2	B	R	b	r	é	Æ	ó	⋮	⊥	Ê	Ô	=
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú		⊥	Ë	Ò	‰
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	á	û	ˆ	Â	ã	í	μ	÷
7	-7	•	↓	'	7	G	W	g	w	ç	ù	ˆ	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	ı	≡	≡	ı	Ý	²
14	-E	♪	▲	.	>	N	^	n	˘	Ä	×	«	¥	≡	ı	-	▪
15	-F	☼	▼	/	?	O	_	o	◊	Å	f	»	⌒	¤	■	-	•

# Character Sets

## 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	ı	⋮	⊥	±	α	≡	
1	-1	☺	◀	!	1	A	Q	a	q	ü	È	ı	⋮	⊥	≡	β	±	
2	-2	☹	↑	"	2	B	R	b	r	é	Ê	ó	⋮	⊥	≡	Γ	≥	
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	ı	⊥	≡	π	≤	
4	-4	♦	¶	\$	4	D	T	d	t	Â	È	ı	⊥	≡	≡	Σ	ı	
5	-5	♣	§	%	5	E	U	e	u	à	İ	ı	≡	⊥	≡	σ	ı	
6	-6	♠	—	&	6	F	V	f	v	¶	û	ı	≡	≡	≡	μ	÷	
7	-7	•	‡	'	7	G	W	g	w	ç	ù	ı	≡	⊥	≡	τ	ı	
8	-8	■	↑	(	8	H	X	h	x	ê	œ	î	ı	≡	≡	Φ	°	
9	-9	○	↓	)	9	I	Y	i	y	ë	Ô	ı	≡	≡	⊥	⊗	•	
10	-A	■	→	*	:	J	Z	j	z	è	Ü	ı	≡	≡	⊥	Ω	•	
11	-B	♂	←	+	;	K	[	k	(	ï	ø	½	ı	≡	≡	■	δ	✓
12	-C	♀	└	,	<	L	\	l		î	£	¼	ı	≡	≡	■	∞	n
13	-D	♪	↔	-	=	M	]	m	)	=	Ù	¾	ı	≡	≡	■	φ	²
14	-E	🎵	▲	.	>	N	^	n	˘	Â	Û	<	ı	≡	≡	■	ε	▪
15	-F	☀	▼	/	?	O	_	o	◊	§	f	>	ı	≡	≡	■	∩	

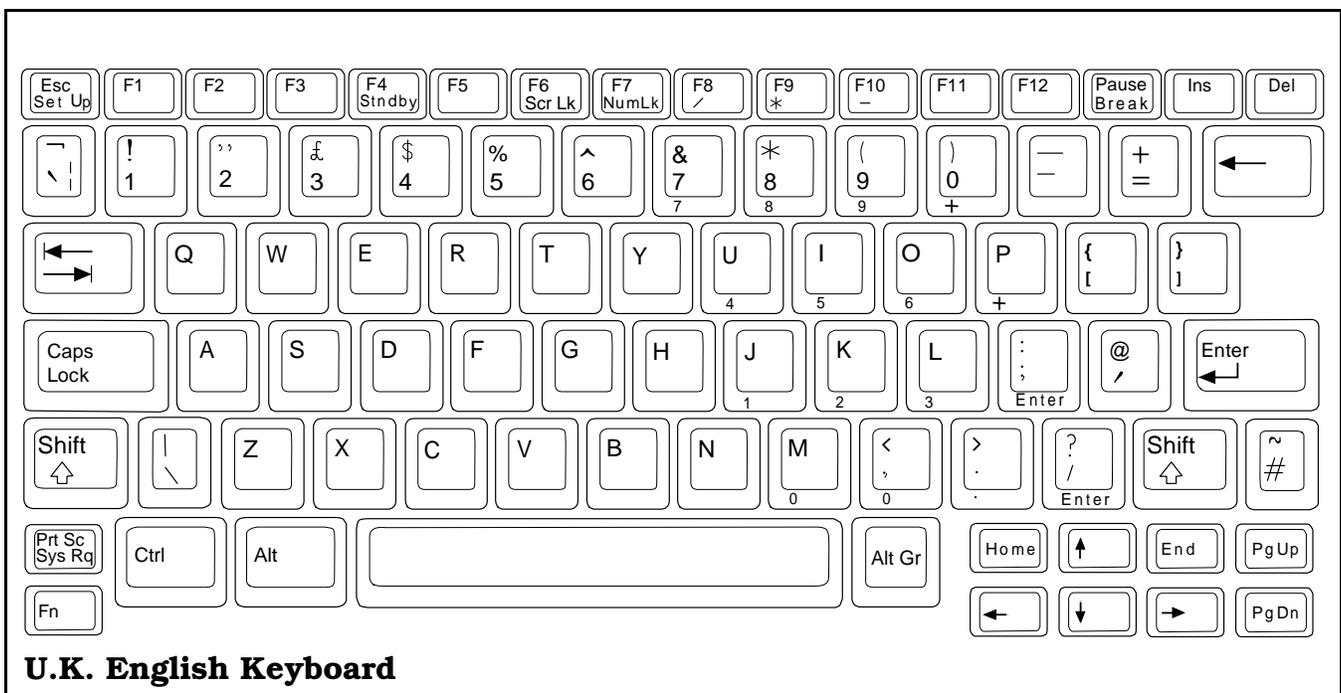
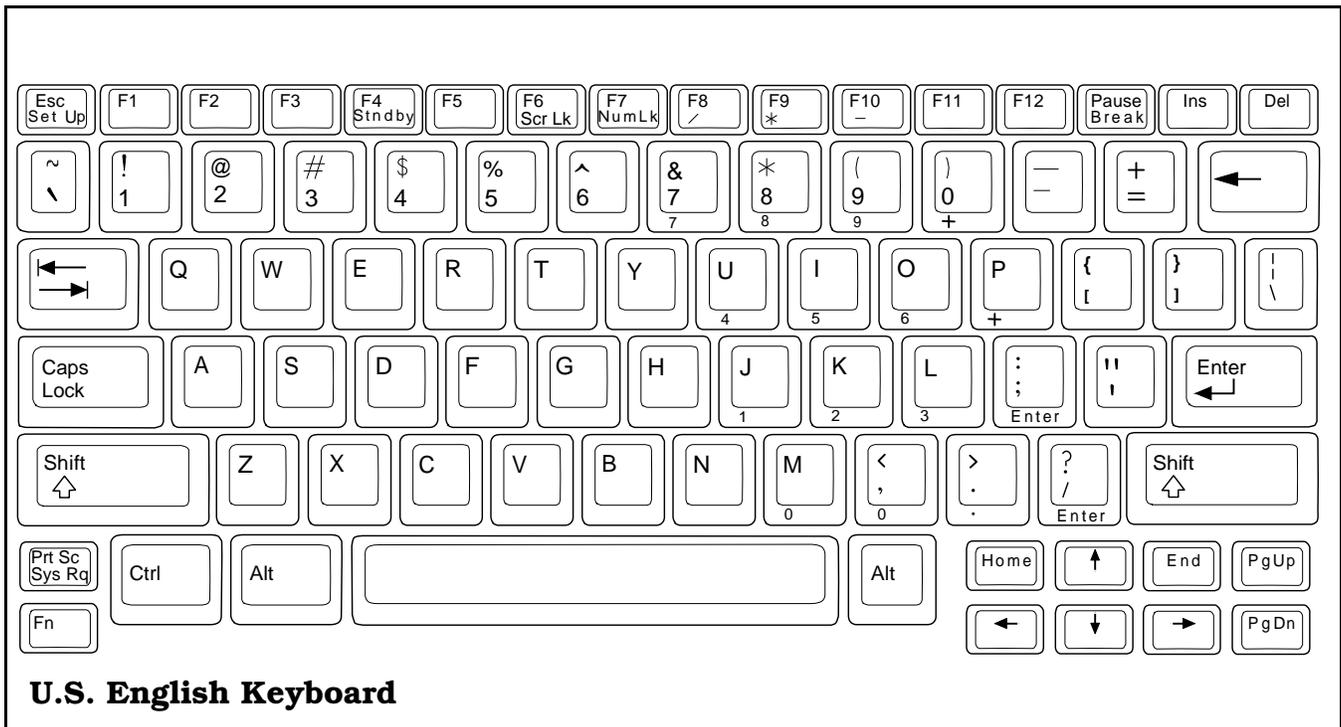
# Character Sets

