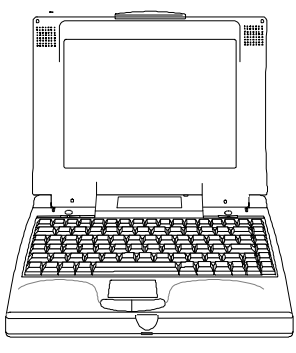
Extensa



Extensa Series Notebook User's Guide
TI Part No. 9803942-0001
Original Issue: July 1995

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

Record the serial number, purchase date, and model number in the space provided below. The serial number and model number are recorded on the label affixed to the case. All correspondence concerning your unit should include the serial number, model number, and date of purchase.

Extensa Notebook Computer

Model_____Serial No._____Purchase Date_____

FCC Notice

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

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

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

Notice: Shield Cables

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

Notice: Peripheral Devices

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

Caution

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

Use Conditions

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

Notice: Canadian Users

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

Remarque à l'intention des utilisateurs canadiens

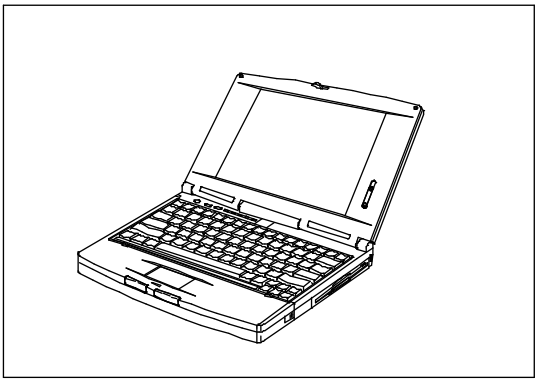
Cet appareil numérique de la classe B respected toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Contents

Contents

This manual describes features of the Texas Instruments Extensa notebook computers. The Extensa series computers are similar in appearance and incorporate such features as PCMCIA, internal pointing device, infrared interface and removable modules.

The following figure displays the Extensa computer.



Extensa

This manual should answer most of the questions you have about the day-to-day operation of your Extensa notebook computer.

Use the *Quick Start* instructions that came with your computer to get your computer running for the first time.

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

We hope you enjoy your Extensa computer. With proper care, your computer will provide you with years of productive service.

1
Before You Begin

After completing procedures in the Quick Start instructions, read this chapter to learn about important functions of your computer. Some, such as *Creating Backup Diskettes*, should be performed as soon as possible after the purchase of your computer.

Contents

Creating Backup Diskettes

You should create your backup system diskettes as soon as possible after purchasing your notebook. This process requires approximately thirty 3 1/2-inch, 1.44 MB diskettes. Labels for the diskettes are included with the manual.

To create backup system diskettes, use the Create System Disk tool that is part of Windows 95.

The following table displays Extensa standard features:

- 4 MB memory (70 ns DRAM)
- 512 KB of video memory
- Fast video graphics accelerator
  - 32-bit Bit Block Transfer (BitBLT) engine
  - True packed-pixel addressing
  - Color expansion for 8- and 16-bit per pixel graphics
  - Linear memory addressing
  - Hardware cursor
  - Internal memory write buffers
  - Internal asynchronous display data FIFOs
- Zero-volt suspend function
- No-reboot CMOS setup function
- Dualscan or Active Matrix Color displays
- Simultaneous display with external CRT
- One type I or II PCMCIA slot
- High speed expansion bus port
- Parallel port with EPP and ECP

- ❑ Expansion port for Mini Port Adapter or Full-Function Port Replicator
- ❑ Serial infrared (SIR) port
- ❑ External keyboard port*
- ❑ External PS/2 mouse port*
- ❑ External numeric keypad port*
- ❑ NiMH primary battery pack
- ❑ 3.5-inch removable floppy drive module**
- ❑ Removable PCMCIA type III slot module**
- ❑ Lithium-ION secondary battery pack**
- ❑ 356-million byte (340 MB) or higher capacity hard disk with VL Local Bus
- ❑ Internal pointing device
- ❑ Small, lightweight AC adapter

* Only one of the keyboard, PS/2 mouse, or numeric keypad options can be installed at any given time.

** Only one of the modules can be installed in the accessory bay at any given time.

This section provides information on the optimum operating environment for your Extensa notebook computer.

Temperature

Operating:	50° to 95°F (10° to 35°C)
Storage:	-4° to 140°F (-20° to +60°C)

Relative Humidity (Noncondensing)

Operating:	20% to 90%
Storage:	20% to 90%

Shock

Operating:	Maximum 5g pulse in X, Y, and Z orientations
Storage:	Maximum 50g pulse in X, Y, and Z orientations

Environment

Vibration

Operating:	Sinusoidal 5 to 25 Hz limited to 0.015 inch peak-to-peak maximum displacement
	0.5g, 25 to 250 Hz
Storage:	Sinusoidal 5 to 27 Hz limited to 0.016 inch peak-to-peak maximum displacement
	2.0g, 27 to 500 Hz

- Never pick up or carry your unit by the LCD.
- Never use the computer in harsh environments where it could be subjected to rapid temperature changes and excessive dust.
- Never expose the computer to excessive vibration.
- Never expose the hard disk or floppies to strong magnetic fields, such as those generated by audio system speakers or telephone handsets.
- Be sure the wall outlet supplies the voltage required by the AC adapter. Check the labels on the bottom of the computer case and on the AC adapter.
- Avoid leaving your computer in storage for more than two weeks without a charged battery if the computer is not connected to the AC adapter. The battery that maintains the configuration, time, and date will discharge.
- To avoid overheating the computer, never place anything on top of the computer when it is recharging or operating.
- Before moving an active computer, press the **Suspend** button to put the computer into sleep mode and close the display (see *Suspend* in the next section).

- Do not try to force the cover beyond its fully opened position — about 180 degrees.

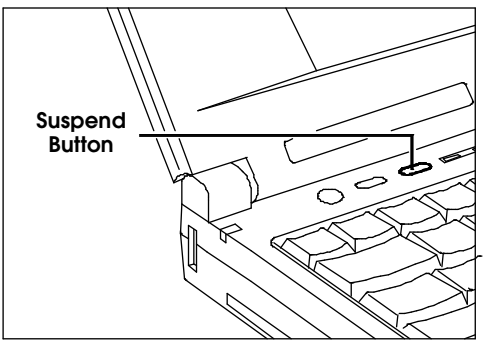
Caution: In the rare event that you should see or smell anything that indicates overheating (smoke or a strange smell):

1. **Turn off the power.**
2. **Disconnect the AC adapter from the power source.**
3. **Remove battery pack(s).**
4. **Contact your Texas Instruments dealer.**

Suspend mode puts your computer to "sleep" whenever it is not actively being used. This feature helps save battery power and allows you to make some hardware configuration changes without turning the computer off.

In Suspend mode, data is saved onto a partition of your hard disk so that even if power is cut off, data still remains intact. The PHDISK utility performs the zero-volt suspend function.

Press the **Suspend** button to enter Suspend mode. To return from Suspend, press the **Suspend** button or the power switch. If the STANDBY/SUSPEND AFTER parameter in Setup is enabled and expires, Suspend also occurs.



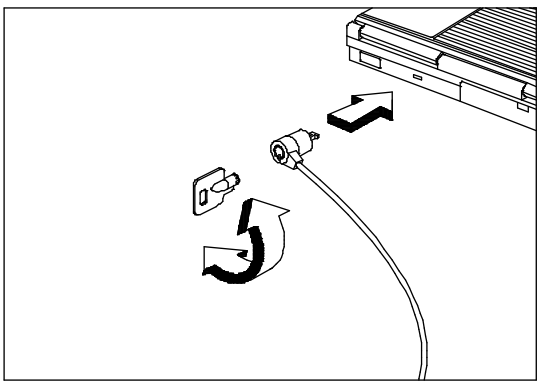
Suspend Button

Note: If the notebook is unable to enter Suspend mode, the Standby mode indicator LED lights up. Data will remain in memory and is lost if power is cut off from the notebook. Call your dealer for assistance.

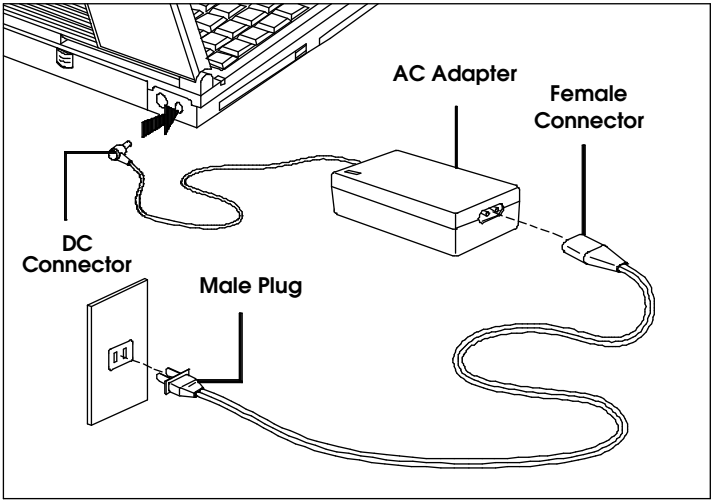
Safety Notch

Your Extensa computer comes with a safety notch. To physically secure your computer, complete the following steps:

1. Wrap the cable of a portable computer security lock around a table, desk drawer handle or any immovable object.
2. Insert the lock into the notch at the rear of the computer.
3. Turn the key to secure the lock.



