DECpc 325P

User's Guide

Order Number ER-PCP12-UA.A01

Digital Equipment Corporation

DECpc 325P

Application Bulletin

Serial Port Maximum Baud Rate

The maximum baud rate for the DECpc 325P serial port is 38,400 bits per second (bps). Some applications, such as LapLink or WinConnect, may not operate properly at baud rates above 38,400.

Operating Temperature

The optimum operating temperature for the DECpc 325P is 10° C to 40° C (50° F to 104° F).

FAXit and Windows Power Management

Your DECpc package may include FAXit software for a FAX/data modem. If you use FAXit with the Windows APM (Advanced Power Management) features, it is recommended that you use the standard mode of Windows Power Management. The advanced mode can cause loss of FAX reception and transmission. See your Windows documentation for additional information on APM features. For customer support for FAXit for Windows software, contact SoftNet Customer Service at (404) 984-9958.

Windows Enhanced Mode

By default, the standard (2MB) DECpc 325P uses Windows standard mode. To configure Windows to always run in enhanced mode, you can change the SMARTdrive line in your AUTOEXEC.BAT file to:

```
c:\windows\smartdrv.exe 1024 0
```

This line reduces the amount of RAM SMARTdrive uses to 0 when Windows is operating. Or, to begin a Windows session in enhanced mode type `win /3` and press ENTER to run Windows from the operating system command line.

Refer to your windows documentation for additional information about the SMARTdrive disk caching utility.

Order Number ER-PCP12-BA.A01

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digital

The FCC wants you to know...

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of *FCC Rules*. These limits are designed to provide reasonable protection against harmful radio and TV interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation.

If this equipment does interfere with radio or television reception, which you can tell by turning the equipment off and on, you are encouraged to try to correct the interference. Use one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the radio/TV.
- Connect the equipment to an outlet that is on a different circuit from the one used for the radio/TV.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded cables must be used with this equipment. If you add or replace any cables, the new cables must have shielding capabilities equal to or higher than those provided by the dealer.

Modifying or tampering with internal components can cause a malfunction and might invalidate the warranty and void your FCC authorization to operate this equipment.

The DOC wants you to know...

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class B prescrites dans le Réglement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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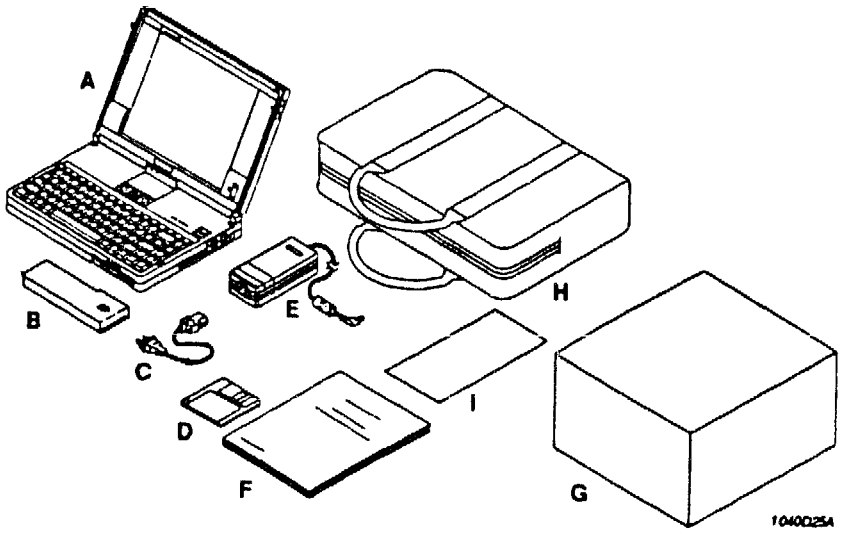


Unpacking Your Computer

Your package contains:

A DECpc 325P Portable
B rechargeable battery pack
C AC/DC adapter power cord
D Utilities Diskette
E AC/DC adapter/charger
F *DECpc 325P User's Guide*
G MS-DOS and Windows manuals and diskettes
H carrying case
I *Hotkeys Quick Reference* card

Your package might also contain additional software, options that you need to install, and documentation. Always consult the documentation provided with an option kit before installing the option.

NOTE

The battery is not charged. To use the battery to power your computer, you must charge the battery. Refer to "Charging the Battery Pack" in the "Getting Started" chapter.

About This Book

Chapter 1	Introduction
Chapter 2	Getting Started — Explains how to set up your computer for the first time.
Chapter 3	Utilities — Explains how to use the utilities. Also explains using keyboard shortcuts, or hotkeys, to quickly perform specific functions such as changing the video configuration.
Chapter 4	Installing Optional Hardware — Explains how to add internal and external options.
Appendix A	Specifications — Lists technical information for the DECpc 325P.
Appendix B	System Memory — Describes how the system memory is mapped for conventional memory, high reserved memory, extended memory, and shadow RAM.
Appendix C	BIOS Error Messages — Lists the BIOS error messages that might be displayed.
Appendix D	Beep Codes — Lists the system BIOS error codes and their meanings.
Appendix E	Warranty Information— Lists warranty and customer service information.

Conventions

Throughout this manual, the following conventions differentiate various types of text:

- Words that are printed in small bold capital letters represent keys on your keyboard. For example: ENTER.

  Groups of keys are printed like this: CTRL+ALT+DEL. Press and hold the specified keys (CTRL, ALT, and DEL in this example) in the order shown.

- Information that you are instructed to type or that is shown on the screen is printed differently than the regular text in this manual. For example:

  Type 3 at the SELECT THE ACTION DESIRED prompt.

  After typing the text, you must press ENTER. Most programs allow you to type in either uppercase or lowercase.

- Information that is especially helpful or important is presented as a note, a caution, or a warning:

  NOTE — Provides information of general interest.

  CAUTION — Provides information about preventing damage to hardware or equipment.

  WARNING — Provides information about preventing personal injury.

1

Introduction

Standard Features

This chapter describes the standard features and the options for the DECpc 325P

Table 1-1. Standard Features

Feature	Description
25 MHz 386SL microprocessor	Provides 386 performance, low power consumption, a 32-bit central processing unit (CPU) with a 16-bit data bus.
High-capacity, 3½-inch diskette drive	Enables you to read and write standard-density (720KB) and high-density (1.44MB) diskettes.
16KB SRAM (static random access memory) cache	Improves computer and application performance by decreasing the number of memory accesses required.
2MB of system memory, expandable to 8MB	Enables you to run a variety of software. You can upgrade system memory to 4MB, 6MB, or 8MB by installing optional RAM cards.
VGA grayscale video	Provides 640 x 480 resolution and 16 levels of grayscale (64 levels in Mode 13).
Keyboard	Enables easy typing with an 84-key layout that emulates the 101-key enhanced keyboard.

Table 1-1. Standard Features (Continued)

Feature	Description
Hard drive	Provides 85MB of storage space. Optional 120MB systems are also available.
Built-in pointing device (trackball)	Lets you move the cursor by spinning the trackball. The trackball is not operational when an external mouse is connected.
Rechargeable battery pack	Provides approximately 3 hours of power when fully charged.
Serial and parallel ports	Let you connect a serial mouse, an external modem, or another standard serial device and a parallel printer or other parallel device.
PS/2-style mouse port	Enables you to connect a PS/2-style mouse, a trackball, or another PS/2-style device.

Options

Table 1-2. Options

Option	Description
Additional rechargeable battery pack	Provides a backup power supply in case the battery pack supplied with the computer runs down when no AC power is available.
Expansion chassis	Enables you to integrate one full-sized and/or one half-sized AT-compatible option card into the system. This option enables you to connect your computer to a Digital DECnet PCSA network.
2MB, 4MB and 6MB RAM cards	Increase system memory from the standard 2MB to 4MB, 6MB, or 8MB.
25 MHz 387SL math coprocessor	Increases numeric processing capability.
Internal or external modem	Transmits and receives data through an ordinary telephone line. You can connect an external modem to the computer's external serial port. An internal modem must be installed by a Digital Customer Service Engineer.
Automobile adapter	Enables you to recharge the computer battery using a standard automobile cigarette lighter socket.
Leather carrying case	Provides convenient storage when you travel with the portable computer. Using the durable leather case lessens the chance of damage when you travel.

2

Getting Started

This chapter lists system cautions you should observe and explains how to power up and start using your computer.

System Cautions

- Observe temperature and humidity specifications when using, storing, or transporting the computer and when charging the battery pack. Refer to "Appendix A Specifications" for safe operating conditions.
- If you must transport the computer from a cold location to a warm location, allow a few minutes for condensation on internal system components to evaporate before you use the computer.
- To prevent accidents that might damage the system, use the carrying case when transporting the computer.
- Do not use the computer in areas with a high concentration of dust.
- Do not expose the computer to severe vibrations or impacts.
- Do not place heavy objects on top of the computer.
- Do not attempt to disassemble the computer.
- Do not insert paper clips or other small objects into the computer.
- Use the correct battery pack with this computer.
- Keep at least a 2-inch clearance space around the computer and any external device(s) to prevent overheating.

Installing the Battery Pack

The battery pack is shipped discharged. You must install and charge the battery pack for first-time use. Install the battery pack as instructed in the following procedure. Then refer to "Using the AC/DC Adapter and the Battery Pack."

1. Turn off the computer, and disconnect the AC/DC adapter and all other external devices from the wall AC outlet. Then, disconnect all devices from the computer.
2. Turn the computer over. Place it on a flat surface.
3. Place the battery pack into the battery compartment, and align the side tabs with the compartment slots as shown in Figure 2-1.

4. Press down until the battery pack is flush with the bottom of the computer. Then, slide the battery pack to lock it into place.

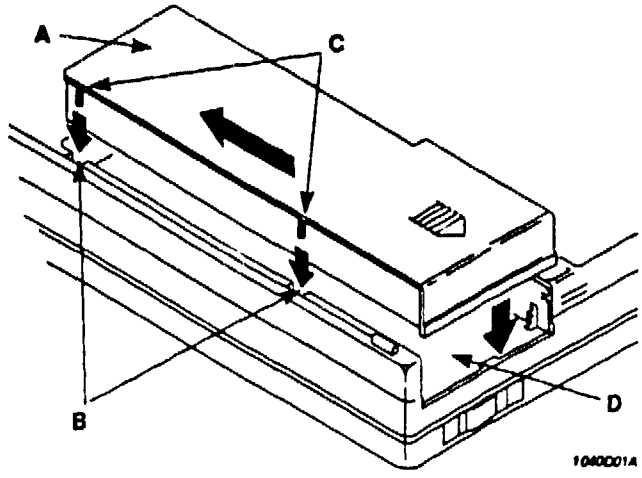


Figure 2-1. installing the Battery Pack

A	Battery Pack
B	Compartment Slots
C	Battery Pack Side Tabs
D	Battery Compartment

Charge the battery pack before you use the computer. Refer to "Charging the Battery Pack." If you are replacing a previously used battery with another battery that you charged previously, check that the replacement battery is still fully charged. Refer to "Using the Gauge Utility" in the "Utilities" chapter for instructions on checking a battery's charge.

Charging the Battery Pack

Follow these steps to attach the AC/DC adapter and charge the battery:

1. Install the battery pack. Refer to "Installing the Battery Pack."

CAUTION

To prevent damage to the battery pack, charge the battery pack only within the allowable temperature range. Do not expose the battery pack to an open flame. Refer to "Appendix A Specifications" for the temperature range.

2. Connect the DC plug of the AC/DC adapter to the DC IN jack on the left side of the computer as shown in Figure 2-2.

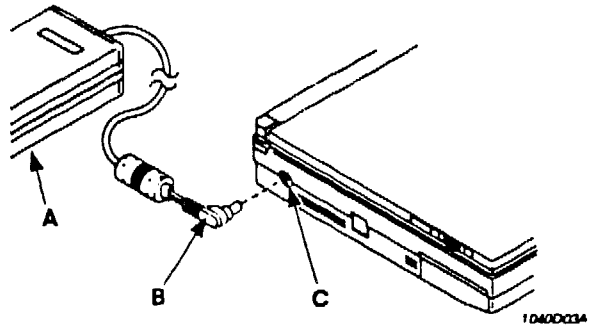


Figure 2-2. Connecting the Adapter DC Plug to the DC IN Jack

A AC/DC Adapter

B DC Plug

C DC IN Jack

3. Plug the female end of the adapter power cord into the inlet socket of the AC/DC adapter.
4. Plug the male end of the adapter power cord into a standard, grounded AC wall outlet that is easy to access. The appearance of the power cord varies, depending on your country.