## Code Page 865, Nordic

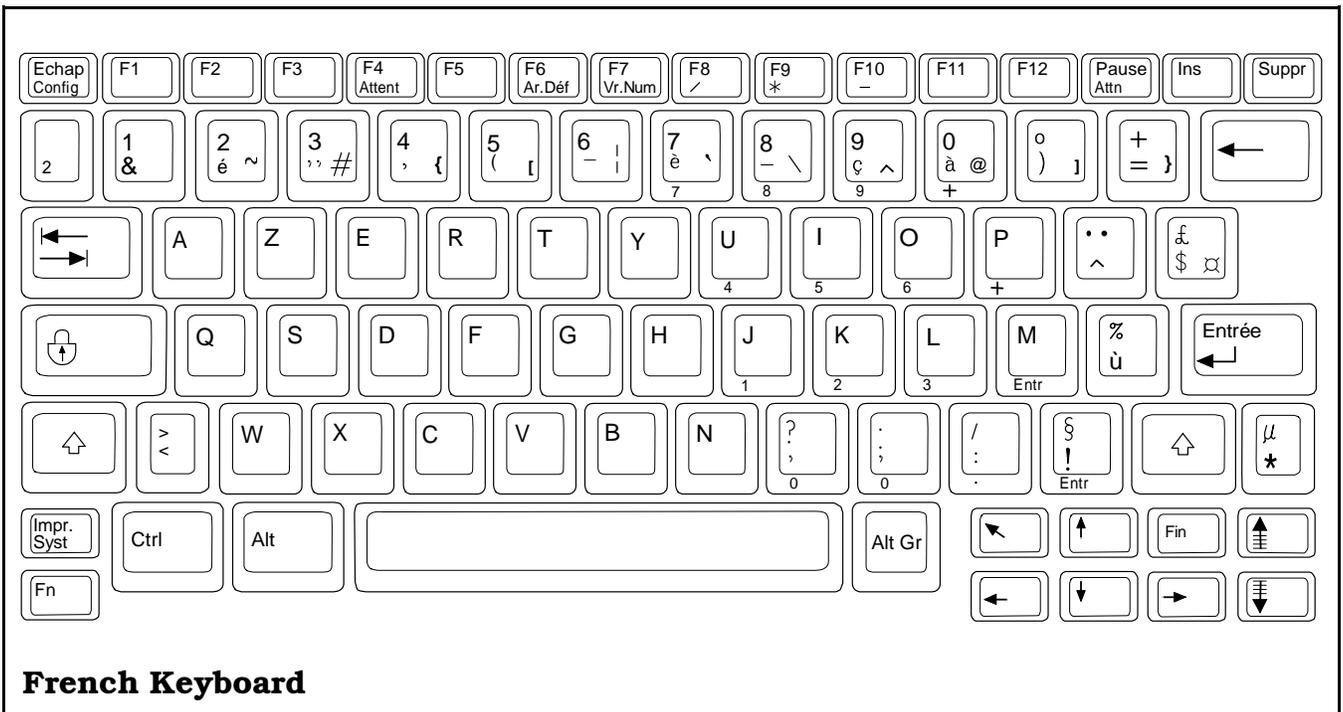
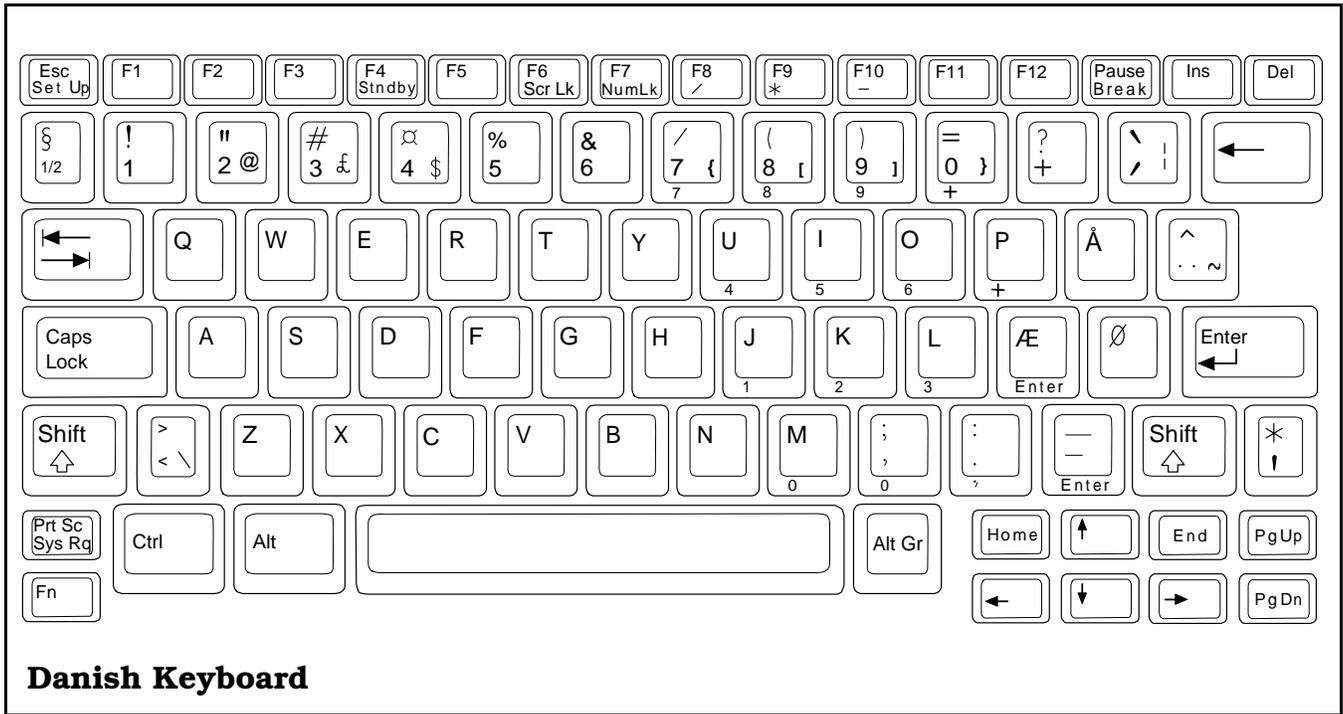
Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0	▶		0	@	P	·	p	Ç	É	á	⋮	⊥	⊥	α	≡	
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	⋮	⊥	⊥	β	±
2	-2	☺	↑	'	2	B	R	b	r	é	Æ	ó	⋮	⊥	⊥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú		⊥	⊥	π	≤
4	-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	f
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	J
6	-6	♠	—	&	6	F	V	f	v	à	û	°	⊥	⊥	⊥	μ	÷
7	-7	●	↑	'	7	G	W	g	w	ç	ù	°	⊥	⊥	⊥	τ	~
8	-8	■	↑	(	8	H	X	h	x	ê	ÿ	è	⊥	⊥	⊥	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⊥	⊥	⊥	⊥	⊙	•
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	ì	⊥	⊥	■	φ	²
14	-E	♪	▲	.	>	N	^	n	˘	Ä	Pt	<	⊥	⊥	■	ε	▪
15	-F	⚙	▼	/	?	O	_	o	◊	À	f	⊥	⊥	⊥	■	∩	

# Keyboard Layouts

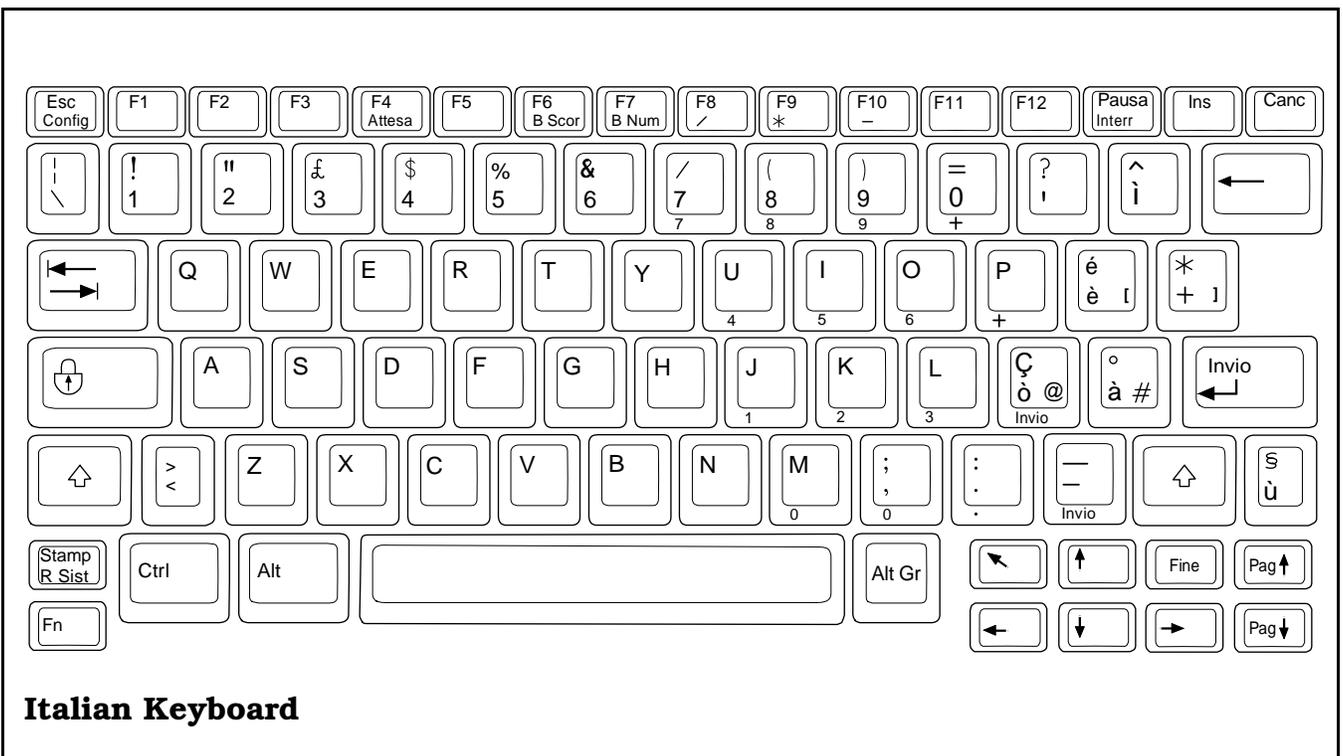
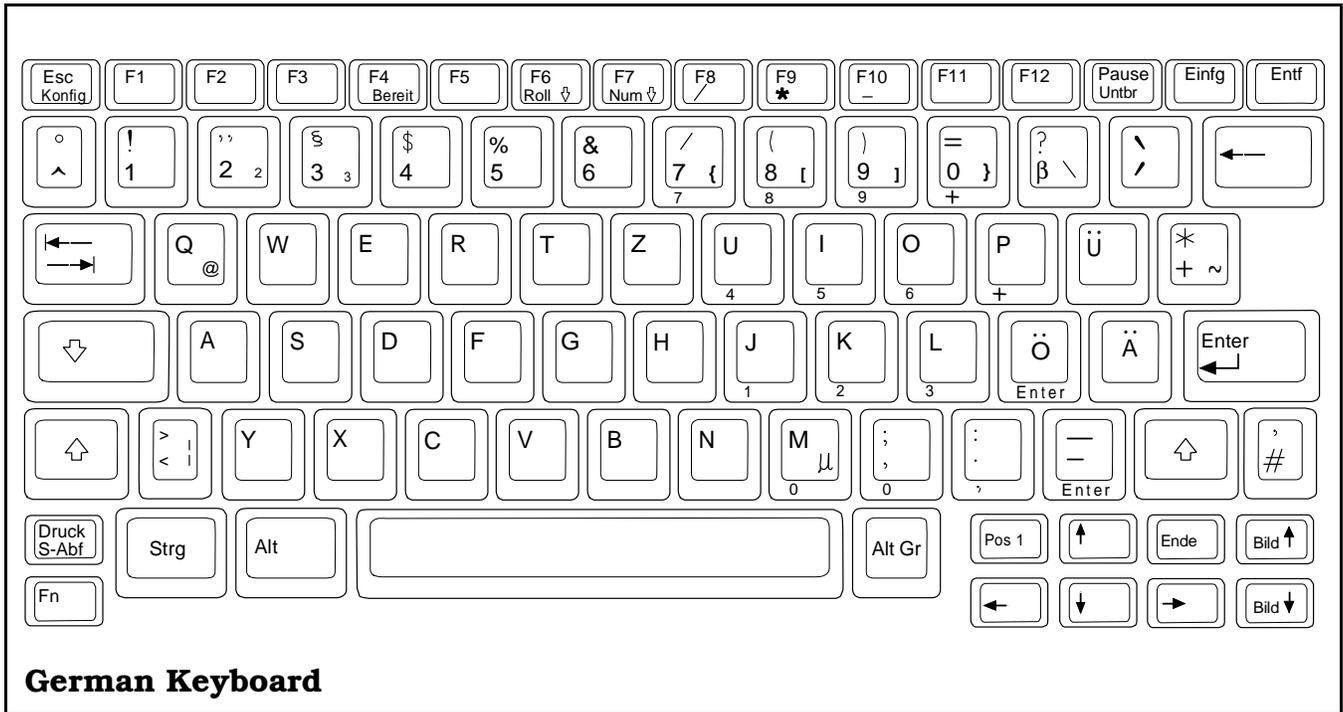
The following diagrams show the keyboard layout for the U.S.A. and international versions.