Securing the Computer



AC Adapter

AC Adapter Charges the internal battery pack(s) and operates the computer on AC power whether or not a battery pack is installed. The AC adapter can be operated anywhere between 100-240 volts AC and has a detachable AC power cord.

Caution: Use only the AC adapter supplied with your computer. Another adapter may damage your computer.

Using the AC Adapter

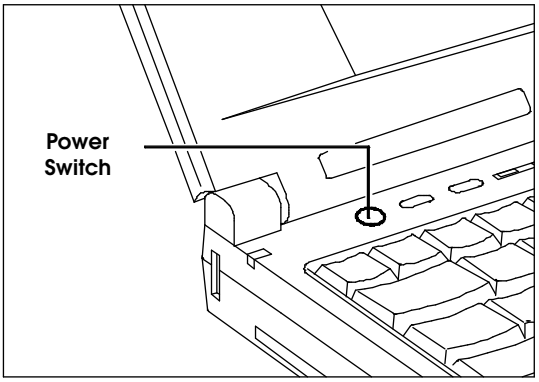
To connect the AC adapter, complete the following steps:

1. Turn off the power, or press the **Suspend** button to put the computer into sleep mode.
2. Connect the female connector of the AC cord to the inlet on the AC adapter.
3. Plug the DC connector into the matching jack on the rear panel of the computer.
4. Plug the male end of the AC cord into a wall receptacle using the correct voltage.
5. Turn the computer on.

2
Using Your Computer

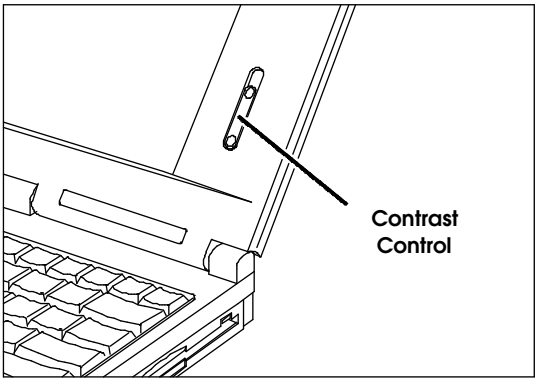
Before beginning this chapter, ensure you have read and understood Chapter 1. Chapter 2 describes how to start and use your Extensa computer.

Contents



Power Switch

Power Switch Turns the computer on and off for both AC and battery operation. When the power is off, the battery continues to charge (if a powered AC adapter is connected to the notebook); however, all computer functions cease.



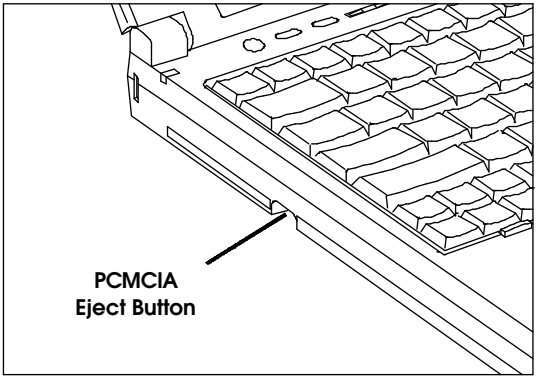
Contrast Control

Contrast Control (Dual-Scan Only)

Adjusts the contrast level of the illuminated screen. Moving the switch up increases the contrast of the display and moving the switch down decreases the contrast of the display. The sharper the contrast, the more power is used during battery operation.

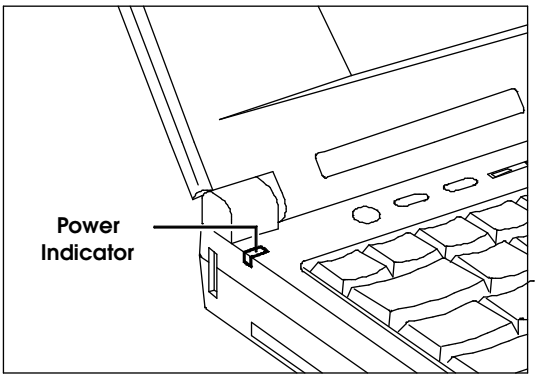
Eject Button

The PCMCIA eject button is found beside the slot. Pressing it ejects the PCMCIA card from the slot.



PCMCIA Eject Button

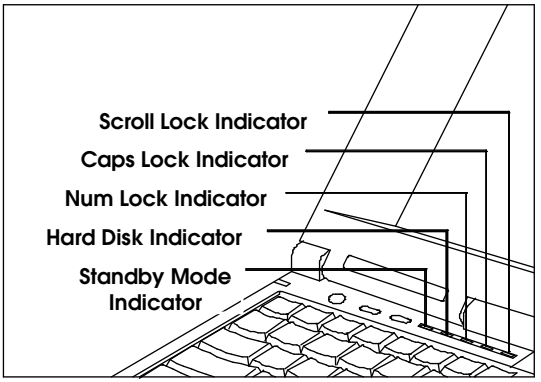
There are several LED indicators on the Extensa notebook computer. These indicators reflect the status of certain functions as you are using the system. This section discusses LED indicators for the Extensa in further detail.



Top LED

Power Indicator Lights green when power is turned on to the notebook computer. It flashes when the battery power is low.

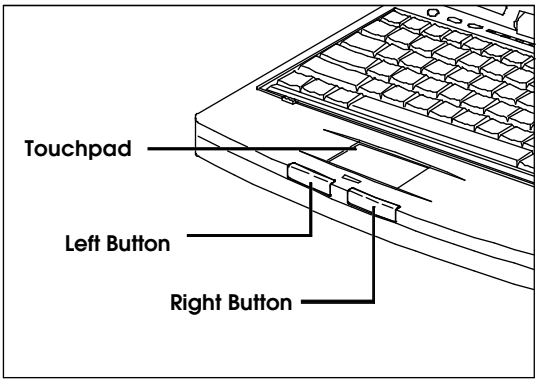
Using LED Indicators



Front LEDs

Standby Mode Indicator	Lights when the computer enters standby mode.
Hard Disk Indicator	Lights when the computer writes to or reads from the hard disk.
Num Lock Indicator	Lights when the embedded numeric keypad is toggled on using the Num Lock (**Fn**-**Num Lk**) key. See *Using the Numeric Keypad* later in this section for further details.
Caps Lock Indicator	Lights when the caps lock function is toggled on using the Caps Lock key.
Scroll Lock Indicator	Lights when the scroll lock function is toggled on using the Scrl Lk key.

The embedded pointing device offers a unique and efficient way of pointing and selecting in a Windows environment. The following figure displays the embedded pointing device.



Touchpad

The EasyTouch™ is a sensitive touchpad that responds to finger movements on its surface. To move your cursor, move your finger on the touchpad surface.

Once your cursor is in the proper place and you want to select, tap once on the surface or use the right button to click just as you would a mouse. Tapping twice means double-clicking.

Note: You may also connect an external PS/2 or serial mouse to your computer. See *Using Connectors and Ports* later in this chapter.

Hard Disk The Extensa notebook comes with a 356-million byte (340 MB) or higher capacity hard disk drive. The hard disk is formatted and loaded with software during manufacture. **Do not** format the hard disk.

Floppy Drive The floppy drive can read from and write to formatted 3.5-inch, double-sided, high-density (2HD), 1.44 MB floppies and to lower capacity, 720 KB, double-density (2DD) floppies.

The floppy drive does not function at low speed with the OS/2™ or Xenix™ operating systems.

Hard Disk Guidelines

If you want to format the hard disk, all data on the hard disk will be erased.

Do not move the computer when the HDD indicator is on. Press the **Suspend** button to spin the hard drive down and put the computer into a sleep mode before moving the computer.

If the HARD DRIVE OFF AFTER parameter in Setup is enabled and expires, the hard drive spins down to save power.

Caution: If the hard disk is damaged, you can lose data. To reduce the impact of data loss, back up the data to floppies frequently.

For further information on your user replaceable hard disk, refer to the installation instructions that come with your user-replaceable hard drive.