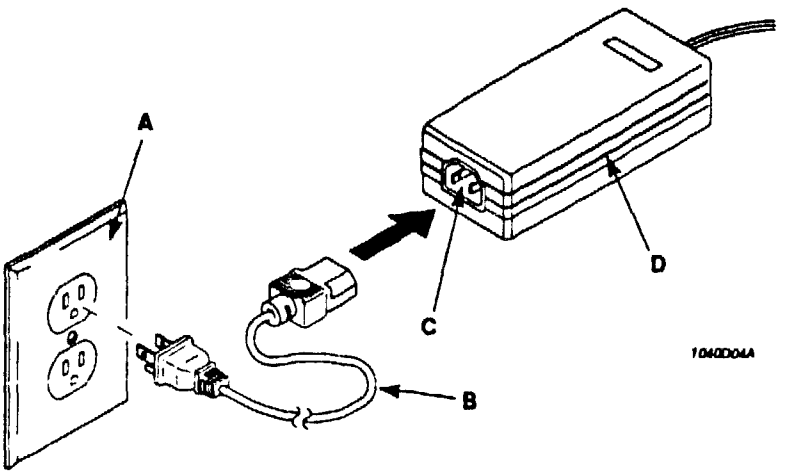


Figure 2-3. Plugging the Power Cord into a Grounded AC Outlet

A AC Wall Outlet

B Adapter Power Cord

C Inlet Socket

D AC/DC Adapter

5. Turn the computer on to begin using it on AC power while the battery pack is charging, or leave the computer power off to complete charging in approximately 2 hours. It is normal for the AC/DC adapter to become warm during use.

The battery indicator on the central hinge of the computer changes color to show the status of the battery's charge. Refer to Table 2-1 for the conditions shown by the battery indicator.

Using the AC/DC Adapter and the Battery Pack

The AC/DC adapter fully charges a discharged battery pack in approximately 2 hours when the computer is turned off. Charging takes 5 or more hours if you are using the computer during charging. Charging times vary depending on the condition of the battery pack and whether you are using the computer. Refer to "Charging the Battery Pack" for instructions on using the AC/DC adapter to charge the battery pack.

After charging the battery, you can disconnect the AC/DC adapter to operate the computer on battery power. If you plan to use the computer for more than 3 hours, you can connect the AC/DC adapter to ensure that the battery pack's charge is maintained. Or, you can remove the battery pack to use the AC/DC adapter to power the computer.

CAUTION

Using an AC/DC adapter other than the one supplied with the computer might damage the battery pack or the computer. Unplug the AC/DC adapter from the AC outlet before you disconnect it from the computer.

Information About Rechargeable Batteries

The 325P uses a rechargeable Nickel-Metal Hydride battery pack to provide portable power. The battery pack installed in the computer is charged automatically when the AC/DC adapter is connected to the computer and an AC wall outlet.

WARNING

Do not directly connect the battery's negative and positive terminals. Do not incinerate the battery. Do not bend or touch the battery terminals.

Nickel-Metal Hydride batteries can gradually lose the ability to hold a full charge if the charge is never allowed to run completely down. You should occasionally use the battery pack until it is completely discharged. Charging the fully discharged pack once a month can prevent the gradual loss of charge capacity.

Keeping an additional battery charged and ready for use can ensure a constant source of battery power for the computer. Remember that a charged battery pack can lose its charge over a period of time, even if it has not been used or installed in the computer. Use the power conservation utilities described in the "Utilities" chapter to extend and check the battery's charge.

Removing the Battery Pack

Follow these steps to remove the battery pack:

1. Turn off the computer, and disconnect the AC/DC adapter from the computer.
2. Turn over the computer.
3. Pull and hold the battery release.
4. Slide the battery pack in the direction of the arrows. Then, lift the battery pack from the compartment.

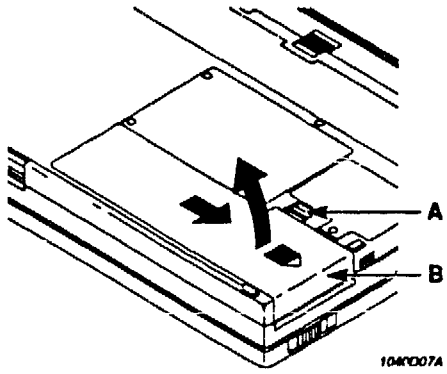


Figure 2-4. Removing the Battery Pack

A Battery Release

B Battery Pack

Powering the Computer

You can use the AC/DC adapter, a charged battery pack, or an optional expansion chassis to power the computer. The AC/DC adapter or the expansion chassis can also recharge the battery pack. "Using the AC/DC Adapter and the Battery Pack" explains how to use the adapter and battery pack to provide power. A fully charged battery pack supplies approximately 3 hours of computer power. The duration of the battery's charge depends on your computer configuration, the applications you are running, and the power management features you have enabled. Refer to the "Utilities" chapter for information about using the setup utility and the hotkeys to enable power management features.

If the computer is attached to an optional expansion chassis, approximately 4 hours of charging are required when the computer is turned off. If the computer is turned on, the expansion chassis can fully charge the battery pack in approximately 5 hours.

Opening and Turning On the Computer

Follow these steps to open the computer and turn it on:

1. Attach the AC/DC adapter, or install the battery pack.
2. Slide the side latches toward the front of the computer. Then, lift the display panel.

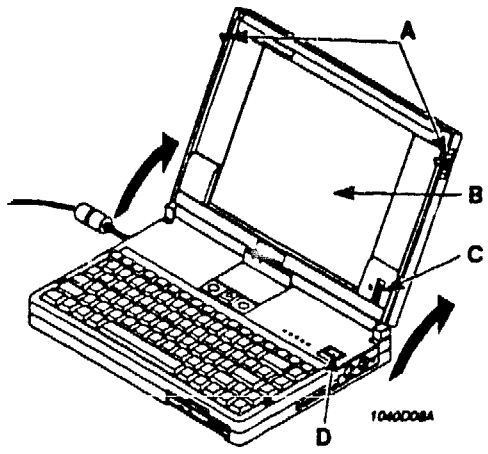


Figure 2-5. Opening the Computer

A	Latches
B	Display Panel
C	LCD Contrast Control
D	Power Button

3. Press and hold down the power button for about 2 seconds to turn on the computer.
4. Tilt the screen to a comfortable viewing angle.
5. If needed, adjust the LCD contrast control.

Checking the System Indicators

Seven system indicators (Figure 2-6, A) are located above the keyboard as illustrated in Figure 2-6.

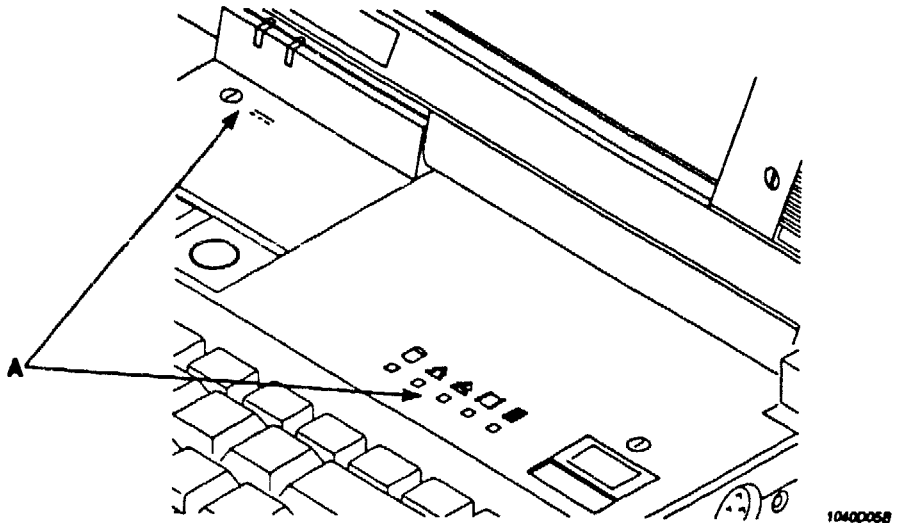
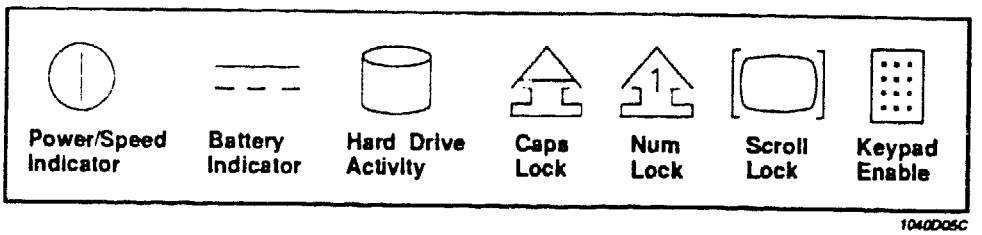


Figure 2-6. System Indicators



The system indicators function as described in Table 2-1.

Table 2-1. System Indicator Descriptions

Indicator	Description
Power/Speed Indicator	Green indicates that computer power is turned on.
	Orange indicates that power has switched to low-speed operation, or Standby Mode. The system saves power by switching to low-speed operation until you press a key or click a mouse button. Your applications are not affected.
	No light indicates that the computer power is turned off.
Battery Indicator	Off indicates that the computer is being powered from the battery alone.
	Orange indicates that the adapter is charging the battery pack.
	Green indicates that the pack is fully charged.
	Red indicates that the battery charge is low. The battery supply will last approximately 10 minutes after the battery indicator turns red.
	Flashing orange indicates the adapter is connected to the computer; the battery pack is removed.
	Flashing red indicates a problem with the battery's charging controller or some other internal component. Call Digital Customer Service.

Table 2-1. System Indicator Descriptions (Continued)

Indicator	Description
Hard Drive Activity	Green indicates that the system is accessing the hard drive.
Caps Lock	Green indicates that the keyboard's caps lock feature is enabled.
Num Lock	Green indicates that the keyboard's number lock feature is enabled.
Scroll Lock	Green indicates that the scroll lock feature is enabled.
Keypad Enable	Green indicates that the keyboard's keypad emulation feature is enabled.

CAUTION

A warning beep sounds every 20 seconds during the last 2½ minutes of the battery pack's charge. To avoid data loss, save the files that you are working on when you hear the first warning beep. You can continue working in your applications if you connect the AC/DC adapter and begin recharging the battery pack immediately.

Using the Keyboard

The keyboard has 84 keys that emulate the functions of the 101 keys on most desktop computers. Many of the keys function like those on a typewriter. Press a key to type the letter or perform the function indicated on the key. For example, press the up arrow key to move the cursor up one line. Some keys have two functions. One of the key functions indicated can be accessed only when you press another key such as SHIFT or FN. Your applications often control how the function keys work.

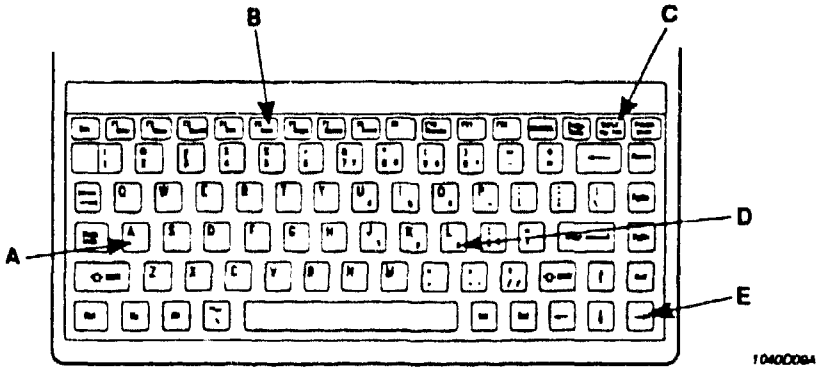


Figure 2-7. Keyboard Layout

A Typewriter Keys

B Function Keys

C Special Function Keys

D Keypad Keys

E Arrow Keys

The Table 2-2 lists the types of keys on the keyboard and describes the general functions of the keys.