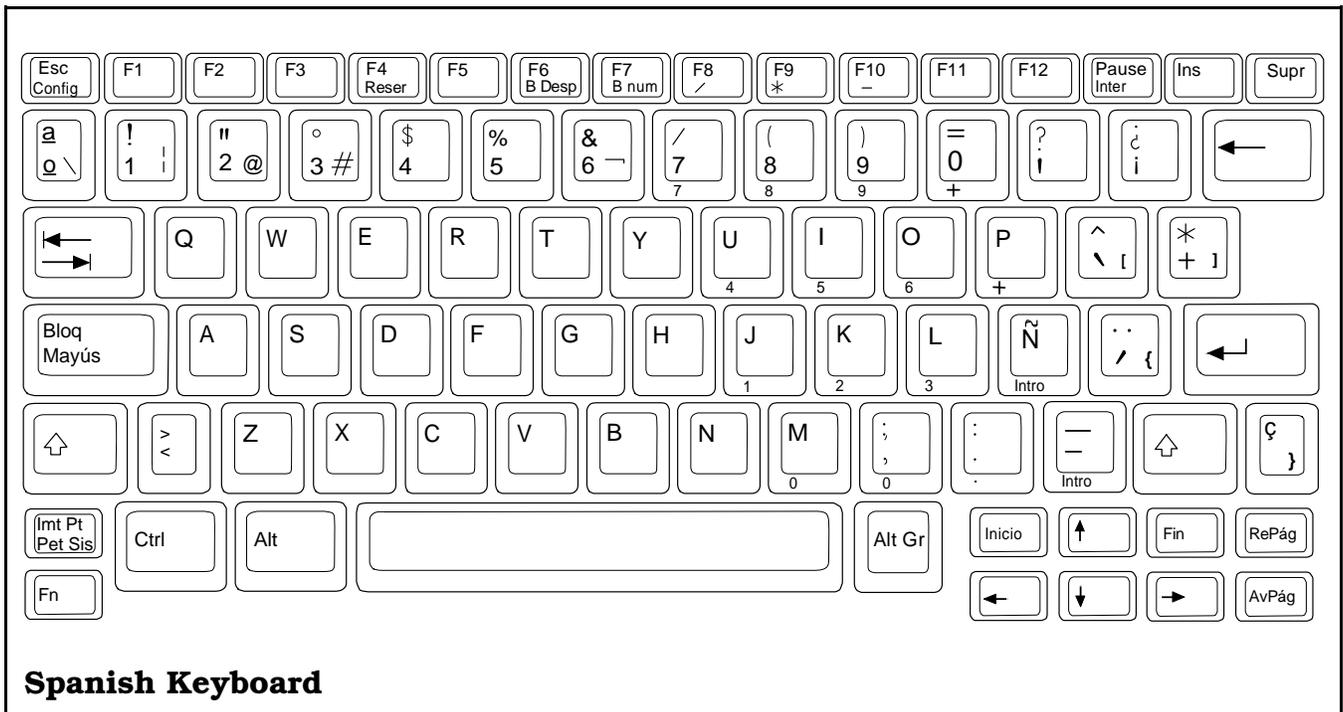
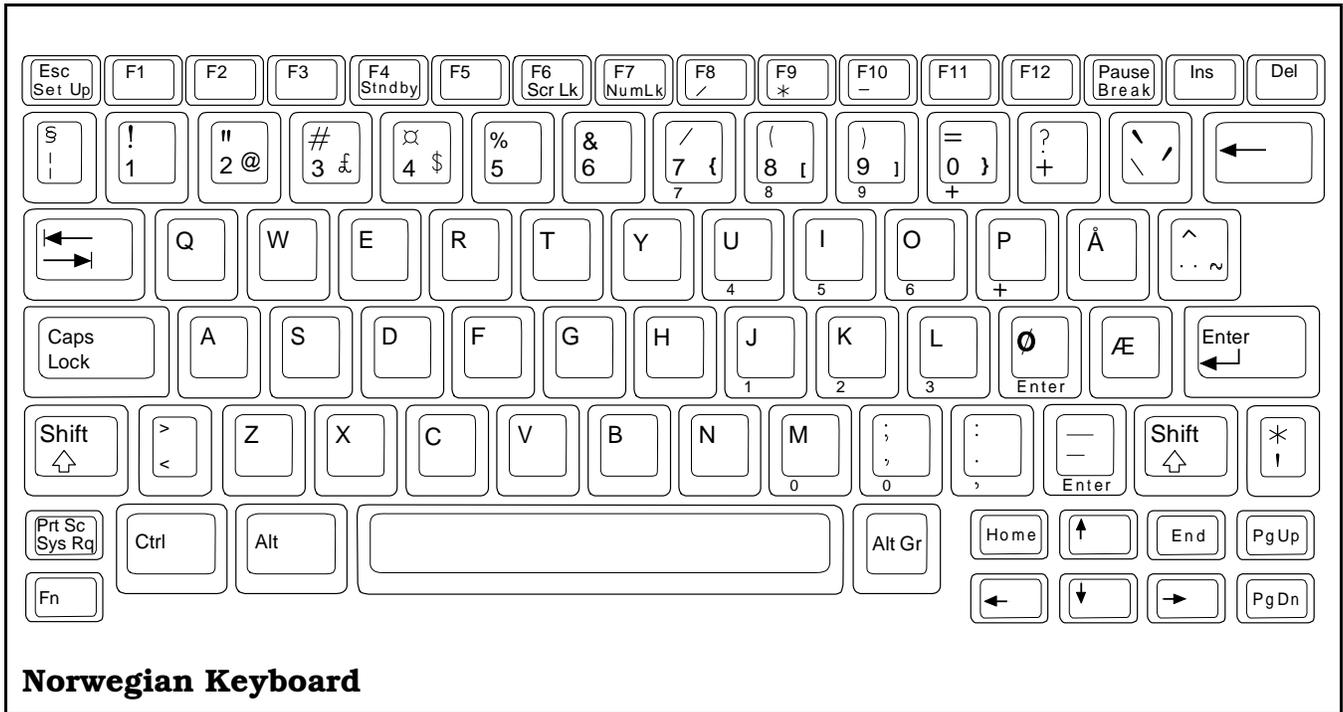
# Keyboard Layouts