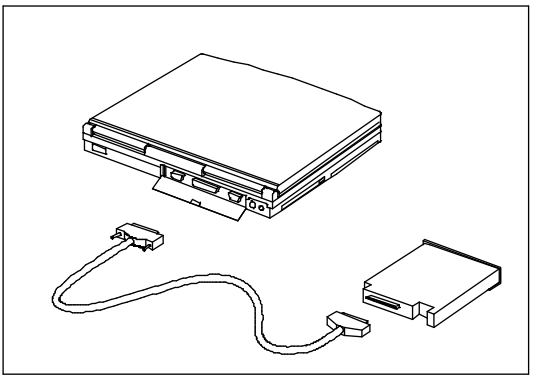
Floppy Drive Guidelines

Failure to observe the following precautions can damage both the floppy drive and the data on the floppy:

- Make sure the floppy drive module is properly installed in the accessory bay.
- If the floppy drive module is being used externally, make sure the floppy drive cable is connected properly.
- Insert the floppy into the floppy drive slot with the label side up and the metal-shutter end first. Gently push the floppy into the floppy drive slot until the floppy clicks into place.
- To remove a floppy, press the eject button until the floppy pops out.
- Never remove a floppy while the indicator on the floppy drive is on.
- Never force open the access shutter on a floppy.
- Always remove a floppy from the floppy drive ***before*** turning off the computer.

- Never transport the computer with a floppy in the floppy drive. Doing so can damage the drive head.
- If a floppy appears to be damaged, try to make a copy of it, and immediately discard it.
- Keep all floppies when not in use in a disk storage box to protect them from damage or loss.

You can also connect the floppy drive externally. First, remove the drive from the accessory bay if it is installed. Then, connect one end (25-pin) of the optional FDD cable to the notebook's parallel port and the other end to the floppy drive module.



Connecting the Floppy Drive Externally

Your computer is equipped with 4 MB of random access memory (RAM). Memory expansion can be accomplished by upgrading from 4 MB of memory up to 32 MB of memory. Refer to Chapter 4, *Options*, or to the installation instructions that come with optional memory for further information.

Caution: TI does not warrant the use of non-TI memory. TI will not be held responsible for problems or degradation of performance incurred by using any memory other than TI memory described in this document.

The computer has many special keys, but most of them depend on an application for their functionality. The following keys have special functions at the command level of MS-DOS and within many programs.

Fn-Pause	Stops a command or application; primarily used to stop the screen from scrolling; pressing any other key resumes the execution of the command or application
Shift-Prt Sc	Sends the contents of the screen to the printer port; prints only text characters unless you have run the GRAPHICS.COM utility to enable printing graphics
Fn-Break **Ctrl-Fn-Pause** **Ctrl-Fn-Break** **(Break)**	Terminates the current command or application
Ctrl-P	Sets the computer to echo keystrokes to the printer; prints a line when you press **Enter**; continues until you press **Ctrl-P** again
Ctrl-Alt-Esc **(Setup)**	Loads the ROM-based Setup

Ctrl-Alt-Del	Terminates all programs, reloads MS-DOS and executes the AUTOEXEC file; also called “warm start” or “warm boot”
Ctrl-Alt--	Decreases CPU speed from high to low
Ctrl-Alt-+	Increases CPU speed from low to high

Using the Internal Numeric Keypad

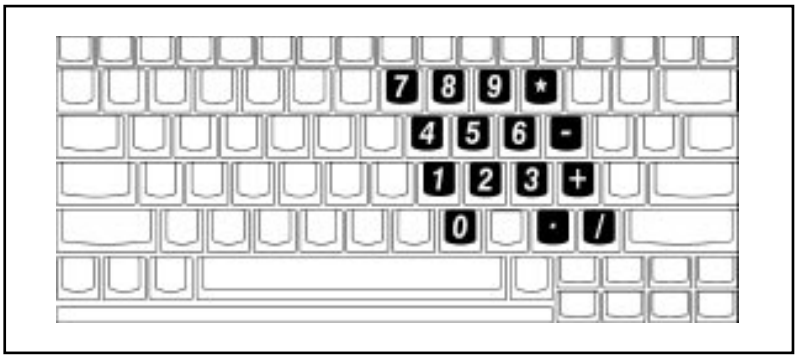
The keyboard has an embedded keypad that provides the same functions as the discrete numeric keypad on an AT™ enhanced keyboard.

The embedded numeric keypad keys shown in the following figure generate AT-keypad characters and functions when pressed in conjunction with **Num Lock**, **Fn** and **Shift**.

The embedded numeric keypad has two modes you can enter by toggling **Num Lock** (**Fn**-**Num Lk**) as signaled by the **Num Lock** indicator: on or off.

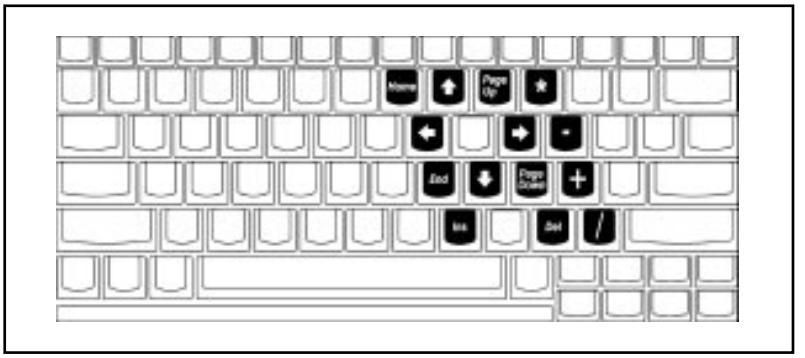
Num Lock On

When the **Num Lock** indicator is on, pressing a key generates the characters shown in the following figure.



Num Lock On

Pressing **Shift** with a key generates the characters shown in the following figure.



Num Lock On (with Shift)

If you press and hold **Fn** in this mode, the keypad generates their normal characters.

Num Lock Off

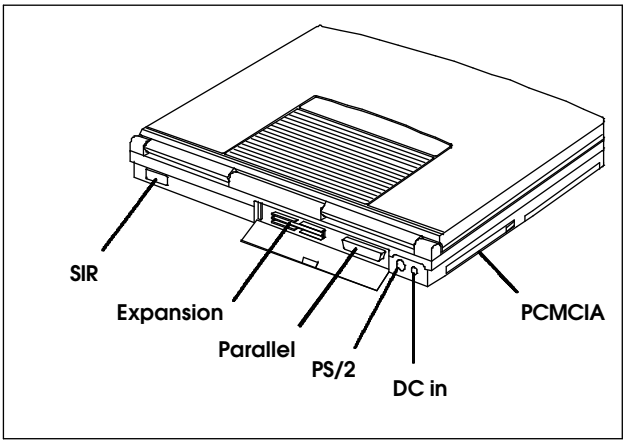
When the **Num Lock** indicator is off, the keyboard acts as normal.

Pressing **Fn** with a key generates the same characters shown in the previous figure, *Num Lock On (with Shift)*.

Using Connectors and Ports

This section provides a description of connectors and ports on the rear and left side panel of the Extensa notebook computer.

Caution: Turn off the computer before connecting external devices.



Ports

1 SIR — The serial infrared (SIR) port allows you to connect serial devices (such as another IrDA-compliant computer or printer) without the use of a cord or cable.

2 Expansion (120-pin) — Connects to the Mini Port Adapter or the Full-Function Port Replicator. See *Docking Options* in Chapter 4.

3	**Parallel (25-pin)**	Connects to a parallel printer or other device that uses a standard parallel interface. EPP/ECP compatible.
4	**PS/2**	Connects to an external PS/2 keyboard, numeric keypad or mouse. If you are connecting a 101-type keyboard, a 101 to PS/2 keyboard adapter must be purchased.
5	**DC In**	Connects the AC adapter output connector to this jack to recharge the battery and supply ac power to the computer.
6	**PCMCIA**	The PCMCIA slot supports one Type I or one Type II PCMCIA card. Included with your notebook is the Phoenix PCMCIA PhoenixCARD Manager Plus software. The manual for this software is stored electronically on your hard disk. This software package provides the necessary configuration and driver support for installing PCMCIA option cards. For further information on the PCMCIA option, refer to Chapter 4, *Options*.

Caution: Use only the supplied AC adapter with your computer. Other adapters can cause serious damage to the electronic circuits.

3
Using Battery Power

The primary difference between using battery power and AC power is the limited time you can operate under battery power before you must recharge.

This chapter covers charging the battery and maximizing the time between charges and assumes that you installed and charged the battery as directed in the *Quick Start* instructions.

Contents

Guidelines for Battery Use

Caution: Never dispose of exhausted batteries in a fire. Recycle if possible.

The battery should be handled carefully to ensure maximum life. In particular:

- Do not drop the battery or subject it to shocks.
- Do not expose the battery to direct sunlight, moisture, chemicals, or temperature extremes.
- Do not short the battery leads or connect the battery with the wrong polarity.
- Charge the battery after several days of disuse to keep it fully charged. If your computer is idle for an extended period of time, charge the battery every 3 months.
- Never use the battery to power other products.
- The battery pack has thermal fuses to prevent unsafe computer operation. The computer may not operate on battery power after storage in a very warm place until the thermal fuses cool.
- The secondary Li-ION battery and its case are built as one unit; do not try to open the battery case.