Table 2-2. Key Functions

Keys	Function
Typewriter Keys	Work like the keys on a typewriter. These keys feature auto repeat: each keystroke repeats as long as you hold down the key.
Arrow Keys (← ↑ → ↓)	Moves the cursor one space at a time in the direction indicated on the key.
Keypad Keys	The rightmost typewriter keys are labeled 0-9, +, _, /, and * in blue to indicate that they also function as keypad keys. Pressing FN and any keypad key enables the numeric keypad for that keystroke only. Press the same combination with NUMLK to lock keypad functionality. Adding the SHIFT key to the combination enables the arrow keys and the HOME, END, PGUP, PGDN, INS, and DEL special function keys in many applications. Press FN and any keypad key a second time to disable keypad functionality. In many applications, pressing the FN and any keypad key enables the arrow keys and the HOME, END, PGUP, PGDN, INS, and DEL special function keys.
Function Keys	Perform functions as assigned by the software you are using. Eleven function keys have secondary functions that can be performed by pressing various key combinations. Refer to "Using the Hotkeys" in the "Utilities" chapter for more information.
Special Function Keys	Perform the functions indicated on the keys, usually when pressed as part of a key combination. For example, CTRL +BREAK enables you to stop the processing of some applications. The NUMLK and KEY PAD function keys work with other keys to enable you to type numbers. Functions for these keys vary according to the application you are running.

Swapping the CTRL and CAPS LOCK Keys

The setup utility enables you to swap the functions of the CTRL and CAPS LOCK keys. If you have set the `Ctrl/Caps Lock` parameter to `Swapped`, you might want to swap the positions of the CTRL and CAPS LOCK keys on your keyboard.

To remove a key, lift the top of the key and carefully pull it from the keyboard. To place the key in the new position, slide the key pin to the top of the key opening. Then, position the key over the center socket of the key opening and snap it into place.

Using the Trackball

To use the trackball, spin the ball in the direction you want the cursor on the screen to move. The cursor moves in the direction of the spin.

The buttons on each side of the trackball function like left and right mouse buttons. Press these buttons to select items as described in the documentation for your applications. You cannot use the trackball when an external mouse is connected to the mouse port.

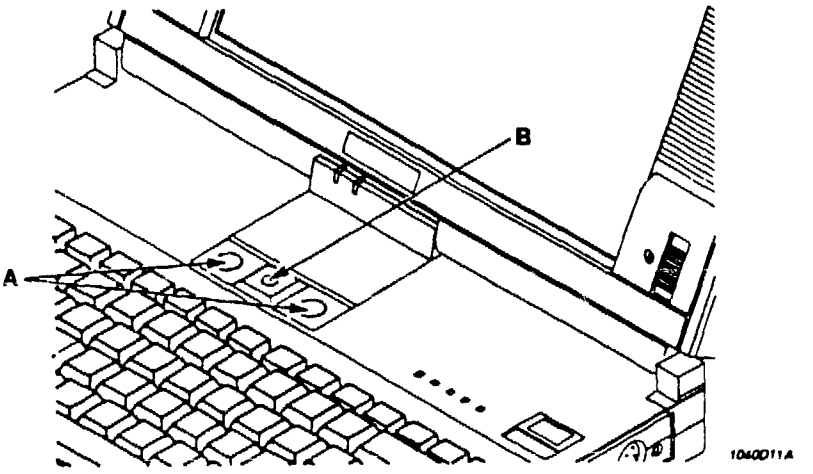


Figure 2-8. Trackball

A Left and Right Buttons

B Trackball

To keep the trackball and buttons in good condition, follow these guidelines:

- Do not place or drop heavy objects on the ball or the buttons.
- Keep the ball surface free from dust, water, and oil.
- If necessary, refer to "Cleaning the Trackball."

Cleaning the Trackball

Turn off the computer, and use the following steps to clean the trackball.

1. Insert the blade of a small, flat-blade screwdriver or a pair of tweezers into the slot between the trackball cover and the computer.

WARNING

Do not touch any metal parts in the computer when you remove or after you remove the trackball.

2. Carefully pry the cover from the trackball. Slide the cover to the right, and then pull gently to remove it.

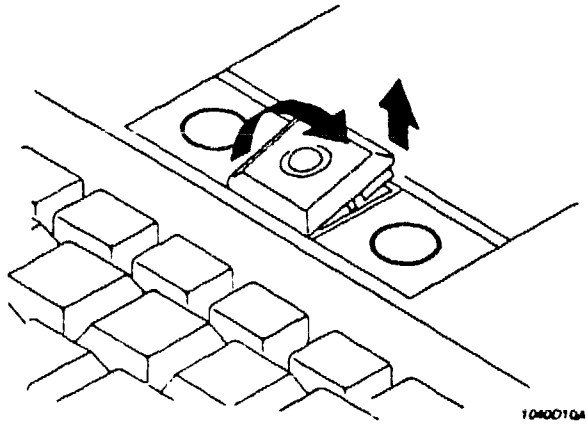


Figure 2-9. Removing the Trackball

3. Clean the ball with soapy water. *Do not* use solvents to clean the ball.
4. Thoroughly rinse the ball with clean water. Then, dry the ball completely with a soft, clean cloth.
5. Place the dry ball into the compartment, and replace the cover.

Using the Diskette Drive

You can access data or programs on diskettes, and you can save data to diskettes. To protect diskettes and information contained on the diskettes, follow these guidelines:

- Keep diskettes away from magnetic fields.
- Do not touch the magnetic surface of the diskettes.
- Do not expose diskettes to extreme heat or humidity.
- Do not remove a diskette from the drive when the diskette drive activity indicator is lit.
- Do not turn off the computer while the diskette drive is operating.

To insert a diskette, gently slide the diskette into the drive slot (label side up) until it clicks into place.

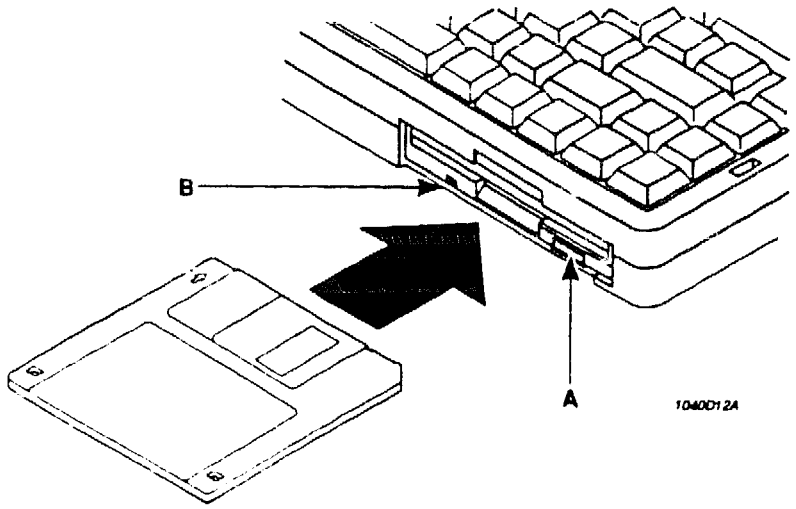


Figure 2-10. Inserting a Diskette

A Diskette Drive Activity Indicator

B Diskette Eject Button

To remove a diskette, press the eject button until the diskette is partially ejected. Then, pull the diskette from the drive.

NOTE

The diskette drive supports 1.44MB or 720KB diskettes. The drive can read, write, and format standard-density (720KB) diskettes and high-density (1.44MB) diskettes. To format a 720KB diskettes in this drive, you must specify the appropriate switches with the **format** command. Refer to your operating system documentation for information.

Turning Off the Computer

Before you turn off the computer, exit any program and return to the system prompt (A> or C>). Then, press and hold down the power button for about 1 second to turn off the computer.

CAUTION

Do not turn off the computer while the hard disk drive indicator or the diskette drive indicator is on. These indicators show that the computer is reading from or writing to the hard disk or diskette. Turning off the computer during these times can cause data loss.

Resetting the System

A system reset returns the system to its initial (startup) state. When you have system or application problems, you can reset the system to clear it and start your applications and devices again. Your computer has a recessed RESET button.

To reset the computer, insert a pointed object (such as a pen) into the opening labeled RESET (Figure 2-11, A) on the right side of the computer:

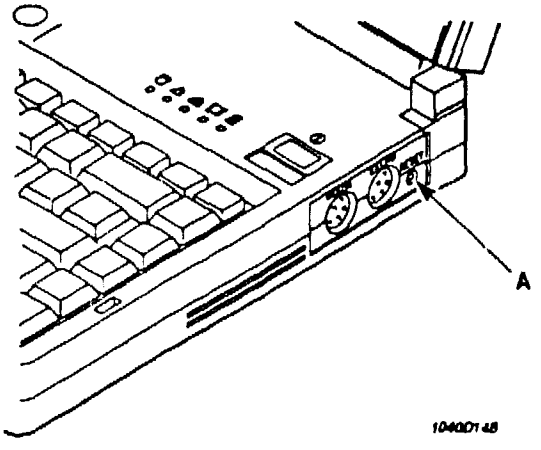


Figure 2-11. Resetting the Computer

You can also press CTRL+ALT+DEL to reset your computer.

3

Utilities

A utility is a program that enables you to perform tasks such as enabling or disabling power management and selecting the cursor type. The DECpc 325P Utilities Diskette contains the following utility files:

Table 3-1. DECpc 325P Utilities

Filename	Utility Name	Function
SET325P.COM	SET325P	setup utility
PWR325P.COM	PWR325P	power management utility
GAUG325P.COM	GAUG325P	battery charge gauge utility
KP.EXE	KP	keyboard password utility (also locks the trackball and PS/2-style mouse)

The Setup Utility

The SET325P setup utility enables you to change your system configuration. The setup utility displays a basic setup screen and an advanced setup screen. The basic screen includes parameters you might want to change often. The advanced screen displays parameters such as the inactivity triggers for Suspend Mode and Standby Mode. You normally do not need to change the advanced parameters.

Your utility files can be copied to the hard drive for convenient access. To copy all the utilities to the root directory of the hard drive, insert the Utilities Diskette into the diskette drive. Then, type:

```
copy a:*.* c:
```

and press ENTER.

Running the Setup Utility

To run the setup utility, change to the drive and directory into which you copied the SET325P.COM file or insert the Utilities Diskette into the diskette drive and type a: and press ENTER. Then, type set325p and press ENTER. The basic setup screen is displayed. Figure 3-1 shows the basic setup screen and the default setting for each parameter. Refer to "Basic Setup Screen" for a description of each parameter.

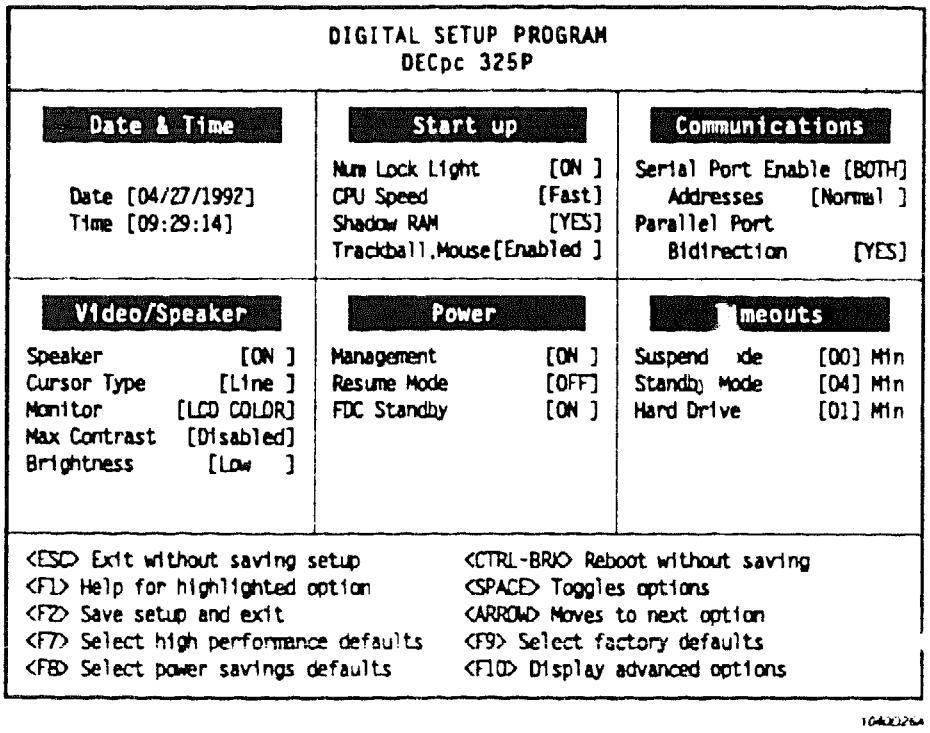


Figure 3-1. Basic Setup Screen

Basic Setup Screen

Table 3-2 describes the parameters on the basic setup screen. Press F1 to display the on-line help for the highlighted parameter.