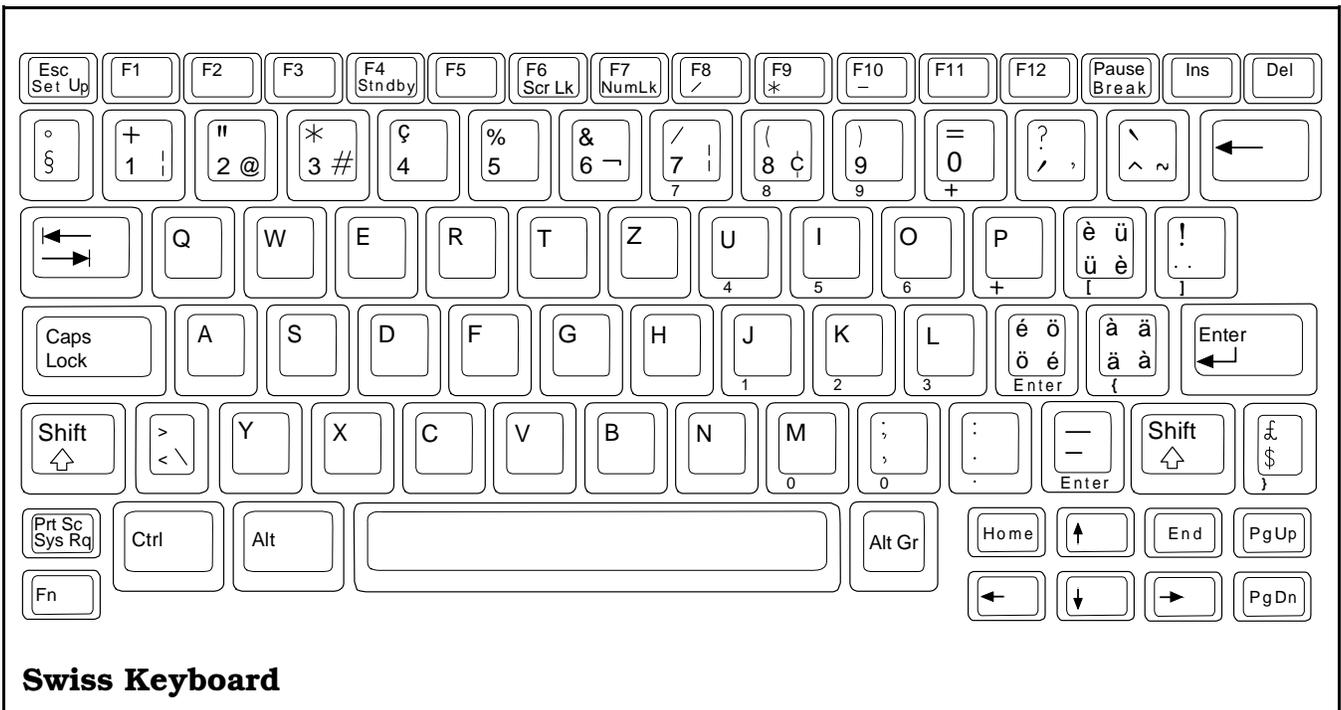
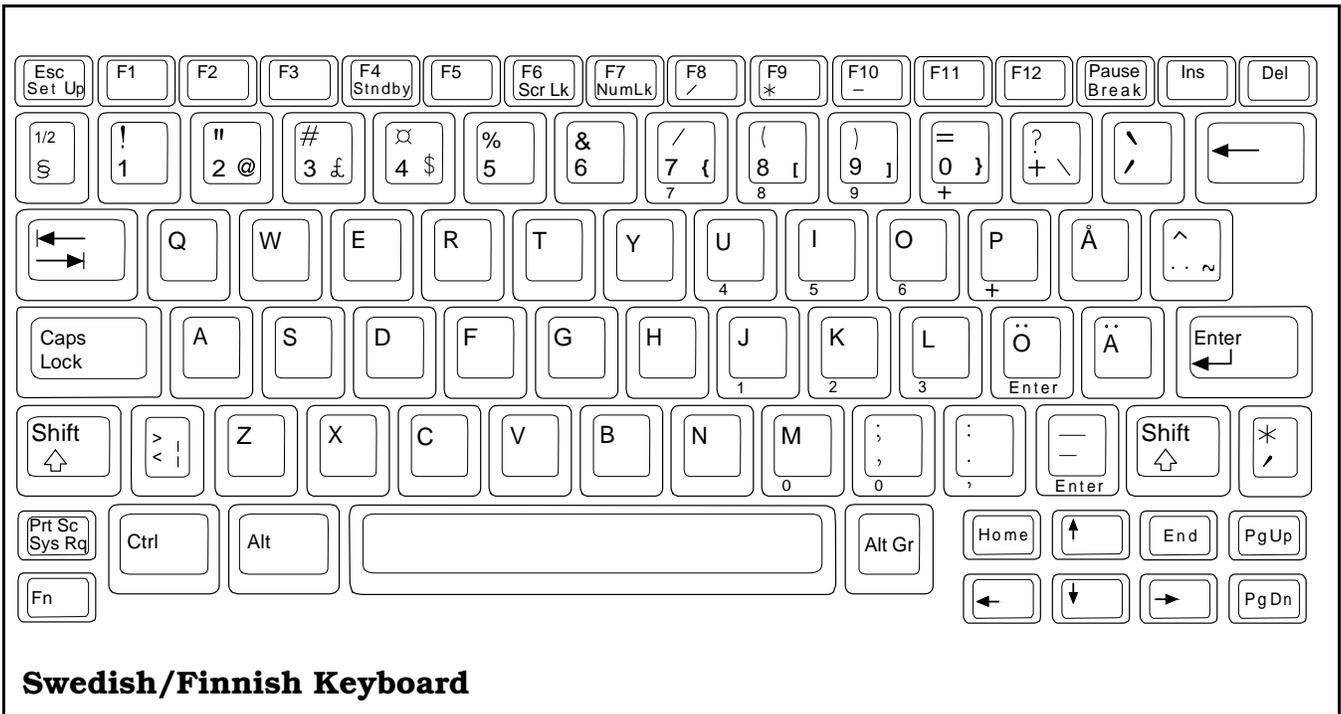
# Keyboard Layouts



# Keyboard Layouts



# Keyboard Layouts



Your computer provides two diagnostics routines to ensure that it and its peripherals are functioning properly. One routine is executed every time you turn on the computer. The other is accessed from a separate Diagnostics Program.

## Power-On Diagnostics

When you turn on the computer, a self-test executes, checks internal memory, and displays the number of kilobytes available for use.



---

**Note:** If Quick Boot is enabled, the memory is not displayed.

---

After a few seconds, MS-DOS starts to load. If MS-DOS fails to load from the hard disk or a floppy, an error message appears.

Turn off the computer, wait 5 seconds, and turn the computer on again. If the error message displays repeatedly, call your Texas Instruments dealer, or call TI Service at 1-800-TI-TEXAS.

Refer to “Error Messages” in the *User’s Guide* for a list of power-up error messages.

## Diagnostics Program

To load the Diagnostics Program, insert your *BatteryPro & Productivity Software* floppy into drive A. Press **Ctrl-Alt-Del**, or turn your computer off and then on again. Diagnostics loads and displays its main menu. Use the cursor keys to highlight the test you want, and press **Enter** to start the test.

# Diagnosics

## Park Fixed Disks

The Park Fixed Disk function prepares the fixed disks for relocation. The fixed disk heads are placed over the diagnostics cylinder so that vibrations do not cause errors on the usable media. The heads are also automatically parked for safe travel when you turn off the computer or the computer enters standby mode.

## Diagnosics

If you select the Diagnostics Program, a warning and menu display. Press **N** to abort Diagnostics. Press **Y** to continue, and the Diagnostics menu displays.

Each test listed indicates the hardware item and its configuration to be tested. Some items are listed only present (**P**) or not present (**N**), while others specify a hardware type. For example, **Keyboard** can be an 84-key keyboard, a 101-key keyboard, or not present (**N**). The floppy types are defined as they are in the Setup Program menu.

The Diagnostics menu reflects the hardware configuration that the Diagnostics Program detects in your computer. The selection process overrides this automatic selection process or excludes specific tests from a complete suite of tests to be performed.

Press the cursor keys to highlight an item you want to test or change, and press **F5** and **F6** to select new items in each field.

You can test a single item by moving the highlight to a particular test and pressing **F10**. You must select something other than not present (**N**) or **None**.

Pressing **F9** tests all currently selected devices. If you do not want to perform specific tests, set these test selections to not present (**N**); this tells the Diagnostics Program not to test these items.

When a single test or suite of tests is initiated, the Test Control Options and Test Results menu displays. On the left side of this menu is information relating to the test currently being performed. The right side of the menu contains the results of previously completed tests.

## Test Control Options

The fields at the top of the menu represent options that control how tests are performed. These options must be set before a single test or suite of tests is initiated.

**Continuous Test** — This field causes the tests to be performed continuously until you specifically stop them by pressing **Esc**. When you press **Esc**, you can continue again by pressing the Space Bar, or abort the suite of tests by again pressing **Esc**. If you select a single test using **F10**, the single test is repeated if the continuous test field is set to **Yes**. If you select a suite of tests using **F9**, the entire suite is repeated.

**Stop On Error** — If an error is detected during a suite of tests, the Diagnostics Program stops after the error is reported, depending on the status of this field. If set to **Yes** (the default), the program reports the error and then stops testing until you press the Space Bar to continue or **Esc** to end testing.

**Echo to LPT1** — This field permits you to send the test results to a parallel printer attached to LPT1. The information written to the right side of the menu is echoed to LPT1 if this option is set to **Yes**. This is useful if you set the Continuous Test field to **Yes**, the Stop on Error field to **No**, and want to run a test or tests unattended.

# Diagnosics

## Choosing Specific Suites of Tests

Many of the tests have submenus that permit you to select which parts of the test you want. When you select any of these tests, either individually (using **F10**) or as part of suite of tests (using **F9**), the submenus ask for additional information. If the tests are run multiple times, the submenus are displayed only before the first pass.

Each of the test submenus displays whether or not the test is interactive and whether or not it is destructive to data. Interactive tests require some user intervention to operate. For example, if you select the interactive keyboard test, you must press keys on the keyboard to verify that it is operating properly. In general, if you are performing continuous tests, you should not select any interactive tests, permitting the suite of tests to run unattended.