Switching to Battery Power

This procedure should only be done if your batteries currently have charge remaining. The primary NiMH and secondary Lithium-ION battery packs are "hot-pluggable". To use battery power, install batteries as described in *Installing the Battery Pack* later in this section. Your computer will automatically switch to AC power whenever an AC adapter is plugged into the notebook. At this time, your batteries will automatically be recharged.

Hint

To maintain a full charge on your battery, always reconnect the computer to the AC adapter as soon as possible after battery operations.

Responding to Low Battery Conditions

The notebook has battery-low warning signals that are both audible and visible. When the battery has 5% to 10% of its charge remaining, the power indicator LED found to the left of the power on/off button flashes at regular intervals until the battery power is depleted. The buzzer also generates four continuous beeps every minute if you enabled the BATTERY-LOW WARNING BEEP parameter in Setup.

If a secondary battery pack is installed and the power indicator still flashes, the secondary battery pack is also running low on power.

When the LED starts to blink, you typically have around 3 minutes remaining before the computer enters suspend mode. The time remaining depends on the battery, the computer, and the activity it is performing. Experience will teach you the amount of time to expect with the applications you use.

The following actions can maximize the time before the battery is depleted and minimize the effect of losing power:

- ❑ Turn the screen brightness control to the lowest possible setting.
- ❑ Press **Ctrl**-**Alt**-↓ to reduce the CPU speed.
- ❑ Save your work in progress to minimize the danger of losing data.

- ❑ If you are using a RAM disk, save the contents of the RAM disk to the hard disk.
- ❑ Press the **Suspend** button to put the computer to sleep whenever you are not actively using the computer.
- ❑ Turn off the computer if it does not need to be active.

Once your system enters suspend mode, you can replace with fully-charged batteries one at a time and then resume from suspend mode or connect AC power.

Recharging the Battery

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

The following procedure is acceptable under most circumstances:

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

2. Connect the AC adapter as described in Chapter 1.

   When the notebook is turned off, the power indicator turns orange. This is called rapid charge mode.

   When the notebook is turned on, the power indicator turns green and yellow. This is called charge-in-use mode.

   When the battery is fully charged, the AC adapter changes to trickle mode to maintain the battery charge level.

3. To maintain a full charge, leave the computer connected to the AC adapter except when transporting the computer.

Note: Charge time is reduced by several hours if the unit is turned off when charging the batteries.

Installing and Removing the Battery Packs

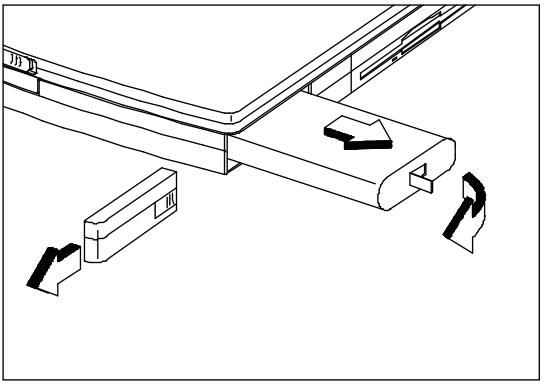
Removing the Battery Packs

The notebook uses a Duracell-standard NiMH primary battery pack and a secondary Li-ION battery pack. The following sections tell how to remove these batteries.

Caution: Turn off the notebook or enter suspend mode before removing a battery pack.

Primary Battery Pack

1. Remove the primary battery compartment cover.
2. Flip-out the battery handle and pull out the battery.

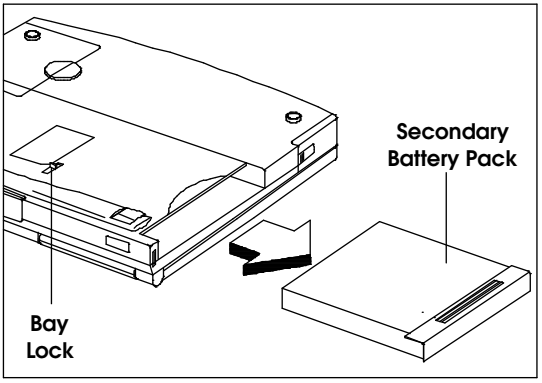


Releasing the Primary Battery

Installing and Removing the Battery Packs

Secondary Battery Pack

Release the accessory bay lock and pull out the secondary battery pack.



Releasing the Secondary Battery

Installing and Removing the Battery Packs

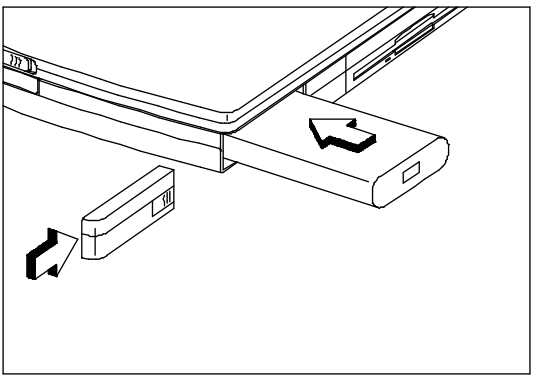
Installing the Battery Packs

The following sections tell how to install the primary and secondary batteries.

Caution: Turn off the notebook or enter suspend mode before removing a battery pack.

Primary Battery Pack

1. Remove the primary battery compartment cover.
2. Insert the primary battery pack (connector side up) into the compartment.
3. Replace the cover.
4. Reconnect the external devices and AC adapter (if necessary).

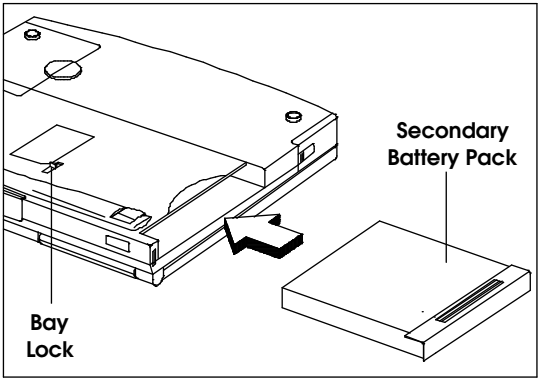


Sliding the Primary Battery in Place

Installing and Removing the Battery Packs

Secondary Battery Pack

1. Release the accessory bay lock and remove the accessory bay module (diskette drive, PCMCIA, etc.) if one is currently installed.
2. Slide the secondary battery pack into the accessory bay until it clicks into place.
3. Reconnect the external devices and AC adapter (if necessary).



Sliding the Secondary Battery in Place

Conserving Battery Power

The following tips can help you prolong the life of a battery charge:

- Keep the LCD at the lowest comfortable contrast level. Reducing contrast even a small amount can significantly reduce power consumption and increase operating time.
- Enter Setup using the **Setup** button to access the Power Management screen and enable the power saving parameters.
- You can choose between two CPU speeds: high and low. The computer uses less power at lower CPU speeds. When using an application that is not CPU-intensive (for example, many word processing programs), press **Ctrl-Alt-↓** to reduce the CPU speed. To increase the speed again, press **Ctrl-Alt-↑**. This speed control feature is not available in the Windows environment or on most models that use a memory manager.
- You can minimize the number of times the computer needs to access the hard disk by using disk caches or RAM disks.
- Disconnect or turn off external options that you are not using.
- Enter Setup using **Ctrl-Alt-Esc** and disable the ports you are not using.

- Use only Texas Instrument options. These options are designed to operate with the least possible energy consumption. Third-party options (such as RAM and mouse devices) can drain the battery more quickly.
- Run the computer with the AC adapter connected when using external devices, such as an external keyboard.

4
Options

This chapter provides information on Options available for your Extensa computer. For further information, refer to the installation instructions that come with the specific option.

Contents

User Replaceable Hard Drives

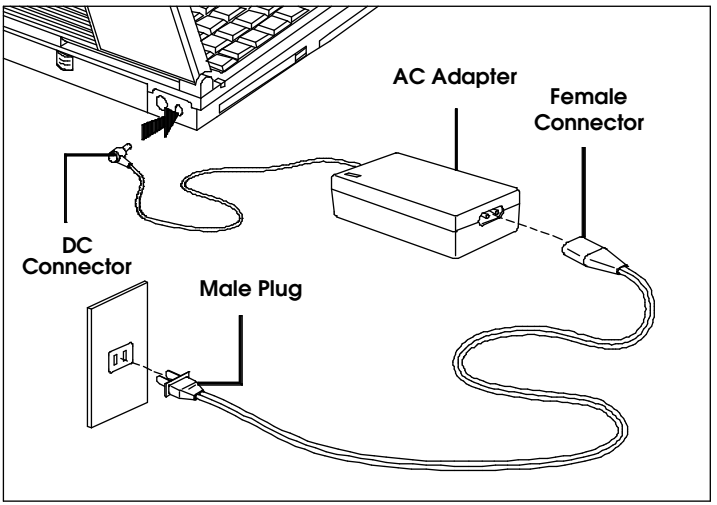
The following additional hard drives may be ordered from TI:

- 356 million byte (340 MB) (TI Part No. 9803947-0001)

Directions for installing and removing hard drives are provided in the installation instructions that come with your user-replaceable drive.