Table 3-2. Basic Setup Parameters

Parameter	Function
Date & Time	
Date	Sets the computer's date in *mm/dd/yyyy* format.
Time	Sets the computer's time in *hh:mm:ss* format.
Start Up	
Num Lock Light	Sets the number lock indicator to come on when you turn on the computer.
CPU Speed	Sets the processing speed to `Fast` (25 MHz) or `Slow` (12.5 MHz). Press FN+F3 to toggle the 12.5 MHz and 25 MHz CPU speeds. Refer to the `Management` parameter in the Power section for information about changing the CPU speed to conserve power.
Shadow RAM	Designates RAM between 640KB and 1MB as shadow RAM. If you set this parameter to `YES`, the system BIOS and video BIOS are copied to a 128KB portion of shadow RAM. The remaining portion of shadow RAM (192KB) can be used by as extended memory. This configuration of shadow RAM results in faster performance with some applications. If you set this parameter to `NO`, the system BIOS and video BIOS are not copied to shadow RAM. An additional 320KB of shadow RAM is used as extended memory.
Trackball, Mouse	Enables or disables the built-in trackball or a PS/2-style mouse.

Table 3-2. Basic Setup Parameters (Continued)

Parameter	Function
Communications	
Serial Port Enable	Configures the serial ports. Select COM1 to enable the serial port (external) or COM2 to enable the modem port (internal). Select NONE to disable the serial and modem ports. Select BOTH to enable the serial and modem ports.
Addresses	Assigns addresses to the serial port and modem port. Select Normal to use the COM1 address for the serial port and the COM2 address for the modem port. Select Swapped to reverse the addresses for the serial and modem ports.
Parallel Port Bidirection	Lets you select two-way data transfer (YES) or one-way data transfer (NO).
Video/Speaker	
Speaker	Enables or disables the speaker.
Cursor Type	Sets up a line cursor or a block cursor.
Monitor	Sets the computer to use the LCD screen, an external VGA monitor, or both. Select LCD COLOR to display 16 shades of gray (color mapping). Select LCD MONO to display black and white (monochrome mapping). If you connect an external VGA monitor, the computer detects the monitor type and uses the appropriate mapping (color or monochrome).
Max Contrast	Sets the LCD screen for the maximum contrast between the foreground and background when enabled. When Max Contrast is disabled, the LCD screen is set for normal contrast. You can press FN+F1 to select from 12 shades of gray (6 shades for normal video and 6 for reverse video) when Max Contrast is disabled. Refer to "Using the Hotkeys" for hotkey information. Choose the setting that looks best with the application(s) you are using.
Brightness	Controls the screen brightness. Select a low, medium, or high setting.

Table 3-2. Basic Setup Parameters (Continued)

Parameter	Function
Power	
Management	Conserves power by lowering the CPU speed under certain conditions. When management is set to ON, the computer might require more time to perform calculations for large spreadsheets or similar applications. To operate the computer at a fixed speed of 12.5 MHz or 25 MHz, set management to OFF.
Resume Mode	Switches the system to Suspend Mode when the power is turned off or when the Suspend Mode timeout elapses. If Resume Mode is set to OFF, the system does not switch to Suspend Mode when power is turned off, and the Suspend Mode timeout is set to 0.
FDC Standby	Conserves power by switching the diskette drive to Standby Mode when the diskette drive is idle. To disable Standby Mode for the diskette drive, set FDC standby to OFF.

Table 3-2. Basic Setup Parameters (Continued)

Parameter	Function
Timeouts	
Suspend Mode	Sets the number of minutes of serial port, parallel port, hard drive, or keyboard inactivity allowed before the system switches to Suspend Mode. The Suspend Mode timers begin monitoring for inactivity only after the Standby Mode timeouts have expired. Suspend Mode powers off the computer after the time you set expires. Resume holds your place in an application after Suspend Mode turns off the computer. When you turn the computer on again, the system returns to the point at which Suspend Mode turned off the computer. The Resume Mode parameter must be set to ON for the Suspend Mode to work. Choose 00, 10, 20, 30, 40, 50, or 60 minutes. If you set the Suspend Mode to 00, the computer never enters the Suspend Mode. If you choose any setting other than 00 and the Resume Mode is disabled, the system automatically enables Resume Mode.
Standby Mode	Sets the number of minutes before the system turns off the built-in LCD and the hard drive when there is no activity. Choose 00, 1, 2, 4, 8, 16, 32, or 64 minutes. If this mode is set to 00, the computer never enters the Standby Mode. When the computer is in the Standby Mode, press any key to turn on the computer. If the computer enters Standby Mode and an external VGA monitor is connected, the external monitor stays on.
Hard Drive	Sets the number of minutes of hard drive inactivity allowed before system turns off the hard drive. Choose 00, 1, 2, 4, 8, or 16 minutes. The hard drive does not turn off if this function is set to 00.

Using Function Keys on the Setup Screens

On the bottom of the basic and advanced setup screens are several function keys:

- ESC — Exits the setup utility without saving any changes you made. The system prompt appears.
- F1 — Displays the help screen for the highlighted parameter. The help screen describes the available settings for the parameter.
- F2 — Saves any changes you made, exits the setup program, and restarts the computer so that the changes can take effect immediately.
- F7 — Selects the default settings for the high-performance parameters. These settings allow the computer to operate at its optimum level. You can change the settings as needed.
- F8 — Selects the default settings for all power-saving parameters. These settings conserves battery power by operating the computer at the most efficient level. You can change the settings as needed.
- F9 — Selects the default settings for all parameters. You can change the settings as needed.
- F10 — Displays the advanced setup screen. Refer to "Advanced Setup Screen." On the advanced setup screen, pressing this key displays the basic setup screen.
- CTRL+BRK — Restarts the computer without saving any changes you made.
- Space Bar — Displays the optional settings for the highlighted parameter.
- Arrow Keys — Moves the cursor in the direction of the arrow key to highlight the parameters.

Advanced Setup Screen

The advanced setup screen displays parameters that control timeouts for Standby Mode and Suspend Mode, power management, and cache memory. You should not change the settings on the advanced setup screen unless you understand well the cache memory usage and the power management features of the computer. To view the advanced setup screen, press **F10** from the basic setup screen. The advanced setup screen is displayed with the following default settings:

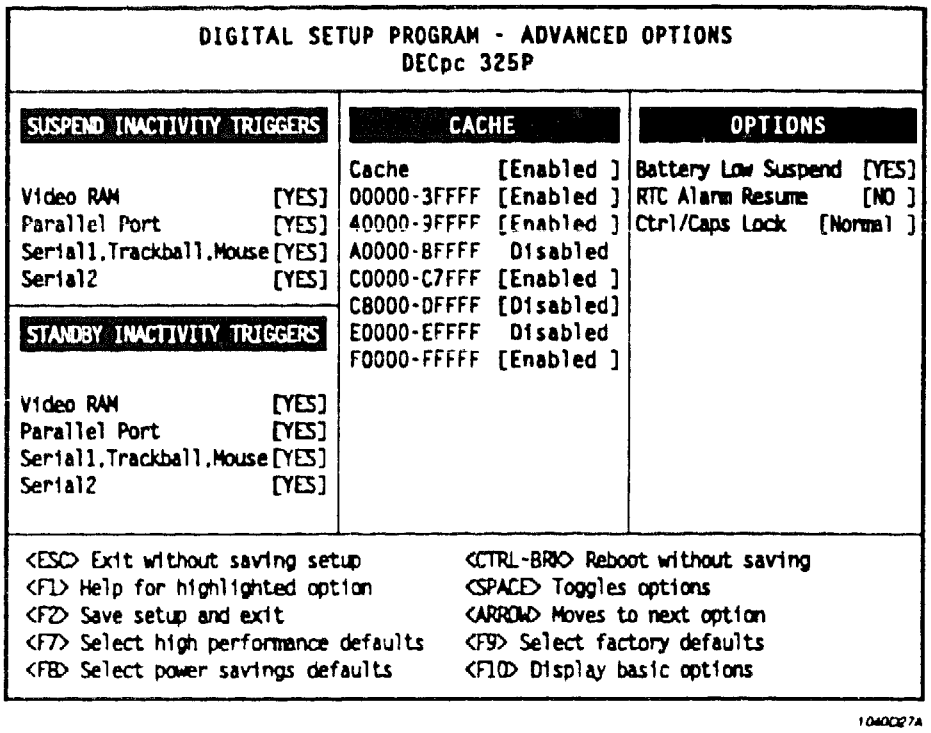


Figure 3-2. Advanced Setup Screen

To move around the screen and make selections, use the keys as instructed at the bottom of the screen. For more information about the advanced parameters, refer to "Advanced Setup Parameters."

Advanced Setup Parameters

This section describes the settings for each parameter on the advanced setup screen. Refer to Figure 3-2 and read the descriptions carefully before changing the default settings.

Suspend Mode and Standby Mode Inactivity Triggers — Inactivity triggers are system components that are checked for inactivity before the computer enters the Suspend Mode or Standby Mode. When the inactivity triggers are set to YES — as they are by default — the system monitors the activity of the video RAM, the parallel port, the first serial port (and/or a trackball and mouse), and the second serial port. The system always monitors the keyboard for activity.

The computer enters the Suspend Mode and/or Standby Mode after there is no video RAM, parallel port, or serial port activity for the number of minutes set in the timeouts portion of the basic setup screen. Any activity resets the Suspend Mode and/or Standby Mode timers and the system begins new monitoring sessions for inactivity. If you set a trigger to NO, it is disabled and the system does not monitor it for a period of inactivity. Setting the inactivity triggers to YES saves power and can increase the length of time you can use the battery without recharging.

Cache — Enables or disables cache memory. To improve system performance and maximize the system's power-saving capabilities, keep the Cache parameter set to Enabled, the default setting. Select Disabled to turn off cache memory. The following parameters list the memory ranges affected when the Cache parameter is enabled:

00000-3FFFF (0KB to 256KB) and 40000-9FFFF (256KB to 640KB) — Improves overall performance when set to Enabled.

A0000-BFFFF (640KB to 768KB) — Always disabled; this parameter cannot be changed. Video RAM is located in this range.

C0000-C7FFF (768KB to 800KB) — Contains the video BIOS. Caching is enabled by default in this range. Caching this range might cause a conflict when software writes to the range or if the video BIOS cannot operate correctly in cache memory. If the Shadow RAM parameter on the basic setup screen is set to NO, the computer disables this cache range and you cannot enable it.

C8000-DFFFF (800KB to 896KB) — Reserved for adapters. This range is normally disabled.

E0000-EFFFF (896KB to 960KB) — Always disabled; you cannot enable this block of memory.

F0000-FFFFF (960KB to 1024KB) — Contains the system BIOS. This range is enabled when cache is enabled. If Shadow RAM in the basic setup is set to NO, the computer automatically disables this cache range and you cannot enable it.

Battery Low Suspend — Sets the system to switch to Suspend Mode if the battery is low. Select YES to enable, NO to disable battery low suspend.

RTC Alarm Resume — Sets the computer to exit the Suspend Mode and resume operation if an alarm for the real-time clock occurs. Select NO if you do not want the computer to resume operation when an alarm occurs.

Ctrl/Caps Lock — Swaps the functions of the CTRL and CAPS LOCK keys (Swapped) or returns the functions to normal (Normal). Refer to "Swapping the CTRL and CAPS LOCK Keys" in the "Getting Started" chapter.

Keyboard Password Utility

The KP.EXE keyboard password utility enables you to temporarily lock and unlock your keyboard (and mouse if you have one) without turning off the computer. The keyboard password is cleared when you turn off the computer. Specifying a keyboard password with KP.EXE can help protect your computer from unauthorized users.

KP.EXE is included on the Utilities Diskette. Insert the Utilities Diskette into the diskette drive and type `a:` and press ENTER to access the drive, or change to the directory on the hard drive that contains the password utility. Type `kp` or `kp /c` and press ENTER to specify or change a keyboard password.

The keyboard password can have as many as seven characters, consisting of any characters on the keyboard. The system does not distinguish between uppercase and lowercase letters. Try to create passwords that are easy to remember but difficult to guess. For example, do not use your name. Use a word or number that has special meaning to you.

The system records the exact keys you press as you enter the password. For example, if you use the 6 from the typewriter keys, you cannot substitute the 6 from the numeric keys.

NOTE

When you create a password, the characters in the password are displayed on the screen as you type them. When you enter a password, the password characters are not displayed on the screen as you type them.