The following component tests and their respective options can be selected.

### **Keyboard Test**

- Keyboard test (interactive)
- Controller test (non-interactive)

### **Floppy Disk Test**

- Seek tracks
- Verify tracks
- Disk change (interactive)
- Read/Write (destructive)
- Format (destructive)

### **Fixed Disk Drive Test**

- Controller test
- Head select test
- Seek test

## **Monochrome Adapter Test**

- Attribute test
- Character test
- Text test
- Memory test

## **Color Graphics Adapter Test**

- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

## **EGA Adapter Test**

- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

## **VGA Adapter Test**

- Attribute test
- Character test
- Text test
- Page test
- Graphics test
- Background test
- Memory test

## **Parallel Port Test**

- Internal loopback
- Printed pattern (requires connected printer)
- External loopback (requires loopback connector)



# Diagnosics

## **Asynchronous Communications Port Test**

Baud rate clock

Internal transmit/receive

Modem control lines

External loopback (requires loopback connector)

## **Additional Diagnostics**

The Diagnostics Program hard disk tests are all nondestructive except on the diagnostics cylinder. The tests perform seek tests, head tests, and controller tests, but do not perform read/write tests on the entire media.

Additional tests for the hard disk are contained in the hard disk format system, which is described later in this appendix.

## **Diagnosics Error Codes**

When an error is detected by the Diagnostics Program, a two-byte hexadecimal code is displayed. The first byte is the class of the error and the second byte is the subclass. The error code class generally corresponds to a specific hardware system or group of hardware systems. For example, class one (01) is used for the system planar board. The last byte of the code (subclass) describes the actual test that failed on the specified peripheral. For example, error 0108 indicates that the 8253 counter test failed during the system planar board test.

# Diagnostics

The following table lists the classes of error codes. The numbers are in hexadecimal.

<b>Diagnostics Error Code Classes</b>	
<b>Code</b>	<b>Description</b>
01xx	System planar board tests
07xx	Keyboard tests
10xx	Math coprocessor tests
17xx	Video tests
20xx	Asynchronous ports tests
27xx	LPT ports tests
30xx	Memory tests
37xx	Diskette/FDisk tests

The following table lists the error codes, by class and subclass, that could be displayed by the Diagnostics Program.

## **Diagnostics Program Error Codes**

<b>Code</b>	<b>Class</b>	<b>Failure Description</b>
0101	System board	DMA registers
0102	System board	DMA memory move
0103	System board	Interrupt mask
0104	System board	Hot interrupt line
0105	System board	Stuck NMI
0106	System board	Processor registers
0107	System board	System timer

# Diagnosics

## Diagnosics Program Error Codes (continued)

Code	Class	Failure Description
0108	System Board	8253 counters
0109	System Board	System timer interrupts (1)
010A	System Board	System timer interrupts (2)
010B	System Board	Processor flags
0110	System Board	CMOS memory
0111	System Board	Real time clock
0120	System Board	BIOS checksum
0701	Keyboard	Controller
0702	Keyboard	Keyboard map
1001	Coprocessor	Registers
1002	Coprocessor	Calculations
1701	Video	Text attributes
1702	Video	Background colors
1703	Video	Character set
1704	Video	Text page registration
1705	Video	Text pages
1706	Video	Graphics display
1707	Video	EGA/VGA palette
1708	Video	Memory
1709	Video	VGA sequencer
170A	Video	VGA controller registers
170B	Video	VGA attribute controller
170C	Video	VGA DAC



# Diagnosics

## Diagnosics Program Error Codes (continued)

<b>Code</b>	<b>Class</b>	<b>Failure Description</b>
1730	Video	Cannot initialize video
2001	Serial	Baud rate clock
2002	Serial	Internal loopback data
2003	Serial	Internal loopback control
2004	Serial	External loopback data
2701	LPT	Registers read/write
2702	LPT	Control loopback
2703	LPT	Printed pattern
2704	LPT	Printer not ready
2705	LPT	Unknown error
2706	LPT	No paper/paper jam
2707	LPT	Printer timeout
2708	LPT	Printer busy
3001	Memory	Address lines
3002	Memory	Data patterns
3003	Memory	Walking bits
3701	Disk	Invalid parameter
3702	Disk	Address mark not found
3703	Disk	Write protect error
3704	Disk	Sector not found
3705	Disk	Reset failed
3706	Disk	Change line active
3707	Disk	Drive parameter error



# Diagnosics

## Diagnosics Program Error Codes (concluded)

<b>Code</b>	<b>Class</b>	<b>Failure Description</b>
3708	Disk	DMA overrun
3709	Disk	Attempt to DMA across 64 KB
370A	Disk	Bad sector flag found
370B	Disk	Bad cylinder detected
370C	Disk	Media type not found
370D	Disk	Invalid format sectors count
370E	Disk	Control data mark detected
3710	Disk	CRC or ECC error detected
3711	Disk	EGC corrected error
3720	Disk	General controller failure
3740	Disk	Seek operation
3750	Disk	Change line test
3780	Disk	Drive not ready
37BB	Disk	Undefined error occurred
37CC	Disk	Write fault on selected drive
37E0	Disk	Status error
37FF	Disk	Sense operation failed

## Loopback Connections

The serial and parallel communications tests in the Diagnostics Program offer optional loopback tests that require placing loopback connectors on the output ports of the computer. The loopback connector pin assignments are listed in the following tables.

### Loopback Connector Pin Assignments

#### Serial Loopback Connections

<b>DB9 Pin</b>	<b>Signal</b>
1-7-8	CD-RTS-CTS
2-3	TX-RX
4-6	DTR-DSR

#### Parallel Loopback Connections

<b>DB25 Pin</b>	<b>Signal</b>
15-2	D0-ERR
13-1	STRB-SLCT
16-10	INIT-ACK
17-11	SLCTIN-BUSY
14-12	AUTOFEED-PE

# Diagnosics

## Hard Disk Format

When you select the Hard Disk Format, the program displays the Format Fixed Disk menu.

Use the cursor keys to highlight the hard disk you want formatted or analyzed, and press **Enter**. After you have selected a hard disk, the program displays a warning that the formatting operation will erase any data currently stored on the hard disk.

If you do not intend to format or analyze your hard disk, press **N**; otherwise, press **Y** to continue, and the program displays a menu listing the drives, heads, and cylinders under test.

## Bad Track Table

The center portion of the Format Fixed Disk menu displays the list of currently recorded bad tracks. This list is central to the processing of most of the format functions.

Bad tracks are areas of the hard disk that cannot store data properly. A list of the bad tracks detected by the drive manufacturer is usually provided with the hard disk drive when it is purchased. Some of these areas may work intermittently, but are not dependable for storing data. The program formats these tracks with a special attribute so that other programs or commands (such as the MS-DOS `FORMAT` command) will not attempt to use bad areas on the disk.

The bad track list is modified automatically by the `SCAN BAD TRACKS` command, the `ANALYZE SURFACE` command, and the `FORMAT PREFORMATTED DRIVE` command. Each of these functions adds to the list bad tracks they detect during their processing.

To manually add a bad track to the table, press **Ins**. Use the cursor keys or **Enter** to select between cylinder and head fields. After the cylinder and head are entered, press **F10** or **Enter**, and the new entry will be added to the table. If an invalid head or cylinder value is entered, the program displays a menu permitting you to delete a bad track.

To delete a bad track, use the cursor keys to highlight the bad track, and press **Del**. You are not prompted to verify the deletion, so use this function with care.

To clear the bad track table, press **F2**; the program displays a warning message to be sure you want to continue. Press **Y** to clear all entries from the bad track table, or press **N** to abort. To print the bad track table, press **F3** (be sure your printer is connected).

You can search the disk for all existing bad tracks if the drive has already been formatted by selecting **F5** (scan for bad tracks). This causes the program to quickly test each track on the hard disk to determine if it has already been formatted as bad. Each track found to be bad is added to the list if not already there.

## Setting Interleave

Press **F4** to set the interleave, which is the value used by the format operation to interleave the hard disk tracks. When setting interleave manually, always use a value of 1, the default. The interleave setting is the value used to format, not necessarily the current value for your hard disk.

# Diagnosics

## Analyzing the Hard Disk Surface

If you do not need to reformat the entire hard disk but want to perform a thorough test of the media to detect any bad or marginal areas, select **F6** to analyze the surface.



---

**Caution: This performs a destructive analysis of the hard disk media (all data on the hard disk will be erased).**

---

Any bad tracks found during the analysis are automatically added to the bad track table. As bad tracks are found, they are reformatted as bad so that a subsequent MS-DOS operation does not attempt to use these areas on the disk.

## Formatting a New Hard Disk

After installing a new hard disk, you should enter the bad track information provided by the manufacturer into the bad track table (see above). Then press **F7**. This option, specifically for formatting a hard disk that was previously unformatted—performs the following operations:

- Each track of the hard disk is reformatted using the current interleave value.
- Each track in the bad track table is reformatted as bad so that it cannot be used.

When the format operation is complete, run a surface analysis to verify that no additional bad tracks are found.

## Reformatting a Hard Disk

If your hard disk was previously formatted, press **F8** to automatically reformat. This causes the following operations:

- The program scans the drive for tracks that have already been marked as bad and adds them to the bad track table.
- Each track is reformatted using the current interleave value.
- Each track in the bad track table is reformatted as bad so that it cannot be used.
- The program performs a surface analysis on the media, reformats any additional bad tracks as bad, and adds them to the list.