The AC adapter charges the internal battery pack and operates the computer on AC power whether or not a battery pack is installed. The AC adapter can be operated anywhere between 100 - 240 volts AC and has a detachable AC power cord.

Caution: Use only the AC adapter recommended in this document (TI Part No. 9803931-0001). Another adapter may damage your computer.



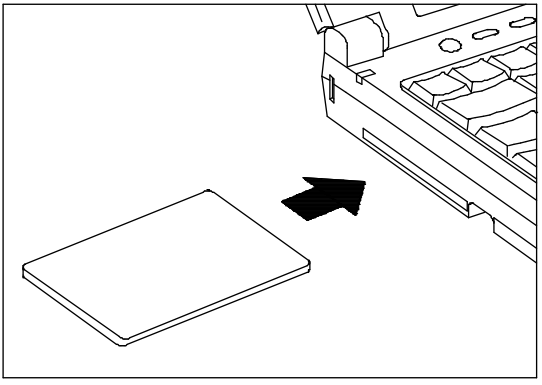
AC Adapter

To install your AC adapter, refer to instructions that come with your AC adapter.

PCMCIA Option Cards

PCMCIA option cards are used to add additional functionality to your computer, such as communicating over a telephone or connecting to a network.

The Extensa computer has a built-in slot that supports one Type I or one Type II PCMCIA option card.



Inserting the PCMCIA Card

The following PCMCIA cards are available from TI:

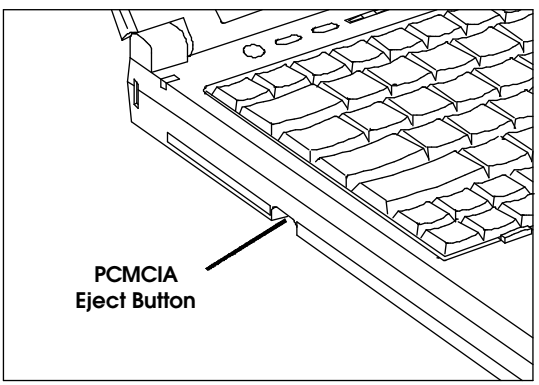
- PCMCIA 14.4 KB data/send/receive/fax/voice modem with XJACK®(TI Part No. 9798074-0001).
- PCMCIA Token Ring Card (TI Part No. 9791774-0001)

- 10BaseT Ethernet Twisted-Pair Card 9791773-0001)
- 10Base2 Ethernet Thin Coax Card 9791773-0002)
- 10Base5 Ethernet Controller (TI Part No. 9791773-0003)

For the current list of available PCMCIA cards, call 1-800-TI-TEXAS, option 2, 1.

To install your PCMCIA option card, refer to the installation instructions that come with your PCMCIA card and the online *Phoenix PCMCIA User's Guide*.

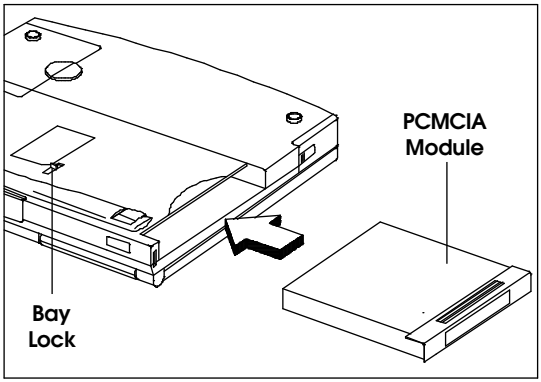
To eject your PCMCIA option card, press the eject button found beside the slot.



Ejecting the PCMCIA Card

PCMCIA Slot Module

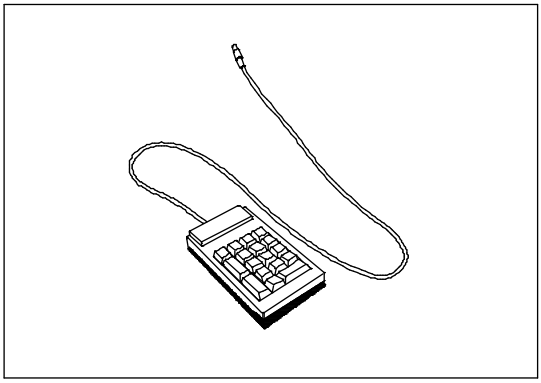
A removable PCMCIA slot module can be installed in the accessory bay to accept a Type III option card. If a module is present in the accessory bay, release the bay lock and pull it out of the bay. Then, install the PCMCIA slot module.



Installing the PCMCIA Module

To install your PCMCIA module, refer to instructions that come with your PCMCIA module.

The optional PS/2 Numeric Keypad (TI Part No. 2581381-0001) can be used instead of the internal numeric keypad.



PS/2 Numeric Keypad

To use the PS/2 numeric keypad, turn the notebook off. Plug the keypad's cable connector into the computer's PS/2 (Mouse/Keyboard) connector located on the rear of the computer (See *Using Connectors and Ports* in Chapter 2).

For further information on the PS/2 Numeric Keypad, refer to instructions that come with your keypad.

Using External Monitors

You can also connect the computer to external monitors, many of which can display resolutions higher than 640 x 480.

When the external monitor is configured for 640 x 480 x 256 VGA, however, the computer can display on the LCD at the same time as the external monitor. This feature is called SimulSCAN™ and is enabled using the VGA utilities found in the Windows VGAUTIL Group.

While SimulSCAN is in effect, the LCD screen may display characters less brightly than when the computer is displaying only on the LCD screen.

Hint

When the computer is connected to an external monitor, you can use the computer with the cover closed.

Your computer is equipped with 4 MB of random access memory (RAM), occupying one memory slot. There are 2 memory slots on the notebook. You can increase memory by installing any combination of the following RAM options:

- 4 MB RAM Expansion Board (TI Part No. 9803932-0001)
- 16 MB RAM Expansion Board (TI Part No. 9803933-0001)

You can expand RAM from 4 MB up to 32 MB.

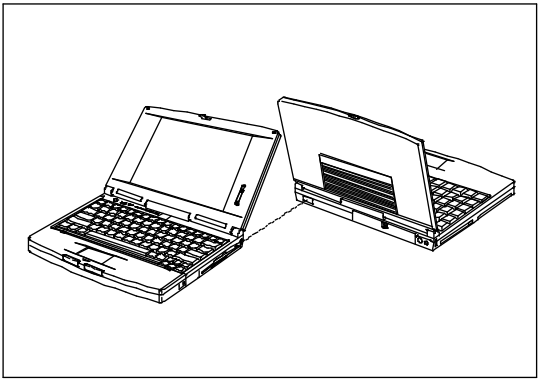
For further information, refer to the installation instructions that come with your optional memory.

Caution: TI does not warrant the use any memory other than that supplied by TI specifically for the Extensa computer. TI will not be held responsible for problems or degradation of performance incurred by using any memory other than TI memory described in this document.

SIR Options

The Serial Infrared (SIR) port offers wireless communication with other Extensa notebooks or with a variety of IrDA-compliant devices made by other manufacturers. Ensure that the third-party manufacturer supplies you with the appropriate SIR drivers before attempting connection.

To use the SIR port, align the SIR ports of the two devices making sure that the distance separating them is between six inches and three feet (15 centimeters and 1 meter).



Using an SIR Option

After the devices are aligned, you must use the TranXit software (located in the Windows TranXit Group) to complete the SIR communication process. For further information, refer to the *TranXit Quick Reference Guide*.

You can connect a port replicator to the Extensa using the expansion port on the rear panel.

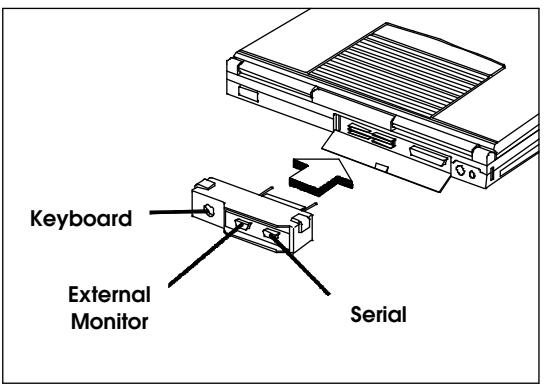
There are two port replicators available for the Extensa:

- Mini Port Adapter
- Full-Function Port Replicator

Mini Port Adapter

The Mini Port Adapter is a small, compact port replicator that gives you three additional ports besides those found on the notebook.