Locking and Unlocking the Keyboard

Use the keyboard password whenever you want to lock the keyboard and mouse without turning off the computer. When the keyboard, trackball, and mouse are locked, the computer can process information, but does not accept any input from the trackball or mouse. The current password is the only keyboard input that will be accepted.

NOTE

The keyboard password is removed when you turn off the computer and Resume Mode is set to OFF. If Resume Mode is set to ON when you turn off the computer, the keyboard password is maintained. Press the RESET button to remove the keyboard password.

Run the KP.EXE utility to lock or unlock the keyboard and trackball (and the mouse if one is installed).

Follow these steps to lock the keyboard:

1. Change to the drive and directory containing KP.EXE. Or, insert the Utilities Diskette into the diskette drive, type `a:`, and press ENTER.
2. At the system prompt, enter one of the following command lines:

   To lock the keyboard with the current keyboard password, type `kp` and press ENTER.

   To specify a new keyboard password, type `kp/c` and press ENTER. The system prompts you for a new password and then locks the keyboard.
3. Type the password, using the BACKSPACE key to correct any errors, and press ENTER. The following prompt appears:

   ```
   Is this correct? (Y/N/ESC)
   ```
4. If the password is correct, type `Y` and press ENTER.

   If the password is incorrect, type `N`, press ENTER, and type the correct password.

   To cancel the utility, press ESC. You will return to the MS-DOS prompt.

To unlock the keyboard, trackball, and mouse, type the keyboard password.

Using the Power Utility

Run PWR325P to permanently change the power management settings without resetting the computer.

PWR325P lets you:

- turn power management on or off
- enable or disable the serial ports
- set timeouts for the hard drive, the Standby Mode, and the Suspend Mode

To run PWR325P, change to the drive and directory to which you copied the file PWR325P.COM or insert the Utilities Diskette into the diskette drive. Then, type:

```
pwr325p
```

and press ENTER. The power management screen displays the current settings. The default settings are shown in Figure 3-3.

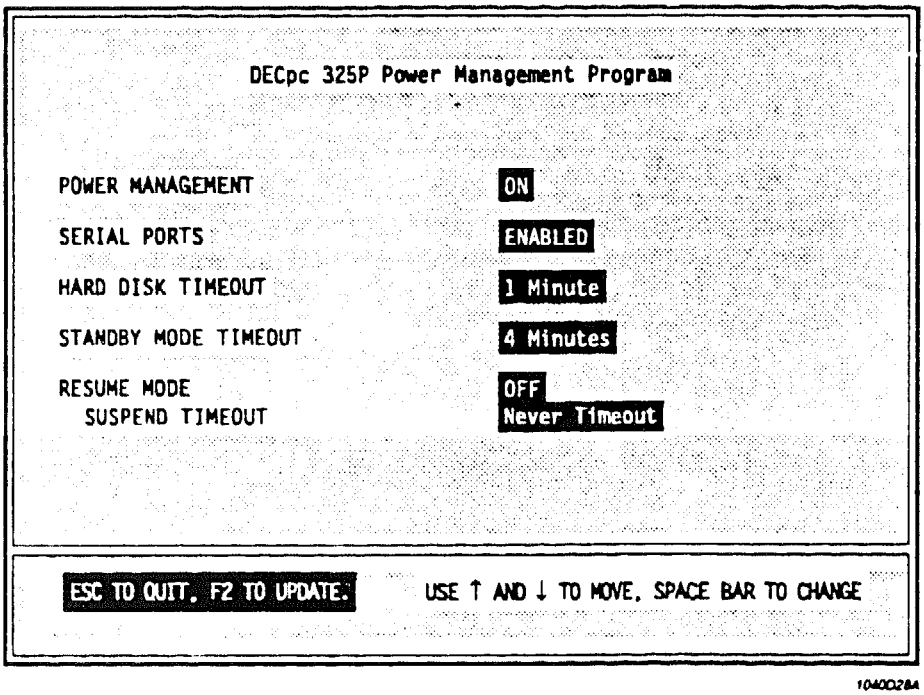


Figure 3-3. Power Management Screen

Using the Gauge Utility

The GAUG325P utility enables you to check the percentage of battery charge remaining. After using your computer for more than 2 hours, you should periodically check the condition of the battery by running GAUG325P. To run the utility, insert the Utilities Diskette and change to Drive A. Or, change to the directory into which you copied the GAUG325P.COM file. Then, type:

```
gaug325p
```

and press ENTER. The gauge screen is displayed.

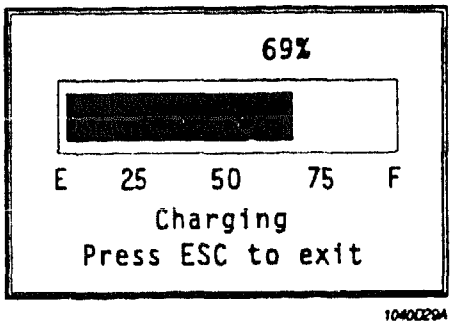


Figure 3-4. GAUG325P Screen

The percentage displayed at the top of the screen indicates the portion of the battery pack's charge that remains. The status bar gives a graphic representation of the amount of the remaining charge. The message area beneath the status bar indicates that the battery is `Charging`, that the charge status is `Unknown`, or that the information displayed is for the `Power remaining`. Press ESC to exit the utility.

Using The Hotkeys

You can control certain computer operations by using specific key combinations. To use a key combination, press and hold down the keys in the indicated order. For example, when using FN+F7 to turn off the computer's LCD screen and backlight, press and hold down FN and then press F7. Press any key to turn the LCD screen and backlight on again.

Video Hotkeys

Use the following key combinations to change specific computer operations:

FN+F1 (COLOR)	For two-value display, changes the display to black on white or to white on black. For 16-grayscale display, changes the background shade. This hotkey combination works only when the Max Contrast parameter of the setup utility is disabled.
FN+SHIFT+F1	Displays the grayscale shades in reverse order. Hold down FN+SHIFT. Then, press F1.
FN+F2 (VIDEO)	Selects the LCD screen, the external monitor, or both. This hotkey combination might not work if the system is running in the processor's protected mode.
FN+F11	Turns display expansion on or off.
FN+F12	Changes the display to two-value (black and white) or 16-grayscale. This hotkey combination works only when the Max Contrast parameter of the setup utility is disabled.

Keypad Hotkeys

Use the following keys to change keyboard functions:

FN+numeric keypad key	Lets you type the number or symbol pictured on a numeric keypad key.
FN+KEYPAD	Locks the numeric keypad functionality so that you can enter numbers and symbols without holding down the FN key. Press FN+KEYPAD again to unlock the numeric keypad.

Power Management Hotkeys

You can temporarily put one or more computer functions in Standby Mode to conserve battery power. The hotkeys enable you to turn on power management without exiting your applications. Use the hotkeys to save power whenever the computer will be operating on battery power alone for more than 2 hours.

FN+F3 (SPEED)	Changes the CPU speed to high (25 MHz) or low (12.5 MHz). The Power/Speed indicator is orange when the CPU speed is 12.5 MHz.
FN+F4 (DISK)	Turns off the hard disk motor. The motor automatically turns on the next time the hard drive is accessed. This key combination has no effect when the computer is connected to an expansion chassis.
FN+F5 (SPKR)	Turns the speaker on or off.
FN+F6 (BRIGHT)	Changes the backlight brightness to low, medium, or high. Hold down FN and repeatedly press F6 until you select the desired setting.

FN+F7 (DISPLAY)	Turns off the LCD screen and its backlight. Press any key to turn the LCD screen and backlight on again.
FN+F8 (SERIAL)	Turns the serial and modem ports on or off.
FN+F10 (STANDBY)	Selects the Standby Mode. The hard disk motor turns on the next time the hard disk drive is accessed. Press any key to turn on the LCD screen and backlight.

NOTE

Hotkey combinations might not operate with some applications. The hotkeys can be disabled by applications that assign other functions to these and similar key combinations.

Using Resume

Resume Mode works with Suspend Mode to enable you to turn off the computer while running an application and return to the same point in the application the next time you turn on the computer. This saves you from reloading the application and helps you conserve battery power.

Resume Mode is set to OFF by default. Run the setup utility or the power utility and set Resume Mode to ON.

The length of time Resume remembers your place within an application depends on the amount of RAM your computer has and on the condition of the computer's battery pack. Table 3-3 shows the amounts of memory and the corresponding time that Resume Mode typically keeps your place in an application.

Table 3-3. Resume Memory Hold and Battery Charge

Amount of Memory	Memory Hold for a Fully Charged Battery	Memory Hold for Fully Discharged Battery
2MB	1 week	1 hour
4MB	6 days	1 hour
6MB	6 days	1 hour
8MB	5 days	1 hour

Resume Tips

- The Resume function does not work with an expansion chassis. If Resume Mode is enabled and you use an expansion chassis, the computer restarts automatically.
- The Resume works only if you turn off the computer with the POWER button while the computer operates on battery or AC power, or if Suspend Mode automatically turns off the computer. If the battery runs down completely or if you disconnect both the battery and AC power from the computer before you turn it off, Resume does not work. In this case, you lose any unsaved information.
- The main battery powers the Resume function by periodically recharging the backup battery. When the main battery is not connected and the backup battery loses power, the Resume function does not work. To help prevent losing information, you can keep the main battery connected when you use the Resume function and regularly save your work to the hard drive. Also, enable the Resume function before you replace the main battery.
- The Resume function might not work with some applications. Be sure to save all information to a diskette or the computer's hard drive before you turn off the computer, even if Resume is on.
- The computer might not recognize an external device after the computer resumes operation. If this occurs, re-initialize the device as instructed in the device documentation.
- The information can be erased from the Resume function's memory by pressing the recessed RESET button or the key combination CTRL+ALT+DEL to restart the computer.

4

Installing Optional Hardware

This chapter describes how to add options to the computer. Carefully read the instructions in this chapter and those provided with your optional hardware.

Opening the Back Cover

The parallel, serial, and VGA monitor connectors are located under the back cover of the computer. To install options that connect to these ports, pull down the center notch to open the back cover. You can leave the cover open or press it underneath the computer. In this stand position, the computer is elevated slightly; this might make typing more comfortable. Press the cover release on the bottom of the computer to unlock the cover from the stand position.

Installing a Parallel Device

Follow these steps to install a parallel printer or other parallel device.

1. Prepare the device for parallel operation as instructed in the option documentation.
2. Run SET325P to configure the parallel port for unidirectional or bidirectional operation. Your option and operating system documentation might contain additional instructions for bidirectional operation.
3. Turn off the computer, and unplug the AC/DC adapter if it is connected.

4. Open the back cover.
5. Connect the 25-pin connector on the cable to the port labeled PARALLEL.

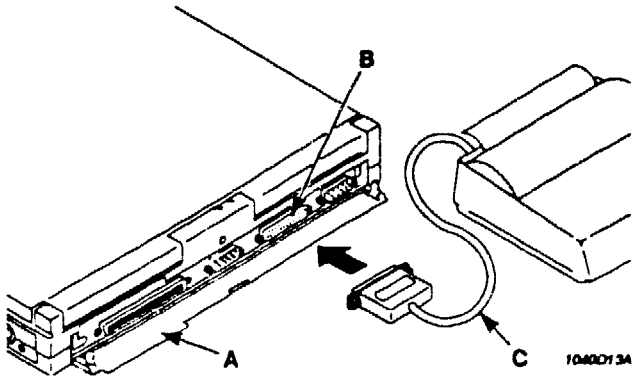


Figure 4-1. Connecting a Printer Cable

A Back Cover

B Parallel Port

C Printer Cable

6. Connect the other end of the device cable to the device's parallel port.
7. Turn on the computer.
8. Turn on the device.

The parallel device is ready for use with most programs. If you have problems, check that the computer is correctly set up for the device, and then refer to your program and option documentation for information on configuring the device.

Installing a Serial Device

You can connect a serial mouse, or another device with a 9-pin serial connector, to the serial port. When you use a serial mouse, you cannot use the built-in trackball. Follow these steps to install the serial device:

1. Prepare the mouse (or other device) for operation according to device documentation.
2. Run SET325P to update the serial port configuration. Refer to the "Utilities" chapter for information about running SET325P.
3. Turn off the computer, and unplug the AC/DC adapter if it is connected.
4. Connect the 9-pin serial cable connector to the port labeled SERIAL.