Using this option is equivalent to performing a SCAN FOR BAD TRACKS command (**F5**), followed by a FORMAT UNFORMATTED DRIVE command (**F7**), followed by an ANALYZE HARD DISK operation (**F6**). The only differences are that all three operations are done automatically, and the surface analysis performed is not as thorough or as time-consuming as that performed when you select **F6**.

If the bad track table from the manufacturer is available when the reformat of the drive is done, enter that map before this operation is performed. This ensures that all tracks in that list are reformatted as bad regardless of whether or not they are found by the SCAN FOR BAD TRACKS operation.

## After Formatting is Complete

The HARD DISK FORMAT commands perform low-level formatting operations on hard disks. After these operations are complete, insert the *MS-DOS Disk 1* floppy into the floppy drive, and reboot the computer. Follow the instructions displayed to install MS-DOS and utilities. If you are using another operating system, see its documentation for formatting and installation instructions.

# Power Consumption Values

---

The following table summarizes approximate power consumption using various computer power-saving features, manual and automatic.

## Power Consumption by Operating Mode

Operating Mode	Typical Power Consumption
Manual Standby* with DOS background tasks	4.0 – 6.0 watts
Manual Standby* with no background tasks	2.0 – 4.0 watts
Auto Suspend† with DOS background tasks	3.5 – 6.0 watts
Auto Suspend† with Windows background tasks	2.5 – 5.0 watts
Auto Suspend† without background tasks	2.0 – 3.5 watts
Cover Closed Suspend mode	2.0 – 3.2 watts
Operation with hard disk access‡	7.5 – 12.5 watts
Operation with no hard disk access‡	7.0 – 9.0 watts
Operation with LCD off	3.5 – 6.5 watts
Setup Program <i>LCD Power</i> set to Low	0.5 watts
LCD brightness, minimum to maximum	1.5 – 3.5 watts
Typical full-charge battery capacity	24 – 27 watts
Maximum power consumption, all options	20.5 watts

\*Press **Fn-F4** (Standby) keys to enter standby mode.

†Select *Auto Suspend* in the Setup Program's Power Savings category.

‡Add 3 to 3.5 watts if BatteryPro is *not* activated (level 0).

# Configuring Memory

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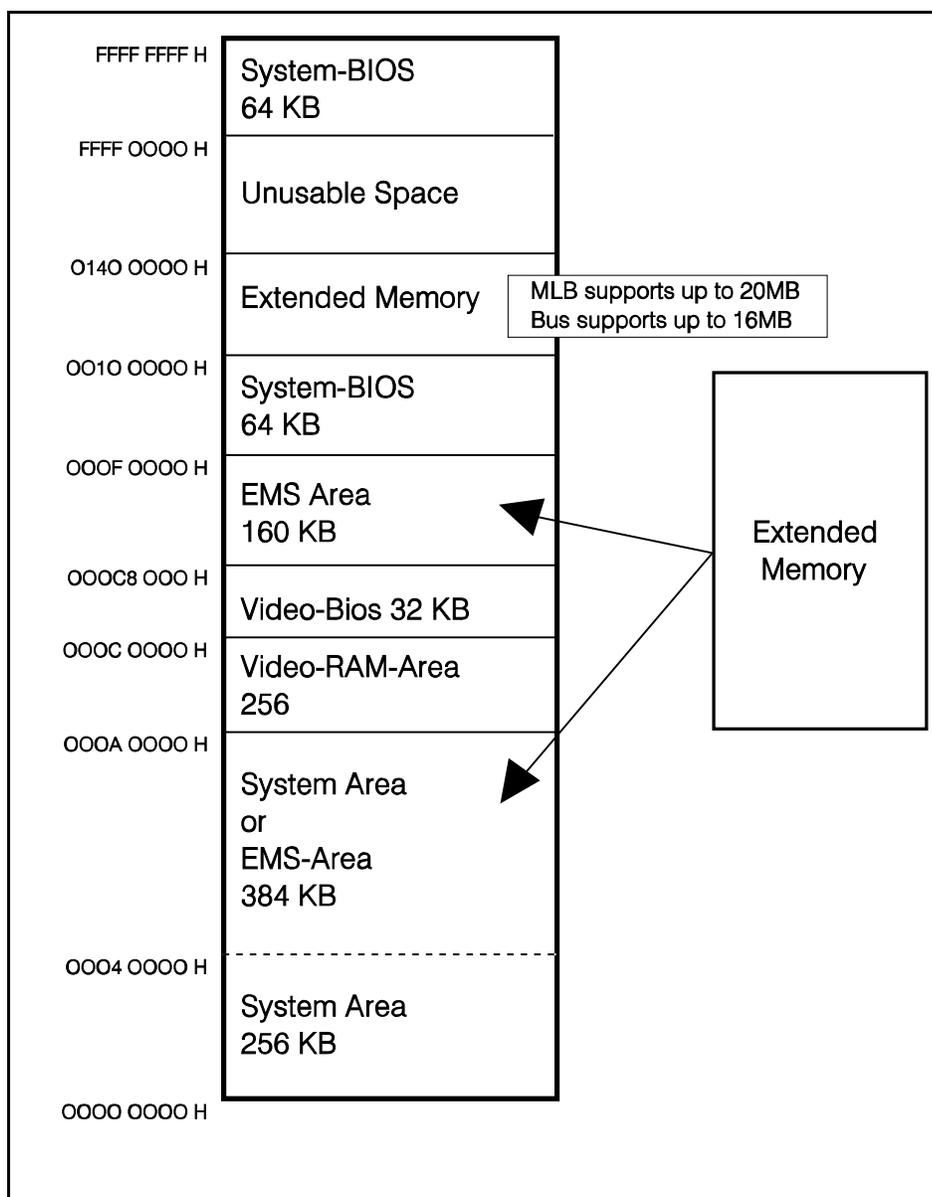
This appendix describes the various areas of RAM and how you can make it more efficient by configuring it with the memory management device drivers supplied with your computer.



# 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).



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**Note:** MS-DOS can also be loaded in HMA to free up conventional memory. Refer to your *MS-DOS User's Manual* for instructions.

---



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**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.



# Memory Areas

## 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.

# Memory Device Drivers

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\XXXXXXXXX.XXX [options]
```

Where **XXXXXXXXX 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).

# Memory Device Drivers

## 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.

---



# Memory Device Drivers

Some applications may require “backfill” memory, which is the unused area of standard memory that can be used by EMM386.EXE as Expanded memory. For example, an application may require only 256 KB or 512 KB of standard memory, leaving 384 KB and 128 KB of backfill memory space, respectively, for use as Expanded memory.

The Shadow ROM memory that you define with the Setup Program enables mapping the internal system BIOS, Video BIOS, and option BIOS into high-speed memory for faster operation. When not selected, the shadow memory is available for use as Extended memory. The shadow memory area is limited to 384 KB.

Your computer provides 4 MB of RAM (main memory) standard. The first MB (1024 KB) of the *standard* 4 MB is the system base memory (640 KB) and shadow memory (384 KB) and cannot be increased beyond 1024 KB. You can optionally add 4 MB or 16 MB of memory to use as Extended and/or Expanded memory. This added memory when combined with the remaining standard 3 MB (4 MB - 1024 KB) of system memory (not used for base or shadow memory) provides either 7 MB or 19 MB, respectively, of Extended or Expanded memory.

See the *Microsoft MS-DOS User's Guide and Reference* for detailed instructions on installing and configuring expanded memory.

## HIMEM.SYS

HIMEM.SYS is an eXtended Memory Manager (XMM) conforming to eXtended Memory Specifications (XMS), version 3.04. HIMEM.SYS uses 64 KB of the high-memory area (HMA) at the beginning of Extended memory to store a single TSR program or device driver, or it uses this area for data storage. This effectively increases the size of standard memory for use by your main application.



# Memory Device Drivers

To install HIMEM.SYS in its simplest form, include the following command line in your CONFIG.SYS file before any other device commands that use Extended memory:

```
DEVICE=C:\WINDOWS\HIMEM.SYS
```

In this form, HIMEM.SYS uses default values. Access to HMA is on a “first-come-first-served” basis.

## RAMDRIVE.SYS

A RAM disk is a portion of your computer’s memory configured to simulate a disk drive. A RAM disk, also called a *virtual disk*, can be accessed much faster than a normal drive.

You lose the data stored on a RAM disk when you turn the computer power off. Therefore, to save the contents of a RAM disk, copy the contents of the RAM disk to a floppy or to the hard drive before turning off power. You can copy files using the included Laptop File Manager utility or the MS-DOS COPY command, or you can set up a batch file to do it automatically. Unlike a normal disk, a RAM disk does not require formatting before use.

To set up a RAM disk, include the following line in your CONFIG.SYS file:

```
DEVICE=C:\DOS\RAMDRIVE.SYS [size]
```

Specify the size in kilobytes. The minimum size is 16 KB, and the default value is 64 KB.

Several other options are available for setting up a RAM disk. Refer to your *BatteryPro & Productivity Software User’s Manual* for details.

The RAM disk is given the drive letter that follows the last drive letter being used by your system. For example:

# Memory Device Drivers

- ❑ If your hard drive is configured as drive C, the RAM disk is drive D.
- ❑ If your hard drive is drive C and your hard drive is drive D, the RAM disk is drive E.

## SMARTDRV

SMARTDRV is a disk-caching program that reduces the time it takes your computer to read data from the hard disk.

When SMARTDRV is installed, information from the hard disk is temporarily stored in a cache in Extended or Expanded memory. When needed, the data can be accessed by the processor directly from the cache memory. The data on the hard disk is updated automatically to reflect the changes in the data stored in the cache.

## Installing SMARTDRV .SYS

To install SMARTDRV.SYS in its simplest form, include the following command line in your AUTOEXEC.BAT file:

```
C:\WINDOWS\SMARTDRV.EXE
```

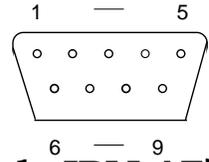
In this form, a 256-KB cache will be set up in Extended memory.

If you need to specify a particular size for the cache, or if you want the cache to be in Expanded memory, refer to your MS-DOS and Windows manuals.



# Connector Pin Assignments

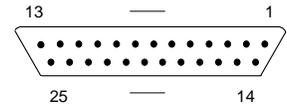
## RS-232C Connector



### 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

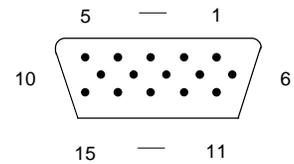


### 25-Pin Centronics Type (Male IBM-PC)

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 empty	PE	Input
13	Select	SLCT	Input
14	Auto feed	AUTO FEED-	Output
15	Printer error	PERROR-	Input
16	Initialize printer	INIT-	Output
17	Select input	SLCT IN-	Output
18-25	Ground	GND	

# Connector Pin Assignments

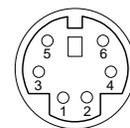
## 15-Pin VGA External Monitor Connector



Pin No.	Signal Name	Direction
1	Red video	Output
2	Green video	Output
3	Blue video	Output
4	Not used	
5	Ground	
6	Red return	Input
7	Green return	Input
8	Blue return	Input
9	Not used	
10	Ground	
11	Not used	
12	Not used	
13	Horizontal sync	Output
14	Vertical sync	Output
15	Not used	

**Note:** Monochrome monitors use green video for all video input and ignore red and blue video.

## Six-Pin Mini-Din PS/2 Mouse or PS/2 Keyboard Connector



Pin No.	Signal Name	Abbreviation
1	Data	DATA
2	Not used	
3	Ground	GND
4	+5 volts	VCC
5	clock	CLK
6	Not used	

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

## VGA (Video Graphics Array)

The VGA standard supports 640-by-480 pixel monochrome or 16 of 64 color graphics and 320-by-200 pixel 256-color graphics. The VGA standard uses an 8-by-16 pixel character box for text display.

Your computer's LCD supports VGA by displaying text in an 80-column by 25-line text display with 16 shades of gray (selectable from 64 shades) in an 8-by-16 pixel character box in a 640-by-400 pixel area centered on the display.

Your computer also supports color graphics by displaying colors as 64 shades of gray in two modes:

### **Resolution: 320-by-200 pixels with 256 shades of gray mapped into 64 shades**

---

One pixel is converted to a  $2 \times 2$  cell  
Display area:  $640 \times 400$

### **Resolution: 640-by-480 with 64 shades of gray**

---

One pixel is displayed as a  $1 \times 1$  cell  
Display area:  $640 \times 480$

# Screen Standards

## External Monitor Support

Your computer supports all IBM standard VGA video in addition to 640-by-480, 800-by-600, and 1024-by-768 extended graphics modes on an external monitor. Many extended text modes are also supported.



---

**Note:** Operating the LCD in high-resolution modes (800 × 600 or 1024 × 768) or operating the computer in SimulScan mode requires the computer to use more power than the Battery Pack can supply; use the AC Adapter to supply the additional power required.

---



---

**Caution:** Do *not* operate the LCD in SimulScan mode with a low battery. Damage to the LCD may occur.

---

# Screen Standards

## Extended Modes Supported

The following table lists the supported extended modes.

### Extended Modes

Mode (hex)	Colors	Graphics Resolution	Text Resolution (Char x Row)	DotClk MHz	Horizontal Frequency	Vertical Frequency	Notes
2e	256/256K	640x480		25	31.5	60	1,4,5
30	256/256K	800x600		40	37.8	60	2,5
37	16/256K	1024x768		44.9	35.5	87	2,3,5,7
52	16/256K		132x60	40	31.5	60	1,5
54	16/256K		132x25	40	31.5	60	1,5
64,6a	16/256K	800x600		40	37.8	53	2,6

#### Notes:

1. All PS/2 compatible monitors supporting horizontal sync frequency of 31.5 KHz
2. All Multisync type monitors supporting variable horizontal sync frequencies ranging from 25.9 KHz to 37.8 KHz
3. Interlaced mode
4. This mode is supported on the LCD, showing 64 gray shades. Simultaneous LCD and CRT display is supported with the LCD showing 16 gray shades.
5. The extended modes require special software drivers to function correctly. Your computer comes with an extensive selection of software drivers. Execute `INSTALL` on the extended VGA drivers diskette to see information on loading these drivers. Some applications come with extended mode support. If so, select the computer or Cirrus Logic driver provided by the application.
6. This is Super VGA compatible mode (SVGA). If SVGA is supported by the application, this is the mode it will use. Super VGA modes, or other modes identified as needing a multisync type monitor, do not work with fixed-frequency monitors. Examples of fixed-frequency monitors are IBM PS/2, 8503, 8512, 8613, and 8514.
7. Supported only with systems containing 1 MB of video memory

# 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



# Creating Help Displays

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.

# Creating Help Displays

- ; — (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 Of ; 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 Of ; 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
;1234567890123456789012345678901234567890123456789012
;
; 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
;
```

# Creating Help Displays

## 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.

---



This glossary explains many of the terms found in this manual as well as other computer-related terms.

**access** — The ability to obtain data from or place data into internal memory, a floppy, or the hard drive.

**access shutter** — A metal cover on a floppy that slides open to allow the computer to read or write data.

**adapter** — A device that connects an option to the computer.

**application program** — A program that instructs the operating system to perform specific tasks by using either off-the-shelf routines, such as word-processing, or programming languages such as BASIC that allow you to design your own programs.

**archiving** — The process of storing back-up copies of data files in a specific location.

**ASCII** — An acronym for the American Standard Code for Information Interchange; an agreed-upon standard for the assignment of numeric values to letters, digits, punctuation marks, and control codes. The computer processes only numbers even though characters, letters, and graphic symbols appear on the screen. The ASCII list is a set of numeric values for the most frequently used characters. The computer converts these numeric values to their binary equivalents.

**asynchronous communications software** — The software used to communicate with a subscription information service, send or receive electronic mail, or process data using a remote computer.

# Glossary

**backlight** — A feature that allows you to control background brightness for better readability.

**backing up** — Duplicating a program or file onto a separate storage medium so that a copy will be preserved against possible loss or damage to the original.

**backup** — A duplicate copy of information or programs; usually stored on a diskette and kept in a separate location in case the original is lost or damaged.

**BASIC** — An acronym for Beginner's All-purpose Symbolic Instruction Code; a programming language widely used because many of its commands resemble everyday language.

**battery, battery pack** — An electrical power storage device that can be installed in, or affixed to, your computer to provide electrical power.

**baud** — A signal element change per second. If a signal element change has only one bit, baud equals bits per second.

**binary** — A system of numbering that uses patterns of only zero's and one's. Each item of information, whether a letter, graphic symbol, or an instruction, is converted to a binary number before it is processed by your computer.

**BIOS** — An acronym for Basic Input-Output System; instructions stored in read-only memory (ROM) at the factory that check hardware components and load the computer operating system (MS-DOS, for example) into the computer when you boot it.

**bit** — A binary digit (0 or 1); the smallest unit of information used by your computer.

**bits per second** — The speed at which your computer receives or sends data to a device such as a modem or serial printer.

**boot** — To start your computer; also called *start-up* and *power-up*.

**bps** — See *bits per second*.

**brightness control** — A control that allows you to adjust the brightness of the display.

**buffer** — A portion of the computer's memory that temporarily holds information used by a program; for example, the portion of a document you are working on while using a word processor.

**bug** — An error in the hardware or software of your computer that causes an operation to perform incorrectly.

**byte** — A grouping of eight binary digits (bits) that your computer treats as one unit; usually represents one character.

**cache** — A software device that accumulates copies of recently used disk sectors in RAM. The application program can then read these copies without accessing the disk, thereby increasing performance.

**central processing unit (CPU)** — The electronic circuits in your computer where most processing of information takes place.

# Glossary

**character** — One of a set of symbols, such as letters, numerals, or punctuation marks, that can express information when collectively arranged. Although these symbols are intelligible to humans, they are not understood by your computer. For this reason, standardized character codes consisting of groups of binary digits have been developed to allow characters to be processed by computers. In most cases, a character is represented by 8 bits or 1 byte.

**character set** — A system of codes, such as ASCII, that assigns a special standardized group of binary digits to each character.

**clock** — A timing device that coordinates all internal events in your computer.

**CMOS** — An acronym for Complementary Metal Oxide Semiconductor; a large-scale integration technology that requires low-power consumption and is, therefore, used for battery-assisted memory systems.

**command** — The portion of a computer instruction that specifies what operation is to be performed.

**communications** — The electronic transfer of information between computers or between a terminal and a computer. An example is sending a data file to another computer by using telephone lines and a modem.

**compiler** — A program that translates a language, such as BASIC, into a language your computer can understand. A compiler translates the entire program just once.

**computer** — A combination of a central processing unit (CPU) and memory designed to process information. Although a combination of the central processing unit and memory is defined as a computer, an input device (such as a keyboard) and an output device (such as a display unit) are required to make the computer useful.

**configure** — To adapt software so that it sends the correct control codes to external devices such as printers. Also called *customize* and *set up*.

**connector** — A coupling device that allows your computer to communicate with an external hardware device such as a printer or another computer.

**contrast control** — A control that allows you to adjust how data shows up against the background of the display screen.