To connect the Mini Port Adapter, first open the port cover, then connect the Mini Port Adapter to the expansion port.



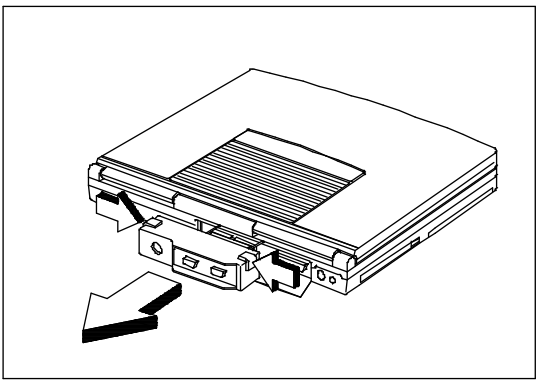
Connecting the Mini Port Adapter

Docking Options

1	**PS/2 Keyboard**	Connects to an external PS/2 keyboard
2	**External Monitor (15-pin)**	Connects to an external analog VGA monitor
3	**Serial (9-pin)**	Connects to external devices such as a serial printer. 16550 UART.

Note: When the Mini Port Adapter is installed, the keyboard/mouse port on the notebook becomes a mouse port. External keyboards must connect to the keyboard connector on the Mini Port Adapter.

To detach the Mini Port Adapter, press the two release buttons on both sides and disconnect the Mini Port Adapter unit from the notebook.

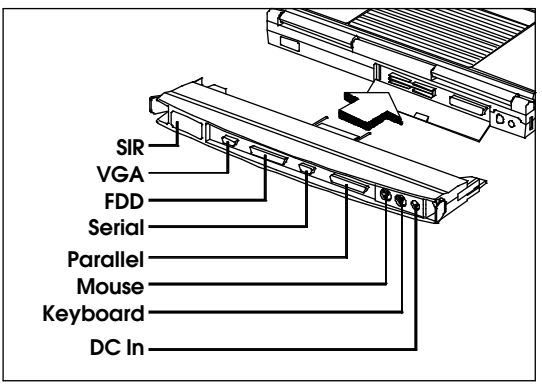


Releasing the Mini Port Adapter

Full-Function Port Replicator

The Full-Function Port Replicator is a full-featured docking bar that duplicates all the ports on the notebook and includes additional ports.

To connect the Full-Function Port Replicator, first open the port cover, then connect the Full-Function Port Replicator to the expansion port.



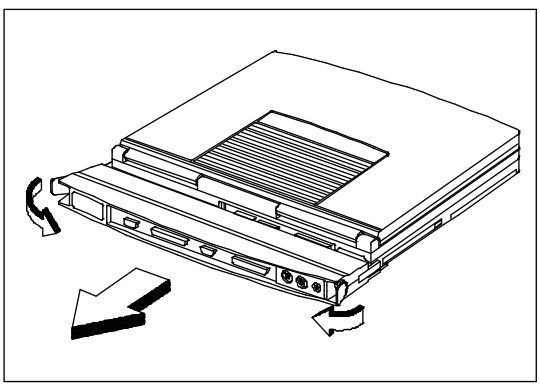
Connecting the Full-Function Port Replicator

Docking Options

1	**SIR Window**	Gives you access to the SIR port on the notebook
2	**External Monitor (15-pin)**	Connects to an external analog VGA monitor
3	**FDD (25-pin)**	Connects to an external diskette drive. The internal, removable diskette drive module can be used externally.

4	**Serial (9-pin)**	Connects to external devices such as a serial printer. 16550 UART.
5	**Parallel (25-pin)**	Connects to a parallel printer or other device that uses a standard parallel interface. EPP/ECP compatible.
6	**PS/2 Mouse**	Connects to an external PS/2 mouse
7	**PS/2 Keyboard**	Connects to an external PS/2 keyboard or keypad
8	**DC In**	Connects the AC adapter output connector to this jack to recharge the battery and supply AC power to the computer

To detach the Full-Function Port Replicator, press the two release levers on both sides and disconnect the option from the notebook.



Releasing the Full-Function Port Replicator

Miscellaneous Options

There are additional options available for use with your notebook. These include:

Batteries

You can purchase spare batteries--primary NiMH (TI Part No. 9803928-0001) or secondary Lithium-ION (TI Part No. 9803929-0001)--for your notebook. For information on these batteries, refer to Chapter 3, *Using Battery Power*.

Carrying Case

Helps protect the computer and accessories during transport. Two carrying cases are available:

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

PS/2 Mouse

Extensa series computers come with a built-in pointing device. You can also use an external mouse by connecting it to the PS/2 keyboard port using a special six-pin connector or to the 9-pin serial port. See *Using Connectors and Ports* for more details.

Printers

You can connect almost any parallel printer to the parallel port or a serial printer to the serial port. Texas Instruments makes a variety of laser and ink jet printers you can use with your computer.

5
Using Software

This chapter describes the software supplied with the computer and how to configure application software to run on the computer.

Contents

Using Supplied Software

Your computer is shipped with the following software installed on the hard disk:

- Microsoft Windows 95
- Power-saving utilities (including PHDISK zero-volt suspend utility)
- PCMCIA card and socket services
- VGA external monitor utilities

All of the supplied software have online help files, which reduce the need to refer to printed manuals and provide you with information when you are away from printed manuals.

Windows 95 Help

To obtain Windows 95 help, select the Start button and then select Help.

Extensa Utilities Help

For help with the functions of DOS-based utilities, see the README files of the specific utility.

Guidelines for Installing Applications

Adjusting the Software for the Computer

Your computer can execute almost all programs written to execute on AT computers. When installing software, you may need to provide the following information to the installation program:

Display The LCD has an 80-column by 25-line display with 640 x 480 (VGA) resolution. When installing an application, select the highest resolution configuration that both the program and the computer can support. If you are using the computer with a high-resolution external monitor, you can select a higher resolution than 640 x 480 depending on the model of your computer, but this configuration does not work on the internal LCD.

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.

Mouse If you are using the built-in pointing device or an external PS/2 mouse, you may select the Microsoft or IBM PS/2 mouse.

Configuring the Computer for the Software

Some programs require you to modify the way the computer operates to ensure compatibility.

Processing Speed Some older applications cannot execute at the higher speeds available with the computer. If the user's manual for the program indicates a maximum processing speed, press **Ctrl-Alt-↓** to reduce the CPU to the required speed, or you can include the SPEED utility as part of a batch file that runs the program. Not available on some models that use a memory manager or that operate within the Windows environment.

RAM Your computer has 4 MB of memory. This is sufficient to run most software. For improved operation, you may want to install additional RAM (refer to Chapter 4 for information on upgrading your memory).

Guidelines for Installing Applications

Internal Cache

Some applications may require the internal cache to be disabled in the system Setup menu.

Custom Windows Utilities

Extensa has Windows-based utilities described in the following table. For detailed information, use the Windows help files.

Icon	Location	Function
Extensa User's Guide	Notebook Group	Provides online help on the Extensa notebook computer.
PC-Doctor Diagnostics		Runs system diagnostics
Synaptics Touchpad	Windows Control Panel	Controls the touchpad.
TranXit	TranXit Group	Runs like File Manager and allows you to connect to the SIR port.

Using a Password

You may set a password to prevent unauthorized access to your computer. To set a password, follow these steps:

1. Get to the Control Panel.

2. Click on the TI Setup icon.

3. Click on the System Config tab.

4. Click on Set Password.

5. Press the left or right arrow key.

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

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

You are asked to verify the password by retyping it.

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

The password is set to Enabled and you will be prompted for the password every time you reboot the system. You have three tries to enter the correct password on power-up before the system halts and you have to shutdown.

8. To save your changes, click on OK.

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

6
Important Information

This chapter helps you prepare for traveling with your computer, using external devices, and configuring the touchpad.

Contents

Tips for the Traveler

Your Extensa Computer is a precision instrument containing many sensitive components. It should be handled with care. Here are some suggestions for traveling:

- Never expose the computer to excessive vibration.
- Do ***not*** check the computer as baggage: take the computer as carry-on luggage if traveling by air.
- Do not put the computer through a security X-ray machine or a metal detector; have the computer inspected by hand. Be sure the computer is loaded with a charged battery in case airport security requires you to turn on the computer.
- If you are traveling internationally, carry a proof of purchase with you in case you need to show it to customs officials.
- Avoid placing the computer where it can be stepped on or knocked around.
- Disconnect all peripherals before packing the computer.
- Transport the computer with the display closed and the power off.

- Changes in temperature and humidity can cause condensation. Allow the computer to return to room temperature, and inspect the LCD for condensation before turning on the computer. If the temperature change is greater than 18°F (10°C), allow the computer to come to room temperature slowly. If possible, leave the computer for 30 minutes in an environment with a temperature between outside and room temperatures.
- Always carry the computer in a protective case.