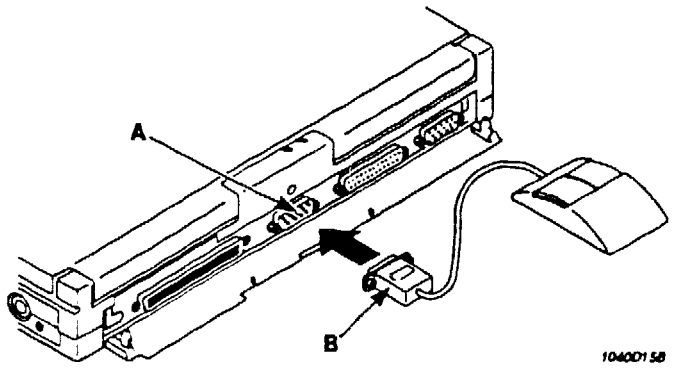


Figure 4-2. Connecting a Serial Mouse

A Serial Port

B Serial Cable Connector

5. Turn on the computer. You can begin using the serial device with applications that support it.

Installing a PS/2-Style Mouse or Other PS/2-Style Device

Use the port labeled MOUSE to connect a PS/2-style mouse or other device with a mini-DIN connector.

Follow these steps to install the device:

1. Prepare the mouse (or other device) for operation according to device documentation.
2. Run SET325P to update the mouse configuration. Refer to the "Utilities" chapter for information about running SET325P.
3. Turn off the computer, and unplug the AC/DC adapter if it is connected.
4. Connect a PS/2-style mouse or other device to the port labeled MOUSE.

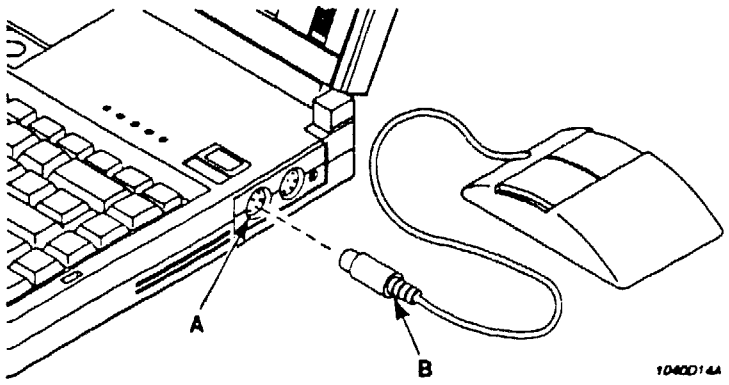


Figure 4-3. Connecting a PS/2-Style Mouse

A MOUSE Port

B PS/2-Style Mouse Connector

5. Turn on the computer. You can begin using the device with applications that support it.

Installing an External VGA Monitor

You can install and use an external VGA monitor in addition to or instead of the computer's LCD display. Refer to "Using the Hotkeys" in the "Utilities" chapter for information on switching between the screen and a VGA monitor. Follow these steps to connect an external monitor:

1. Prepare a VGA monitor for operation according to the monitor documentation.
2. Run SET325P to select EXT VGA or BOTH as the monitor setting. Refer to "The Setup Utility" in the "Utilities" chapter for more information about the monitor setting.
3. Turn off the computer, and unplug the AC/DC adapter if it is connected.
4. Open the back cover of the computer.
5. Connect the monitor connector to the port labeled VGA.

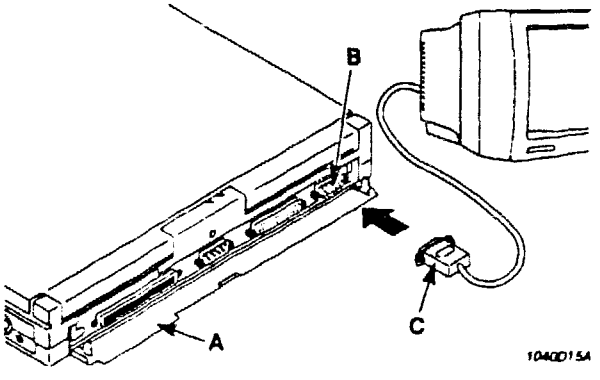


Figure 4-4. Connecting an External Monitor

A Back Cover

B VGA Port

C Monitor Connector

6. Turn on the computer. Then, turn on the monitor.

Installing an External Keyboard

You can install and use an external keyboard in addition to the built-in keyboard.

1. Prepare the keyboard for operation according to the keyboard documentation.
2. Turn off the computer, and unplug the AC/DC adapter if it is connected.
3. Connect the keyboard connector to the external keyboard port labeled EXT. KB on the right side of the computer.

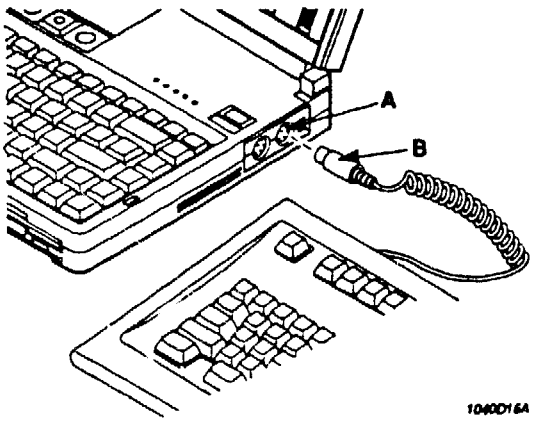


Figure 4-5. Connecting an External Keyboard

A Keyboard Port

B Keyboard Connector

4. Turn on the computer. Your system detects the connection of the external keyboard at startup.

Installing a Math Coprocessor

You can install a 25 MHz 80387SL math coprocessor in your computer to speed up mathematical processing. Graphic design programs and applications that perform extensive mathematical calculations can run faster after the installation of the coprocessor.

CAUTION

Static electricity can damage electronic components. Before opening the computer, discharge any static electricity from your body by touching a grounded metal object. Be careful not to drop small objects such as paper clips into the computer's electronic component opening.

Follow these steps to add a math coprocessor:

1. Run SET325P to set the Resume Mode parameter to OFF. Press F2 to save your change to SET325P.
2. Turn off the computer, and unplug the AC/DC adapter if it is connected. Then, remove the battery pack. Refer to "Removing the Battery Pack" in the "Getting Started" chapter for more information.
3. Remove the rubber cover from the back of the computer. Then, remove the screw.

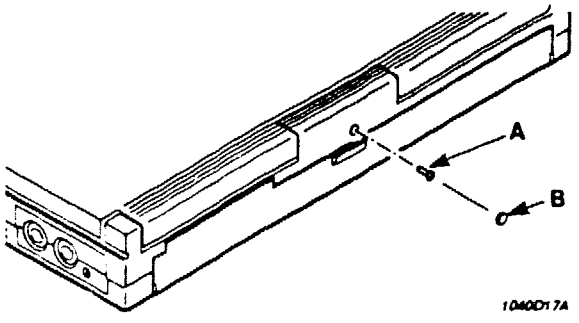


Figure 4-6. Removing the Rubber Cover and the Screw

A Screw

B Rubber Cover

4. Open the display panel completely. Then, remove the electronic component cover (Figure 4-7, A).

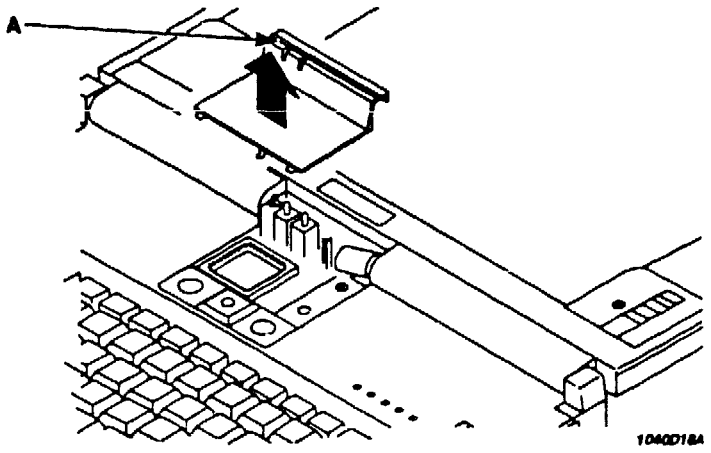


Figure 4-7. Removing the Electronic Component Cover

CAUTION

To avoid damaging the coprocessor and the computer, correctly position the coprocessor as shown in Figure 4-8. After the coprocessor is installed, it can be removed only with a special extraction tool.

5. Align the slanted corner of the coprocessor (indicated by a dot) with the slanted corner of the socket. Carefully press the coprocessor into the socket until it is fully seated.

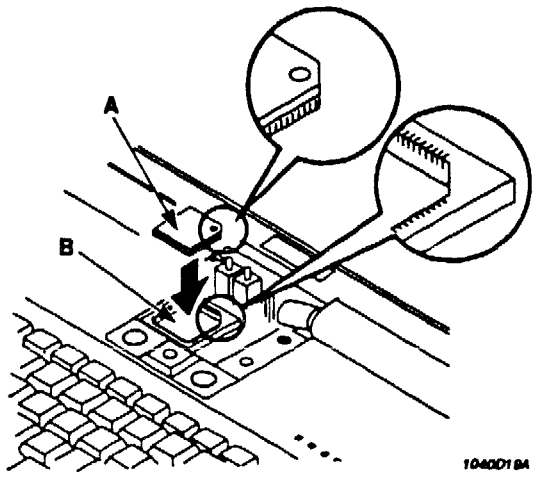


Figure 4-8. Installing the Math Coprocessor

A Math Coprocessor

B Math Coprocessor Socket

6. Place the cover back on the electronic compartment. Secure the cover with the screw removed earlier. Replace the rubber cover.
7. Turn on the computer.
8. Run SET325P and press F2 to automatically update the system configuration. Refer to the "Utilities" chapter for more information about running SET325P.

Installing Additional Memory

Your computer comes with 2MB of memory. You can increase the system memory to 4MB by installing a 2MB RAM card, 6MB by installing a 4MB RAM card, or 8MB by installing a 6MB RAM card. Refer to "Appendix B System Memory" for an explanation of memory types and for the memory allocation map.

CAUTION

Static electricity can damage electronic components. Before opening the computer, discharge any static electricity from your body by touching a grounded metal object. Do not drop any foreign objects, such as a paper clip, into the opening. Use only the specified RAM cards.

Follow these steps to install additional memory:

1. Run SET325P to set the Resume Mode parameter to OFF. Press F2 to save your changes to SET325P.
2. Turn off the computer, and close the display panel. Unplug the AC/DC adapter if it is connected.
3. Open the back cover. Locate the slot labeled EXT. RAM.
4. Remove the two screws (Figure 4-9, B) that secure the RAM card slot cover. Then, remove the slot cover (Figure 4-9, A).

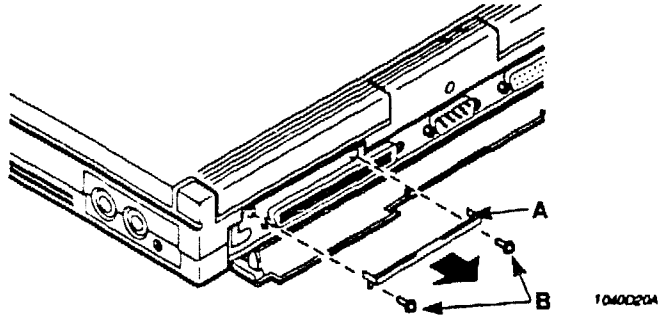


Figure 4-9. Removing the Screws and the RAM Card Slot Cover

5. Hold the RAM card (Figure 4-9, B) with the side labeled A facing upward. Then, slide the card into the RAM card slot (Figure 4-9, A) until it is firmly seated.

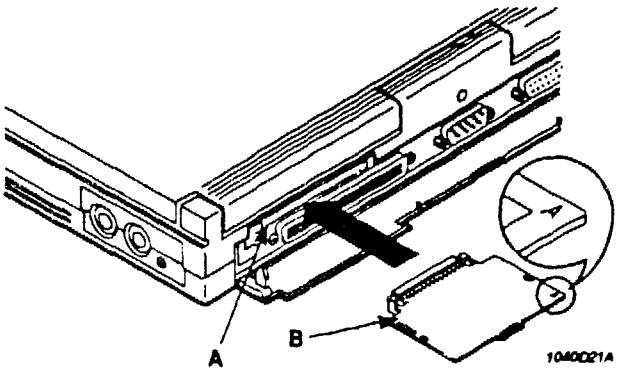


Figure 4-10. Installing a RAM Card

CAUTION

Be sure to slide the RAM card into the RAM card slot with the correct side (labeled A) facing upward as shown in Figure 4-10.