**control code** — A code that initiates some kind of physical control action that is not printed (such as line feed and tab), turns off an external device, or, in combination with other characters, defines unique commands (for example, pressing the **Ctrl** and **C** keys might tell the computer to abort a program); a numeric value that instructs the computer or an external device to perform a specific instruction.

**controller** — The electronic circuitry that allows communication between the computer unit and an external device.

**conventional memory** — Internal RAM up to 640 KB, accessed by MS-DOS directly; also called *main memory* and *RAM*.

**coprocessor** — An auxiliary processing unit designed to speed up the processing of certain types of information.

# Glossary

**CPU** — See *central processing unit*.

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

**CRT adapter** — A hardware option that allows you to use a CRT with your computer.

**cursor** — A special graphic character on the screen (usually a block or underline shape, sometimes blinking) that indicates the next position at which a character will be entered or deleted from the keyboard.

**customize** — See *configure*.

**data** — Information entered into your computer and then processed by mathematical and logical operations so that, ultimately, it can be output in a sensible form. It usually consists of numerals, letters, or symbols that describe an object, idea, condition, relationship, or other information.

**data base** — A collection of related information; usually a large number of data files stored in one or more storage media.

**data file** — A grouping of information with common descriptive attributes. For example, a customer data file might consist of basic customer information. Each file might represent one customer.

**data processing** — The input, storage, manipulation, and dissemination of information using sequences of mathematical and logical operations.

**default value** — A value that your computer assumes as a response to a prompt, unless instructed otherwise.

**device driver** — The small programs used to control external devices or to run other programs. A device driver directs production, manipulation, and presentation of appropriate signals by the computer so that the external device will perform as required.

**diagnostics programs** — The programs that test the components of your computer to verify proper operation or to diagnose problems.

**directory** — The list of all files, which itself is a file, on your computer storage medium for easy reference.

**disk controller** — A device that controls how information is transferred between the system unit and the hard disk or floppies.

**disk drive** — A device that rotates magnetic media and accesses data by means of a read/write head.

**diskette** — See *floppy*.

**DOS** — The disk operating system, programs that act as translator between you and your computer; also see *operating system*.

**expanded memory** — The memory that utilizes an area of the computer memory as a window, through which pages of data are “passed.”

**expansion bus connector** — A coupling device that connects an external device to your computer.

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

# Glossary

**external commands** — The utility programs of an operating system (for example, MS-DOS) that enable you to perform occasional operations such as copying an entire floppy or partitioning a hard drive.

**external devices** — The devices, usually for input and output, connected to your computer to increase its capability and usefulness. Examples include printers and modems.

**file** — A group of organized data assembled for one particular purpose, considered as one unit, and stored in permanent offline storage, such as a drive or tape.

**filename** — A name that distinguishes one file from another; may consist of alphabetical characters, numeric characters, or a combination of both.

**firmware** — The software that is built into the hardware of a computer and controls the functions of the hardware.

**fixed drive** — See *hard drive*.

**floppy** — A flexible, flat, circular medium that magnetically records and provides access to stored data. It is divided into concentric circular tracks and wedge-shaped sectors. The diskette is sealed in a protective square envelope that is lined with a soft material that cleans as the diskette rotates. The cover has several openings and notches to accommodate the drive.

**formatting** — The preparation of various types of magnetic media to accept data. For example, before you can use floppies, track and sector information must be set for the controller. After the floppy is formatted, it can be used for normal input-output and retrieval operations.

**function keys** — The keys that perform editing functions in MS-DOS and have application-defined functions at other times.

**graphics** — Visual patterns displayed on the screen or produced on a printer; usually formed by patterns of dots.

**hard drive** — A combination of a drive mechanism and permanently sealed storage medium; capable of storing large amounts of information.

**hardware** — The physical components of a computer: central processing unit, internal memory, drives, printer, display unit, option boards, external devices, etc. Contrast with *software*.

**hardware options** — Any of several devices that can make your computer more efficient and powerful.

**head** — A small electromagnetic device that reads, records, and erases data on a magnetic storage medium, such as a drive or tape. Also called a read-write head.

**hexadecimal** — A numbering system that consists of 16 symbols, 0 to 9 and A to F; used by programmers as a convenient method of expressing binary values.

**input** — Information that enters the computer.

**input/output** — An operation that transfers information from the central processing unit to a device or from a device to the central processing unit. An example is storing and retrieving information with a floppy.

**integrated circuit** — A microscopic grouping of electronic components and their connections mounted on a small chip of material, usually silicon.

# Glossary

**internal commands** — The core program of the operating system (for example, MS-DOS) that consists of commands necessary for day-to-day operations, such as copying files.

**internal memory** — A temporary storage area for information (programs and data) in binary form.

**KB** — An abbreviation for 1,024 bytes; used to designate the memory capacity of a computer or the storage capacity of a storage device.

**keyboard** — A device, similar to a typewriter keyboard, that allows you to communicate with your computer.

**kilobyte** — 1,024 bytes, abbreviated KB.

**LCD** — See *liquid crystal display*.

**liquid crystal display (LCD)**— A display made of material, that reflects or transmits changes when an electric field is applied.

**load** — To copy information from a storage device, such as a floppy or a hard drive, into internal memory of the computer. Also called *download*.

**loop** — A series of instructions or one instruction in a program that is repeated a prescribed number of times, followed by a branch instruction that exits the program from the loop.

**main directory** — The primary directory of a diskette or a hard drive. Also called a *root directory*.

**math coprocessor** — An auxiliary processing unit used to speed up the processing of mathematical calculations.

**MB** — An abbreviation for *megabyte*; used to designate the memory capacity of a computer or the storage capacity of a storage device.

**megabyte** — 1,024 kilobytes.

**microprocessor** — A central processing unit assembled on a single silicon integrated-circuit chip.

**modem** — A device, separate from or installed in your computer, that allows it to use telephone lines to communicate with other devices such as computers.

**monitor** — A view screen to which a computer sends graphics or text data you can see.

**mouse** — A device, manipulated by hand, that moves a cursor or pointer in the same direction as the movement created when the mouse is moved.

**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.

# Glossary

**path, pathname** — A sequence of directory names, usually ending in a filename, all separated by backslashes (\), to tell your computer where to find particular subdirectories and files.

**port** — An input/output connection between external devices and the computer. The port has both male and female connectors that contain a specific number of pins.

**processing** — The calculating, sorting, storing, and retrieving of information.

**program** — A list of instructions that tells your computer how to perform a specific task.

**program file** — A program stored on a storage medium such as a floppy or hard disk.

**programming language** — A set of words, abbreviations, or symbols that are converted into the binary numbers and that represent instructions to the computer. Programming languages enable programmers to write instructions using words or symbols and avoid the time-consuming task of entering the long string of 0s and 1s that represent the numeric language of the computer. A programmer can use any one of several different programming languages designed for a particular computer. Some programming languages have more than one version (for example, MS-BASIC and GW-BASIC).

**RAM** — See *random access memory*.

**random-access memory (RAM)** — A type of internal memory used for the temporary storage of information. The contents of RAM can be altered, allowing information stored there to be processed. Unlike read-only memory, information in RAM is usually lost when power is turned off. For this reason, information in RAM must be saved on a storage device before the computer is turned off. Also called *main memory* and *system memory*.

**read** — To access information from a storage device.

**read-only memory (ROM)** — A type of internal memory that contains permanent instructions for your computer. The contents of ROM cannot be altered. For this reason, essential instructions are permanently stored in ROM. These instructions, such as those that execute the self-test, are not lost when the computer is turned off.

**resolution** — The contrast between the display and the background on a screen.

**ROM** — See *read-only memory*.

**self-test** — An automatic check the computer performs every time it is turned on.

**set up** — See *configure*.

**software** — Computer programs, usually supplied on floppies or on ROM. Contrast with *hardware*.

**system board** — An internal circuit board that holds the integrated circuits for the microprocessor, memory, and clock in your computer.

**turbo operation** — A feature of a computer that increases its data processing speed by 50 to 100 percent.

# Glossary

**typematic** — A feature that generates a character when an alphanumeric key is pressed.

**working copy** — A copy of a floppy that is used in day-to-day operations while the original is kept in storage. This term also can mean a floppy that has both an operating system and an application on it.

**working directory** — The default directory used by an application when it first is loaded onto the hard drive.

**write** — To record information on a storage device.

**write-protect tab** — A switch on a floppy drive that prevents recording of data over existing data.

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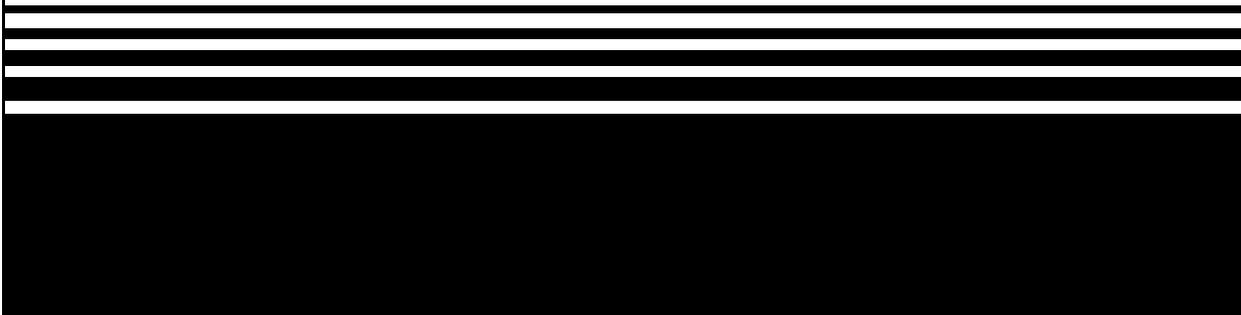
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*User's Reference Manual*

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