Cautions:

When packing the computer, do not pack items next to its top cover. Too much pressure against the top cover can damage the LCD.

Do not travel with a floppy in the floppy drive. This can damage the drive head.

What to Take When Traveling

If you plan to use your computer when traveling, you should consider taking the following items:

- ❑ This manual
- ❑ AC adapter
- ❑ Power cords and adapters for the AC adapter and peripherals appropriate for the countries to which you will be traveling
- ❑ Fully-charged spare battery pack(s)
- ❑ Optional battery charger and accompanying AC adapters and power cords
- ❑ Additional printer driver files if you plan to use another printer
- ❑ Quick Reference Cards for the programs you will be using
- ❑ Optional Mini Port Adapter or Full-Function Port Replicator

Packing the Computer and Accessories

1. Turn off the computer. Disconnect the AC adapter from the computer and from the AC outlet.
2. Close and latch the display.
3. Tie up cables using twist ties or rubber bands.
4. Enclose peripherals in plastic bags.
5. Place computer, peripherals, documentation, and floppies in a carrying case. If you do not have a carrying case, put the computer in a briefcase you plan to carry and the other supplies in luggage you plan to check.

Using a Mouse

Although the Extensa comes with a pointing device already installed, you may use an external PS/2 or serial mouse.

1. Turn off the computer.

Note: If you connect the mouse to the computer while power is on, press **Ctrl-Alt-Del** (warm start), or cycle power so the computer can detect the presence of the mouse.

2. To connect a PS/2 mouse, attach the six-pin Mini-Din connector to the mouse and insert the other end of the connector into the rear of the Extensa.

To connect a serial mouse, attach the Mini Port Adapter or Full-Function Port Replicator docking bar (see *Docking Options* in Chapter 4); then connect the serial mouse to the 9-pin serial port on the option. You can also use a serial infrared mouse.

Note: If you installed the Mini Port Adapter, the keyboard/mouse port on the Extensa becomes exclusively a mouse port. Connect an external mouse to this port and use the connector on the Mini Port Adapter for an external keyboard.

3. Reconnect the AC adapter, and turn on the computer.

Using an External Keyboard

If desired, you may also connect any IBM-compatible external PS/2 keyboard by completing the following steps:

1. Turn off the computer.

Note: If you connect the PS/2 keyboard to the computer while power is on, press **Ctrl-Alt-Del** (warm start), or cycle power so the computer can detect the presence of the mouse.

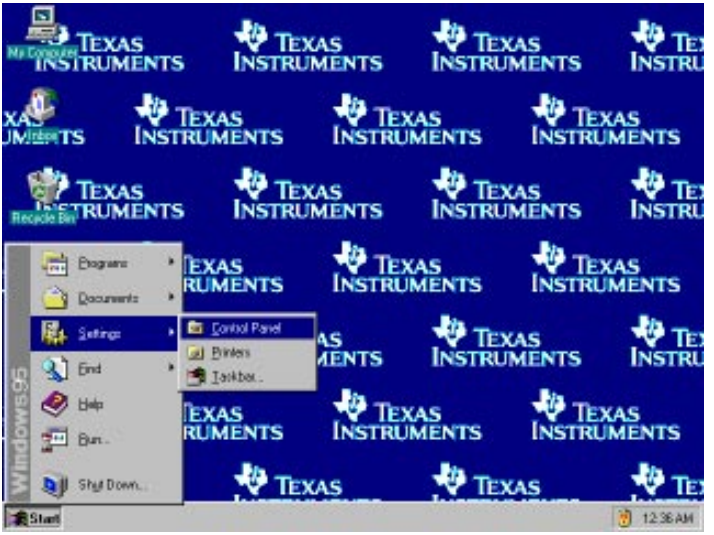
2. Attach the six-pin Mini-Din connector to the keyboard/mouse connector on the rear of the Extensa.

3. Reconnect the AC adapter, and turn on the computer.

Configuring the Touchpad

You can configure the touchpad using the Touchpad utility in Windows 95. Follow these steps to configure the touchpad:

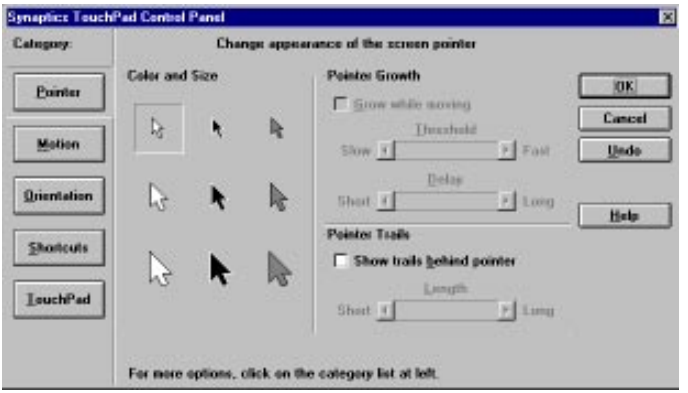
1. Select the Start button, then select Settings.



2. Select Control Panel to display the Control Panel window.

3. Double-click on the Mouse icon and select General.

4. Select the Options... button to display the Synaptics Touchpad Control Panel dialog box.



Configuring the Touchpad

You can configure different aspects of the touchpad including the pointer, motion and orientation as well as touchpad shortcuts. See the online help for details.

7
Care and Troubleshooting

This chapter tells you how to clean your computer safely and solve operational problems.

Contents

Cleaning the Computer

Regularly take the time to check your computer and clean the screen, keyboard, and case to ensure trouble-free computing.

Caution: Never use alcohol, benzene, thinner, or strong chemical agents that could damage the computer's case, and never apply liquid directly to the computer, only to a clean cloth. Never spray cleaning fluid or any liquid directly onto the case or screen.

Keep the case of the computer free of dust. Apply a small amount of mild liquid cleaner to a dry, lint-free cloth, and wipe the case with the cloth.

The surface of the screen is covered with a protective plastic film that may become smeared and accumulate dust during use. Avoid touching the screen with your fingers.

Clean the screen regularly by applying a small amount of diluted neutral detergent to a dry, lint-free cloth. Gently rub the surface of the screen with the cloth.

Computer does not come on when power switch is pressed	☐ Low battery; use AC adapter and recharge battery. ☐ Ensure AC adapter cable and power cord are securely connected. Verify that the AC adapter LED is on. ☐ Connect AC adapter to another outlet.
Computer power is on but screen is blank	☐ Adjust contrast switch. ☐ The LCD standby timer in Setup is enabled and has expired. Press any key or move the mouse. ☐ Computer set for external monitor; cycle power or change the LCD display control parameter in Setup.
Special functions (Setup, Ctrl-Alt-Esc, etc.) do not work	☐ Applicaiton is overriding computer BIOS interrupts; notify your application provider. ☐ Computer model does not support special function.
Computer indicates an error at start-up	☐ Turn the computer off; wait several seconds; then turn the computer on again. If error persists, check list of error messages for corrective action. Press **Ctrl-Alt-Esc** to ensure all settings are correct.

Startup Error Messages

CMOS battery bad	☐ Contact your dealer or an authorized service center.
Gate A20 failure	☐ Contact your dealer or an authorized service center.
Unexpected interrupt in protected mode	☐ Contact your dealer or an authorized service center.
Display adapter failed; using alternate	☐ Contact your dealer or an authorized service center.
No timer tick interrupt	☐ Contact your dealer or an authorized service center.
Shutdown failure	☐ Contact your dealer or an authorized service center.
Timer 2 failure	☐ Contact your dealer or an authorized service center.
Keyboard controller failure	☐ Contact your dealer or an authorized service center.
Keyboard clock line failure	☐ Ensure external keyboard connected correctly. ☐ Replace external keyboard.

Keyboard data line failure	☐ Ensure external keyboard connected correctly. ☐ Replace external keyboard.
Keyboard stuck key failure	☐ Press jammed key to unstick it. ☐ Ensure no keys pressed during computer startup.
No diskette controller	☐ Contact your dealer or an authorized service center.
Diskette drive A failure	☐ Press **Ctrl-Alt-Esc** to ensure that the drive type is set correctly in Setup (should be 3.5 inch, 1.44 MB).
Diskette drive B failure	☐ Press **Ctrl-Alt-Esc** to ensure that the drive type is set correctly in Setup (should be 3.5 inch, 1.44 MB).
Pointer device failure	☐ Contact your dealer or an authorized service center.
Hard disk configuration error	☐ Press **Ctrl-Alt-Esc** to ensure the hard disk is defined correctly in Setup.
Hard disk controller failure	☐ Contact your dealer or an authorized service center.