6. Replace the slot cover. Then, secure the cover with the screws you removed earlier.
7. Close the rear cover.
8. Open the display panel, and turn on the computer.
9. Run SET325P and press F2 to automatically update the system configuration. Set the Resume Mode parameter to ON if you wish use resume. Refer to the "Utilities" chapter for information about SET325P. At startup, your computer recognizes the additional memory you installed.

A

Specifications

This appendix provides information about the technical characteristics of the DECpc 325P computer. Included are component specifications, external connector pin assignments, and diskette drive specifications.

System Unit

Table A-1. System Unit Specifications

Attributes	Specifications
Size	22.0 cm D x 29.9 cm W x 4.5 cm H
	(8.7 in D x 11.7 in W x 1.7 in H)
Weight	2.7 kg (5.94 lbs)
Power	110 to 240 VAC
	Input Voltage: 22.8 VDC
	Current Consumption: 1.25A Maximum

Table A-1. System Unit Specifications (Continued)

Attribute	Specification
Temperature	Operating: 4°C to 38°C (40°F to 100°F)
	Non-operating: -40°C to 66°C (-4°F to 150°F)
Humidity	Operating: 20% to 80% (non-condensing)
	Non-operating: 10% to 80% (non-condensing)
Vibration	Operating: 0.5 G (maximum)
	Non-operating: 1 G (maximum)

AC/DC Adapter

Table A-2 lists the dimensions, power requirements, and environment specifications for the AC Adapter.

Table A-2. AC/DC Adapter Specifications

Attribute	Specification
Size	14 cm D x 6.5 cm W x 4.0 cm H
	(5.5 in D x 2.5 in W x 1.5 in H)
Weight	Weight (excluding cord) 0.37 kg (0.81 lb)
Power	Input: 50 to 60 Hz, 110/240 VAC (auto-sensing)
	Output: 22.8 VDC
Air Temperature	Operating: 0°C to 40°C (36°F to 104°F)
	Storage: -40°C to 66°C (-4°F to 150°F)
Humidity	Operating: 20% to 80% (non-condensing)
	Storage: 10% to 90% (non-condensing)

Battery Pack

Table A-3. Battery Pack Specifications

Attribute	Specification
Weight	0.45 kg (1 lb)
Size	6.12 cm W x 18.32 cm D x 1.95 cm H (2.4 in W x 7.1 in D x 0.7 in H)
Nominal Capacity	1.45 AH (5 hours average)
Nominal Voltage	14.4V
Charging Time	Approximately 5 hours during normal operation, 2 hours when power is off
Charging Temperature	10° to 35°C (50° to 95°F)

Peripheral Interfaces

The tables in this section list the function assigned to each pin of the serial, AT bus, parallel, keyboard and PS/2-style device, and VGA video ports. In the tables, a minus (–) after a signal indicates a signal is active low. Otherwise, a signal is active high.

RS-232C Serial Port

Table A-4. RS-232C Serial Port

Pin	Function
1	Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator

AT Bus Port

Table A-5. AT Bus Connector

Pin	Signal	Direction	Pin	Signal	Direction
1	EXT23V	In	21	DRQ1	In
2	EXT23V	In	22	GND	—
3	GND	—	23	HDCS0–	Out
4	S2	Out	24	HD7	In/Out
5	S1	Out	25	GND	—
6	S3	In	26	HD4	In/Out
7	S5	In	27	HDLED–	Out
8	GND	—	28	IOCS16–	Out
9	BALE	Out	29	GND	—
10	DRQ7	In	30	SD0	In/Out
11	DRQ6	In	31	SD2	In/Out
12	DRQ5	In	32	SD4	In/Out
13	DRQ0	In	33	SD6	In/Out
14	IRQ14	In	34	SD8	In/Out
15	IRQ12	In	35	SD10	In/Out
16	IRQ10	In	36	SD12	In/Out
17	DACK2–	Out	37	SD14	In/Out
18	IRQ4	In	38	GND	—
19	IRQ6	In	39	EXTKDATA	In/Out
20	DRQ3	In	40	EXTMCLK	In/Out

Table A-5. AT Bus Connector (Continued)

Pin	Signal	Direction	Pin	Signal	Direction
41	GND	—	61	EXTMDATA	In/Out
42	EXT5V	In	62	EXTKCLK	In/Out
43	EXT5V	In	63	GND	—
44	EXT5V	In	64	SD15	In/Out
45	EXT5V	In	65	SD13	In/Out
46	GND	—	66	SD11	In/Out
47	HSYNC1	Out	67	SD9	In/Out
48	BGND	Out	68	SD7	In/Out
49	RGND	Out	69	SD5	In/Out
50	GGND	Out	70	SD3	In/Out
51	GREEN	Out	71	SD1	In/Out
52	RED	Out	72	GND	—
53	BLUE	Out	73	AEN	Out
54	VSYNC1	Out	74	PDIAG-	Out
55	GND	—	75	EXTRST	Out
56	EXT5V	In	76	IOW-	In/Out
57	EXT5V	In	77	IOR-	In/Out
58	EXT5V	In	78	HDCS1-	Out
59	EXT5V	In	79	GND	—
60	GND	—	80	IRQ7	In

Table A-5. AT Bus Connector (Continued)

Pin	Signal	Direction	Pin	Signal	Direction
81	DACK1–	Out	101	DOCKING–	In
82	DACK3–	Out	102	EXTVCTRL	—
83	IRQ5	In	103	EX5VSW	Out
84	IRQ3	In	104	IOCHCK–	In
85	GND	—	105	SMEMR–	Out
86	IRQ11	In	106	SMEMW–	Out
87	IRQ15	In	107	MEMW–	In/Out
88	DACK0–	Out	108	MEMR–	In/Out
89	DACK5–	Out	109	XD7	In/Out
90	DACK6–	Out	110	EXSYSCLK	Out
91	DACK7–	Out	111	GND	—
92	MASTER–	In	112	LA17	In/Out
93	IRQ9	In	113	LA18	In/Out
94	GND	—	114	LA20	In/Out
95	S6	In	115	GND	—
96	S0	Out	116	SA9	In/Out
97	S4	In	117	SA8	In/Out
98	S7	In	118	SA7	In/Out
99	GND	—	119	SA6	In/Out
100	EXT23V	In	120	SA5	In/Out

Table A-5. AT Bus Connector (Continued)

Pin	Signal	Direction	Pin	Signal	Direction
121	SA4	In/Out	141	F18	Out
122	SA3	In/Out	142	F14	Out
123	SA2	In/Out	143	F4	Out
124	SA1	In/Out	144	TC	Out
125	SA0	In/Out	145	SBHE–	Out
126	GND	—	146	GND	—
127	LPTD5	In/Out	147	POWERSW–	Out
128	GND	—	148	SUBLCLK	Out
129	F28	Out	149	EXTVCTRL	—
130	F24	In	150	DOCKING–	In
131	F2	In	151	GND	—
132	F20	In	152	GND	—
133	F22	In	153	SUBLSYNC	Out
134	F6	In	154	SUBLDATA	Out
135	F11	Out	155	GND	—
136	CE2	In	156	MEMCS16–	In
137	F27	Out	157	DRQ2	In
138	F26	Out	158	P13	Out
139	F16	Out	159	SLCTIN–	Out
140	F12	Out	160	P12	Out

Table A-5. AT Bus Connector (Continued)

Pin	Signal	Direction	Pin	Signal	Direction
161	NC	—	181	SA15	In/Out
162	LPTINIT–	Out	182	SA16	In/Out
163	P11	Out	183	SA17	In/Out
164	P15	Out	184	SA18	In/Out
165	P10	Out	185	SA19	In/Out
166	LPTAFD–	Out	186	GND	—
167	LPTSTRO–	Out	187	LA19	In/Out
168	LPTD3	In/Out	188	LA21	In/Out
169	LPTD2	In/Out	189	LA22	In/Out
170	LPTD4	In/Out	190	LA23	In/Out
171	LPTD1	In/Out	191	GND	—
172	LPTD7	In/Out	192	REFRESH–	In/Out
173	LPTD0	In/Out	193	IOCHRDY	In/Out
174	LPTD6	In/Out	194	0WS–	Out
175	GND	—	195	EXTRTCAS	Out
176	SA11	In/Out	196	EXTRTCDS	Out
177	SA10	In/Out	197	EXTRTCRW	Out
178	SA12	In/Out	198	IRQ8	In
179	SA13	In/Out	199	GND	—
180	SA14	In/Out	200	GND	—

Parallel Port

Table A-6. Parallel Port

Pin	Function
1	Strobe–
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	ACKNOWLEDGE–
11	BUSY
12	PAPER END
13	SELECT
14	AUTO FEED–
15	ERROR–
16	INITIALIZE–
17	SELECT IN–
18-25	Ground

Keyboard and PS/2-Style Device Connectors

Table A-7. Keyboard and PS/2-Style Device Connectors

Pin	Function
1	Data
2	Reserved
3	Ground
4	+5 VDC
5	Clock
6	Reserved

VGA Video Port

Table A-8. VGA Video Port Connector

Pin	Function	Pin	Function
1	Red Video	9	Not Used
2	Green Video	10	Ground
3	Blue Video	11	Reserved
4	Not Used	12	Reserved
5	Ground	13	Horizontal Sync
6	Red Return	14	Vertical Sync
7	Green Return	15	Not Used
8	Blue Return		

1.44MB Diskette Drive

The following table lists specifications for the 1.44MB diskette drive:

Table A-9. Diskette Drive Specifications

Attribute	Specification
Unformatted Capacity	2.0MB
Formatted Capacity	1.44MB
Number of Tracks	80 per side
Number of Heads	2
Average Access Time	95 ms
Track-to-Track Access Time	3 ms
Motor Starting Time	400 ms
Rotation Speed	300 rpm
Media	3½-inch high-density or standard-density

B

System Memory

This computer has 640KB *conventional* memory, 384KB of *high reserved* memory, and 1024KB of *extended* memory. These types of memory are described in the following sections.

This chapter also explains how your system's memory can be used (or mapped). Note that 320KB of high reserved memory can be allocated to extended memory, increasing extended memory to 1344KB. Or, 128KB of the 320KB can be allocated to shadow RAM to increase the operating speed of the video BIOS and the system BIOS, leaving 1216KB of extended memory.

The computer maps high reserved memory ranges as follows:

A0000 to BFFFF	Video RAM
C0000 to C7FFF	Video BIOS
C8000 to DFFFF	Reserved for adapter BIOSes
E0000 to FFFFF	IOS

Figure B-1 provides a graphic representation of how the DECpc 325P memory can be mapped.

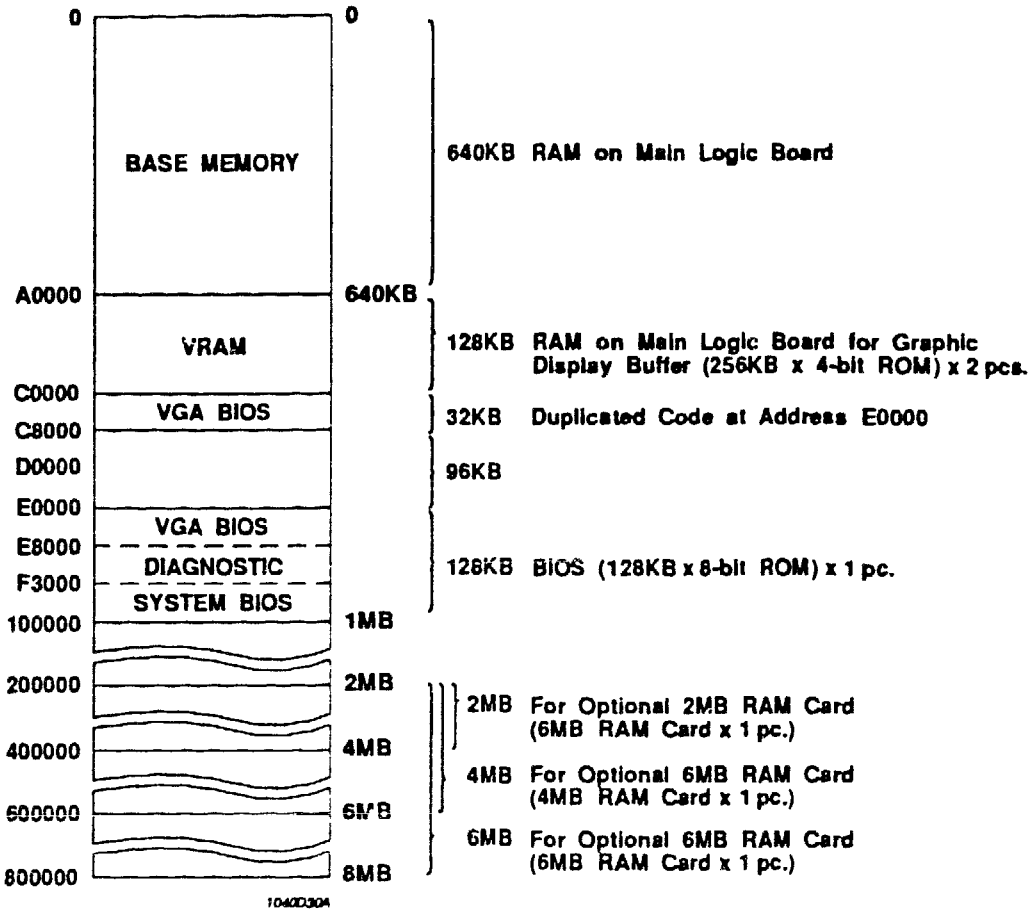


Figure B-1. Memory Map

Conventional Memory

Your computer has 2MB of RAM. The first 640KB is called conventional or base memory. This conventional memory is normally used for application programs when MS-DOS is being used.

High Reserved Memory

The 384KB between 640KB and 1024KB is high reserved memory. The system uses 64KB of high-reserved memory for system maintenance. You can allocate part of the high reserved memory (128KB) as shadow RAM. The computer allocates the remaining reserved memory as extended memory (memory above 1MB).

When you set shadow RAM to YES in the setup utility, you allocate 128KB of the high reserved memory as shadow RAM. This enables the computer to read the basic input-output system (BIOS) and/or video BIOS at a high speed, increasing the processing speed of the video or the entire system.

Extended Memory

The memory above 1MB is extended memory. This memory area is used by operating systems and applications that require a 386 CPU.

RAM Cards and Memory Allocation

Table B-1. RAM Cards and Memory Allocation

RAM Card Used	Total RAM	Extended Memory	Video BIOS (Shadow RAM)	System BIOS (Shadow RAM)
—	2MB	1344KB	--	—
		1280KB	64KB	—
		1280KB	—	64KB
		1216KB	64KB	64KB
2MB	4MB	3392KB	—	—
		3328KB	64KB	—
		3328KB	—	64KB
		3264KB	64KB	64KB
4MB	6MB	5440KB	—	—
		5376KB	64KB	—
		5376KB	—	64KB
		5312KB	64KB	64KB
6MB	8MB	7488KB	—	—
		7424KB	64KB	—
		7424KB	—	64KB
		7360KB	64KB	64KB

C

BIOS Error Messages

The DECpc 325P BIOS displays the following error messages to indicate system problems. Contact Digital Customer Service for assistance.

Table C-1. BIOS Error Messages

Number	Message
(01)	Gate A20 failure
(02)	Unexpected interrupt in protected mode
(03)	Unexpected SW interrupt at *xxxx:xxxx* Type (R)eboot, other keys to continue
(04)	Memory tests terminated by keystroke
(05)	Memory *zzzzz* failure at *x*0000 -*x*ffff *zzzzz*: parity data line odd/even logic double word logic address line write/read
(06)	Display adapter failed; using alternate
(07)	No timer tick interrupt
(08)	Shutdown failure
(09)	Timer chip counter 2 failed

Table C-1. BIOS Error Messages (Continued)

Number	Message
(10)	Keyboard *zzzzz* failure *zzzzz*: controller clock line data line stuck key
(11)	Diskette subsystem reset failed
(12)	Diskette drive 0 seek failure
(13)	Diskette drive 1 seek failure
(14)	Hard disk configuration error
(15)	Hard disk controller failure
(16)	Hard disk failure
(17)	Time-of-day clock stopped
(18)	Invalid configuration information - please run SETUP program
(19)	Time-of-day not set - please run SETUP program
(20)	Keyboard is locked - please unlock
(21)	ROM bad checksum = *xx*
(22)	Strike the F1 key to continue
(23)	Diskette read failure -
(24)	Not a boot diskette -
(25)	No boot device available -
(26)	Hard disk read failure -
(27)	No boot sector on hard disk -
(29)	I/O card parity interrupt at *xxxx* Type (S)hut off NMI Type (R)eboot, other keys to continue
(30)	Memory parity interrupt at *xxxx* Type (S)hut off NMI. Type (R)eboot, other keys to continue

Table C-1. BIOS Error Messages (Continued)

Number	Message
(31)	Unexpected type 02 interrupt at *xxxx* Type (S)hut off NMI, Type (R)eboot, other keys to continue
(32)	SYSTEM DETECTED A DOCKING UNIT - RESUME IS DISABLED.
(34)	Resume memory backup failure
(35)	MEMORY ADDRESS CONFLICT ON THE DOCKING UNIT ADDRESS: *XXXXXX - YYYYYY* PLEASE RUN SETUP SYSTEM IGNORES THE DOCKING UNIT MEMORY
(36)	MEMORY GAP FOUND ADDRESS: *XXXXXX - YYYYYY* PLEASE RUN SETUP SYSTEM IGNORES THE DOCKING UNIT MEMORY

D

Beep Codes

Table D-1 lists the DECpc 325P beep codes that are sounded with no error message displayed.

NOTE

The patterns listed in the following table indicate beep code tone sequences. For example, 1-1-3 is one beep, followed by another single beep, followed by a burst of three beeps. No beep code is sounded if a test is aborted while in progress.

Table D-1. Beep Codes

Pattern	Meaning
none	CPU register test in progress
1-1-3	CMOS write/read failure
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable Interval Timer Failure
1-2-2	DMA initialization failure
1-2-3	DMA page register write/read failure
1-3-1	RAM refresh verification failure
none	1st 64KB RAM test in progress

Table D-1. Beep Codes (Continued)

Pattern	Meaning
1-3-3	1st 64KB RAM chip or data line failure multi-bit
1-3-4	1st 64KB RAM odd/even logic failure
1-4-1	Address line failure 1st 64KB RAM
1-4-2	Parity failure 1st 64KB RAM
2-1-1	Bit 0 1st 64KB RAM failure
2-1-2	Bit 1 1st 64KB RAM failure
2-1-3	Bit 2 1st 64KB RAM failure
2-1-4	Bit 3 1st 64KB RAM failure
2-2-1	Bit 4 1st 64KB RAM failure
2-2-2	Bit 5 1st 64KB RAM failure
2-2-3	Bit 6 1st 64KB RAM failure
2-2-4	Bit 7 1st 64KB RAM failure
2-3-1	Bit 8 1st 64KB RAM failure
2-3-2	Bit 9 1st 64KB RAM failure
2-3-3	Bit A 1st 64KB RAM failure
2-3-4	Bit B 1st 64KB RAM failure
2-4-1	Bit C 1st 64KB RAM failure
2-4-2	Bit D 1st 64KB RAM failure
2-4-3	Bit E 1st 64KB RAM failure
2-4-4	Bit F 1st 64KB RAM failure

Table D-1. Beep Codes (Continued)

Pattern	Meaning
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
none	Interrupt vector loading in progress
3-2-4	Keyboard controller test failure
none	CMOS power failure and checksum calculation in progress
none	CMOS config inform validation in progress
3-3-4	Screen memory test failure
3-4-1	Screen initialization failure
3-4-2	Screen retrace test failure
none	Search for video ROM in progress
none	Screen believed operable
none	Screen believed running with video ROM
none	Monochrome monitor believed operable
none	Color monitor (40 column) believed operable
none	Color monitor (80 column) believed operable

E

Warranty Information

HARDWARE FOUNDATION WARRANTY (US ONLY)

Digital warrants that the Digital Products accompanied by this limited Warranty are free from defects in material and workmanship for a period of one year from the date of original purchase from Digital or an authorized Digital reseller and/or distributor.

The warranty accompanying this product and its options is a Return-To-Factory Limited Warranty. Parts, labor, and return shipment at the Customer Returnable Unit level (CRU = whole unit or option).

During the term of this warranty, Digital will, at its option, repair or replace any defective parts of the Digital Products purchased under this Warranty at no additional charge.

This warranty represents enhanced support for all purchasers who purchase Digital Personal Computers at LIST.

ELIGIBLE PARTS

Customer Returnable Units (CRU) and options as defined by Digital are the only parts eligible for coverage. Any (CRU) or option in need of repair due to improper treatment or use is not eligible for return. Improper treatment includes, but is not limited to; lifted or burnt etches, or delimitation due to non-Digital repair or modification. CRU and options which have been defaced by removing serial numbers, etch levels, or key components are not eligible for return.

WARRANTY CLAIM REQUIREMENTS

Purchaser claims made pursuant to this warranty must conform to the following requirements:

- Installation of this product is the sole responsibility of the purchaser.
- Fault diagnosis and equipment disassembly is the sole responsibility of the purchaser.
- The purchaser shall properly package and prepay transportation cost of CRU (whole Unit) and or option sent to Digital.
- The purchaser assumes all risk of loss or damage to CRU and/or option in transit to Digital.

DISCLAIMERS:

This limited warranty does not apply to any Digital products which have been damaged or rendered defective as a result of accident, misuse, or abuse; by the use of parts not manufactured or sold by Digital, by modification without written permission from Digital, or, as a result of service by anyone other than Digital, or an authorized Digital service provider.

Except as expressly set forth above, Digital makes no other Warranties, express or implied, including, but not limited to, any implied warranties of merchantability and fitness for purpose, and Digital expressly disclaims all warranties not stated herein. In the event the products are not free from defect as warranted above, the purchaser's sole remedy shall be repair or replacement as described above. Under no circumstances will Digital be liable to the purchaser, or to any user, for any damages, expenses, lost profits, lost savings, damage to or replacement of equipment and property, costs of recovering, reprogramming, or reproducing any program or data stored in or used with the products, or other damages arising out of the use or inability to use the Digital products.

ADDITIONAL INFORMATION

For complete warranty information, please contact your Digital representative. For additional enhanced Warranty offerings and Out-of-Warranty service for your Digital product, contact your local Digital office or authorized reseller.

HOW TO MAKE A WARRANTY CLAIM

Warranty Information
Consult the purchase documents for the product or directly with Digital Equipment Corporation in the country of purchase if you should have any questions concerning your warranty terms and conditions.

PRE-CALL CHECKLIST

Prior to calling Digital Equipment Corporation, please follow the PRE-CALL CHECKLIST. This will allow us to assist you more quickly and efficiently.

Step 1. Consult your computer user documentation that is included with your product to assure that your system features are properly configured.

Step 2. Execute the customer diagnostics provided with your product and record the information. Consult the accompanying user documentation for more details on operating this utility.

Step 3. If you have detected a product hardware failure during Steps 1 or 2, call the Digital Repair number to get your unit serviced. Please refer to the attached list of Digital Service numbers.

Step 4. If you were unable to determine the cause of the failure, call the Digital Assistance number to obtain further assistance.

Please have the serial number of your system available when calling Digital for assistance.

SHIPPING INSTRUCTIONS - IMPORTANT

If you need to send your product back to Digital Equipment Corporation, please remember the following.

Package your product in the original shipping carton. You are responsible for insuring any product shipped to Digital Equipment Corporation. For all returns under the warranty, you assume the risk of loss or damage during shipping to Digital Equipment Corporation. Include the following:

- Your dated proof of purchase, such as a copy of your receipt or invoice.
- Your name, street address, and postal code (zip code)
- Brief description of product failure symptoms.

If applicable in your country, please include your return authorization number.

DIGITAL PHONE SUPPORT AND SERVICE LOCATIONS

If your country is not in the following list, please consult the sales person who sold you the Digital product.

COUNTRY		ASSISTANCE	REPAIR
UNITED STATES		1-800-332-8000	1-800-225-5385
AUSTRIA		0222-86630-555	
BELGIUM		02-7297744	
DENMARK		80301050	02-7298603
GERMANY		01307702	45173034
IRELAND		01-381216	
NETHERLANDS		030-832888	01-3812
NORWAY		02-256300	
SPAIN	MADRID	34-(9)1-5834257	
	BARCELONA	34-(9)3-4012222	
SWEDEN		08-988835	
SWITZERLAND		1555544	
UNITED KINGDOM		025 6-59200	0734-444366

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PHILIPPINES	623-810-5156	THAILAND	66-254-8191

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