Startup Error Messages

Hard disk 0 failure	☐ Turn the computer off; wait several seconds; then turn the computer on again. ☐ Press **Ctrl-Alt-Esc** to ensure the hard disk is defined correctly in Setup.
Real time clock failure	☐ The battery sustaining the system configuration has failed. Follow the procedure in this chapter to restore the configuration.
Invalid configuration information - please run setup program	☐ Defaults in Setup may have changed. Enter Setup and press **Esc-F5** to restore the default values. Then press **Esc-F4** to save and reboot. ☐ Battery that maintains configuraiton has failed; follow procedure in this chapter to restore configuration.
Keyboard is locked - unlock	☐ Contact your dealer or an authorized service center.
Diskette read failure -	☐ Floppy defective or unformatted; insert a different floppy and retry.

Not a boot diskette -

- ☐ Eject floppy from floppy drive, and press a key to load MS-DOS from the hard disk.
- ☐ Insert a floppy containing MS-DOS in the floppy drive, and press a key.
- ☐ Press **Ctrl-Alt-Esc** to ensure that the drive type is set correctly in Setup.

No boot device available -

- ☐ Reboot to load MS-DOS again.
- ☐ Replace the floppy if you are loading MS-DOS from a floppy.
- ☐ Press **Ctrl-Alt-Esc** to ensure that the dirve type is set correctly in Setup.

Hard disk read failure -

- ☐ Press **Ctrl-Alt-Esc** to ensure the hard disk is defined correctly in Setup.

No boot sector on hard disk -

- ☐ Reboot to try loading MS-DOS from the hard disk again.
- ☐ Load MS-DOS from a floppy, and try to display a directory of drive C. If you cannot display a directory, the hard disk may need to be reformatted.

Caution: Reformatting erases all of the data on the hard disk. Reformat your hard disk only as a last resort.

A
Where To Get Help

Texas Instruments and your Texas Instruments authorized reseller want you to succeed with your TI product. If you are in the United States or Canada and have questions about or operating difficulties with your TI product, follow these steps to get support. If you are outside the United States or Canada, contact one of the numbers listed in the back of this appendix.

1. Call your dealer.

Your dealer should be the first person you call when you have questions or difficulties. Your dealer is familiar with your system requirements and should be able to provide you with the needed informaiton or service.

2. Call the appropriate TI number.

Customer Satisfaction Line **1-800-TI-TEXAS**
Option 3,1
FAX: 817-774-6660
TDD: 817-774-6582

Call the TI Customer Satisfaction Line (CSL) with service, warranty, service contracts, or product support questions. Hours of operation are 24-hours a day, 7 days a week.

Have the following information available when calling or faxing:

- Name, address, daytime phone number
- Product model
- Serial number
- Brief description of the symptoms being observed (include the software applicaton you are using)

Where To Get Help

Call TI Express to order options

In the U.S. and Canada	**1-800-TI-TEXAS** **Option 2,1** **FAX: 1-800-443-2984**
For all other locations, dial direct:	**1-817-774-6969** **FAX: 1-817-774-6869**

TI Express hours of operation are 8:00 am to 6:00 pm Central Standard Time, Monday through Friday.

For information about other TI products, call the Customer Response Line

In the U.S. and Canada	**1-800-336-5236**
For all other locations	**1-214-995-6611**

If you have a question about any other TI product, the Customer Response Center can put you in touch with the right person.

Worldwide Sales Offices

Australia
Texas Instruments Australia Ltd.

6-10 Talavera Road
North Ryde, NSW 2113
Tel: (02) 878-9000
Fax: (02) 805-1186

Royal Domain Centre
14th Floor
380 St. Kilda Road
Melbourne, VIC. 3004
Tel: (03) 696-1211
Fax: (03) 696-4446

Belgique/België (Belgium)
S.A. Texas Instruments Belgium N.V.

11, Avenue Jules Bordetlaan 11,
1140 Bruxelles, Brussel
Tel: (02) 242 30 80
Fax: (02) 242 48 76
Telex: 61161 TEXBEL

Amsterdamseweg, 204
1182 HL AMSTELVEEN
Tel: (051) 3049292
Fax: (052) 3049360

Canada
Texas Instruments Incorporated
Personal Productivity Products

41 Shelley Road
Richmond Hill
Ontario L4C 564

Danmark (Denmark)
Texas Instruments A/S

Borupvang 2D
DK-2750 Ballerup
Tel: 44 68 74 00
Fax: 44 68 64 00
Telex: 35123 TEXIN

Deutschland (Germany)
Texas Instruments Deutschland GmbH.
Personal Productivity Products

Haggertystraße 1
85356 Freising
Tel: (08161) 80 49 57
Fax: (08161) 80 49 58

Eire (Ireland)
Texas Instruments
Ireland Ltd

(Call United Kingdom)

Espana (Spain)
Texas Instruments España S.A.

c/ Gobelas, 43
Ctra de la Coruña Km. 14
La Florida
28023 Madrid
Tel: (1) 207 70 60
Telex: 32634

C/Diputación, 279-3-5
08007 Barcelona
Tel: (3) 317 91 80
Fax: (3) 301 84 61
Telex: 50436

Worldwide Sales Offices

France
Texas Instruments France
Produits de Productivité Personnelle

8-10 Avenue Morane Saulnier,
B.P. 67
78141 Vélizy Villacoublay cedex
Service après-vente
Tel: (1) 34 65 00 05
Telex: 698884

Greece

(Call Middle East/Africa)

Holland
S.A. Texas Instruments Belgium N.V.

11, Avenue Jules Bordetlaan 11,
1140 Bruxelles, Brussel
Tel: (02) 242 30 80
Telex: 61161 TEXBEL

Amsterdamseweg, 204
1182 HL AMSTELVEEN
Tel: (051) 3049292
Fax: (052) 3049360

Hong Kong
Texas Instruments Hong Kong Ltd.

15th Floor, Tower 2, The Gateway
25-27 Canton Road
Kowloon, Hong Kong
Tel: (852) 9567288
Fax: (852) 9561078

Hungary

(Call Middle East/Africa)

India

(Call Middle East/Africa)

Israel

(Call Middle East/Africa)

Italia (Italy)
Texas Instruments Italia S.p.A.
Personal Productivity Products

Centro Direzionale Colleoni
System Division Palazzo
Perseo-Via Paracelso, 12
20041 Agrate Brianza (Mi)
Tel: (039) 68421
Fax: (039) 652206

Viale Castello della Magliana,
38 00148 Roma
Tel: 06-6572651
Fax: 06-6570447

Korea
Texas Instruments Supply Company Korea Branch

(Call Hong Kong)

Worldwide Sales Offices

Latin America Region
Texas Instruments

P.O. Box 149149, MS 2223
Austin, Texas 78714-9149
U.S.A.
Tel: (512) 250-4051
Fax: (512) 250-7456

Malaysia
Texas Instruments Malaysia Sdn Bhd - Asia Pacific Division

100 Jalan Tun Perak
Lot 36-1, Menara Maybank
50050 Kuala Lumpur
Tel: 02-03-2085708/02-03-2086001
Fax: 02-03-2306605

Middle-East and Africa
Texas Instruments Italia S.p.A.
Centro Direzionale Colleoni

System Division Palazzo
Perseo-Via Paracelso, 12
PPP Division
20041 Agrate Brianza (Mi)
Tel: (039) 68421
Fax: (039) 652206

Viale Castello della Magliana,
38 00148 Roma
Tel: 06-6572651
Fax: 06-6570447

Norge (Norway)
Texas Instruments Norge A/S

PB 106 - Refstad (Sinsenveien 53)
0513 Oslo 5
Tel: (02) 155090

Österreich (Austria)
Texas Instruments G.m.b.H.

Laxenburgerstraße 52
A-1100 Wien
Tel: 01/604 19 31 72
Fax: 01/604 19 31 85

Scweiz/Suisse
Texas Instruments (Switzerland)

Riedstraße 6
CH-8953 Dietikon
Tel: 01/744 28 11
Fax: 01/742 06 16

Route de la Chocolatière 3
CH-1026 Echandens-Denges
Tel: 021/701 53 54
Fax: 021/702 24 94

Singapore
Texas Instruments Singapore (PTE) Ltd.
Personal Productivity Products Asia Pacific Region

990, Bendemeer Road,
Singapore 1233
Republic of Singapore
Tel: 65-3907149 / 65-3907080
Fax: 65-3907060

Suomi Finland
Texas Instruments OY

Worldwide Sales Offices

Tekniikatie 12
SF-02150
Espoo, Finland
Tel: (90) 435 42033
Fax: (90) 467 323

Sverige (Sweden)
Texas Instruments International Trade Corporation (Sverigefilialen)

Box 30
S-164 93 Kista
Isafjordsgatan 7
Tel: (08) 752 58 00
Fax: (08) 751 97 15

Taiwan
Texas Instruments Supply Company Taiwan Branch

(Call Hong Kong)

United Kingdom
Texas Instruments Ltd.

Manton Lane,
Bedford, England MK41 7PA
Tel: (0234) 270111
Fax: (0234) 223572

United States of America
Texas Instruments Incorporated

5701 Airport Road
Temple, Texas 76502
U.S.A.
Tel: 817-771-5856